Low HIV testing rates among people with a sexually transmissible infection diagnosis in remote Aboriginal communities

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The known Sexually transmissible infection (STI) guidelines recommend full STI screening, including testing for HIV and syphilis, for people diagnosed with any STI.

The new Analysis of clinical data for 2010–2014 from 65 remote Aboriginal communities indicated that about one-third of people with positive test results for chlamydia, gonorrhoea or trichomoniasis were tested for HIV within 30 days of the STI test, as were about one-half of those tested for syphilis.

The implications Adhering to HIV and syphilis screening recommendations is clearly an area for improvement in the delivery of sexual health services to remote communities.

Abstract

Objective: To determine the rates of HIV testing among people who had received positive test results for chlamydia, gonorrhoea and trichomoniasis, or who had been tested for syphilis.

Design, setting and participants: Pathology data for the period January 2010 – December 2014 from 65 remote Aboriginal communities participating in the STRIVE trial of sexually transmissible infection (STI) control were analysed.

Main outcome measures: Rates of HIV testing within 30 and 90 days of an STI test (for chlamydia, gonorrhoea or trichomoniasis), the result of which was positive, and within 30 days of a test for syphilis; factors independently associated with concurrent HIV testing.

Results: 31.8% of 15 260 positive STI test results were linked with an HIV test within 30 days of the test (including 5.6% not on the same day), and 34.8% within 90 days; 44.1% were linked with syphilis testing within 30 days. 53.4% of all those tested for syphilis were also tested for HIV within 30 days. Multivariate analysis found that HIV testing was more likely for men, in geographical regions 3 and 4, in association with positive STI test results during 2012, 2013 or 2014 (*v* 2010), and in association with positive test results for gonorrhoea or chlamydia. Similar associations with these factors were found for syphilis testing.

Conclusions: A significant challenge in Aboriginal health is avoiding an increase in the number of HIV infections. One critical intervention in this regard is timely and appropriate testing. Adhering to screening recommendations is clearly an aspect of the delivery of sexual health services to remote communities that can be improved in striving to achieve this aim.

A significant challenge in Aboriginal and Torres Strait Islander health is averting a major outbreak of human immunodeficiency virus infection (HIV) as has occurred in indigenous populations in other countries.[1,2] Although the number of HIV diagnoses among Aboriginal people has been relatively stable over the past 20 years, there are now early warning signs of an increase. The number of cases is small, but standardised population rates of HIV diagnoses in Indigenous and non-Indigenous Australians have diverged over the past 5 years: the population rate is now almost twice as high for Aboriginal as for Australian-born non-Indigenous people (5.9 per 100 000 *v* 3.7 per 100 000 population). In addition, there are differences in the way HIV is transmitted in the two populations: a higher proportion of infections among Aboriginal people are attributed to injecting drug use (16% *v* 3%) or heterosexual sex (20% *v* 13%), and the proportion of female patients is higher (22% *v* 5%) than among non-Indigenous Australians.[3]

There are several risk factors for HIV, including social, psychological and individual aspects. However, of particular significance for the Aboriginal population are the higher endemic rates of sexually transmissible infections (STIs) such as chlamydia, gonorrhoea and trichomoniasis,[4,5] as well as an ongoing outbreak of syphilis (almost 1000 cases across northern and remote Australia),[6] all of which increase the risk of HIV transmission.[7]

One of the critical factors for preventing HIV in any population is timely, targeted and appropriate testing. In Australia, HIV and STI care guidelines include specific recommendations for Aboriginal and Torres Strait Islander populations,[8,9] including testing for an undiagnosed HIV infection when another STI is diagnosed. Timely testing and diagnosis can prevent the spread of HIV, as people may reduce their sexual risk behaviour once they are aware of their positive status.[10] Further, early detection can facilitate early treatment, and the risk of transmission remains extremely low if individuals can sustain an undetectable HIV viral load by adhering to highly active anti-retroviral treatments.[11,12]

Despite awareness for more than two decades of the very high notification rates of chlamydia, gonorrhoea, trichomoniasis and syphilis in many remote communities, there is a gap in our knowledge about the extent of HIV testing, including concurrent testing with other STI diagnostic testing. We report here on an analysis of clinical and laboratory records from 65 remote Aboriginal communities participating in the randomised, controlled community trial, STRIVE (STI in remote communities: improved and enhanced primary health care).[13] The communities are located in four regions (two in the Northern Territory, one in northern Western Australia and one in Far North Queensland; anonymised in our reported results), and the approximate combined community population of people aged 16–34 years was 28 000 according to Australian Bureau of Statistics data. The trial examined whether a sexual health quality improvement program could increase STI testing to a level sufficient to reduce the

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community prevalence of STIs. Our aim was to determine the level of concurrent HIV testing of individuals who had received positive results for chlamydia, gonorrhoea or trichomoniasis, and of concurrent HIV testing of people tested for syphilis.

Methods

The STRIVE trial collected de-identified data from pathology laboratories for the period January 2010 – December 2014. The primary outcome of our study was the rate of concurrent HIV testing (same day testing, or within 30 or 90 days of the diagnostic test for chlamydia, gonorrhoea or trichomoniasis) of people who tested positive for any of these three STIs. HIV testing referred to any HIV screening test conducted by the laboratory; no HIV rapid tests were used by the participating health services.

The unit of analysis was the episode of STI testing (tests for any of the three STIs on the same date). All episodes of STI testing that resulted in a positive result for any of the three STIs were included in the denominator for calculating the HIV testing rate. We focused on chlamydia, gonorrhoea and trichomoniasis because urine or a swab is collected when testing for these STIs, but not blood (which is needed for HIV testing). We selected 30 days as the cut-off point because most people would return for STI treatment within this period, and there would be an opportunity to collect blood for HIV testing if it had not been collected at the initial consultation. We separately analysed the period 1–30 days (ie, excluding same day HIV testing) and testing within 90 days.

Secondary outcomes were the rate of concurrent syphilis testing (within 30 days of a positive STI test), and the rate of HIV testing (on the same day and within 30 days of the syphilis test) among people tested for syphilis (regardless of the test result), as syphilis testing requires collecting blood, thereby making HIV testing more convenient. We analysed syphilis separately from the other three STIs because it was difficult to distinguish between latent and infectious syphilis cases on the basis of the datasets to which we had access; for latent cases, the decision as to whether an HIV test should be ordered would be determined by the clinician.

We used multivariate logistic regression to determine factors independently associated with HIV testing and syphilis testing within 30 days of an STI test with a positive result. Age group, sex, year, geographic region, and year of the positive test were included in the model. We examined models adjusted for clustering by patient, clinic, and region, and also a model with a patient random effect, as it accounted for most variation; this final

1 HIV testing of people aged 16–34 years attending 65 remote primary health care services within 30 days of a sexually transmissible infection (STI)* diagnostic test for which the result was positive, 2010–2014

		Testing within 30 days of the STI test (including same day)		Testing within 30 days of the STI test (excluding same day)	
	Any positive STI test†	HIV	Syphilis	HIV	Syphilis
Total	15 260	4858 (31.8%)	6727 (44.1%)	854 (5.6%)	1099 (7.2%)
Sex‡					
Men	4190	2035 (48.6%)	2355 (56.2%)	208 (5.0%)	209 (5.0%)
Women	11 055	2815 (25.5%)	4361 (39.4%)	646 (5.8%)	889 (8.0%)
Age group (years)					
16–19	3924	1305 (33.3%)	1761 (44.9%)	259 (6.6%)	302 (7.7%)
20–24	3827	1282 (33.5%)	1777 (46.4%)	233 (6.1%)	300 (7.8%)
25–29	2486	819 (33.0%)	1106 (44.5%)	119 (4.8%)	171 (6.9%)
30–34	1597	498 (31.2%)	686 (42.9%)	83 (5.2%)	112 (7.0%)
≥ 35	3416	954 (27.9%)	1397 (40.9%)	163 (4.8%)	214 (6.3%)
Region					
1	4320	1314 (30.4%)	1528 (35.4%)	121 (2.8%)	161 (3.7%)
2	7670	2269 (29.6%)	3639 (47.4%)	435 (5.7%)	633 (8.3%)
3	1087	437 (40.2%)	620 (57.0%)	131 (12.1%)	105 (9.7%)
4	2183	838 (38.4%)	940 (43.1%)	170 (7.8%)	200 (9.2%)
Year					
2010	2658	765 (28.8%)	1095 (41.2%)	167 (6.3%)	193 (7.3%)
2011	2994	907 (30.3%)	1389 (46.4%)	196 (6.5%)	253 (8.5%)
2012	3044	935 (30.7%)	1372 (45.1%)	175 (5.7%)	220 (7.2%)
2013	3133	990 (31.6%)	1347 (43.0%)	138 (4.4%)	205 (6.5%)
2014	3425	1261 (36.8%)	1524 (44.5%)	181 (5.3%)	228 (6.7%)
Type of infection					
Chlamydia	5015	1883 (37.5%)	2439 (48.6%)	361 (7.2%)	396 (7.9%)
Gonorrhoea	4546	1787 (39.3%)	2101 (46.2%)	279 (6.1%)	342 (7.5%)
Trichomoniasis	8954	2360 (26.4%)	3703 (41.4%)	437 (4.9%)	638 (7.1%)

*Chlamydia, gonorrhoea or trichomoniasis. †Missing values not included. ‡Data missing for 15 people. ◆

version is reported in this article. All analyses were conducted in Stata 14 (StataCorp).

Ethics approval

The STRIVE trial was approved by the Central Australian Human Research Ethics Committee (HREC) (reference, 2009.11.03), the HREC of the NT Department of Health and Families and the Menzies School of Health Research (reference, 09/98), the University of New South Wales HREC (B) (reference, HREC 10112), the WA Aboriginal Health Information and Ethics Committee (reference, 267-11/09), the WA Country Health Service Board Research Ethics Committee (reference, 2010: 04), and the Cairns and Hinterland, Cape York, Torres Strait and Northern Peninsula HREC (reference, HREC/09/QCH/122). Participating health services signed a site participation agreement before commencing involvement in STRIVE.

Results

During the 2010–2014 study period, there were 15 260 positive test results for STIs (chlamydia, gonorrhoea or trichomoniasis), including 4190 in men and 11 055 in women; there were 5015 positive chlamydia, 4546 positive gonorrhoea and 8954 positive trichomoniasis test results. Of the 15 260 positive test results, 31.8% were associated with an HIV test within 30 days, including 5.6% between 1 and 30 days (ie, excluding same day testing) (Box 1); 34.8% were associated with an HIV test within 90 days (data not shown). When analysed by geographical region, the proportion of people with a positive STI test who had an HIV test within 30 days ranged between 29.6% and 40.2%. Of all people tested for syphilis (regardless of the test result), 53.4% were also tested for HIV within 30 days (Box 2). Further, 44.1% of those who received a positive STI test result were tested for syphilis within 30 days of the STI test (Box 1).

Multivariate analysis found that HIV testing within 30 days of a positive STI test was more likely for men, in geographical regions 3 and 4 (*v* region 1; and less likely in region 2), and in association with positive STI test results during 2012, 2013 or 2014 (*v* 2010) or with positive STI tests for gonorrhoea or chlamydia (*v* other two STIs combined). Similar associations pertained to syphilis testing within 30 days of an STI test with a positive result (Box 3).

2 HIV testing of people aged 16–34 years attending 65 remote primary health care services within 30 days of a test for syphilis, 2010–2014

	Syphilis test*	HIV testing within 30 days (including same day)
Total	46 744	24 961 (53.4%)
Sex		
Men	19 718	11 743 (59.6%)
Women	26 961	13 192 (48.9%)
Age group (years)		
16–19	6481	3640 (56.2%)
20–24	9306	5114 (55.0%)
25–29	8095	4512 (55.7%)
30–34	6295	3474 (55.2%)
≥ 35	16 553	8220 (49.7%)
Region		
1	8221	4765 (58.0%)
2	27 533	13 369 (48.6%)
3	4978	2124 (42.7%)
4	6012	4703 (78.2%)
Year		
2010	7576	2765 (36.5%)
2011	9546	3802 (39.8%)
2012	9812	5228 (53.3%)
2013	9559	6043 (63.2%)
2014	10 241	7123 (69.6%)

* Missing values not included. ◆

Discussion

We found a low rate of HIV testing within 30 days of an STI diagnostic test with a positive result in remote communities with persistently high rates of curable STIs. About one-third of all people with positive STI test results were tested for HIV within 30 days, irrespective of age group. The rate was significantly higher in men, which may reflect more full STI screens being undertaken in men presenting with symptoms or risk behaviour. There was a slightly higher rate of HIV testing when blood for syphilis testing was collected, but it was still less than optimal according to current clinical recommendations. Most HIV testing occurred on the same day as other STI testing (94%), suggesting that full STI screens were being undertaken.

The rate of HIV testing within 30 days of the STI test varied somewhat between health services in different geographical regions, but did not exceed 40.2% in any region. The low rate of HIV testing we observed is not confined to communities in northern Australia. Preliminary data from a study of four Aboriginal primary health care services in urban and regional areas of New South Wales also indicate that the rate of HIV testing associated with a positive STI diagnosis was low (42%), and, similar to what we found, most tests (82%) were conducted on the same day as the other STI test.[14]

We found that the rate of HIV testing within 30 days of an STI test with a positive result increased across the STRIVE study period; a formal analysis is evaluating whether this difference can be attributed to the intervention.

The strengths of our study include the large dataset, comprising data for patients with an STI diagnosis from 65 remote communities across the NT, WA and Queensland. In addition, capture of records of STI testing was complete, as each community participating in STRIVE has only one clinical service provider and used one of three pathology laboratories that provided data on all testing undertaken during the study period. A limitation is that we only had access to information for those who consented to HIV testing; it is therefore possible that some individuals were offered testing but declined. We did not collate the results of HIV testing in the study, and it is possible that some patients known to be HIV-positive were included in the study, who would therefore not have required HIV testing. However, this would only account for a very small number of people, given the low rate of HIV-positivity in remote health services.

HIV testing is important at the patient level and from a public health perspective, ensuring that people with HIV are identified quickly in order to reduce transmission by individuals who may not know their status, to enable rapid contact tracing, an efficient strategy for identifying undiagnosed infections,[15] and so that patients with HIV can start treatment as early as possible.

3 Multivariate model of HIV and syphilis testing within 30 days of a sexually transmissible infection (STI)* diagnostic test for which the result was positive (including same day as initial test)†

	HIV test within 30 days			Syphilis test within 30 days		
	Odds ratio	95% CI	*P*	Odds ratio	95% CI	*P*
Sex						
Women	1			1.00		
Men	2.67	2.43–2.92	< 0.01	2.12	1.95–2.31	< 0.01
Age group (years)						
16–19	1			1.00		
20–24	1.07	0.96–1.19	0.23	1.08	0.98–1.20	0.11
25–29	1.08	0.96–1.22	0.20	1.03	0.92–1.15	0.61
30–34	1.06	0.92–1.23	0.42	0.99	0.87–1.13	0.94
≥ 35	0.93	0.82–1.05	0.22	0.87	0.78–0.97	0.01
Region						
1	1			1.00		
2	0.87	0.79–0.95	< 0.01	0.52	0.50–0.57	< 0.01
3	1.52	1.30–1.77	< 0.01	1.43	1.24–1.66	< 0.01
4	1.28	1.14–1.44	< 0.01	0.74	0.67–0.83	< 0.01
Year						
2010	1			1.00		
2011	1.10	0.97–1.25	0.13	1.30	1.16–1.45	< 0.01
2012	1.14	1.01–1.30	0.04	1.25	1.12–1.40	< 0.01
2013	1.24	1.09–1.40	< 0.01	1.17	1.04–1.31	0.01
2014	1.61	1.42–1.82	< 0.01	1.24	1.11–1.39	< 0.01
Type of infection‡						
Chlamydia	1.28	1.10–1.34	< 0.01	1.22	1.11–1.34	< 0.01
Gonorrhoea	1.52	1.16–1.42	< 0.01	1.11	1.01–1.22	0.03
Trichomoniasis	0.87	0.84–1.05	0.24	1.10	0.99–1.21	0.08

*Chlamydia, gonorrhoea or trichomoniasis. †The model was adjusted for individual clustering by including an individual patient random effect. ‡Reference group for each comparison consists of patients with the other two sexually transmissible infections. ◆

Our study identified adherence to HIV screening recommendations as an area in the delivery of sexual health services to remote communities that clearly needs to be improved. Barriers to offering HIV testing in these settings should be investigated. Urgently needed are training and systems that increase awareness of clinical guidelines among clinical staff and support their implementing these guidelines when testing for STIs in remote communities. As nearly 40% of young people in the services we investigated had been diagnosed with at least one of the three STIs,[4] and in view of the current syphilis outbreak, offering a full STI screen is likely to be an efficient way to improve HIV testing rates. Failure to increase HIV testing risks an outbreak that may be difficult to control in remote settings. HIV testing should be a priority, and its uptake should be routinely audited by those managing sexual health programs or remote area clinics.

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