

# **The Tiwi Sexual Health Program**

**2002-2005**

**— A Case Study**

November 2007

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## **Abbreviations**

AIDS Acquired Immune Deficiency Syndrome

CWP Clinical Working Party

DHCS Department of Health and Community Services

HIV Human Immunodeficiency Virus

NT Northern Territory

OATSIH Office of Aboriginal and Torres Strait Islander Health

SG Steering Group

SHBBV Sexual Health and Blood Borne Viruses Unit

STD Sexual Transmitted Disease

STI Sexually Transmissible Infection

THB Tiwi Health Board

CDEP Community Development Employment Project

## **Executive Summary**

At the invitation of Tiwi Health Board (THB), staff of the AIDS/STD Unit conducted a comprehensive situation analysis of sexual health program activity on the Tiwi Islands in June 2000. It found high rates of sexually transmissible infections (STIs), pelvic inflammatory disease (PID) and infertility, deficiencies in the investigation and management of STIs, a lack of consistent sex education in the communities or schools, and poor access to condoms in the community. The THB decided to develop and implement a comprehensive Sexual Health Program (SHP) to address the situation.

A Steering Group (SG) and Clinical Working Party (CWP) consisting of both community members and health service staff were formed to begin development and implementation of the program. Initial non-recurrent funding was secured from the Office of Aboriginal and Torres Strait Islander Health (OATSIH) and used to employ a dedicated Coordinator in February 2002 whose task was to continue this task under the direction of the SG and CWP.

The SHP consisted of community development activities, community and school education, health promotion and condom promotion throughout the community as well as providing better quality and proactive sexual health services at the health centres.

A Young People's Sexual Health Screening was conducted in 2004 and 2005, which targeted people aged 15 to 30 years. A range of advertising campaign and community education activities were conducted in the months prior to the actual screening in a four-week period in September and October. Vigorous treatment and contact tracing followed the screen.

As a result of a change to the position description of the program coordinator, the original Coordinator left the program in February 2006. Due to a range of circumstances, this position was not able to be recruited to for over a year.

## **Methods**

The history of the development of the program was analysed by reviewing relevant documents provided by the Tiwi Health Services.

Notification data and laboratory testing data were collected and analysed with a view to describe and better understand the nature of changes in the incidence of STIs. Comparisons were made with similar data from the Darwin and Katherine rural regions.

In order to obtain a more in-depth understanding of the contents of the program, and how and why it work, qualitative inquiry methods were also used. Semi-structured interviews with the Coordinator and staff involved in the program were conducted to explore Tiwi people's perceptions of the program and staff views on its strengths and weaknesses.

## **Key findings**

After a significant increase in rates of STIs in the Tiwi Islands in the first year of the program, there was a significant reduction in rates. The notification rates of chlamydia, gonorrhoea and syphilis decreased by 95%, 60% and 89%, respectively, between 2002 and 2005. There was no concurrent similar decreasing trend in STIs in the neighbouring Darwin or Katherine Rural Districts.

This reduction in the Tiwi islands occurred despite a significant and sustained increase in the number of STI tests being performed and the number of individuals being tested. A very high proportion of those tested were in the 15-34 year age group, within which over 80% of all STIs occur in the NT. In 2006, without a dedicated coordinator driving in the program, the number of STI tests performed dropped by 40% and the notification rate of chlamydia showed an increase.

Taken together these pieces of evidence suggest that the reduction in STI rates in the Tiwi Islands was not the result of reduced testing nor part of a broader secular trend. It seems likely to have been the result of the program being successfully implemented.

The reasons why the program worked identified during the interviews with staff include the following:

- Having a dedicated Coordinator driving the program who had skills in health promotion and community development and who was not involved in day to day clinic work but with a sole focus on sexual health.
- Being a community-owned and community-driven program and it therefore enjoyed a high level of support and participation by local people and organisations.
- Increased and sustained opportunistic STI testing.
- Greatly increased distribution of condoms in both numbers and distribution points and demand for condoms by community members.
- Culturally appropriate school sex education after overcoming initial reservations from within the local religious schools.
- Other strengths about the program identified by the staff included:
- Receiving expert support from the AIDS/STD Unit (now known as Sexual Health and Blood Borne Viruses Unit, SHBBVU).
- Adopting a bottom-up approach to develop the program in a way informed by Tiwi people and clinic staff.
- Having a strong and sustained focus on health promotion and community education.
- The Young People's Sexual Health Screen conducted in the fourth and fifth year of the program were thought to be very successful. The participation rate in the targeted age group of 15-30 year olds was 85%. The information, consultation and education phase leading up to the screen was very effective in raising awareness of sexual health issues and in promoting participation in the screen.

The weaknesses of the program as perceived by the staff included having only a female coordinator on the program (thus she often needed to ask male staff to help with her community work), non-recurrent funding and consequent lack of security of tenure, and, varied management support.

### **Recommendations:**

- That the model of a comprehensive sexual health program with a dedicated program coordinator be recognised as an effective means to reduce rates of STIs and that it be further implemented both in the Tiwi Islands and other similar regions.
- To re-establish the two guiding bodies to work with the program, i.e. the Steering Group and the Clinical Working Party.
- To continue the original focus of the program, i.e. community development, health promotion and school education in conjunction with high quality sexual health care and proactive promotion of testing for STIs.
- That the SHBBVU continue to provide technical and logistic support.

- To make the Young People Sexual Health Screen an annual event until there is evidence of sustained low STI prevalence.
- The Tiwi Health Services to provide ample management support and security of tenure for the program coordinator.
- To work in partnership with the NT-wide initiatives on child sexual abuse by the Government.
- To improve the current system for keeping corporate files and storing data, ensuring that important program documents are properly archived in hard copy and health-related data are securely stored.
- To include program evaluation as a regular component of the program.
- To explore the possibilities of further research in sexual health in order to achieve a better understanding of the current situation (e.g. a rigorous study on the situation of infertility and PID) and the real needs of Tiwi people with a view to translating the findings into policy and practice.

## Introduction

The notification rates of notifiable bacterial sexually transmissible infections (STIs, including gonorrhoea, chlamydia and syphilis) in the Northern Territory (NT) have been by far the highest among all States and Territories in Australia and have been consistently rising in the recent decade<sup>1</sup>. However, the disease burden of these STIs is not evenly distributed among subpopulations or across administrative districts and it has been reported that the STI rates are substantially higher in rural and remote Indigenous communities than in the general NT population<sup>2-5</sup>. Inadequate access to and under-utilisation of diagnostic and treatment services<sup>6,7</sup>, and substance abuse<sup>8</sup>, in addition to a range of determinants of ill health of Aboriginal people (such as dispossession, unemployment and their sequelae)<sup>3</sup>, have been implicated as major contributing factors.

In response to such high and rising STI rates, an enormous amount of resources and program activities have been dedicated to tackling this serious public health issue over the years. Among these, it has been noted that the Sexual Health Program (abbreviated as SHP henceforth) implemented on the Tiwi Islands from 2002 to 2005 had successfully resulted in a dramatic reduction of STI rates.

In this case study we seek to evaluate the program by assessing its approaches, program activities and outcomes. The objectives are to document a successful example of delivering sexual health services to remote Indigenous communities with high STI rates, and to analyse the reasons for its success. It is hoped that the experience from the Tiwi Islands can provide useful information for the sexual health programs implemented in other similar settings.

## Background

The Tiwi Islands are situated about 80 kilometres north of Darwin in the Arafura Sea consisting of two major islands: Bathurst Island and Melville Island. There are three major Aboriginal communities on these islands, namely Nguiu (on Bathurst Island, the biggest communities among the three), Pirlangimpi and Milikapiti (on Melville Island) with a total population of 2512 people (estimated resident population for 2006). They are part of the Darwin Rural District of the NT DHCS.

Against the backdrop of high and rising STI rates in the NT, in 2000, the Territory Health Services (through the then AIDS/STD Unit, which is now named Sexual Health and Blood Borne Viruses Unit, SHBBVU) invited the Tiwi Health Board (THB, an Aboriginal-controlled health service responsible for delivering healthcare to all Tiwi communities) to be part of the new STD/HIV Strategy for the Darwin Remote region. As part of this process, the AIDS/STD Unit was invited by the THB to conduct a comprehensive STD/HIV situation analysis in order to inform future program development. This analysis examined levels of STIs, standards of investigation, treatment and follow-up of persons with STIs and the availability and quality of preventive programs on the Tiwi Islands. The methodologies employed consisted of casenote auditing on STI investigation and management as well as history of pelvic inflammatory disease (PID) and infertility; assessment of condom availability and possibilities of ongoing community education and health promotion strategies; and consultation with clinic staff in relation to current and potential program activities as well as barriers and support needed.

This unpublished STD/HIV situation analysis report<sup>9</sup> revealed some disturbing findings in relation to sexual health, including:

- High rates of STIs (3-10 times higher than the rates for the rest of the NT)
- High proportion of women (47%) having at least one definite episode of an STI

- High proportion of women (28%) ever experiencing pelvic inflammatory disease (PID)
- High seroprevalence of syphilis in both men (26%) and women (15%), of whom 15% had no record of adequate treatment.
- High rates of infertility (about 29% of women over the age of 24 years have never had babies)
- 61% of females and 28% of males over the age of 10 years had an STI test in the 12-month audit period.
- Fully appropriate STI testing was only performed in two thirds of clinical situations requiring them.
- Fully appropriate STI treatment was performed in about 90% of situations but in only one quarter of women with a diagnosis of pelvic inflammatory disease.
- No consistent sexual health education in the communities or schools
- Condoms were only available in the health clinics.

Based on these findings, the following recommendations were made in the report:

- Increasing access to condoms in the communities
- Increasing sexual health education programs in the communities and for school children
- Increasing community awareness of PID
- Improving clinical screening and treatment of STIs
- Providing staff education around sexual health issues
- Developing a strategic approach to STI screening
- Developing a management plan for clients in the community diagnosed with HIV

In acknowledgement of the serious STI problems identified in the report, the THB decided to develop a sexual health program to implement the recommendations. A *Clinical Working Party* (CWP) was formed comprised of an Aboriginal Health Worker (AHW) and a nurse from each community, a medical officer, a Tiwi For Life (a community development and health promotion program) representative and a staff member of the AIDS/STD Unit. The CWP's role was to begin addressing some of the issues identified in the situation analysis concerning clinical management, develop protocols on STI screening and treatment, and to advise the SHP on clinical issues. Key documents informing the CWP were "National Indigenous Australians' Sexual Health Strategy 1996-1997 to 1998-1999"<sup>10</sup> and 'STD Control in Remote Aboriginal Communities: a manual for clinic workers'<sup>11</sup>. In addition, a *Steering Group* (SG) was formed consisting of members from each community to provide guidance on the development and the implementation of the program. Arrangements were made for a number of Tiwi people to sit on both the SG and the CWP in order to ensure consistency across the two groups, and also to have clinical representation within the SG, which was made up of non-clinical community members.

An application for funding for the Tiwi SHP was sent to OATSIH for funding under the National Indigenous Sexual Health Strategy. A key component of the application was the employment of a part time (0.8 FTE) program coordinator. Funding for an initial 12 months period only was approved in June 2001. Unfortunately, the THB was experiencing financial difficulties at about this time, which led to disruptions of health services and staff cuts. Because of this delay, the SHP program coordinator did not commence until February 2002. Funding was again sought and gained in June 2002 to continue the newly established program.

The aim of the SHP was for it not to be a solely clinic based program. The role of the program coordinator was developing, organising and managing all the program activities including ongoing community based education and health promotion as well as ensuring the provision of high quality clinical care for STIs and pro-active detection of STIs.

Key elements of the program included:

- A Steering Group and a Clinical Working Party to provide program direction and advice to the coordinator.
- Regular orientation and training for staff.
- A strong focus on opportunistically but systematically offering STI testing to the population.
- Participation in regional, centralised systems to facilitate diagnosis, treatment and follow up of people with STIs and their partners.
- Regular education initiatives with schools and community based organisations.
- Very active condom promotion and distribution in a wide range of locations.
- Regular feedback to health service management and staff to keep them informed and keep the sexual health program on the agenda.
- Strong support from the SHBBV in the provision of specialist public health and clinical expertise and occasional logistic support.
- Community wide intensive sexual health screens targeting 15-30 year olds in 2004 and 2005.

As time progressed a number of improvements in the program became apparent. Clinical management and treatment rates improved and substantially increased numbers of people were being offered STI testing. Regular education activities in a range of community settings, including the schools, were occurring and condoms were available in many locations. The number of condoms distributed on the islands increased dramatically from 3,000 in 2001 to over 12,000 in 2002 and each year subsequently. STI testing (with parental consent) was included as part of the school screening process for those aged 12 years and above.

Unfortunately, in 2003 the THB collapsed and the NT DHCS took over management of the service. This was a time of great turmoil, staff losses and consequent health service program disruption. However, the SHP coordinator was retained and was able to maintain substantial continuity in the program. In February 2006 the coordinator left the program following a change to the position description and duties required in the role. As is unfortunately common in many remote community health services, she was not able to be replaced for over a year.

## Methods:

As the SHP was implemented as a comprehensive program consisting of a wide range of distinctively different components and spanning over a period of four years, we used both qualitative and quantitative methodologies to assess the program with a view to achieving a more in-depth and also comprehensive evaluation.

### Quantitative assessment

This part was conducted first in order to assess the effectiveness of the SHP using objective outcome indicators, i.e. STI statistics. In addition, trend comparison was made between the STI rates of the Tiwi Islands and those of Darwin Rural Balance<sup>1</sup> region and Katherine District as their population structure, community infrastructure and access to services are similar to those of the Tiwi Islands. The purpose of this is to determine whether the changes in STI epidemiology in the Tiwi Islands was unique or merely part of the general trend in the broader region.

The following STI statistics were used in this section:

- Notification data: notification rates.
- STI Testing data: number of tests performed, testing positivity rate
- Screening results: number of tests performed, number of people tested, screening coverage rate, seroprevalence of syphilis.
- Trend analysis on notification rates and positivity rates

In the NT, the epidemiology of STIs is monitored by a passive surveillance system relying on the legally required notifications received from pathology laboratories. It is known that a large proportion of people with STIs either show no symptoms or, even when symptomatic, do not present to a clinic<sup>7 12</sup>. Therefore, many STIs will only be detected if testing is offered to people who have not presented with symptoms: either by opportunistic testing of people who present to clinics for other reasons or by outreach screening activity. Consequently, diagnoses and subsequent notifications of STIs are greatly affected by the amount of testing activity. An increase or decrease in STI notification rates may often reflect a change in the number of people who are tested rather than a change in the transmission of infection. Thus it is known that STI notification data tend to underestimate the real incidence rates<sup>2 3</sup>. In order to better assess the change in STI epidemiology in relation to the program, we included the analysis of testing data in addition to the more usual analysis of notification rates.

Extracts of STI testing data were obtained from the private pathology laboratories servicing the Tiwi Islands exclusively for the period 2001-2006 (Queensland Medical Laboratories for 2001-2002 and Western Diagnostic Pathology for 2003-2006), and STI notification data for the period of 1998-2006 retrieved from the Northern Territory Notifiable Disease Database (NTNDD). Testing results from the community screens of 2004 and 2005 was also extracted from the data provided by the Tiwi Health Services. These were all de-identified data.

The NT population data were provided by the Epidemiology Branch (which were estimates based on the 2001 Census data provided by the Australian Bureau of Statistics). Estimated resident population (ERP) data for the Tiwi Islands were retrieved from the Australian Bureau of Statistics for the Census years (1996, 2001 and 2006). The population for the inter-censal years (1998-2000 and 2002-2005) were then calculated based on these data as described in Appendix 2.

Screening coverage rates were calculated by dividing the number of people tested with the number of people eligible for screening in the targeted age group. A person was defined as

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<sup>1</sup> This is Darwin Rural District excluding the Tiwi Islands.

'eligible' and included in the population lists for screening if they were in the targeted age group and present on the Tiwi Islands any time during the four weeks' period of screening. Given the high mobility of the population and the fact that a proportion of young women were pregnant or had recently given birth (therefore had been tested only recently), the number of eligible people would always be smaller than the figure retrieved from the Tiwi population data mentioned above.

All statistical analyses were carried out using Stata for Windows (StataCorp. 2005. Stata Statistical Software, Release 9.0. College Station, TX, Stata Corp LP). Chi-square test for trend was performed using the *tabrate* (author: David Clayton, MRC Biostatistical Research Unit, Cambridge, Michael Hills, London School of Hygiene and Tropical Medicine, London, UK) and *ptrend* (author: Patrick Royston: MRC Clinical Trials Unit, London, UK) commands where appropriate to assess the trends of the various rates over time.  $P < 0.05$  was considered significant.

## **Qualitative assessment**

The qualitative assessment was conducted to understand the approaches, components, and activities of the program in its various stages, to investigate the reasons for the results found in the quantitative assessment section, to achieve a broader social and cultural understanding of the acceptability, appropriateness and impact of the program, and also to explore the strengths and weaknesses of the program as considered by the staff involved.

Information on the development and implementation of the SHP was collected by reviewing relevant documents provided by the Tiwi Health Services. Further, individual semi-structured interviews were conducted with the Coordinator of the program and the staff of the community health centres who were involved for either all or part of the time. We aimed to interview at least one nurse, one female and one male AHW from each of the three health centres in order to ensure that all three communities were adequately represented.

The interview with the Coordinator was conducted to obtain first-hand information on the detailed steps and measures taken to develop and manage the program and engage various stakeholders and health centre staff in the implementation. In other interviews, a pre-prepared interview schedule (see Appendix I) was used as a guide, but where possible, the interviewees were encouraged to freely express their views and experiences about the program. All interviewees were current or previous public servants involved in the SHP as health professionals, and, after we provided a brief introduction to this case study and the purpose of the interview, all gave their verbal consent to being interviewed.

The interview results were analysed following the method of thematic analysis<sup>13</sup>. Themes from the interview results related to the goals stated above were extracted and organised first, different views on the same theme were compared, and other themes of interest were identified with only those relevant to this study kept. The results were presented under the most relevant themes with typical or remarkable quotes from the interviewees provided where appropriate. Permission was obtained from the Coordinator to identify her responses separately from other staff (whose responses were reported anonymously).

Because this case study was conducted as a routine evaluation of a public health program within the public sector, formal ethical approval was not sought. However, this study was approved by the Tiwi Health Advisory Committee, which is empowered to grant such approval by the Tiwi Islands communities. The Committee considered the cultural, spiritual, physical, emotional and environmental factors in research, and their benefit to the Tiwi Islands communities in granting such approvals. The section of quantitative assessment and the use of cited data, being part of a doctoral thesis by one of the authors (J-Y Su), was approved by the Human Research Ethics Committee of NT Department of Health and Community Services and Menzies School of Health Research.

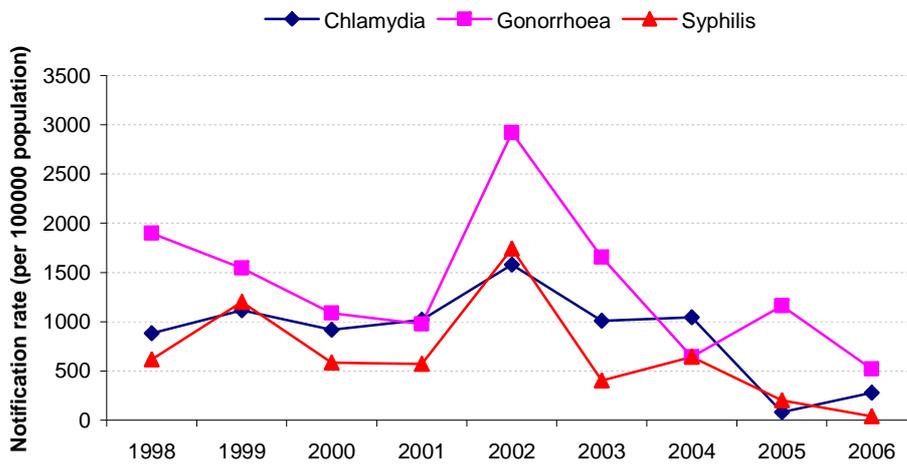
# Results:

## A. Quantitative outcomes

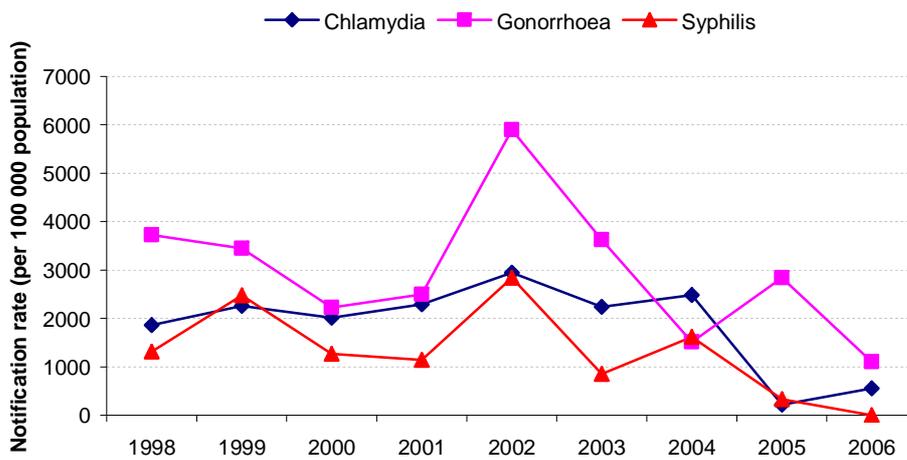
### *Trend of notification rates*

The notification rates of chlamydia, gonorrhoea and syphilis for the Tiwi Islands for the period 1998-2006 are presented in Figure 1. Between 1998 and 2002, the rate of gonorrhoea showed a decreasing trend while the chlamydia rates remained relatively stable over the years. The syphilis rate increased from 1998 to 1999 by 100%, but then dropped back to the 1998 level in the following year and remained about the same in 2001.

**Figure 1: Notification rates of STIs, Tiwi Islands, 1998-2006**



**Figure 2: Notification rates of STIs for those aged 15-34 years, Tiwi Islands, 1998-2006**



In 2002, the year in which the SHP commenced, there was a sharp increase in the rates of all three STIs: the rate of gonorrhoea increased by about 200%, chlamydia by 55% and syphilis also by about 200%. This was believed to be mostly due to a sharp increase in the number of STI tests performed as will be shown below. However, all these rates dropped sharply in the next year. The rate of gonorrhoea showed a further decrease in 2004 (642.8 per 100000) but rebounded to 1159.7 per 100000 in 2005. The rates of chlamydia and syphilis also showed a decreasing trend during the period of 2002-2005, although there was

a small increase in 2004 in both. In sum, between 2002 and 2005, the notification rates of chlamydia, gonorrhoea and syphilis for the Tiwi Islands decreased by 95%, 60% and 89%, respectively.

In 2006, the gonorrhoea rate dropped to 517.5 per 100000, and the syphilis rate also decreased; but the chlamydia rate showed a 3.5-fold increase (from 80.0 per 100000 to 278.7 per 100000).

Figure 2 presents the same data for the 15-34 year age group. The patterns and trends are almost identical to those presented in Figure 1 but the rates are about twice as high. This is consistent with the fact that over 70% of all notifications of these STIs were from this age group during the period 1998-2006. Because this age group includes the age group targeted by the SHP and the community screens (15-30 years), contains the bulk of the disease burden and therefore represents the most at-risk subpopulation, all the following analyses will focus on this age group unless otherwise mentioned. The choice of the range of 15-34 years instead of 15-30 was due to the lack of population data for 15-30 years age group and also because the 30-34 year age group contained a considerable disease burden.

We performed chi-square test for trends on the notification rates for all ages and for the 15-34 year age group, and found that the decreasing trends for the three STIs in the period 2002-2005 were all statistically significant (see Table 1 and Table 2).

**Table 1: STI notification rates (per 100 000 population) with trend analysis results, Tiwi Islands, 2002-2005**

<b>Disease</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>p (Chi-square for trend)</b>
Chlamydia	1581.3	1009.0	1044.5	80.0	<0.0005
Gonorrhoea	2919.2	1654.7	642.8	1159.7	<0.0005
Syphilis	1743.4	403.6	642.8	200.0	<0.0005

**Table 2: STI notification rates (per 100 000 population) with trend analysis results, 15-34 year age group, Tiwi Islands, 2002-2005**

<b>Disease</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>p (Chi-square for trend)</b>
Chlamydia	2948.0	2237.4	2480.1	218.3	<0.0005
Gonorrhoea	5896.0	3622.4	1509.6	2837.8	<0.0005
Syphilis	2842.7	852.3	1617.4	327.4	<0.0005

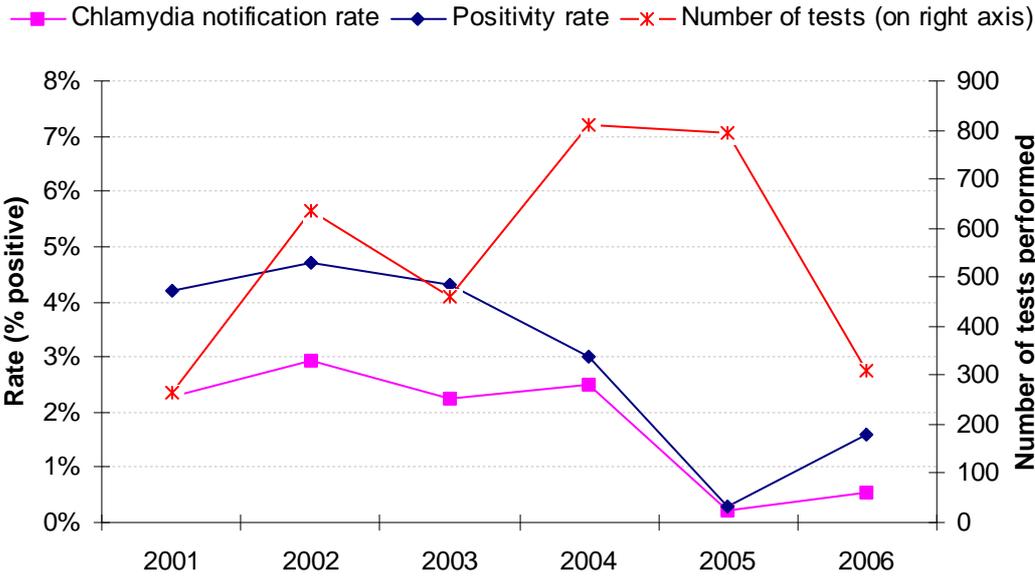
***Trend of testing data:***

Only the testing data for chlamydia and gonorrhoea were analysed in this section as the diagnosis of these two diseases is based on a single diagnostic test result. The diagnosis of syphilis requires more information than a single test result.

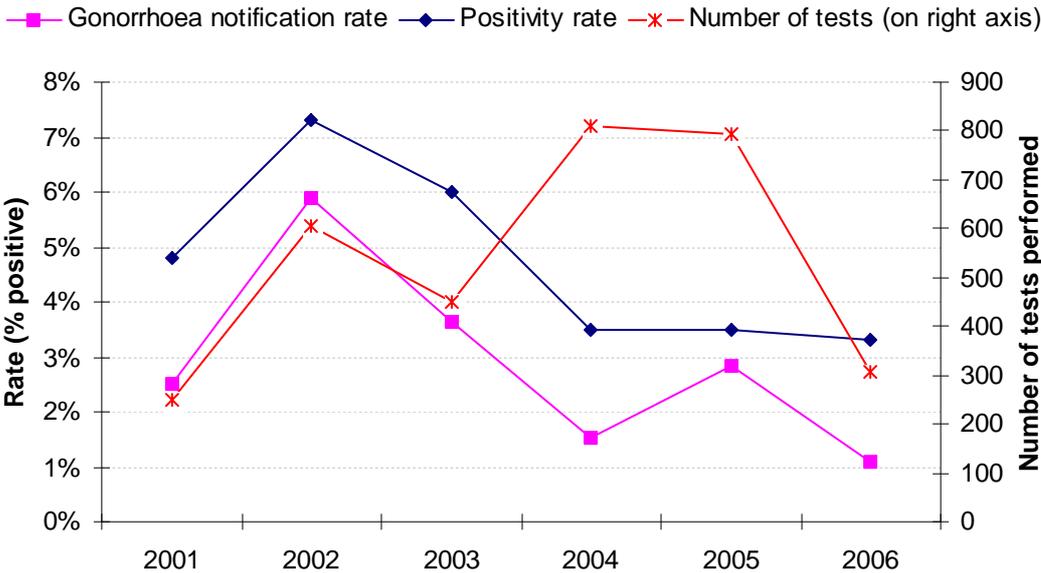
As presented in Figure 3, the notification rate for chlamydia in the 15-34 year age group was 2.3% (or, 2289.3 per 100000, expressed in percentage here for convenient comparison, with the positivity rates to be discussed below) in 2001, and increased to 2.9% in 2002, but since then followed a decreasing trend to reach 0.2% in 2005. During the same period, the annual number of nucleic acid tests for chlamydia increased sharply from 264 in 2001 (before the SHP started) to 636 tests in 2002, which represents a 2.4-fold increase in testing amount in the first year of the implementation of the SHP. It decreased slightly in 2003, but then increased again in 2004 and remained at about the same level in 2005 (a great proportion of these increases was due to the community screens undertaken in 2004 and 2005). The termination of the SHP at the end of 2005 has seen this number dropped by 40% and a small increase in notification rate in 2006.

Furthermore, the testing positivity rate (i.e. the proportion of tests showing positive results, calculated by dividing the number of tests with positive result by the total number of tests done) showed a decreasing trend between 2002 and 2005, decreasing from 4.7% in 2002 down to 0.3% in 2005 (chi-square for trend,  $p < 0.00005$ , see Table 3). After the termination of the program, it increased to 1.6% in 2006.

**Figure 3: Notification rate, testing positivity rate and number of tests for chlamydia in the 15-34 year age group, Tiwi Islands, 2001-2006**



**Figure 4: Notification rate, testing positivity rate and number of tests for gonorrhoea in the 15-34 year age group, Tiwi Islands, 2001-2006**



The pattern and trends for gonorrhoea were slightly different (see Figure 4). The notification rate increased dramatically in 2002 when the SHP commenced, but then decreased rapidly in 2003 and 2004. It increased in 2005 (from 1.5% in 2004 to 2.8% in 2005) and dropped again in 2006 (1.1%). The number of nucleic acid tests for gonorrhoea generally followed the

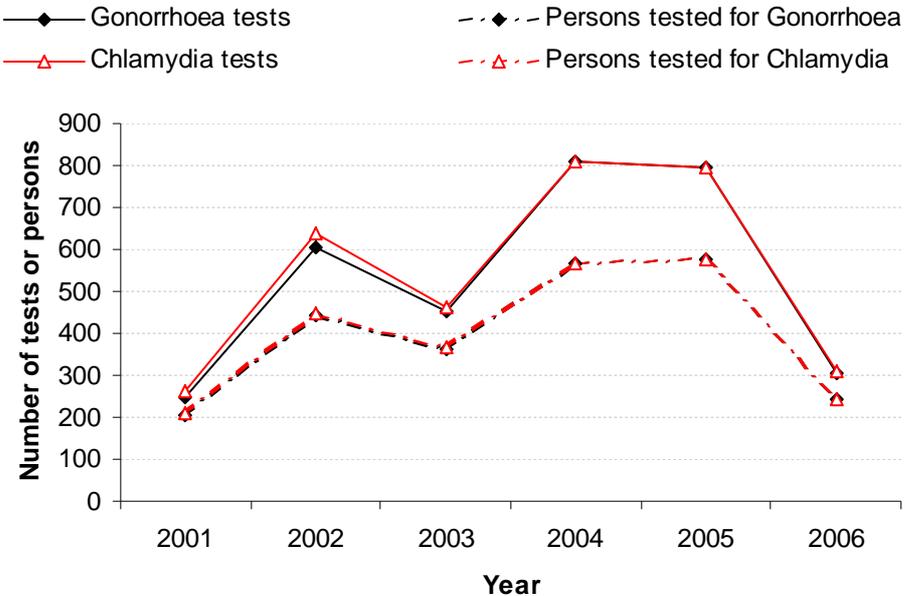
same pattern as that for chlamydia. Between 2002 and 2005, the positivity rate showed a decreasing trend (chi-square for trend,  $p=0.0002$ , see Table 3), and then remained about the same level in 2006 (3.3%).

**Table 3: Testing positivity rates for chlamydia and gonorrhoea with trend analysis results, 15-34 year age group, Tiwi Islands, 2002-2005**

Disease	2002	2003	2004	2005	p (Chi-square for trend)
Chlamydia	4.7%	4.3%	3.0%	0.3%	<0.00005
Gonorrhoea	7.3%	6.0%	3.5%	3.5%	0.0002

As a person could be tested multiple times in a year, we also examined the number of individuals tested. We presumed that all entries of the same combination of gender, date of birth and community (the only demographic data available in the de-identified testing data) were from the same individual. This method provides an underestimate of the total number of individuals tested as it is not possible to distinguish different individuals with the same date of birth or the same individual being tested on more than one occasion. Like the number of tests, the number of individual persons tested per year had increased after the program started in 2002, and maintained at a high level from 2002 to 2005; it dropped substantially in 2006 (see Figure 5).

**Figure 5: Number of tests and number of persons tested for chlamydia and gonorrhoea with trend analysis results, 15-34 year age group, Tiwi Islands, 2001-2006**



It is worth noting that, for both chlamydia and gonorrhoea, the increase in testing numbers happened at the same time when both the notification rate and testing positivity rate were decreasing (both statistically significant). It is not possible to determine the actual number of people tested per year as the testing data are de-identified and it is not unusual for more than one persons in the same community to share the same sex and date of birth (these are the only three demographic variables available in the testing data sets).

However, comparing the greater than 800 gonorrhoea and chlamydia tests performed in both 2004 and 2005 with the population of 15-34 year olds (776 in 2004), and considering the fact that screening coverage rates were above 80% in both years (described in the Coordinator’s screening reports and also verified with the screening datasets, see below), all the above-

mentioned trend data strongly suggest that there was a decrease in chlamydia incidence and prevalence between 2002 and 2005.

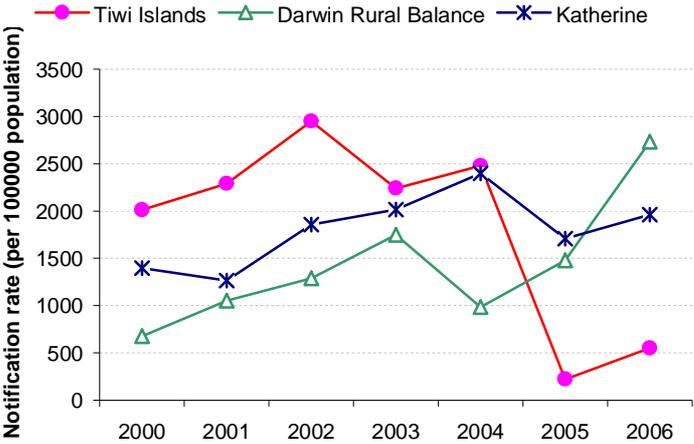
**Comparison of notification rates with nearby comparable regions:**

With the decreasing trends in STI rates in the Tiwi Islands during the period 2002-2005 established in the analyses above, we further compared the trends of STI rates of the Tiwi Islands with those of its neighbouring comparable regions, i.e. the Darwin Rural Balance region (which is the Darwin Rural District minus the Tiwi Islands) and Katherine District.

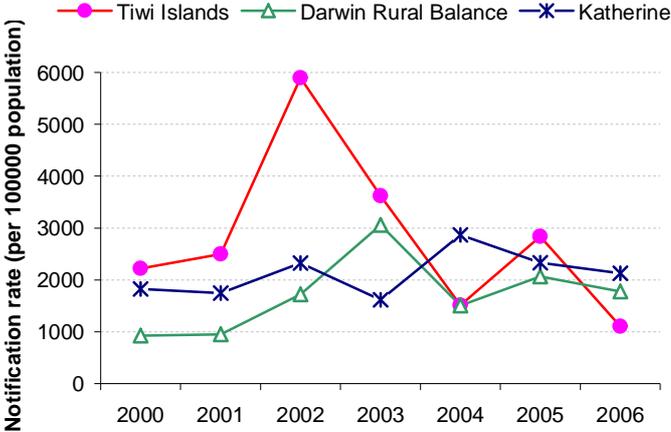
As presented in Figure 6 and Figure 7, in contrast to the quite remarkable decreasing trends for the Tiwi Islands between 2002 and 2005, the rates of gonorrhoea and chlamydia for both the Darwin Rural Balance region and Katherine District showed no significant trends (chi-square for trend,  $p > 0.1$  for both chlamydia and gonorrhoea for both regions). Although the syphilis rates for both regions showed a significant decreasing trend (chi-square for trend,  $p < 0.05$  for both regions), the decrease in rates was not as substantial as that for the Tiwi Islands (see Figure 8).

Furthermore, the notification rates for the three STIs for the Tiwi Islands were two to three times as high as the corresponding rates for the Darwin Rural Balance region in 2001 before the program started and with a low number of tests done. The difference in rates became greater in 2002, which was mostly due to increased testing in the Tiwi Islands. However, in 2005 the chlamydia rate for the Tiwi Islands was less than one sixth of the rate for Darwin Rural Balance region, representing a remarkable 15-fold change in rate ratio over 4 years (between 2002 and 2005). While the Tiwi rates for gonorrhoea and syphilis were still higher in 2005, considering that these were the results of over 80% of the residents aged 15-34 years tested (see below), it is reasonable to believe that the actual incidence and prevalence of the Tiwi Islands was close to those for the balance of Darwin Rural District, if not lower.

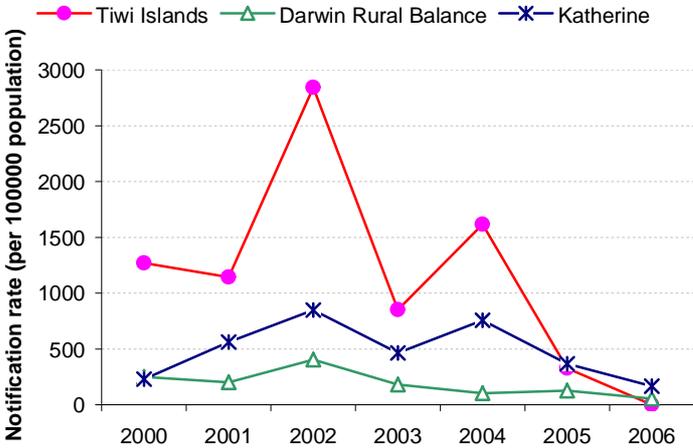
**Figure 6: Chlamydia notification rate for those aged 15-34 years, the Tiwi Islands and the Darwin Rural Balance Region and Katherine District, 2000-2006**



**Figure 7: Gonorrhoea notification rate for those aged 15-34 years, the Tiwi Islands and the Darwin Rural Balance Region and Katherine District, 2000-2006**



**Figure 8: Syphilis notification rate for those aged 15-34 years, the Tiwi Islands and the Darwin Rural Balance Region and Katherine District, 2000-2006**



In conclusion, it is unlikely that the decreasing trends of STI rates observed in the Tiwi Islands during the period 2002-2005 were part of the general trend of the broader regions such as Darwin Rural District or Katherine District. The STI rates for the Tiwi Islands were much higher than those for the Darwin Rural Balance region and Katherine District in 2002, but had improved significantly to be either close to or lower than the corresponding rates for these two regions at the end of the program in 2005.

***The Young People Sexual Health Screen, 2004 and 2005***

These community-wide screens were conducted In September-October of 2004 and 2005 over a period of four weeks. The target age group was 15-30 year olds, but persons of any age could participate if they wished. The demographic data and the screen results from these two screens are summarised in Table 4.

In 2004 and 2005, a total of 533 and 513 people aged 15-30 years were tested, giving a screening coverage rate of 84.9% and 82.1% respectively, which far exceeded the target of 70% originally set by the program. The prevalence rates of both gonorrhoea and chlamydia were substantially lower than expected (for example, compared with the 2003 figures in Figure 2). While the rates for the two infections went in different directions in the second year (the gonorrhoea rate increased by about 200% but the chlamydia rate showed a 70%

decrease), the prevalence of infection with either gonorrhoea or chlamydia remained at a similar level (2.4% in 2004 and 2.6% in 2005).

**Table 4: The demographic data and results of the Tiwi Young People Sexual Health Screen, 2004 & 2005**

	2004			2005		
	Male	Female	Total	Male	Female	Total
Eligible 15-30 year olds for screening	336	292	628	343	282	625
No. screened	286	247	533	270	243	513
% screened	85.1%	84.6%	84.9%	78.7%	86.2%	82.1%
Those screened and <15 years of age	3	1	4	2	9	11
Those screened and >30 years of age	48	14	62	26	19	45
Total screened	337	262	599	286	263	549
% Gonorrhoea +	0.6%	0.8%	0.7%	1.4%	3.1%	2.2%
% Chlamydia +	1.2%	2.4%	1.7%	0.4%	0.8%	0.6%
% + either gonorrhoea or chlamydia	1.8%	3.1%	2.3%	1.7%	3.4%	2.6%
% Trichomonas +	-	-	-	0.0%	11.7%	5.6%
New Syphilis diagnosis	8	3	11	3	1	4
% Syphilis seropositive	23.1%	16.7%	20.3%	20.1%	11.9%	16.2%
No. of gonorrhoea tests	324	250	574	283	258	541
No. of chlamydia tests	324	250	574	281	258	539
No. of trichomonas tests				279	256	535
No. of syphilis RPR tests	77	43	120	50	27	77
No. of syphilis EIA tests	334	258	592	255	244	499
No. of people tested for syphilis	334	258	592	283	261	544
No. of people tested for HIV	334	257	591	283	261	544

# One female was found to be infected with both gonorrhoea and chlamydia in 2005 Screen.

In 2005, a nucleic acid test for trichomonas was included in the STI tests. A total of 30 out of 256 females tested showed positive result (11.7%). All males tested (279) were negative.

A total of 533 and 513 people were tested for HIV in 2004 and 2005 respectively. All tests showed negative result in both years.

The same numbers of people as those for HIV were tested for syphilis in both years. The seropositive rate was high in 2004 (20.3%) and decreased slightly in 2005 (17.6%), though the difference was not significant ( $p=0.05$ ). A person ever infected with syphilis will test positive with specific treponemal tests (such as TPPA, EIA or FTA) even after adequate treatment. In 2005, 45 people (28 males and 17 females) were tested with RPR but not with EIA test (maybe due to known history of syphilis from previous Screen). They were also counted as seropositive if the RPR result was reactive (24 males and 14 females).

The seroprevalence rate for males was significantly higher than the female rate in both years ( $p= 0.04$  in 2004 and  $0.005$  in 2005).

A total of 11 (1.9%) new infections of syphilis were found in 2004, and 4 (0.7%) in 2005. The difference in the prevalence of new infections was not significant ( $p=0.05$ ).

## **B. Qualitative results**

There were in total eleven people interviewed, including the Coordinator of the program and ten previous and existing staff members (referred to as the Coordinator and the staff respectively henceforth in this section), among whom there were five nurses (one male and four females, one of them being the nursing manager of a health centre) and five AHWs (two males and three females). All three communities were represented by at least one nurse and one AHW, and all interviewees were involved in the SHP for at least one year.

### ***Focus of the interviews: what had worked and why?***

As illustrated in the Epidemiological Analysis section, after the initial rise in the first year of the program implementation, the STI rates declined considerably from 2003 onwards. Furthermore, the Young People Sexual Health Screening conducted in 2004 and 2005 discovered very few new cases of STIs, much fewer than expected. Therefore, the major focus of the interview was the staff's understandings about what aspects of, or in which way, the program had worked to achieve decrease in STI rates. Our hypothesis is that such decline in STI rates must have come from a decrease in disease transmission, which could be due to more effective case-finding and case management (i.e. more opportunistic testing and better case treatment and contact tracing), as well as changed behaviour (i.e. more people were using condom more consistently). And these should be the result of enhanced awareness among not only community members but also clinic staff. These outcomes were exactly the goals of the SHP. During the interviews, we set out to find evidence to support this hypothesis and to also explore other associated factors contributing to the success of the program.

### ***1. Having a dedicated Coordinator driving the program***

All staff who were involved in the 2004 screen reported that they felt there was an evident increase in the number of people volunteering to the clinic for an STI check up in the lead up to the actual screen conducted in September and October. They thought it had a lot to do with the intensive community education and media advertisement before the screen, which helped to raise people's awareness. One staff member mentioned in particular that using the photo of a Tiwi local senior on the poster was effective because that was something that Tiwi people could relate to. Here is one nurse's explanation about why there was increased testing before the screen:

“That is because people had higher awareness. So they didn't have to wait until the screen. Once they have the suspicion that they might be infected, they would come to the clinic, be tested and treated.”

However, when reminded of the fact that the STI rates had dropped considerably in 2003 and 2004 before the screen started and this decline in rates was obviously not due to the intensive campaign right before the screen, these staff then agreed that having a coordinator driving the program and who did community and school education as well as health promotion with the help of local Aboriginal people (for example, educators from Tiwi for Life and Strong Women groups) was the major reason for this. One AHW said,

‘The main reason why the STI rates declined to a very low level was that there was a coordinator here. She kept sexual health on the agenda of the clinic. She used to talk to Strong Women groups, and getting me over to talk to the Strong Men's groups. She might not have talked to every individual

person, but she certainly had talked to every influential person and such word of mouth could spread. The awareness in the communities was enhanced during those two years because of this.'

The importance of having a dedicated coordinator was described by a nurse in this way:

'The reason why it was able to move ahead was because we had [the Coordinator] who was always working on it for the whole time.'

'[I]t wouldn't have worked without that. Because people can't put the same amount of energy to thinking about what would work and to actually making it work. You need someone for the planning and also the logistics. And that person didn't need to be a clinician. That person needed to provide the organisation and the drive and the coordination. And the clinical side of the program, which was the screening side of the program, the staff at the health centre were easily able to manage that. Because all the difficult things were being handled by [the Coordinator], including the planing, getting the supply.'

Some other benefits were explained by another nurse as follows,

'The person has got to be passionate about it. It also provides a focus of having someone driving it who is not pressured by the acute care that goes on in the clinic or the social upheaval that goes on in the communities. It's someone with a sole focus as that. With this, it is easier as other things are not really your concern. Your concern is here.'

In sum, the consensus among the staff was that this coordinator does not (some said preferably not) have to be based in Tiwi, is preferably not involved in clinical work in order to maintain a sole focus on sexual health. This was the case for the Coordinator of this program.

Moreover, the staff thought that the Coordinator had some special qualities to help her to achieve such success, which appeared to imply that the program coordinator needed to have the right qualities in order for the program to succeed. For example, a nurse provided this account:

'[She] has a much bigger role than just the sexual health. I don't think people had appreciated that. In fact, she had an amazingly good understanding of the communities. She generated loads of good will towards the clinic, and health. She did a lot of community work. These may not have necessarily been sexual health, but something led her to be able to access people and the support for the SHP. She knew her business. It's not just about this one thing, but there's a number of things that will influence that.'

## ***2. Being a community-owned and community-driven program***

This has been raised and stressed by the Coordinator and some staff as an important reason for the program's success. Initially, it was the THB that decided to take action to respond to the alarming statistics disclosed by the Situational Report in 2000. From then onwards, the Working Party at first and the SG later (both consisting mainly of community members) had in turn played pivotal and directive roles in the development and implementation stages of the program. This was also thought to be the major reason why the program was well received by the communities, as they ensured that program activities would suit the communities and were culturally appropriate for Tiwi people. One of the accounts stressed this factor:

'I believe the success of the program was due to it's formation under a community controlled organisation, and therefore it was able to develop without the constraints of Government. It was a program that was *wanted* and *requested* by the community, and therefore had community support. The Steering Group sought input from community leaders and gave them ownership of how the program developed.' (stress added)

Furthermore, both the Coordinator and some staff thought that because the program was community-owned and driven, it was well supported by many other program areas such as the youth program, the mental health program and Tiwi for Life (consisted of mainly Tiwi people; this referred to the stage when the THB was still operating). This had proved extremely instrumental to one of the priority areas of the program – community education and development, as stressed by the Coordinator in the following,

‘We also did a lot of community education... It’s never just me or me with [AHWs]. There were always Tiwi people who would come with me to the education...The Sexual Health Program was not just community-driven, but there was also extensive community *involvement and participation*.’ (stress added)

This sense of ownership of the program was also shared by the clinic staff. It was reported by the Coordinator that, during most of the period of the program,

‘the staff in the clinics were stable and long term, and their involvement in the Clinical Working Party gave them ownership, and allowed them to have their input into how and when the clinical aspects of the program developed.’

Such sense of ownership appeared to have had positive impact on the commitment of the staff to the program. For example, several staff shared similar experiences they had during the screening in 2004 and 2005 in which they actually competed with one another to see who could get more people on the list to be screened. An AHW said that, if there were still people on the list not screened, they would drive out to the communities to ‘hunt them down.’ All of these factors would have contributed to both the high coverage rates of the screens and the success of the program.

In line with this spirit of program ownership, both the Coordinator and the staff reported that there was constant dialogue between the Coordinator, the SG, the CWP and other community organisations. There were regular meetings held for the SG and CWP, and the information provided and discussed were conveyed to other community members and clinic staff. The Coordinator, with the help of some AHWs, took every opportunity to attend the meetings of local councils, community-based organisations and other groups to promote the program and give feedback on its progress and results. These actions helped reinforce the sense of ownership, kept people informed about the program, encouraged them to continue to be involved, and kept sexual health issues on their agenda.

### ***3. Increased opportunistic STI testing***

One of the main outcomes of the SHP was that there was an increased number of screening tests done at the clinic, and this was due to enhanced awareness not only in Tiwi people, but often more importantly, among the staff. The staff reported that, since the program started, many people would present at the clinic asking for an STI check-up. One nurse claimed that she had personally offered everybody a sexual health screen while doing a Well Women’s Screen. Another nurse reported that,

‘if you are doing the routine care plan check, and you are doing bloods for the diabetic check or renal check or whatever, if you say to them, “Can I take some blood for sexual health check?” I have never been refused.’

This feedback suggests that the effort of the Coordinator striving to put and keep sexual health on the agenda of the clinic paid off. At the same time, the advice provided by the staff while offering such STI testing would also help to further strengthen the awareness of sexual health issues in their clients.

#### ***4. Behavioural and attitudinal changes in relation to condom use***

Safe sex and condom use were two key preventive measures that were promoted in the educational activities of the program. According to the Coordinator and the staff, these were difficult to promote initially in Tiwi communities where religious influence had been strong and where the supply of condoms was poor. Not only were the Elders in the SG reluctant to let the program promote condom use, but the AHWs in the clinics also felt uncomfortable talking about them to people. It was the information about the high rate of infertility that made them turn around on this issue. The Coordinator recalled discussion in a meeting,

‘[The Elders] said, “Well, the Pope might say ‘no condoms’. We understand that. But for Tiwi people, we have to survive, and we have to talk about condoms, and we have to promote condoms.” And so they did. This happened to some middle-aged women. They changed their thinking. To me, this was a really big milestone, and for them to support the program, for me, is another big one.’

This observation was shared by almost all staff interviewed. For example, a female staff member said,

‘Motherhood is a large part of women’s life in Tiwi. Inability to have children can lead to lower status within the community....I think that’s how they got the support of the Tiwi people.’

And the male perspective of this situation was enthusiastically described by a male staff member as follows,

‘[The program was] well received. They came to see there was a problem affecting their community. It wasn’t just something that’s happening somewhere else. When the program was started, there was a big concern about the possibility of HIV getting into the community. When there were advertisements on the TV and you talked to people, they said they knew about AIDS, but it’s really difficult to scare young men about AIDS, you know. They didn’t really think it was going to happen to them. The thing that did really influence them a lot was that they really wanted to be able to be fathers, and they wanted to have children. That’s why I thought, the effect of STI causing infertility had a greater effect than being afraid of getting AIDS or something like that, especially in the young men.’

The staff described that before the program started, the only place besides the clinics where people could access condoms was the store, but the storekeeper did not maintain stocks for years because no one had ever come into the store asking for them.

After the program started in 2002, the Coordinator communicated with the storekeepers, the club owners and relevant community members to secure their approval for setting up new condom distribution sites, which included clubs, men’s centres, CDEP (Community Development Employment Project) workshops, some sports and recreational areas, and airports. The AHWs from the clinic and council would refill the dispensers regularly (The staff said they did deliberately install the dispenser at higher positions to prevent children from playing with the condoms). The staff reported that the education programs did work because there were often people coming to the clinic asking for condoms. This never happened before the program started as people felt ashamed to be seen accessing condoms.

It was not possible to measure the numbers of condoms actually used before and after the program. However, according to the annual reports, estimates from the 3 main community

clinics gave a total of condoms distributed at around 3,000 per annum prior to 2002. Condom distribution during the first 12 months of the program had raised this number by around 300% to over 12,000 condoms. Moreover, anecdotal feedback from community members was very favourable regarding increased condom availability – they disappeared from the dispensers with minimal wastage being reported. Such high numbers of condom distribution remained at about the same level through to 2005 (see Table 5).

However, when asked about their understanding of actual condom use in Tiwi communities, two interviewees reported that they didn't think Tiwi people were using condoms consistently. As one of them has always been working in the smallest community of the three on Tiwi Islands and the other only participated in the program since 2004, it is difficult to determine whether this statement was true for the majority of Tiwi communities during the whole period of the program.

In sum, despite some divergent views, most of the above findings serve as indications that there was a change in local people's attitudes towards condoms and that there was behavioural change in relation to condom use. Such change in attitude and behaviour, as described by a staff member, 'was very much personalised as the survival of the Tiwi people, which is more important than anything really.'

**Table 5: The estimated number of condoms ordered and distributed per year, Tiwi Islands, 2001-2005**

Year	Number ordered and distributed
2001	3000
2002	12800
2003	~12000
2004	~12000
2005	~12000

**5. Culturally appropriate school sex education**

According to some staff, sex education was not offered at Tiwi schools at all before the program started. Seeing this, the Coordinator had made providing culturally appropriate sex education to school students one of the priorities of the program. However, this was not easy because some local high schools were religious schools which did not allow such a topic to be taught (in particular, condom use). It was only after quite some effort of frank discussion and negotiation with the principals and teachers of the schools that sex education was allowed by school staff. However, at first, the program staff not only had to organise and deliver such sessions themselves, but they needed to do it off school grounds. The Coordinator recalled what happened as follows,

'The senior teacher at a [religious school] told me, "You can talk about sexual health and condoms, but not in the school. If you want to talk to them about that, you have to take them away from the school. We will make them available to do that. But you are not allowed to talk about that on the school ground." That's just the way we first operated.'

Following initial approval, boys' and girl's education was organised each year with the assistance of local Tiwi AHWs, school staff and the Aboriginal Educators from the SH & BBV Unit. In 2005 a camp was held for girls and the Coordinator worked with clinic staff, the school and parents to bring students to the camp and deliver sessions of sex education on the beach. They also treated the students with barbecues and fun activities. With the program gradually developing in the communities and the support for it growing accordingly in the ensuing years, the conservative attitudes held by school staff towards sex education

also started to change. This account provided by the Coordinator best described the eventual change seen in the last year of the program as well as some of the sense of achievement program staff felt,

'I will tell you one of the greatest successes that I felt. The very last thing I did over there in Tiwi at the end of 2005 on my last working day was doing education with the girls. We had been doing education in the whole year at school camps. But on that very day we did a bit more education on sexual health and reproduction. I had Tiwi teachers with me. And we were doing condom demonstrations in the classroom on the model. That to me was a really high point.'

## ***6. Strengths and weaknesses of the program***

The majority of the strengths of the program reported by the staff have already been listed above. One other strength was the expert support by the AIDS/STD Unit. In particular, the Coordinator and most staff shared the same opinion that the Aboriginal Educators and nurses from the Unit helped tremendously in delivering community and school education as well as in the screening activities. The medical officer from the Unit also provided technical advice to the program and medical supervision to the screening activities.

Another strength mentioned was that the program was not made to sit within the AIDS/STD Unit but was placed with the communities. Such an arrangement made it possible for the communities to see the program as their own and therefore made it easier for them to be involved. In other words, because it didn't adopt a top-down approach, the program was able to develop in the way that Tiwi people wanted.

The program being set up not only as a clinical program but also as a program for health promotion and community education was also thought of as one important strength. The Coordinator could recall that there were times when she was asked to be involved in something else or to pull the focus into a different direction, but the focus of the program had remained unchanged throughout.

When asked about the weaknesses of the program, some staff said that it would be ideal to have one male and female dedicated to the program as the female Coordinator needed to ask some male AHW or Aboriginal educators to help her with the activities for men. Some staff also regretted that the original Coordinator left the job and a year passed without any program activities, especially the community screening.

Another weakness reported was that the funding for the program was not ongoing and the Coordinator had to write funding application every year. Consequently there was a lack of security of tenure. Due to the nature of non-ongoing funding, the position of the Coordinator was offered as a 6-month contract position during the whole time of the program. However, with the success of the program in 2004, the funding became recurrent in 2005.

The lack of consistent management support for the program was cited as one of the major weaknesses. Some interviewees thought this might have to do with the program not being viewed as a priority at the time, and could also be because it was believed that the program was going to be returned to be controlled by the Tiwi people in about 2 or 3 years' time after the DHCS took over the role played by the THB.

## ***7. Applicability to other Darwin Remote communities***

All staff thought this program can be recommended to other Darwin Remote communities. The main reason for this was that most Darwin Remote communities are predominantly Aboriginal communities and share the same or similar characteristics and problems as the Tiwi Island communities. Judging by the achievements of the program on the Tiwi Islands, they thought that this model should also work for other Darwin Remote communities. But

three requirements were mentioned as being essential for the program to work: a dedicated coordinator, community support and a good population list (which was thought to be essential for community sexual health screens).

### ***8. The Young People Sexual Health Screen in 2004 and 2005***

According to the Coordinator, community-wide screening was proposed at the start of the program because it had been done successfully in Nganampa, but both the SG and the CWP did not approve it because they needed more time to think about it. It was proposed again in 2004 and this time the SG was willing to trial it as a one-off event. Since the results of the 2004 screening were very encouraging, they agreed to do it again in 2005.

The Coordinator thought that the screens could become successful for several reasons. Firstly, there was community education done before the screens, and, more importantly, there was significant Tiwi people involvement. She said,

‘The education was done by the Tiwi people, the Tiwi people talked among themselves about why and what this was happening. The Tiwi people got really involved.’

When asked who got them to talk, the Coordinator said,

‘They just did it themselves. This was their program. They felt some ownership of it. There was even some competition on who was going to get the most people to get screened this week. That was not any official competition, but there was some competitive edge there. “Tell Milikapiti that we have screened all of ours.” You know, things like this. That was good. And at the end of the screen, we had a barbecue at each of the communities and one for the staff as a reward for their great work.’

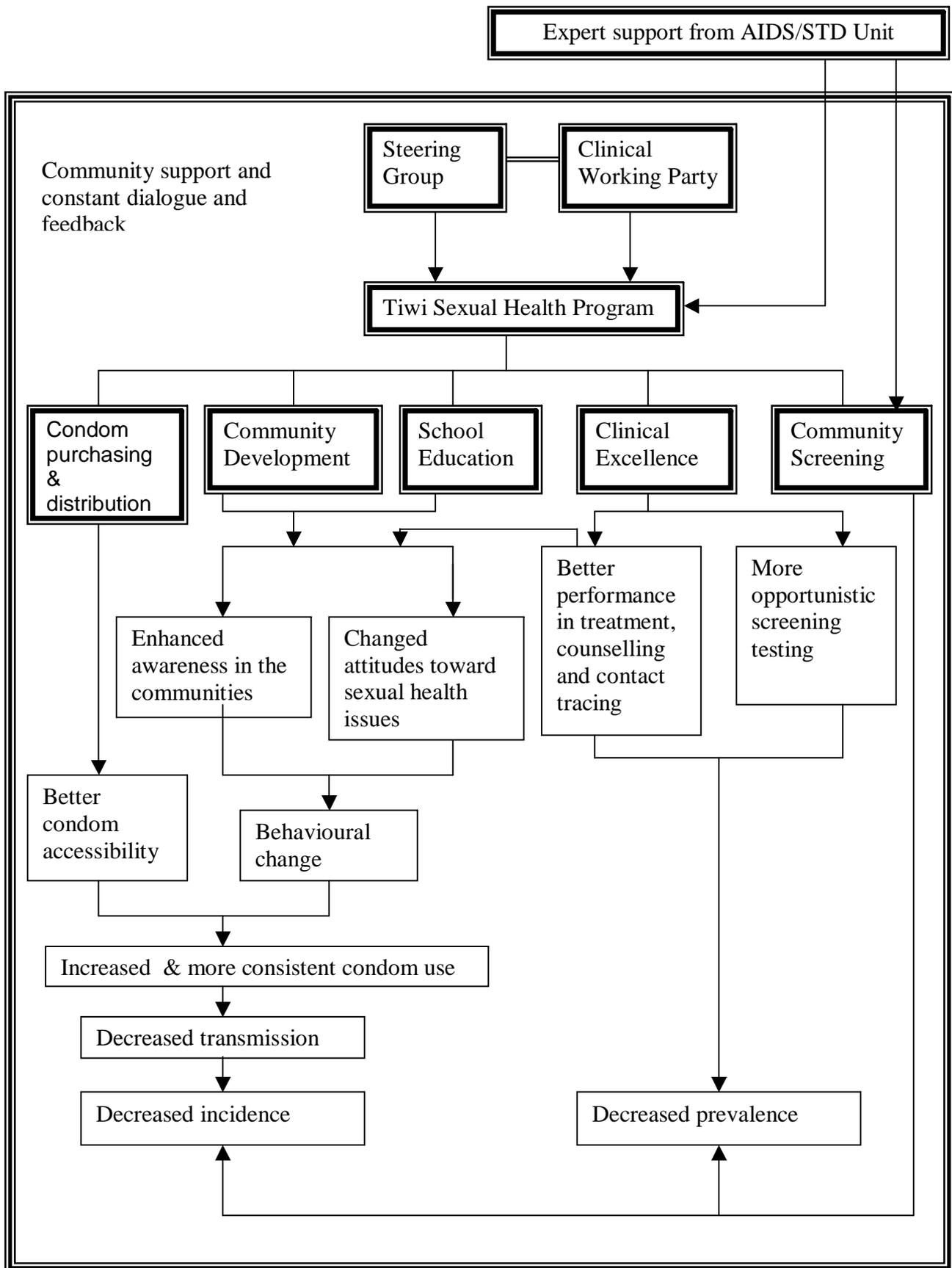
It appeared that the screen was not viewed as ‘a job for the clinic’ but as ‘something that is everyone’s responsibility’. This may explain why there was high degree of involvement and participation by the Tiwi people in the two consecutive screens.

In addition, all staff also thought that the two screens were highly successful, not only because they both achieved high coverage rates but also because the associated community education and health promotion activities helped to enhance local people’s awareness and change their attitude towards sexual health issues. Many staff shared the same observation that, although the targeted age group was 15-30 years, there were quite a few older people who had volunteered themselves to the clinic for testing. They also thought it was not difficult to get people on the list to come to the clinic for the testing as they had all heard about it and knew roughly what the screening was for. These made the staff believe that all the community education and publicity work had paid off.

The staff were also asked whether this annual screening event had posed a heavy burden to their day-to-day clinic workload. They thought, because the Coordinator had done basically all the work to organise everything, the screening itself did not add much to their usual workload. They liked the way that all the pathology forms and labels for specimens were pre-printed, and the screening kits were all put in brown paper bags ready for screening. The population lists were checked with the help of local AHWs who knew most people in the community before the screening to ensure that all and only those eligible people present in the communities were included. As the staff all knew the importance of the screening from the meetings with the Coordinator, they were happy to screen as many people on the list as possible. Sometimes, this meant they had to go door-knocking to reach those still unscreened. But overall, they were all very pleased with the results. In contrast to the work in screening people, they found it much harder to get people to come back for the ‘needles’ (referring to the one to three injections of penicillin for syphilis patients).

The interview results in relation to the components of the program and its effects are summarised in Figure 9.

**Figure 9: A summary chart of the Tiwi Sexual Health Program, its components and effects**



## Discussion

This study has produced convincing evidence to show that the SHP had been effectively implemented with most of its goals achieved in the period 2002-2005, and that this particular model of delivering sexual health services was acceptable to the Tiwi communities. The effectiveness of the program was evidenced by a continuous and significant decrease in the rates of common STIs (gonorrhoea, chlamydia and syphilis) in spite of concurrent large numbers of STI tests performed and high proportion of population tested for STIs, and considering the fact that there was no similar decreasing trends in STI rates in the neighbouring comparable regions. It was also supported by a change in local people's attitudes towards sexual health issues in general and condom use in particular. All of these together indicate that the program had led to behavioural change in local people in relation to sexual health, which, we believe, had in turn resulted in reduced disease transmission and the consequent decrease in STI rates.

A number of factors contributing to the program's success are worth highlighting here. Firstly, the program was developed, owned and driven by the communities in response to the reported high rates of STIs, PID, and, more importantly, infertility. This sense of ownership had also led to a high degree of community involvement and participation. For example, the high coverage rates in the two screens were not only due to the clinic staff (particularly the AHWs) going to great lengths to test as many people as they could, but also due to a high level of community participation. We also think that the Coordinator's provision of timely and informative feedback to both the communities and health centre staff had further reinforced this sense of ownership.

Secondly, a dedicated coordinator with good skills in community development and health promotion was employed to drive the program with a sole focus on sexual health, and was therefore not distracted by clinical work or any other social upheaval in the communities. This helped to keep sexual health on the agenda and keep the program going despite the collapse of the THB and the associated staff cuts and disruptions to the health services. This is important as health centre staff in most remote Aboriginal communities such as Tiwi Islands constantly have a full plate of other services to provide, such as acute care, regular vaccination and care for chronic diseases to make them unavailable for developing or implementing other intervention programs<sup>7</sup>. Furthermore, were it not for the work of community education, publicity, coordination and preparation by the coordinator, the two community screens wouldn't have been possible or successful.

Thirdly, the program was developed and implemented as a comprehensive public health program rather than just a clinical program. As such, it had a strong focus on community development, education and health promotion (primary prevention) to address the more upstream causes, in addition to the components of early detection and effective and timely treatment and follow-up (secondary and tertiary prevention) to deal with the prevalent and incident cases. However, as a disease-specific program within the health sector, it is not possible that it could effect any significant changes to the broader social determinants of sexual health. This would require a whole-of-a-government approach and will need to be addressed if the STI rates are to be reduced further.

The factor that provided the strongest motivating momentum for the Tiwi people to be involved in this program and thereby contributed to the program's success was the reported high rate of infertility, as reported by almost every interviewee. Similar experiences have been reported for other Aboriginal communities<sup>7 12</sup>. The high infertility rate consequent to high STI rates was appropriately represented in the health perspective in the situational analysis report in 2000 and in the program. However, as Tiwi people attach a great deal of importance to the ability to have children as individuals and the survival of the community as a whole, to them, the fact that STIs could cause and had been causing infertility posed a real threat to both. A health concern was thus transformed implicitly into a social and cultural concern –

though not intended by the program. It is mainly this new representation of the problem that drove Tiwi people to change their attitudes, especially the traditional religious view held on condom use, although the program's effort in health promotion and community and school education should not be discredited. It is amazing how a device originally for contraception had turned into a weapon to combat STIs thereby preserving fertility in this particular situation, and how it actually worked.

Another important contributing factor was the two successfully conducted community-wide screens. Screening for STIs can reduce the average duration of infection and infectiousness and increase case-finding thus benefiting both individuals and the population, and therefore is indicated in areas where there is known high prevalence<sup>14</sup>. Such screening had been conducted in other sexual health programs to great benefit<sup>3 15</sup>. For the Tiwi Islands, a multitude of benefits from the two screens can be identified. Firstly, the preparatory work on publicity and community education had encouraged local people to ask for testing when they felt such a need, as evidenced by the increased number of testing well before the screen started in 2004, an indication that the concept of opportunistic screening had been conveyed across to many people. Secondly, the high screening coverage rates in both years further proved that Tiwi people were responding to the program activities. Thirdly, these screens not only provided health benefit mentioned above, but also doubled as community-wide events to further enhance the regular work of community education as well as provide great opportunities to propagate and promote safe sex messages. Lastly, the screens provided the best opportunity to ascertain the prevalence of STIs in the targeted age group and thereby generated a good indicator for assessing the effectiveness of the SHP, which was not easy to achieve as has been explained in previous sections. The high coverage rates in the targeted age group and the sustained low rates of positivity in the second year of screening together provided solid evidence that the low and decreasing STI notification rates in 2003 to 2005 were most likely due to decreased transmission, rather than the artefact of decreased testing. Based on these points, we would argue that any sexual health program implemented in high prevalence/incidence areas would not be complete without a component of targeted community-wide screening.

There were numerous well-thought out program activities that also contributed to its success. For example, inviting Tiwi people to be involved in providing community and school education made good use of local knowledge and cultural insight in relation to the most appropriate way of imparting essential sexual health knowledge to their own people. Using well-known local senior's image on posters to promote sexual health made it easier for Tiwi people to relate to the program.

The combination of all the factors mentioned above, in our view, has changed the communities' views and perceptions about sexual health issues. For instance, to come to the clinic asking for condoms was thought to be a 'shameful' thing before the program and rarely happened, but it became a quite usual thing to do at least in the third or fourth year of the program due to the changed attitude in the communities. For public health programs to achieve behaviour modification in individuals is notoriously difficult. We would argue that with such changed attitude in the communities in response to the program, it may have been easier for women to negotiate condom use and for men to accept its use. However, further research is needed in order to prove this, particularly given that there were interviewees who disagreed that Tiwi people were using condom consistently.

The program also benefited from the generous expert support and assistance from the SHBBVU. In fact, this model of locally developed program assisted by a centrally located expert program area was highlighted as one of the strengths of the program. This bottom-up approach, we would argue, made it possible for this community-owned program to continue to build its capacity in terms of width and depth without having to compromise its nature of self-determination and community participation, both of which are important principles of primary health care<sup>16</sup>.

On the other hand, it has been pointed out in the interviews that the lack of ongoing funding and the subsequent lack of security of tenure had to some extent negatively impacted on the program. Thanks to the success of the sexual health screen in 2004, the funding has become recurrent since 2005. However, it is of concern to see that, when the original coordinator left the program in early 2006 and was not replaced, the number of STI tests dropping by about 40% in 2006, and the rate of chlamydia has also started to increase, signs that the effects of the program are not yet sustainable. Whether the change of the position of the program coordinator to a clinical position at the end of 2005 was a wise move remains to be seen, but at least it has most likely impacted on the benefits associated with the original position description as described above.

We have found in this study that there was a lack of continuity in the program and that the organisations involved failed to preserve the corporate knowledge and documents associated with such a successful program. There were only few documents made available to us from the organisations previously involved in this program. Were this study not conducted, a great amount of valuable knowledge and experience about this program, be it about the successful results or otherwise, would have been lost. For example, after several attempts, we were still unable to obtain any copy of the annual program reports written by the Coordinator and submitted to the funding body, which contained important statistics and information about the program. In addition, we would argue that public health programs that are known to be successful should be reported as a priority, not only because they provide valuable information about what has worked, but also because such good news stories are highly encouraging. This is particularly true in the area of STI control programs given that the STI rates have been high in the NT.

As the program is a 'sexual health' program, it is only fitting to see where it sits using a formal definition of the term 'sexual health', such as this one provide by World Health Organisation<sup>17</sup>:

"Sexual health is a state of physical, emotional, mental and social wellbeing related to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled."

This case study can only touch on the aspects of disease statistics and Tiwi people's responses to the program as reported by the involved staff. Further studies will be needed in order to achieve a more in-depth understanding of the impact of the program in the areas mentioned in the WHO definition. However, given the results of this study and judging by the available documents which give the goals and design of the program, we believe there is still considerable room for improvements, particularly considering the existence of an established transgender population and with regard to the issue of child sexual abuse (both of these were briefly mentioned as concerns of Tiwi people during the interviews).

Another area that is worth further researching is the value of the community-wide screening activities to a sexual health program in the setting of remote Aboriginal communities with known high STI rates. As shown above, the STI rates had decreased well before the two screens were conducted – an indication that a comprehensive sexual health program with focuses on community education and health promotion together with the day-to-day health service activity in systemically offering testing and treatment can result in STI rate decrease. This Tiwi model is different from the one implemented in Nganampa, which, though a comprehensive program, placed much focus upon the mass screening aspect<sup>15</sup>. However, whether such effect is sustainable and whether the effect can be monitored or ascertained without any community-wide screening are not known. Consideration should also be given to the associated effects of enhanced awareness in the communities and of shifting the social

norm in relation to sexual health issues that such large-scale screens and the accompanying publicity and promotion activities can bring about.

An innovative method of assessing the epidemiology of STIs was employed in this case study, which, to the best of our knowledge, has not been used before in Australia. By incorporating the analyses of testing data in the quantitative assessment, we were able to examine the changes in testing amount and the rate of positivity in relation to the program, which is essential to the quantitative assessment of the program. For example, without such data or the knowledge about the SHP being actively implemented at that time, it would be difficult to interpret the sharp increase of notification rates in 2002 as it could be also be caused by an outbreak. Without the information yielded from the testing data, it would be difficult to determine with confidence whether there was a true decrease in STI prevalence and incidence.

Therefore we would argue that wherever possible, laboratory testing data for STIs should be collected regularly not only for localised sexual health programs like this, but also for State and Territory surveillance systems. In addition, in areas where there are high STI rates and hence opportunistic screening tests are recommended for people in the most at-risk age groups, the number of STI tests performed can be used as a good performance indicator of the delivery of sexual health services and the effectiveness of sexual health programs.

Finally, we would like to address the limitations of the data used in this study. The testing data were kindly provided by the pathology companies at our request or on request by the Coordinator. The computer system and the methodologies these companies used to retrieve the data would inevitably impact on the completeness and the correctness of the data. It is impossible for us to examine or control the quality of these data.

We also had difficulties obtaining population data of good quality for Tiwi communities. There was no official population registry on the Tiwi Islands and the population is known to be highly mobile. The population estimates for the 15-29 year age group used in this study for 2004 and 2005 are greater than the number of eligible persons on the screening population lists (15-30 year olds) by about 14%. It is hoped that with the roll-out of the new community information system in remote NT communities, there will be better population data in the future.

The last two years has seen a high turnover rate in the health staff working on the Tiwi Islands, which is not exceptional or unusual for Darwin Rural communities. This has influenced the number of eligible and available staff for the interviews. Fortunately, a number of staff involved with the program who had left Tiwi Islands are still accessible in Darwin and agreed to be interviewed. So eventually, we were still able to interview at least one nurse and one AHW for each health centre to ensure basic individual community representation.

As mentioned above, the sexual health of Tiwi people will benefit from more research in the future. For example, this study, being a departmental internal evaluation project, could only use existing and previous staff's understandings to assess the program's acceptability to Tiwi people. Qualitative studies that investigate Tiwi people's views and perceptions directly will be able to achieve more direct understandings. It would also be of interest to investigate the level of infertility and PID after the implementation of the program, as compared with the baseline data yielded in the situational analysis. And since a large number of STI tests and a great amount of staff working hours were dedicated to the community-wide screens, it would be worthwhile conducting cost-effectiveness studies to understand whether the yield and benefit of the testing can justify the associated costs at this current level of prevalence.

## Recommendations

- That the model described of a comprehensive sexual health program with a dedicated program coordinator be recognised as an effective means to reduce rates of STIs and that it be further implemented both in the Tiwi Islands and other similar regions
- To re-establish the two guiding bodies to work with the program, i.e. the Steering Group and the Clinical Working Party
- To continue the original focus of the program, i.e. community development, health promotion and school education
- To continue to work in partnership with the SHBBVU for expert support
- To make the Young People Sexual Health Screen an annual event until there is evidence of sustained low STI prevalence/incidence
- The Tiwi Health Services to provide ample management support and security of tenure for the program
- To develop program activities for broader sexual health issues, such as those related to transgender people
- To work in partnership with the NT-wide initiatives on child sexual abuse by the Government
- To improve the current system for keeping corporate files and storing data, ensuring that important program documents are properly and orderly archived in hard copies and health-related data securely stored
- To include program evaluation as a regular component of the program
- To explore the possibilities of further research in sexual health in order to achieve a better understanding of the current situation (e.g. a rigorous study on the situation of infertility and PID) and the real needs of Tiwi people with a view to translating the findings into policy and practice

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# Appendices

## Appendix 1: The Interview Schedule

Can you please tell me how and why the program was developed in the first place?

Can you please tell me your awareness and knowledge of the program (its objectives, components, activities, structures, etc.)? How was the program implemented in clinics and communities, eg. in school, in women's business?

Can you please describe your involvement in the program? Please give me all the details.

How did involving in this program impact on you? Did you feel any sense of achievement or any other feelings then?

We found that the STI rates had already decreased significantly before the 2004 screen and there were only very few new cases found in the screens in 2004 and 2005. I guess something about this program must have happened before 2004 to make the rates drop so much. Can you please talk about this?

Can you please recall how Tiwi people thought about the program, particularly when the full range of program has stopped for some reason?

What strengths do you think the program had? Do you think they had contributed to the good outcomes?

What weaknesses do you think the program had? Do you think, without them, the program would have had even better results? How do you think they can be improved on?

Were this program to be implemented again, do you have any suggestions as to how it can be done better?

Do you think a similar program can and/or should be implemented in other Darwin Remote communities? Why?

### **About the sexual health screen:**

Please describe your opinions about the sexual health screen in 2004 and 2005

-appropriate

-effectiveness

-work load, too much or OK, well-supported?

-community engagement

## Appendix 2: Estimates for the population of the Tiwi Islands

In this report we used the estimated resident population (ERP) data for the Tiwi Islands (Bathurst-Melville statistical local area or subdivision) from the Australian Bureau of Statistics ([www.abs.gov.au](http://www.abs.gov.au)) for 1996, 2001 and 2006 Census years. Further, for the purpose of this study, we divided the difference between the ERP data for two consecutive Census years into five parts and added one part per year to generate the estimated population for the inter-censal years (1997-2000 and 2002-2005). The estimated population data are listed in the following table.

Table: Estimated and Census population data for the Tiwi Islands, 2001-2006

Population group	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
15-29 year olds	699	707	716	724	733	741	734	726	719	711	704
15-34 year olds	880	896	912	929	945	961	950	939	927	916	905
Whole of Tiwi	2143	2205	2268	2330	2393	2455	2466	2478	2489	2501	2512