HIP Fiji

Health in Prisoners in Fiji

Research Report

September 2013

A partnership between Empower Pacific and the Burnet Institute.

Contents

The *Health in Prisoners in Fiji Study (HIP Fiji)* was a collaborative undertaking between the Burnet Institute (located in Melbourne, Australia) and Empower Pacific in Fiji. For further information about the study please contact Rebecca Winter (rwinter@burnet.edu.au), Stuart Kinner (s.kinner@unimelb.edu.au) or Kate Saxton (katherine.saxton@usp.ac.fj).

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The *Health in Prisoners in Fiji (HIP Fiji) Study* was supported by an enormous number of individuals and organisations at various times throughout the study planning and execution periods. There are too many to name, but those listed hereon were key contributors. Firstly, and most importantly, the study team thank the research participants for their time, candid responses and patience. Secondly, Supt Salote Panapasa and Fiji Corrections Service gave critical support to the study, provided information on upcoming prisoner releases and allowed our staff to enter the prisons to recruit and interview participants. Staff at the individual participating prisons were also generous and flexible with their time and information and this support was greatly appreciated.

HIP Fiji was funded under the competitive grants round (iv) of the Secretariat of the Pacific Community (SPC) HIV and STI Response Fund from January 2011 to June 2013. We would particularly like to thank our Grant Management Officer Sala Tupou-Tamani for her unwavering support, prompt responses to queries and patience from the time of application, right through to the submission of the final report. Dr Sophaganine Ali also provided valuable input on the study design. Many other SPC staff guided us through the reporting and acquittal process and gave invaluable feedback on the draft report. The Australian Agency for International Development (AusAID) also provided additional funding to enable the study team (along with other potential research leaders from Fiji) to visit Melbourne for a three week training course in research methods with justice-involved populations.

This study would not have been possible without the strong partnership between the Burnet Institute and Empower Pacific. Our dedicated team of interviewers included Semisi Siga, Meli Tailau, Lanieta Matanatabu and Kiniviliame Mateboto, who managed to achieve our target recruitment sample in often difficult circumstances. In particular, their efforts to locate and interview participants after their release from prison were commendable: interviewers travelled considerable distances to remote locations in often difficult circumstances across Viti Levu and Vanua Levu to follow-up their participants.

Other Empower Pacific Staff played key roles in the study's success. At the inception of the study, the former CEO Joanne Cohen was instrumental in ensuring the success of the partnership arrangement and this strength continued under her successor Rhianon Vichta. Andrew Scott was responsible for the on-the-ground logistics, coordination and staff support in the first 12 months, later replaced by Katherine Saxton who competently oversaw the bulk of data collection. The following staff were also invaluable and we thank them for their time, patience, information and persistent smiles: Sandeep Prasad, Pratik Sen, Roselin Chandra, Kirthi, Charles Mudaliar, Kim Tilbury and the various site managers across the Empower Pacific offices. Mr Patrick Morgam supported the study in its final stages.

Many individuals supported various aspects of the study at the Burnet Institute. In particular Damien McCarthy provided much-needed database construction expertise and data management advice. Suzanne O'Neil and Tamara Kwarteng were generous with their knowledge and introductions. Joy Liu, David Anderson and Mary Garcia worked tirelessly on their new method of syphilis testing for this study. Margaret Hellard and Mark Stoove gave much needed technical advice on various aspects of the study and have supported it throughout.

Our study Advisory Group provided invaluable advice on the data collection tool and study logistics. Members included Dr Olayinka Ajayi (SPC), Mr Misaele Driubalavu (NSAAC), Mr Ferdinand Strobel (UNDP), Ms Melinia Nawadra (AusAID) and Mr Gray Sattler (UNODC). Dr Josaia Samuela from the Fiji Ministry of Health gave initial support to the study, and facilitated a prompt ethical review process.

Note for readers: *Globally prisoners are known to enter prison in poor states of health. This puts a significant burden on corrective services to manage these health conditions. In this study we documented the health status of people leaving prison and captured health-related risk behaviours prior to and following imprisonment. Participants' reported health conditions may have pre-dated their time in prison, the measures we utilised did not identify the timing of the onset of disease. These data should in no way be construed as a comment on the performance of Correctional Services in managing prisoners' health needs.*

Prisoners are known to be a risk population globally due to a number of concomitant behavioural and environmental risk factors, and the personal and public health issues surrounding their release are almost universal. This is why prisoners were selected as a population to be studied, in the absence of any pre-existing data on HIV prevalence in prisons in Fiji. However, it is not our intent to draw conclusions about actual infection rates in prisons, only the risk of the population and the wider community following their release.

Executive Summary

Introduction

Although Fiji is classified as a low prevalence country, HIV infection has increased steadily since 2001 and the current prevalence is thought to be underestimated due to low testing rates [1, 2]. Routinely collected data and behavioural surveys in Fiji have demonstrated a high prevalence of sexually transmitted infections (STIs) [3-6].

Globally, prisoners are known to be a group at higher risk of HIV infection [7-9], and following release into the community risky behaviours such as unprotected sex and alcohol and other drug (AOD) use have the potential to spread infection [10]. Although many prisoners experience multiple health problems [11-14] and are at higher risk of both contracting and transmitting infectious diseases [7-9, 15-18], little is known about what happens to them after release from prison [19]. This is important not only in terms of their own health care, but also in order to inform strategies to prevent the spread of infectious disease to others in the community [15, 20-22].

The Burnet Institute, in partnership with Fiji-based NGO Empower Pacific, was funded by the Secretariat of the Pacific Community (SPC) HIV and STI Response Fund competitive grants round to undertake research with people leaving prison in Fiji.

Aims

The aims of the study were to:

1. Estimate the prevalence of HIV and syphilis infection among a representative sample of prisoners in Fiji;
2. Follow a sample of prisoners for 4 months after release from custody and document changes over time in risk behaviours, health service utilisation and health status;
3. Analyse the incidence, timing and correlates of reimprisonment among ex-prisoners;
4. Support local agencies to conduct research using robust methods and build capacity in data analysis, interpretation and reporting.

Methods

Using a prospective cohort study design, we aimed to recruit 200 people incarcerated in Fijian prisons within 4 weeks prior to their release from prison and re-interview them at approximately one and four months post-release. Participants were tested for markers of HIV and infectious syphilis at baseline (pre-release) using a dried blood spot (DBS) and were asked about their physical and mental health status, sexual and other risk behaviour for sexually transmitted infections and blood-borne viruses, alcohol and other drug use, community transition plans and health service utilisation. These measures, excluding HIV and syphilis testing, were repeated at follow-up. Due to delays a data-linkage component to analyse reimprisonment (aim 3) was not conducted.

The study protocol was approved by the Fiji National Research Ethics Committee (ref 65/2010) and in Australia from the Alfred Hospital Human Research Ethics Committee (ref 400/10).

Results

Of the 198 participants recruited and interviewed, 80.3% completed at least one follow-up interview: 75.8% completed a follow-up approximately one month post-release and 48.5% completed a follow-up approximately four months post-release. Forty-four per cent (n=87) completed both follow-up interviews. Most participants were male, iTaukei (Indigenous Fijian) and aged less than 36 years.

Key findings:

- There was a low prevalence of HIV (1.0%) and acute syphilis (1.0%) among the pre-release sample of men and women. These estimates *approximate* the prevalence in the general population.
- Knowledge about risk factors for HIV and other STI transmission varied: participants had strong knowledge about sexual risk but weak knowledge and misinformation about other ways of transmitting infection. Only half of the sample reported receiving education/information on HIV, other STIs and/or condom use. Seventy per cent reported having never had an HIV test at baseline.
- One-third of participants reported not using condoms 'all of the time' with casual sex partners in the 12 months prior to their imprisonment. The most common reason given for having unprotected sex with casual partners was a lack of availability of condoms.
- Approximately one-third of participants reported engaging in behaviours (other than unprotected sexual intercourse) which put them at risk of blood-borne virus transmission including in-prison tattooing and penile beading.
- Alcohol, cannabis and yagona (kava) use was very common during the months leading up to imprisonment. High risk alcohol use was particularly common, with one in four participants reporting binge drinking at least weekly prior to their imprisonment.
- More than a third of participants reported a high degree of psychological distress in the weeks leading up to their release from prison. This reduced to around one in four by one month post-release.
- Almost half of the sample reported at least one existing physical health condition at baseline. Consistent with this, almost one-quarter reported accessing a hospital or doctor within one month of release from prison, although one third did not access a health service despite reporting a need to do so.

Conclusions and Recommendations

This study enabled, for the first time, documentation of significant health needs among Fiji's soon-to-be-released prisoners and ex-prisoners, and pointed to some important areas requiring responses and/or further research. This section draws conclusions about the data presented and makes recommendations for policy, practice and future research.

HIV and other STI prevention and education

While the low prevalence of HIV and syphilis is fairly consistent with epidemiological data on the wider population in Fiji, sexual risk behaviour remains a potential vector for transmission, especially given the observed knowledge gaps, reported limited availability of condoms, low testing rates and engagement in risky alcohol and other drug use. While there has been considerable progress on HIV

and other STI education and prevention (e.g. condom distribution) programs in Fiji, these data suggest there is still room for improvement and a broadening of the scope, importantly including prisoners and those recently released from prison. Factors such as stigma also impact on decision-making, including decisions about access to services for testing and treatment.

Recommendations

1. ***Target prisoners/ex-prisoners for HIV and STI education and prevention campaigns.***

   Programs such as the Yellow Ribbon campaign could be funded to provide condoms to prisoners on release as part of a pre-release education and infection control intervention. Items such as condoms can be relatively expensive for newly-released prisoners with little or no income.

2. ***Expand transitional support provided by the Yellow Ribbon program***

   The Yellow Ribbon program currently provides socio-economic community re-integration support by providing access to education and start-up resources for running small businesses. The reach of the program means that it is well-placed to help with other transitional needs, including accessing health services and obtaining testing for infectious diseases where appropriate.

Primary and preventive health care

A high proportion of participants reported poor mental and/or physical health at baseline (prior to release from prison). The opportunity exists to implement health screening systems on entry to prison and initiate management of existing conditions to prevent or reduce future health problems. Poor mental health is a significant and under-recognised issue in this population, and requires both further research and treatment responses. Primary health care, particularly in populations such as this where the prevalence of preventable ill health is high, can provide long-term economic benefits, by reducing the future burden on more expensive secondary and tertiary health services [23].

Recommendations

3. ***Review the current model for providing primary and mental health care for prisoners, screening for mental and physical health risks and conditions upon entry to prison*.**

   One potentially effective model in resource-constrained settings is 'in-reach' where community medical practitioners and mental health workers provide limited services inside the prison, linking to external community health services where required.

4. ***Expand the existing system for screening and collection of data on key health indicators, at prison reception to include mental and physical health assessment and infectious disease testing.***

   Routine screening for key health conditions at reception, potentially including HIV and mental illness, would allow for early initiation of treatment. This would have benefits for the prisoner, other prisoners and prison staff, particularly in terms of reducing the risk of disease transmission in custody.

Further research

Few studies have investigated the health of prisoners/ex-prisoners in any Pacific Island country or territory, and consequently knowledge of this marginalised population is poor. To our knowledge, this is the first ever longitudinal study of ex-prisoners in the Pacific, focussing on health outcomes and behaviours. This study demonstrates that research with prisoners and ex-prisoners in the Pacific is possible and provides some preliminary data that larger, better-resourced studies could build on. However, this study was limited by participant loss to follow-up which has implications for the generalisability of the results.

Recommendation

5. ***Secure funding for further research***

   Following ex-prisoners in the community post-release is a difficult and time-consuming task. In order to accurately assess health status and health behaviours post-release, adequate funding for a well-designed longitudinal study is required.
   There may also be potential to conduct a data-linkage study using reimprisonment and/or arrest data, or using national mortality data, to examine recidivism and other key health outcomes in this population. Such studies provide high-quality, population-level data at relatively little cost.

1. Introduction

Although Fiji is classified as a low prevalence country, HIV infection has increased steadily since 2001 and the current prevalence is thought to be underestimated due to low testing rates [1, 2]. A cumulative total of 420 cases were confirmed between 1989 and December 2011, representing a population prevalence of <0.1% [2]. However, second generation behavioural surveys and routinely collected data have demonstrated a high prevalence of sexually transmitted infections (STIs) in Fiji [3-6].

Globally, prisoners are known to be a group at high risk of HIV infection [7-9], and following release into the community risky behaviours such as unprotected sex and alcohol and other drug (AOD) use have the potential to spread infection [10]. Although many prisoners experience multiple health problems [11-14] and are at high risk of both contracting and transmitting infectious diseases [7-9, 15-18], little is known about what happens to them after release from prison[19]. This is important not only in terms of their own health care, but also in order to inform strategies to prevent the spread of infectious disease to others in the community [15, 20-22].

Alcohol and other drug use is known to be associated with risky sexual practices [10, 24-27], and alcohol and cannabis use are prevalent across Pacific Island Countries and Territories (PICTs) [25, 28, 29]. A situation analysis in Fijian prisons (unpublished) showed that prisoners engage in high levels of HIV risk behaviour including unprotected sex and tattooing using unsterilized equipment [30]. However, the prevalence of HIV and other STIs among prisoners in Fiji is unknown. Furthermore, although most prisoners return to the community within a relatively short period of time, almost nothing is known about patterns of risk behaviour among ex-prisoners in Fiji. National surveillance data show that the population most at risk of HIV infection is Indigenous Fijian males aged 20-39 years [2, 31]; Indigenous Fijian males also constitute over 80% of the prison population in Fiji, and 55% are aged 20-30 years [32]. Some previous research has been conducted in Fiji with groups known to be at high risk of HIV and STIs (e.g. sex workers, men who have sex with men) [33, 34], however aside from the aforementioned situation analysis, prisoners have remained absent from previous research in the Pacific.

Prison provides an opportunity for health intervention with a group who may not access mainstream health services [35]. Evidence from around the world suggests that there is considerable potential to improve the health of prisoners and ex-prisoners [23, 36], and that doing so has the corollary benefits of improving community health and community safety [37, 38]. Many ex-prisoners return to custody after some time in the community, and the risk of re-offending is higher for those with poor health and those who engage in health risk behaviours, such as illicit drug use [14, 39, 40]. Provision of appropriate health care for ex-prisoners may therefore confer benefits not only for public health, but also for community safety, by leading to a reduction in criminal activity among ex-prisoners. However, almost nothing is known about the health of ex-prisoners in Fiji. The opportunity exists for an appropriately designed research project to fill this knowledge gap, and inform strategies that will improve the health of some of Fiji's most marginalised individuals, promote health in the wider community, and possibly reduce the rate of criminal behaviour among ex-prisoners.

2. Aims

The Burnet Institute, in partnership with Fiji-based NGO Empower Pacific (formerly Pacific Counselling and Social Services) was funded by the Secretariat of the Pacific Community (SPC) HIV and STI Response Fund 2010 competitive grants round to undertake a research project involving men and women leaving prison in Fiji.

The aims of the study were to:

1. Estimate the prevalence of HIV and syphilis infection among a representative sample of prisoners in Fiji;
2. Follow a sample of prisoners for 4 months after release from custody and document changes over time in risk behaviours, health service utilisation and health status;
3. Analyse the incidence, timing and correlates of reimprisonment among ex-prisoners;
4. Support local agencies to conduct research using robust methods and build capacity in data analysis, interpretation and reporting.

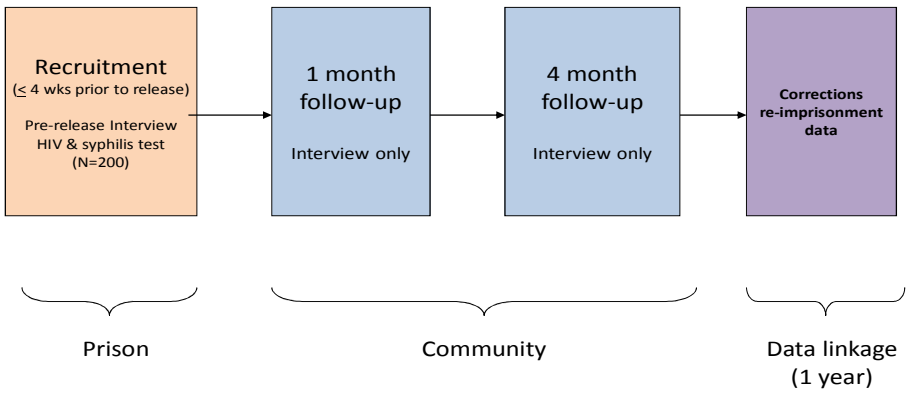
Due to unforeseen delays in the primary data collection along with resourcing limitations, Aim 3 was not able to be addressed within the study period. The opportunity remains to complete this aspect of the study at a later date, subject to data accessibility.

3. Methods

3.1 Study Design

Using a prospective cohort study design, we aimed to recruit 200 people incarcerated in Fijian prisons just prior (≤4 weeks) to their release from prison and re-interview them at approximately one and four months post-release. Participants were tested for markers of HIV and infectious syphilis at baseline (pre-release) using a dried blood spot (DBS) and were asked about their physical and mental health status, sexual and other risk behaviour for sexually transmitted infections and blood-borne viruses, alcohol and other drug use, community transition plans and health service utilisation. These measures, excluding HIV and syphilis testing, were repeated at follow-up (note that the data-linkage aspect did not occur).

Figure 1: Study Design



3.2 Participants, recruitment and follow-up process

Participants were prisoners due to be released from prison between 24th January 2012 and 30th April 2013. We aimed to recruit a representative sample (N=200) of people leaving prison in Fiji. Due to uncertainty surrounding release, unsentenced (remand) prisoners were excluded from participation. Prisoners with profound intellectual disabilities or significant mental illness (where capacity to give informed consent was compromised) were excluded from the study, although in practice this happened very rarely. Capacity to provide informed consent was determined by trained interviewers, in collaboration with prison staff.

Specifically, the eligibility criteria for participation were:

1. being aged 18 years or over;
2. being due for release from prison within 4 weeks of recruitment & first interview;
3. being able to give informed consent to participate, including in follow-up interviews;
4. intend to reside on Viti Levu or Vanua Levu after release from prison; and
5. not having previously participated in the study.

All prisons located on the two most populous islands in Fiji (Viti Levu or Vanua Levu) were recruitment sites for the study. All but one of these prisons is located on Viti Levu. The prisons, their locations and official capacities, are listed in Table 1 below.

Table 1: Recruitment prisons in Fiji*

Prison	Authorized capacity	Type	Gender	Location
Suva Correctional Centre	279	Receiving Centre/unclassified	Males	Walu Bay, Suva, Viti Levu
Naboro Complex Medium Corrections Centre Minimum Corrections Centre Pre-release Centre	 112 170 45	 Classified Classified Classified	Males	Suva, Viti Levu
Nasinu	140	Classified	Males	Nasinu, Viti Levu
Ba	22	Receiving Centre/unclassified	Males	Namosau, Ba, Viti Levu
Lautoka Corrections Centre	134	Receiving Centre/unclassified	Males	Natabua, Lautoka, Viti Levu
Labasa	48	Receiving Centre/unclassified	Males	Labasa, Vanua Levu
Women's Correctional Centre	28	Receiving Centre/unclassified	Females	Walu Bay, Suva, Viti Levu

*Prison information retrieved from Fiji Corrections Services website http://www.corrections.org.fj/pages.cfm/about-us/13-institution/ on 27th August 2013.

Potentially eligible participants (i.e. prisoners due to be released) were identified by Fiji Corrections Service at each participating prison. A list of all potentially eligible prisoners from each prison was regularly provided to the study team. Interviewers travelled to prisons and approached potentially

eligible prisoners, explained the study objectives and invited them to participate after explaining in detail what participation involved.

During the first (pre-release) contact, participants were asked to provide their own contact details and those of up to five family members or friends in order to assist with locating them for follow-up interviews after release from prison. Interviewers contacted released participants due for follow up by telephone or in person and organised a mutually convenient time for interview in a public location. Participants were provided with a small gift ('Ai loloma') of approximately FJD $5 value at follow-up to acknowledge their contribution to the study.

3.3 Measures

We collected information on participants' demographic characteristics and socio-economic circumstances, imprisonment history, health status, HIV/STI risk behaviours, alcohol and other drug use and health service utilisation. These measures are described in detail below. For pre-release interviews, questions referred to a specified time period prior to imprisonment, or (where appropriate) to current status. Questions asked at follow-up referred to the period either between release from prison and interview (one-month follow-up), or the period between interviews (one and four-month follow-ups). Where participants completed only one follow-up interview, they were asked to refer to the period between release and interview. Sections 3.3.1 to 3.3.9 describe the measures as they were applied at the pre-release interviews and Section 3.3.10 describes additional measures used only at the follow-up interviews.

3.3.1 Demographics, socio-economic status and prison history

We collected information on participants' age, gender, ethnicity, country of birth, religious beliefs, relationship status, number of dependent children, living arrangements (one month prior to imprisonment) and location, level of education, recent (six months prior to imprisonment) primary income source (full/part time, casual, self-employed, subsistence, criminal activity, other) and average weekly income in the six months prior to prison. Participants were also asked about the length of their current prison sentence, their total number of lifetime incarceration episodes and total time spent incarcerated, and whether they participated in any vocational programs or training while imprisoned. No data on actual offending behaviour were recorded.

3.3.2 Physical and mental health status

Participants were asked if they had ever been diagnosed (by a medical professional) with any of the following conditions (ever and/or current): asthma, back problems, hearing or eyesight problems, tooth decay, brain injury, cancer, heart disease, high blood pressure or high cholesterol. Mental health diagnoses (ever and/or current) included the following: depression, anxiety disorder, bipolar disorder, post-traumatic stress disorder, and schizophrenia or substance use disorder. Current psychological distress (low/none, moderate, high, very high) was measured using the Kessler 10 scale [41, 42].

Participants were also asked to consider whether their physical and mental health had changed when they entered or left prison (health improves, no change, health gets worse).

3.3.3 HIV and other STI knowledge and education

Participants responded to a series of questions and statements on HIV/STI transmission risks, disease effects, management and treatment. Participants were requested to answer yes/no or true/false in response to these questions or statements. We recorded the proportion of participants who answered questions/statements correctly, both individually and as a group.

Participants were asked whether they had ever received information on HIV, other STIs, condom use and voluntary HIV counselling and testing and who/where this information came from.

3.3.4 Risk behaviours for HIV, other STIs and BBVs

To assess risk for HIV, other STIs and BBVs we asked about sexual behaviours and activities where there is the potential for blood transference between individuals. Sexual activity was defined as vaginal or anal intercourse. We asked participants basic information about their sexual history (age of first sexual intercourse and total number of lifetime sexual partners (males, female and transgender)). We asked about the number of recent (in the 12 months prior to imprisonment, or between interviews) *regular* and *casual* sex partners; where 'regular' was defined as a husband/wife or boyfriend/girlfriend and 'casual' included any other sex partner, including sex workers. Frequency of condom use (never, some of the time, half of the time, most of the time, all of the time) with these partners was recorded and for *casual* partners we recorded participants' reasons for not using condoms 'all of the time'. Additionally, we asked participants about condom use with any *new casual* sex partners in the three months prior to prison. 'New casual' partners were defined as casual partners with whom they had had sex for the first time in that time period. Lastly, participants were asked whether they had had sex in prison and with whom (another prisoner, partner, prison officer, other).

Measures of risk for blood transference between individuals included engagement in activities including in-prison tattooing, sharing razorblades, injecting drug use and in-prison penile beading. Penile beading is a modification practice where beads, ball-bearings or other objects are subcutaneously inserted along the shaft of the penis in order to create a permanent protrusion [43-49]. Instruments such as razorblades may be used between multiple individuals to make cuts to insert the beads.

3.3.5 STIs: testing history and symptoms

Participants were asked to report any prior testing for HIV or hepatitis B virus (never tested, tested in the 12 months prior to prison, tested more than 12 months prior to prison) and the results of those tests. In-prison offers, and uptake, of testing for HIV and other STIs were also recorded.

In order to measure the potential for current STI infection among participants, we asked whether they had ever, or currently were experiencing specific symptoms which may be indicative of a sexually transmitted infection. A lack of general knowledge surrounding specific STIs, their names, symptoms, methods of diagnosis and treatment meant that we were unable to ask about specific STIs. The following symptoms were grouped together as possible indications of STIs, but should not be regarded as an estimate of true prevalence due to the inherent inaccuracies in this approach (symptoms may also be indicative of other health issues, not related to STIs): unusual or smelly discharge from

penis/anus/vagina, sores in or around penis/anus/vagina, persistent genital itchiness, pain or burning when urinating.

3.3.6 HIV and acute syphilis prevalence

We estimated the prevalence of HIV and current (infectious) syphilis by collecting a small capillary blood sample obtained with a lancet from participants' index fingers. Blood droplets were collected on specimen collection cards (filter paper) and dried for storage and transport to laboratories in Australia (see Appendix 1 for further detail on the dried blood spot collection process). These 'dried blood spots' (DBS) were used in place of venous blood collection due to the minimal storage requirements in a hot, humid environment (e.g. no refrigeration necessary for a short period) [50], and because there was limited capacity for appropriately transporting blood samples from remote prisons to the laboratory in Suva. Use of available rapid-testing technology was also ruled out due to ethical concerns in continuity of care. The DBS were unable to be processed by Mataika House (laboratory in Suva) and consequently were mailed to Australia for testing.

For HIV testing, dried blood spots can provide an accurate and reliable estimate of HIV infection [51, 52], however this method of testing is not approved for diagnostic purposes in many countries and consequently is used for population-level estimates only. For syphilis, laboratories at the Burnet Institute developed a method of testing for acute infection using dried blood spots, however this method has not been validated and the reliability of results is therefore unknown. Further, the suite of tests required to identify later-stage syphilis infection are not able to be performed on dried blood spots. The testing procedures for HIV and syphilis are described below. Appendix 2 also provides detail on the development of the syphilis testing protocol.

HIV and acute syphilis testing procedures

For the detection of HIV infection, dried blood spots were screened for the presence of HIV antibodies using an enzyme immunoassay (ELISA) followed by a confirmatory Western blot. With confirmatory Western blot, the chance of a false-positive identification in a low-prevalence setting is about 1 in 250 000 [51].

For the detection of acute (active) syphilis infection, blood spots were tested for the presence of anti-treponemal IgM antibodies using an enzyme-linked immunoassay (ELISA). The rationale for IgM detection was based on its ability to differentiate active and past infection due to its specific production in the early stages of disease [53]. Samples which tested positive were retested at least once more to confirm results, with only repeat positive samples considered a true positive.

3.3.7 Alcohol, tobacco and other drug use and harms

To assess potentially harmful consumption of alcohol in the 12 months prior to imprisonment we applied the World Health Organization's 10-item Alcohol Use Disorders Identification Test (AUDIT) [54-56]. The AUDIT classifies respondents in quartiles of low or no risk, moderate risk, high risk and very high risk/possible dependence. Due to the short period between release and the one-month follow-up interview, we did not use the AUDIT at the one month post-release interview (only pre-release and at four months post-release).

We recorded the types, use (ever used, used in 12 months prior to prison), age of first use, use in prison (ever) and route of administration (ever injected, injected in 12 months before prison, injected while in prison) of various licit and illicit substances. These included: alcohol, tobacco, cannabis, yagona (kava), inhalants (e.g. glue, solvents, petrol, amyl nitrate), ecstasy/MDMA, amphetamine and methamphetamine, cocaine, illicit benzodiazepines (i.e. not prescribed or not used as prescribed), heroin, other illicit (unprescribed) use of opiates (e.g. morphine, oxycontin, methadone), steroids and any other drugs consumed. The risk of problematic use of any of these substances in the three months prior to imprisonment was measured using the World Health Organization's Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) [57, 58]. The ASSIST also measures the frequency of use (never, once or twice, monthly, weekly and daily or almost daily), which we applied to the three months prior to imprisonment. As for the AUDIT, we did not apply the ASSIST at the one month post-release interview. For tobacco, we also recorded the number of cigarettes *currently* smoked daily.

Participants were asked about the occurrence (ever and number of times) of alcohol and/or other drug overdose or loss of consciousness, and whether they had ever received information or treatment for alcohol or other drug use.

3.3.8 Use of prison and other health services

Participants were asked to give a personal assessment of the quality of prison healthcare compared with healthcare available in the community (better, equal quality, worse). We also asked whether they had been offered (and accepted or declined) testing for HIV, other STIs or tuberculosis while in prison.

The frequency and type (medications, routine treatment, testing and results, general health check-up, other) of healthcare accessed while in prison was recorded, whether medications or treatment were required to continue after release from prison and if arrangements had been made for these treatments or medications to continue post-release.

3.3.9 Planning for release from prison

We recorded whether participants had been offered help to prepare for release from prison, where this offer of help came from and what sort of help was offered. Participants were asked whether they had somewhere to live when they left prison, and lastly were invited to make any further comments about their health, time in prison, expectations about release etc.

3.3.10 Post-release

As well as any time-limited or changeable measures outlined above from the pre-release interviews, participants were asked the number of times, and for what reason, they had accessed any of the following services: doctor/GP/primary care, hospital, mental health service, psychologist, counsellor, AOD treatment, sexual health service and traditional healer. We also recorded the reasons why participants did not access health services if they were in need of health care.

3.4 Questionnaire translation

Questionnaires were developed in English and translated into Bauan and Hindustani using the following method:

1. Bilingual Empower Pacific staff translated the English version of the questionnaire to Bauan and Hindustani.
2. A second bilingual person independently back-translated without reference to the English version.
3. The original (English version) and back translations were compared for consistency. When there was conceptual discrepancy (as judged by investigators) this was resolved by discussion among the team including 2 English speaking Investigators and 4 bilingual research interviewers.

Interviews were conducted in Bauan, English or Hindustani or a mix of these and/or other Fijian dialects by interviewers fluent in these languages.

3.5 Statistical analyses

Prevalence of HIV and syphilis, markers of poor health and health risk behaviours were assessed using descriptive statistics. Chi-squared, Fisher's Exact and t-test statistics were used to test for differences between groups.

3.6 Ethical considerations

The full project protocol received approval from the Fiji National Research Ethics Committee (ref 65/2010) and in Australia from the Alfred Hospital Human Research Ethics Committee (ref 400/10).

Over multiple preparation sessions, interviewers were trained in interviewing techniques for research purposes and in the collection, storage and transportation of dried blood spots and infection control procedures. Participants provided written informed consent to participate and were informed that they did not have to answer any questions they felt uncomfortable about, nor provide a dried blood sample, and were reminded of this throughout the interview.

Due to the use of dried blood spots (as opposed to venous blood) for HIV and syphilis testing - which are not approved for individual-level diagnosis - we were unable to provide participants with their individual test results. HIV and syphilis test results were therefore strictly de-identified and no individual on the study team had the capacity to link individual participant's names with their test results. Due to the potential for stigma and discrimination surrounding an HIV/STI diagnosis in a correctional setting, coupled with the limited availability of treatment and support options in a correctional setting, this step was necessary to preserve confidentiality.

Interviewers encouraged all participants to seek HIV and other STI testing in the community upon release from prison, where appropriate management could be offered and supported in the event of a positive test result.

4. Results

The data collected for this study consisted of a series of primarily quantitative interviews with a cohort of prisoners interviewed four weeks or less prior to their release from prison (referred to as 'baseline' or 'pre-release') and again at around one and four months post-release ('follow-up'). Section 5 presents the results of these interviews, organised into the topic areas and themes covered in the interviews.

Two-hundred and four (N=204) prisoners were recruited and interviewed prior to their release from prison between January 2012 and April 2013. Of these, data for six interviews were unusable and these participants were subsequently excluded. Data for the remaining 198 participants are included in these analyses.

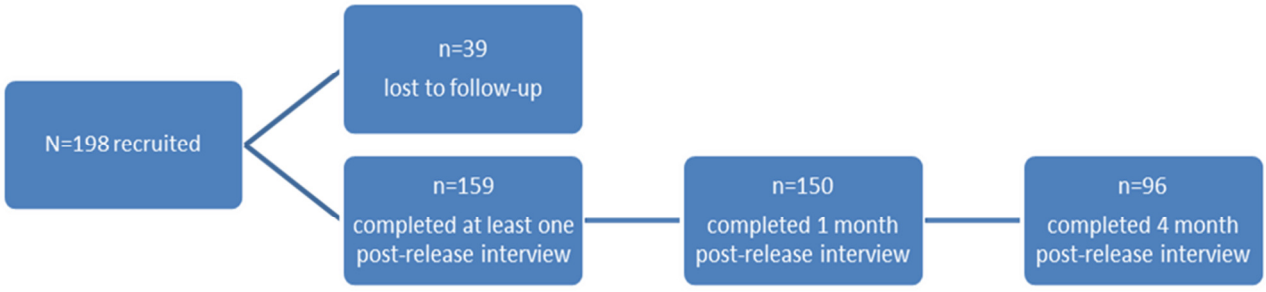
Table 2 shows the number and proportion of participants recruited from each prison.

Table 2: Number and proportion recruited from each participating prison

Prison	n (%)
Suva Men's	48 (24.2)
Naboro Complex	23 (11.6)
Ba	20 (10.1)
Nasinu	24 (12.1)
Lautoka/Natabua	27 (13.6)
Labasa	45 (22.7)
Suva Women's	11 (5.6)
TOTAL	**198 (100.0)**

Of the 198 participants, 80.3% completed at least one follow-up interview: 75.8% completed a follow-up approximately one month post-release and 48.5% completed a follow-up approximately four months post-release. Forty-four per cent (n=87) completed both follow-up interviews (Figure 2).

Figure 2: Recruitment and follow-up flowchart



There were few significant demographic or socio-economic differences between participants who were followed and those who were not, except that none of the 11 female participants were successfully interviewed post-release, and men who were employed (part or full-time, or self-

employed) in the six months prior to imprisonment were more likely to be successfully followed (Table 3).

Pre-release interviews were primarily conducted in iTaukei language (59.2%) followed by English (19.9%) or a mixture of the two (19.4%). Participants were interviewed a median of 7 days prior to their release from prison (range: 0-95 days), taking an average of 45 minutes to complete (range: 15-115 minutes).

4.1 Sample Characteristics

Table 3 shows the demographic and socio-economic characteristics of participants at baseline (pre-release). Most participants were male, iTaukei and aged less than 36 years. Data are stratified by study retention status to assist in identification of biased attrition[1]. Table 4 presents key health indicators by study retention status. See Section 5.3 for discussion on the issue of biased attrition.

Participants lost to follow-up were more likely to be female and more likely to have no income source in the six months prior to prison, or be engaged in criminal activity, than those who received income from external sources or were self-employed. Those lost to follow-up were also more likely to have ever been diagnosed with a mental illness, to be daily tobacco smokers, to report a previous HIV test and to report accessing prison health services for routine medications, treatment, testing or general health.

Table 3: Sample characteristics at baseline, by follow-up status

	Total sample (N=198) n (%)	Followed-up (n=159) n (%)	Not followed-up (n=39) n (%)
Male[***]	187 (94.4)	159 (100.0)	28 (71.8)
Age in years			
≤ 25	56 (28.3)	45 (28.3)	11 (28.2)
26-30	39 (19.7)	27 (17.0)	12 (30.8)
31-35	49 (24.8)	40 (25.2)	9 (23.1)
36+	54 (27.3)	47 (29.6)	7 (17.9)
iTaukei[1]	173 (87.4)	137 (86.2)	36 (92.3)
Religious beliefs			
Christian	180 (90.9)	142 (89.3)	38 (97.4)
Other religion	17 (9.1)	17 (10.7)	1 (2.6)
Relationship status			
Single	94 (47.7)	72 (45.3)	22 (57.9)
In a relationship	103 (52.3)	87 (54.7)	16 (42.1)
Has dependent children	98 (50.5)	77 (49.4)	21 (55.3)
Living with family[2]	106 (53.5)	81 (50.9)	25 (64.1)

[1] Biased attrition: where those lost to follow-up differ in important ways from those successfully followed up. For example, those experiencing psychological distress may have been more likely to be lost to follow-up.

	Total sample (N=198) n (%)	Followed-up (n=159) n (%)	Not followed-up (n=39) n (%)
Residential location[2]			
Rural	58 (29.3)	49 (30.8)	9 (23.1)
Urban	140 (70.7)	110 (69.2)	30 (76.9)
Has post-release accommodation secured pre-release	181 (91.4)	146 (91.8)	35 (89.7)
Completed primary school education	157 (79.3)	123 (77.4)	34 (87.2)
Completed other formal education/training	56 (30.4)	45 (30.6)	11 (29.7)
Primary income source[3*]			
Full/part time employment	85 (42.9)	71 (44.7)	14 (35.9)
Self-employment (incl. subsistence farming)	81 (40.9)	68 (42.8)	13 (33.3)
Criminal activity	24 (12.1)	17 (10.7)	7 (18.0)
No income	8 (4.0)	3 (1.9)	5 (12.8)
Average weekly income[3]			
< $100	61 (31.8)	48 (30.8)	13 (36.1)
$100-200	90 (46.9)	76 (48.7)	14 (38.9)
> $200	41 (21.4)	32 (20.5)	9 (25.0)
Current prison sentence length			
≤ 6 months	100 (50.5)	83 (52.2)	17 (43.6)
> 6 months	98 (49.5)	76 (47.8)	22 (56.4)
History of previous imprisonment	84 (42.6)	66 (41.8)	18 (46.1)

*p<0.05, **p<0.01, ***p<0.001. Differences between groups compared using chi-squared (n>5) or Fisher's exact test (n≤5)

[1]iTaukei = indigenous Fijian

[2]During the month prior to prison

[3]During the 6 months prior to imprisonment

Table 4: Health status and behaviours at baseline, by follow-up status

	Total sample (N=198) n (%)	Followed-up (n=159) n (%)	Not followed-up (n=39) n (%)
Ever diagnosed with physical illness/condition[1]	94 (47.5)	75 (47.2)	19 (48.7)
Ever diagnosed with mental illness[2*]	13 (6.6)	7 (4.4)	6 (15.4)
Psychological distress at baseline			
Low/none	104 (52.5)	85 (53.5)	19 (48.7)
Moderate	40 (20.2)	34 (21.4)	6 (15.4)
High	20 (10.1)	16 (10.1)	4 (10.3)
Very high	34 (17.2)	24 (15.1)	10 (25.6)
Bothered by emotional problems moderately or more[3]	43 (21.7)	30 (18.9)	13 (33.3)

	Total sample (N=198) n (%)	Followed-up (n=159) n (%)	Not followed-up (n=39) n (%)
Risk of alcohol use disorder (AUDIT)[4]			
Low/no risk	58 (29.4)	47 (29.7)	11 (28.2)
Moderate	51 (25.9)	45 (28.5)	6 (15.4)
High	33 (16.8)	26 (16.5)	7 (17.9)
Very high	55 (27.9)	40 (25.3)	15 (38.5)
Binge drinking at least weekly[5]	47 (23.9)	34 (21.5)	13 (33.3)
Daily or more tobacco use[6*]	104 (58.4)	89 (62.2)	15 (42.9)
Weekly or more cannabis use[6]	67 (38.1)	51 (36.7)	16 (43.2)
Weekly or more yagona (kava) use[6]	69 (38.1)	60 (40.5)	9 (27.3)
Ever had an HIV test[***]	58 (29.3)	38 (23.9)	20 (51.3)
Accessed prison health services[7***]	121 (61.1)	88 (55.4)	33 (84.6)

[*]p<0.05, [**]p<0.01, [***]p<0.001

[1]Including: asthma, back problems, high blood pressure, high cholesterol, heart disease, diabetes, poor eyesight or hearing problems, tooth decay, epilepsy, brain injury and/or cancer

[2]Including anxiety disorder, depression, substance use disorder, schizophrenia, PTSD or bipolar disorder

[3]During past four weeks

[4]Refers to alcohol use in the 12 months prior to imprisonment

[5]Defined as consuming more than six standard drinks in one session, during the three months prior to imprisonment

[6]During the three months prior to imprisonment

[7]For medications, routine treatment, testing or general health

4.2 Health status

4.2.1 Physical health

Participants were asked at baseline whether they had ever been told by a doctor or other health professional that they had a range of health conditions (see Table 5). The most commonly reported health problem was tooth decay (21.3%), however despite being relatively young (median age = 30.4 years), a substantial minority reported poor eyesight or hearing, asthma, back problems or vascular disease. Given that participants were asked whether conditions had been diagnosed by a health professional, the true prevalence is likely to be higher. Overall, almost half of the sample (47.5%) reported a diagnosis of least one of these physical health conditions.

Table 5: Physical health status pre-release and at one and four months post-release

	Baseline (N=198) n (%)
Ever been diagnosed with asthma	18 (9.1)

Ever been diagnosed with back problems	27 (13.7)
Ever been diagnosed with high blood pressure	11 (5.6)
Ever been diagnosed with high cholesterol	8 (4.1)
Ever been diagnosed with heart disease	3 (1.5)
Ever been diagnosed with poor eyesight/hearing	29 (14.6)
Ever been diagnosed with tooth decay	42 (21.3)
Ever been diagnosed with brain injury	7 (3.1)
Ever been diagnosed with cancer	7 (3.1)

4.2.2 Mental health

A high proportion of the sample reported high or very high psychological distress at baseline (Table 6), as measured by the Kessler 10. The proportion reporting high/very high distress was lower by one month post-release (27.3% to 16.0%), and lower again between one and four months post-release (from 16.0% to 6.3%). Similarly, prior to release just over one-fifth (21.7%) of participants reported feeling bothered by emotional problems such as anxiety, depression or irritability, although this decreased significantly to 11.3% of participants by one month post-release (chi-squared=4.90; p=0.03). However given substantial loss to follow-up, biased attrition may at least partially explain these changes (see also Table 4).

We tested changes in reported psychological distress among the sub-set of participants (n=87) who completed all three interviews, in order to examine changes in mental health in the absence of potentially biased attrition (Figure 2). There was a trend towards a reduction in reported high/very high psychological distress at each time point, from 44.8% pre-release to 33.3% at one month post-release (not statistically significant), to 6.9% four months post-release (chi-squared = 12.74, p<0.001). Psychological distress changes among these 87 participants are displayed in Figure 3.

Table 6: Mental health status pre-release and at one and four months post-release

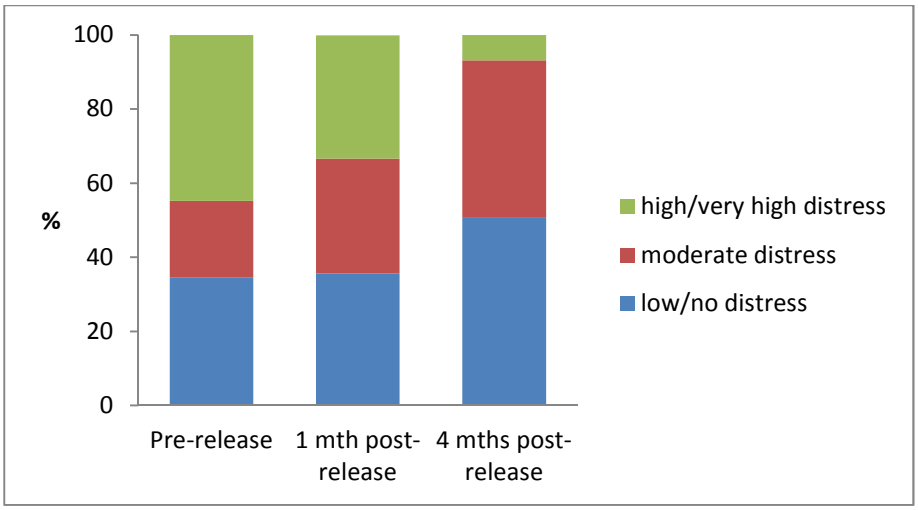
	Baseline (N=198) n (%)	1 month post-release (n=150) n (%)	4 months post-release (n=96) n (%)
Psychological distress			
Low/none	67 (33.8)	80 (40.4)	49 (51.0)
Moderate	54 (27.3)	61 (30.8)	39 (40.6)
High	43 (21.7)	36 (18.2)	6 (6.3)
Very high	34 (17.2)	10 (6.7)	2 (2.1)
Bothered by emotional problems moderately or more[1]	43 (21.7)	17 (11.3)	13 (13.5)
Emotional problems affected ability to do daily activities[1]	38 (19.2)	14 (9.3)	10 (10.4)
Impact of imprisonment on mental/emotional state			
No change	44 (20.3)		
Got better	88 (44.7)	--	--
Got worse	69 (35.0)		

	Baseline (N=198) n (%)	1 month post-release (n=150) n (%)	4 months post-release (n=96) n (%)
Impact of leaving prison on mental/emotional state			
No change		15 (10.0)	10 (10.4)
Got better	--	127 (84.7)	79 (82.3)
Got worse		8 (5.3)	7 (7.3)
Ever diagnosed with mental illness[2]	13 (6.6)	--	--
Currently have diagnosed mental illness	5 (2.5)	--	--

[1]During past four weeks

[2]Diagnosed by a health professional. Conditions include anxiety disorder, depression, substance use disorder, schizophrenia, PTSD or bipolar disorder

Figure 3: Changes in psychological distress after release from prison among participants completing all three interviews (n=87)



4.3 HIV/STI knowledge

Participants' knowledge of HIV and STIs was tested with a series of yes/no questions and true/false statements. Overall, around two thirds (63.5%) of these were correctly answered. The proportion of participants correctly answering each of these questions and statements is shown in Table 7 below. Knowledge was high with respect to some vectors for HIV transmission (e.g. vaginal or anal sex without a condom, injection with a used needle/syringe), but low for others (e.g., over half of the participants said that HIV could be transmitted via mosquito bites).

Just over half (53.0%) of participants reported having received information/education about HIV and similar proportions reported having received education about STIs (49.5%) and condom use (52.5%). Those who had received information about HIV and other STIs reported various sources including Fiji Ministry of Health community awareness activities in home villages, and in-prison education from non-government organisations including the Fiji Red Cross Society and Empower Pacific.

Table 7: Proportion of participants correctly answering questions about HIV and STIs at baseline

	Correct answer	n (%) correct responses
HIV can be transmitted from an HIV-infected person…		
…by vaginal sexual intercourse without a condom?	Yes	174 (87.9)
…by an injection with used needles (medical and injecting drug use)?	Yes	158 (79.8)
…by anal sexual intercourse without a condom?	Yes	155 (78.3)
…by tattooing?	Yes	154 (77.8)
…by shaking hands?	No	144 (72.7)
…from mother to child during pregnancy and child birth?	Yes	134 (67.7)
…by contact with the toilet seat?	No	126 (63.6)
…by drinking from the glass of an HIV infected person?	No	123 (62.1)
…by kissing?	No	99 (50.0)
…by a mosquito bite?	No	84 (42.4)
True or false?		
It is possible to get STIs by having sex without a condom	True	183 (92.4)
Only sex workers and men who have sex with men are at risk of getting STIs	False	130 (65.7)
Some STIs can make women infertile (unable to become pregnant)	True	112 (56.6)
People infected with STIs often don't have any symptoms (tona)	True	96 (48.7)
As long as you feel fine and healthy, there is no reason to think you have an STI	False	95 (48.0)
I would know if someone had an STI by looking at them	False	87 (43.9)
Most common STIs can be easily treated with antibiotics	True	82 (41.4)

4.4 Risk behaviour for BBVs and STIs

4.4.1 Sexual risk behaviour

Participants reported a median of eight lifetime sexual partners (range: 0-100). Over half (56%) reported having one regular sexual partner in the 12 months prior to prison and just under half reported having at least one casual sex partner in this time. The majority of participants reported consistent condom use with casual and new casual sex partners, and this proportion was higher among those who were interviewed post-release. At baseline, 37% of participants reported not using condoms with casual sex partners 'all of the time' in the 12 months prior to prison. This proportion decreased to 7% and 9% at one and four months post-release.

Of those who did not use condoms with their regular partner, most (>75% at each time point) reported using condoms 'all of the time' with any additional casual partners. Among the 59 participants who reported not using condoms 'all of the time' with casual sex partners, reasons given

included availability issues (n=29), knowing or trusting their partner (n=13), loss of sensation (n=11) and intoxication (n=10) (note: participants may have identified more than one reason).

Sexually active participants were asked if they thought they were at risk of getting STIs in the future. Of the 184 who answered this question, 94 (51%) said 'no', most commonly explaining that they had only one monogamous sexual partner. For the 21% (n=38) who said 'yes', commonly identified reasons included not taking precautions (using condoms) with multiple partners, and not knowing their sexual partner's STI status. Table 8 presents detailed information on sexual and sexual risk behaviour prior to and after release from prison.

Table 8: Sexual and sexual risk behaviour prior to and after release from prison

	Baseline (N=198) n (%)	1 month post-release (n=150) n (%)	4 months post-release (n=96) n (%)
Age of first sexual intercourse			
≤ 14 years	44 (25.9)	--	--
15-17	52 (30.6)		
18+	74 (43.5)		
Lifetime number of sexual partners			
0	4 (2.0)		
1-3	50 (25.3)	--	--
4-9	54 (27.3)		
10+	90 (45.4)		
Condom use with *regular* sex partner/s[1]			
Not all of the time	141 (78.8)	109 (73.2)	77 (81.9)
All of the time/no partners	38 (21.2)	40 (26.9)	17 (18.1)
Number of *casual* sex partners[1]			
None	96 (53.3)	133 (89.3)	83 (86.5)
1-2	40 (22.2)	13 (8.7)	8 (8.3)
3+	44 (24.4)	3 (2.0)	5 (5.2)
Condom use with *casual* sex partner/s[1]			
Not all of the time	67 (37.2)	11 (7.4)	9 (9.4)
All of the time/no partners	113 (62.8)	137 (92.6)	87 (90.6)
Number of *new casual* sex partners[1]			
None	141 (78.3)	132 (89.2)	84 (87.5)
1-2	29 (16.1)	15 (10.1)	12 (12.5)
3+	10 (5.6)	1 (0.7)	0 (0.0)
Condom use with *new casual* sex partner/s[1]			
Not all of the time	37 (20.6)	15 (10.1)	8 (8.4)
All of the time/no partners	143 (79.4)	133 (89.9)	87 (91.6)
Had sex in prison[2]	6 (3.5)	--	--

[1]In the 12 months prior to prison (pre-release), or since release (1 month follow-up) or last interview (4 month)
[2]Includes sex with a partner during a conjugal visit

4.4.2 Other BBV risk behaviour

One-quarter of the sample reported having ever had a tattoo in prison and one-fifth reported getting one during their current sentence (Table 9). Similarly, one-third reported ever having had penile beading (subcutaneous insertion of beads in the shaft of the penis) performed in prison (24.3% during the current sentence). In-prison tattooing and penile beading carry the risk of blood-borne virus transmission due to the sharing of equipment used to penetrate the skin between multiple recipients (along with the risk of bacterial infection from being performed in unhygienic conditions). Participants with genital beading were also more likely to report having unprotected sex with multiple casual partners (p=0.02), having a prison-based tattoo (p<0.001) and high risk alcohol consumption (p=0.001). Genital beading was also more common among participants reporting more than one imprisonment (p=0.001) and among those aged less than 30 years (age not statistically significant).

Table 9: Other BBV risk behaviours at baseline

	Baseline (N=198) n (%)
Ever had penile beading[1] conducted in prison	56 (28.3)
Had penile beading[1] conducted in prison during this sentence	48 (24.3)
Ever got a tattoo in prison	49 (24.7)
Got a tattoo in prison during this sentence	38 (19.2)
Ever got body piercings in prison	6 (3.0)
Got body piercings in prison during this sentence	4 (2.0)
Ever shared razorblades	65 (32.8)
Shared razorblades in prison during this sentence	47 (23.7)

[1]Penile beading is a form of genital modification which commonly involves the subcutaneous insertion of beads along the shaft of the penis. Cutting instruments used may be shared between people and thus pose a risk of BBV transmission.

4.5 Sexually transmitted infections: testing history, symptoms and test results

4.5.1 Testing history

Most participants (70%) had never had an HIV test at baseline, and only four per cent (one month post-release) and eight per cent (four months post-release) sought an HIV test during the follow-up period. One participant reported being currently infected with HIV. Only five per cent had ever had a hepatitis B virus test and of these one participant reported previous infection and seven reported never having been infected with hepatitis B.

Six participants reported being offered (and accepting) an HIV and/or other STI test while in prison, and a further four reported an offer which they declined. Overall, 26 participants (13.1%) accessed prison health services for testing and results a median of two times (range: 1-24).

4.5.2 Reported STI symptoms and DBS test results

One-hundred and ninety-three (97.5%) of the 198 participants at baseline provided a dried blood spot for HIV and syphilis testing. Two participants (1.0%) tested positive for HIV infection; one of these

reported a current infection when interviewed. Three participants (1.6%) also tested positive for syphilis specific IgM (please see secion 5.3 for a discussion of the limitations of this estimate).

Table 10: Symptoms of sexually transmissible infections, and dried blood spot (DBS) test results

	Baseline (N=198) n (%)	1 month post-release (n=150) n (%)	4 months post-release (n=96) n (%)
Ever experienced symptoms of STIs[1]	68 (34.3)	--	--
Currently have symptoms of STIs[1]	16 (8.1)	2 (1.3)	0 (0)
Ever had an HIV test	58 (29.3)	--	--
Reported current HIV infection (HIV positive)	1 (0.5)	--	--
Positive DBS HIV test result[2]	2 (1.0)	--	--
Positive DBS syphilis test result[2,3]	3 (1.6)	--	--

[1]STIs = sexually transmitted infections.

[2]Blood samples collected for 193 of 198 pre-release participants.

[3]Syphilis test not validated for individual level assessment. Please see Section 3.3.6 and Appendix 2 for further detail.

4.6 Alcohol, tobacco and other drug use

Alcohol, cannabis and yagona (kava) use was very common during the months leading up to imprisonment (Table 11). The proportion of participants reporting potentially harmful alcohol use (consumption of more than six standard drinks in one session, at least weekly) was lower following release from prison: 23.9% in the three months prior to prison and 15% at one month post-release (chi-squared = 7.79, $p<0.01$). The proportion reporting cannabis use also decreased from 59.7% to 22.7% at one month (chi-squared = 18.93, $p<0.001$). Further, 26.7% of participants reported using cannabis daily in the three months prior to prison and this decreased to a median of five days a week at follow-up. Conversely, tobacco smoking increased after release from prison, from 23.8% pre-release to 66.0% at four months post-release (chi-squared = 19.96, $p<0.001$). These changes should be interpreted with caution however, since the reference periods vary (e.g. three or 12 months pre-imprisonment and one or three months post-release), and as such there was less time post-release for these behaviours to be (re)adopted.

Drug use other than alcohol, tobacco, cannabis and yagona was extremely rare in the sample. Four per cent (n=8) of participants reported using inhalants in the 12 months prior to imprisonment (14.3% reported lifetime use of inhalants). Three participants (1.5%) reported lifetime use of cocaine, two (1.0%) reported lifetime amphetamine/methamphetamine use, and one (0.5%) reported having ever used ecstasy/MDMA and opiates other than heroin. No participants reported ever injecting drugs.

Table 11: Alcohol and other drug use prior to and post prison release

	Baseline (N=198) n (%)	1 month post-release (n=150) n (%)	4 months post-release (n=96) n (%)
Risk of alcohol use disorder (AUDIT)[1]			
Low/no risk	58 (29.4)	--	65 (67.7)
Moderate	51 (25.9)		21 (21.9)
High	33 (16.7)		2 (2.0)
Very high	55 (27.9)		8 (8.3)
Binge drinking at least weekly[2]	47 (23.9)	15 (10.1)	6 (6.3)
Recent[3] **yagona use**	125 (69.1)	81 (54.0)	60 (62.5)
At least weekly use of yagona (kava)[2]	86 (43.4)	--	--
Recent[3] **cannabis use**	105 (59.7)	34 (22.7)	20 (20.8)
At least weekly use of cannabis[2]	89 (44.9)	--	--
Current tobacco smoker	46 (23.8)	91 (61.1)	62 (66.0)
Overdosed/lost consciousness taking alcohol/drugs[4]	91 (46.9)	9 (6.0)	10 (10.4)
Ever received treatment for alcohol/drug use	6 (3.1)	--	--

[1]Refers to alcohol use in the 12 months prior to imprisonment (pre-release), or since release (4 months)
[2]During the three months prior to imprisonment (pre-release), or since release (1 month) or last interview (4 months)
[3]Used in the 12 months prior to imprisonment (pre-release), or since release (1 month) or last interview (4 months)
[4]Ever (pre-release), or since release (1 month), or since last interview (4 month)

4.7 Use of health services while in prison

Overall, 61.1% of participants reported accessing health services while in prison for medications, routine treatment, testing and/or a general health check-up. We are unable to determine from our data whether these services were provided onsite or by an external provider. Eleven participants (5.6%) reported being offered testing for at least one of HIV, syphilis, chlamydia, gonorrhoea, hepatitis B virus or tuberculosis while in prison.

	Baseline (N=198) n (%)
Accessed health services for medications while in prison	111 (56.1)
Accessed health services for routine treatment while in prison	42 (21.2)
Accessed health services for testing while in prison	26 (13.1)
Accessed health services for general check-up while in prison	44 (22.3)

4.8 Post-release health service utilisation

Use of health services in the community at one month post-release was rare. Only one participant reported visiting a doctor in the four weeks since their release, nine reported having been to a hospital and four reported accessing sexual health services. Three participants reported accessing counselling and one reported visiting a traditional healer.

A slightly higher proportion of participants reported accessing any of these services by the four month interview. Five (5.1%) reported accessing a doctor and 18 (18.4%) reported having visited a hospital. Most of these hospital visits were to have body pain symptoms examined. Four participants reported accessing a counsellor by the four month interview, two a sexual health service, and one a traditional healer.

At one month post-release, 33.3% of participants who reported a need for a health service had not accessed any service. The following reasons were given for not accessing services: being worried about stigma/discrimination and/or not being comfortable (n=11), geographic distance/lack of transport (n=6), having family responsibilities (n=2) and being unaware of availability (n=2). At the four month interview, participants gave the following reasons for not accessing health services despite a need: geographic distance/lack of transport (n=5) and not being comfortable (n=2).

5. Discussion

5.1 HIV and syphilis prevalence, knowledge and risk

Two of the 193 participants who provided a blood sample in this study tested positive for HIV infection. While this constitutes an overall low prevalence in the sample (1.0%), it is still almost ten times that documented in the wider Fijian population (0.1%) [59]. However, the fact that HIV amongst prisoners in our study is low suggests that HIV remains rare in this group, who are usually considered to be a key affected population. This view is supported by research conducted in Fiji with sex workers and men who have sex with men, among whom the prevalence of HIV is also relatively low [2, 33, 34]. We were unable to assess lifetime syphilis exposure or late-stage infection using the anti-treponemal IgM test. The proportion of participants testing positive for syphilis specific IgM as an indicator for early, active syphilis (1.6%) was low compared with the 2.7% of syphilis infection recorded amongst pregnant women in a 2008 second-generation behavioural survey [2] and the 5% recorded at antenatal clinics [6]. The test utilised in this study however is not sensitive to later-stage syphilis infection so it is therefore possible that the prevalence of later-stage syphilis infection in our sample was higher, approximating that recorded among pregnant women at ante-natal services.

While participants had a good understanding of some of the vectors for HIV and other STI transmission (such as unprotected sexual intercourse), there was a high degree of misunderstanding about others (for example, over half agreed with the statement that HIV could be transmitted via a mosquito bite). Knowledge about the risk of unprotected vaginal or anal sexual intercourse did not necessarily always translate into action however. Although the majority of participants reported consistent condom use with casual sex partners, 37% reported not using condoms 'all of the time' with casual sex partners. A substantial minority of the sample also reported engaging in other high risk behaviours including in-prison tattooing and penile beading. Since HIV is predominantly transmitted via heterosexual sex in Fiji, this is likely to be the risk factor that needs the most attention. The most common reason given by this sample for having unprotected sex with casual partners was the lack of availability of condoms.

Smaller proportions also identified factors such as loss of sensation, trusting their partner and intoxication. The low level of knowledge about vectors for HIV transmission among prisoners in Fiji is not surprising given that only around half of participants reported having received information/education about HIV (53.0%) or STIs (49.5%). This suggests that there is considerable scope for HIV and STI awareness campaigns to be targeted towards prisoners.

As part of this study, participants were given a pamphlet and some information on where to access HIV and STI testing services in the community. Only 8% of participants reported seeking HIV testing following their release from prison. This may indicate that existing educational materials and HIV campaign messages are ineffective, but there is also evidence that ex-prisoners do not prioritise their health due to competing demands [60]. The low rate of post-release HIV and STI testing is also consistent with participant's beliefs that if you have an STI you will show symptoms, such that those who are not experiencing symptoms may assume that they are not infected. Additionally, within the Fijian context there is a significant taboo and stigma around getting tested for HIV; as well as barriers for men in accessing testing facilities (currently only widely available in Fiji to pregnant women). Thus the low rate of testing following release is not necessarily due to lack of awareness, but could be due to the impact of stigma and unavailability of services. This is also consistent with unpublished research in Fiji amongst sex-workers [33]. The interviewed sex workers had sound knowledge of STIs and where to get tested, but refrained from getting tested due to the stigma of being seen accessing HIV and STI medical services. Availability of testing facilities and the role of community stigma and cultural taboo need to be considered in the development of any HIV and STI awareness programs which seek to target 'at risk' groups in Fiji.

5.2 Health status and behaviours

Despite being a relatively young sample, a substantial minority reported having chronic health conditions including tooth decay, poor eyesight or hearing, asthma, back problems or high blood pressure. Almost half of the sample reported at least one physical health condition. These findings are consistent with those from other countries, where prisoners have disproportionately high health care needs [61-63]. Consistent with this, almost one-quarter reported accessing a hospital or doctor within one month of release from prison, although one third did not access a health service despite reporting a need to do so. Poor health in this group has the potential to place a disproportionate burden on local health services after release from prison, particularly if unaddressed health problems become more severe without treatment. The opportunity exists to screen and commence management of health issues on entry to prison, in collaboration with local health services.

Leaving prison can be a stressful time – a high proportion of the sample demonstrated considerable (high or very high) psychological distress at baseline and reported being bothered by emotional problems such as anxiety, depression or irritability. Around one in five at baseline reported being bothered by emotional problems and/or that emotional problems affected their ability to do daily activities. If left unaddressed, these mental health problems are likely to impact on the individual's capacity to reintegrate into society, and to obtain employment or other meaningful activities. Although data at 1 month post-release showed a smaller proportion reporting high/very high psychological distress (from 27.3% to 16.0%), this is likely to be due primarily to biased attrition, with those experiencing greater distress less likely to be followed up in the community post-release (see Limitations below). Indeed, the decrease in distress observed in this study is not consistent with

existing evidence which suggests that released prisoners have difficulty adjusting to life outside of prison [64] are more likely to engage in substance use [14, 65] and are at increased risk of suicide, partly due to social isolation [66, 67].

The links between mental ill-health, risky substance use, and offending behaviour have been well documented [65, 68-71]. A considerable proportion of the sample reported high risk alcohol and cannabis consumption prior to imprisonment and almost half had been in prison previously. It is possible that substance misuse amongst this sample of prisoners was a pre-cursor to criminal behaviour, which is consistent with existing literature [72, 73]. It is also possible that study participants (in the months leading up to their imprisonment) increased alcohol consumption due to either increased anxiety and/or a desire to 'party' as it might be their last chance to 'have fun' before being sent to prison. More data regarding alcohol and other drug use amongst prisoners in Fiji, both before and after incarceration, are needed to understand the links between substance use and offending in Fiji.

5.3 Limitations

Although this is, to our knowledge, the first longitudinal study of prisoners/ex-prisoners ever undertaken in the Pacific, the study was limited by a number of factors that affect interpretation of the findings. The key limitations are described below.

Sample size and recruitment

While we aimed to recruit a representative sample of people leaving prison in Fiji, in the absence of data on all prison releases for the time period, there is no way to determine whether this sample was representative. Certainly it is likely that prisoners with short sentences, and recidivists, were more likely to be recruited due to the likelihood of being released from prison over the 15 month data collection period. Despite the interviewers' best efforts, the recruited participants were not all consecutive releases from each of the participating prisons. Factors such as prison lock-downs, staffing issues and conflicting release information (caused by early releases due to EMP (extra-mural punishment)) hampered the recruitment of consecutive releases. We were unable to determine who was *not* recruited and how they differed from those who participated. Consequently, this sample should be considered a 'convenience sample'.

The sample of 198 represents over one-fifth of Fiji's prison *capacity*, however over-crowding is common and the exact number of people in the participating prisons during the recruitment period is unknown.

Further, from a statistical perspective the sample size is small to observe rare outcomes such as HIV and syphilis infection, and other 'rare' health issues and behaviours. However, estimates of non-rare (>10%) health outcomes and behaviours among the pre-release sample are likely to be more reliable.

Attrition

In all longitudinal studies a proportion of participants are lost at each wave of follow-up ('attrition' or 'loss to follow-up'). Often, a loss of 10-15% of participants at each wave of follow-up is assumed at the outset of the study. In all cohort studies it is inevitable that some participants will withdraw from the study, some won't be found again or will become ineligible and some may die. In the case of this

study, participants were eligible if due to be released from prison within four weeks, however in some cases participants were not released on the expected date; those who were never released, or released more than 6 weeks after their pre-release (baseline) interview became ineligible for follow-up. Another eligibility criterion was that participants expected to be living on Viti Levu or Vanua Levu after release. This was to enable tracking so that interview staff could travel to meet participants for follow-up interviews. In some cases participants moved to other islands or moved away from their expected place of residence. Due to the remoteness of some of Fiji's population, the configuration and spread of villages and the limited connectivity of mobile telecommunications, postal addresses or phone numbers were not necessarily an available means of contact for many participants. In fact, many streets do not have names in Fiji and houses do not have numbers. Interviewers were most successfully able to contact and locate those participants that provided several family contact options and the details of the village from which they came. It is likely that those most easily contacted for follow-up were the same group of participants who had either found employment or successfully returned to their family and villages following release.

This issue of attrition (50% by the four month follow-up) is likely to have introduced bias to the study. Those who were lost to follow-up may have differed significantly from those who were successfully followed (for example, they may have had worse health outcomes and greater risk behaviours). Consequently, the observed prevalence of risk behaviours and poor health outcomes post-release is likely to be an under-estimate. We attempted to examine biased attrition by comparing key measures from the pre-release interview, stratified by follow-up status (Tables 3 and 4). Female sex, unemployment, mental ill-health, risky alcohol use, tobacco use and utilization of prison health services were all significant predictors of loss to follow-up.

Of those who did participate in the follow-up interviews 50.9% were living with family, 87.5% had found post-release employment (including self-employment) and were more likely to be in a relationship (54.7% compared to 42.1% at release). These are all factors that may increase the sense of psychological wellbeing and community-connectedness and decrease the likelihood of risky substance use and re-offending behaviour [74].

The low retainment of participants at the 4-month follow-up interview also has implications in relation to observed HIV and syphilis risk behaviours. Participants lost to follow-up are more likely to have engaged in risk taking behaviours (putting themselves and others at risk of contracting STIs). Nevertheless, this study provides baseline evidence of risk-taking behaviours prior to, during and after release from prison in Fiji – notably including high-risk alcohol use, unsafe tattooing, penile modifications and inconsistent condom use.

Reliance on self-report and recall bias

Aside from measuring HIV and syphilis prevalence, which we were able to measure objectively using serological samples, the data presented in this report rely entirely on participant self-report. Such data are subject to issues such as recall bias (forgetting information from a previous time period), and social desirability responding (responding according to what is considered more socially acceptable – particularly where sensitive, personal and illegal behaviours are concerned). Where we asked about diagnosed physical and mental health conditions, we are likely to have substantially under-estimated

the prevalence of these conditions, because only a subset of those with the condition would have been diagnosed.

We attempted to reduce the impact of these issues by asking participants to refer to a short time period when asking about their behaviours, and by using trained interviewers who were independent of the prison system. Nevertheless, future studies would benefit from examining health records in prison and the community, to complement self-report data.

Testing methods

The test that we utilised for acute syphilis infection using DBS is not currently validated and cannot be used for individual-level assessment. As such, it is useful for population-level estimation of range only and the reliability of results is unknown. Further, the suite of tests required to identify later-stage syphilis infection are not able to be performed on dried blood spots. We were therefore unable to identify late-stage syphilis infection. The test for HIV however, is validated and reliable but is not approved for individual diagnostic purposes.

6. Conclusions and Recommendations

This study enabled, for the first time, documentation of significant health needs among Fiji's soon-to-be-released prisoners and ex-prisoners, and pointed to some important areas requiring responses and/or further research. This section draws conclusions about the data presented and makes recommendations for policy, practice and future research.

HIV and other STI prevention and education

While the low prevalence of HIV and syphilis is fairly consistent with epidemiological data on the wider population in Fiji, sexual risk behaviour remains a potential vector for transmission, especially given the observed knowledge gaps, reported limited availability of condoms, low testing rates and engagement in risky alcohol and other drug use. While there has been considerable progress on HIV and other STI education and prevention (e.g. condom distribution) programs in Fiji, these data suggest there is still room for improvement and a broadening of the scope, importantly including prisoners and those recently released from prison. Factors such as stigma also impact on decision-making, including decisions about access to services for testing and treatment.

Recommendations

1. ***Target prisoners/ex-prisoners for HIV and STI education and prevention campaigns.***

   Programs such as the Yellow Ribbon campaign could be funded to provide condoms to prisoners on release as part of a pre-release education and infection control intervention. Items such as condoms can be relatively expensive for newly-released prisoners with little or no income.

2. ***Expand transitional support provided by the Yellow Ribbon program***

   The Yellow Ribbon program currently provides socio-economic community re-integration support by providing access to education and start-up resources for running small

businesses. The reach of the program means that it is well-placed to help with other transitional needs, including accessing health services and obtaining testing for infectious diseases where appropriate.

Primary and preventive health care

A high proportion of participants reported poor mental and/or physical health at baseline (prior to release from prison). The opportunity exists to implement health screening systems on entry to prison and initiate management of existing conditions to prevent or reduce future health problems. Poor mental health is a significant and under-recognised issue in this population, and requires both further research and treatment responses. Primary health care, particularly in populations such as this where the prevalence of preventable ill health is high, can provide long-term economic benefits, by reducing the future burden on more expensive secondary and tertiary health services [23].

Recommendations

3. ***Review the current model for providing primary and mental health care for prisoners, screening for mental and physical health risks and conditions upon entry to prison*.**

   One potentially effective model in resource-constrained settings is 'in-reach' where community medical practitioners and mental health workers provide limited services inside the prison, linking to external community health services where required.

4. ***Expand the existing system for screening and collection of data on key health indicators, at prison reception to include mental and physical health assessment and infectious disease testing.***

   Routine screening for key health conditions at reception, potentially including HIV and mental illness, would allow for early initiation of treatment. This would have benefits for the prisoner, other prisoners and prison staff, particularly in terms of reducing the risk of disease transmission in custody.

Further research

Few studies have investigated the health of prisoners/ex-prisoners in any Pacific Island country or territory, and consequently knowledge of this marginalised population is poor. To our knowledge, this is the first ever longitudinal study of ex-prisoners in the Pacific, focussing on health outcomes and behaviours. This study demonstrates that research with prisoners and ex-prisoners in the Pacific is possible and provides some preliminary data that larger, better-resourced studies could build on. However, this study was limited by participant loss to follow-up which has implications for the generalisability of the results.

Recommendation

5. ***Secure funding for further research***

Following ex-prisoners in the community post-release is a difficult and time-consuming task. In order to accurately assess health status and health behaviours post-release, adequate funding for a well-designed longitudinal study is required.

There may also be potential to conduct a data-linkage study using reimprisonment and/or arrest data, or using national mortality data, to examine recidivism and other key health outcomes in this population. Such studies provide high-quality, population-level data at relatively little cost.

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Appendix 1: Protocol for dried blood spot collection

When the survey is completed and the paperwork is packed away, the interviewer can collect blood from the participant for later HIV and syphilis testing.

1. **Prepare** (get everything out ready before you start the procedure, label both of the cards with the unique participant study number, tell the participant what you are going to do)
2. **Prick** (prick participant's finger and fill 3 circles on each card with blood – you may need to prick several times to get enough blood!)
3. **Pack away** (dispose of everything safely and clean the area)

The full procedure for blood sampling is as follows:

1. Ask participant to make sure their hands are warm (this increases their blood circulation and makes it easier to collect blood!).
2. Ensure that the participant's study code is clearly written on the front of the 2 blood collection cards and that it is the same code that is written on the survey. Do not write their name on the card, just the code.
3. Clear the table of any paperwork and other items.
4. Unpack blood collection kit and lay out each item in the order that they will be required (alcohol hand wash, gloves, alcohol swab, lancet, filter paper, cotton wool, bandaid/plaster, bleach spray/disinfectant, paper towel, plastic rubbish bag).
5. Open the sharps disposal container and place it on the table nearby where it can't easily be knocked over. It is important to have this open before you start so that the lancet can be safely disposed of immediately after use.
6. Interviewer should wash their hands with alcohol hand wash (or use soap and running water if available) and then immediately put on a pair of gloves.
7. While you are preparing you can explain to the participant exactly what you will be doing (e.g. *"This is a lancet; it has a needle enclosed in the plastic which will pierce your skin. You may have seen someone with diabetes using one to check their blood sugar levels. I'm going to prick your finger and then we will squeeze blood out onto this card. We need enough blood to fill the circles. Sometimes this requires 2 pricks….*etc".
8. Ask participant to hold out their index or middle finger.
9. Show participant where you will pierce their skin and tell them it will be a small prick that is a little uncomfortable but not painful.
10. Show participant the circles on the filter paper where the blood drops will be collected and explain that they need to be filled up in order to have enough blood.
11. Open alcohol swab and wipe participant's finger once in one direction only.
12. Prime lancet for use (push back and twist plastic 'handle' and then pull out – discard plastic 'handle')

13. Place lancet on edge of finger-tip and press against the skin (make sure it is pressed firmly against the skin so that the needle penetrates deeply enough to get enough blood flow). Press the release button to release the spring. The needle will spring forward and puncture the skin and then immediately retract.
14. Immediately place the used lancet into the yellow sharps disposal container.
15. Dab fingertip against the circles on the filter paper collection card to absorb the drops of blood.
16. Squeeze finger gently from above the knuckle to help the blood flow. NOTE: Some people will bleed quite freely and this will not be necessary, for others you may need to puncture a second finger to obtain enough blood. If you need to make a second puncture, please follow steps 8-15 again.
17. Apply cotton wool to puncture site and ask participant to hold down firmly to stop flow of blood. Cotton wool - and any other item with blood on it - can be placed in the yellow sharps disposal container.
18. Replace lid of sharps disposal container.
19. Prepare bandaid/plaster – give to participant to apply to their puncture site if desired (many people will have stopped bleeding and won't need one, just offer).
20. Spray table surface with bleach/disinfectant and wipe down with paper towel
21. Place paper towel, gloves, used swab, any wrappers etc in plastic bag and throw into rubbish bin (if available, otherwise take with you and dispose in the normal rubbish bin).

Handling and storage procedures

1. Ensure that filter paper is dry and seal into its individual ziplock plastic bag with sachet of dessicant (absorbs moisture)
2. Store bags in another ziplock bag in a cool dry place while waiting for transport to Lautoka Head Office. Likewise, DBS samples should be stored in a cool dry place at the Lautoka Head Office prior to mailing to Australia. Refer to protocol manual for packaging, labeling and mailing insructions.
3. Disposing of yellow sharps disposal container – when the yellow container is full, it should be taken to a hospital or medical waste precinct for incineration. Please liaise with your Coordinator when your yellow container is nearly full so that we can organise for a replacement to be sent from Australia.

Appendix 2: Development of syphilis testing protocol for dried blood spots

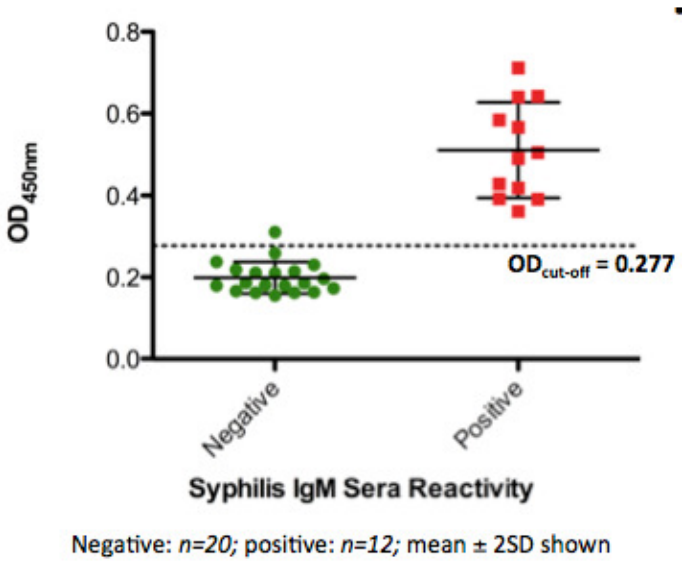
The rationale for IgM detection was based on its ability to differentiate active and past infection due to its specific production in the early stages of disease[1]. Other benefits included the availability of commercial syphilis-IgM ELISAs (Trinity Biotech CAPTIA^{TM}) previously characterised in the literature[2] and precedent with measles antibody detection[3].

Upon receipt, integrity of DBS were documented and stored at -20°C until sufficient numbers were collected for processing. 6mm discs – an equivalent of 5uL of sera[4] – were punched out from the DBS and added to skim milk elution buffer (5% skim milk, 0.5% Tween20 in PBS) at a ratio of 110uL elution buffer per 6mm disc. Following overnight elution at 4°C with gentle agitation, the eluate was spun at 1000*g* for 15 minutes at 4°C. The eluate was then diluted 1:2 in ELISA kit diluent to give a final equivalent sera dilution of 1:44. The diluted eluate was then applied to the CAPTIA^{TM} syphilis-IgM ELISA plate along with controls (a stable negative sera sample) and followed as per manufacturer guidelines. Where possible, samples were run in duplicate.

The controls were multiplied by factors previously derived from a control population to determine the cut-off OD. The main factor is derived such that, when multiplied by the control, it will give the equivalent of the mean plus two standard deviations of a syphilis IgM negative population. Any DBS above the two standard deviation equivalent were retested to confirm reactivity.

The protocol and factor described above were initially developed and optimised using spiked DBS. Packed, washed red blood cells (blood type O+) were spiked with sera either from a commercial syphilis IgM positive panel (n=12) or previously screened samples known to be IgM negative (n=20). The spiked blood was applied to Whatman 903 Protein Saver cards to produce the spiked DBS. Testing of this population indicated a clear differentiation between the two IgM states. (Fig1).

Figure 1: Optimisation of DBS Protocol



Negative: *n=20;* positive: *n=12;* mean ± 2SD shown

References

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