



RACP Foundation Research Awards

FINAL REPORT

Project Title	Epidemic Syphilis: Understanding transmission and improving control of syphilis and other STIs	
Name	Dr Janet M Towns	
Award Received	2017 AChSHM Research Entry Scholarship	
Report Date	3 March 2018	
Chief Investigator / Supervisor	Supervisor: Professor Christopher Fairley Co Supervisor: Dr Eric Chow Chief Investigator of SOS Project: Adjunct Professor Marcus Chen	
Administering Institution	Monash University	
Funding Period	Start Date:	1 January 2017
	Finish Date:	31 December 2017

PROJECT SUMMARY

I am researching syphilis transmission and public health control strategies to address the current syphilis epidemic. My thesis has two main research projects

1. **“SOS: Shedding of Spirochaetes”**. This project researches the dissemination and shedding of *Treponema pallidum* in gay & bisexual men (GBM) with early syphilis infection. We have recruited 132 participants to date for this project, which will likely complete recruiting in 2018. Early results are encouraging and we are anticipating that this research will give further significant insights into the dissemination of syphilis throughout the body and sexual transmission amongst GBM.
2. **“What is it?”** This project involved the development of a self-diagnostic website for members of the general public to self-diagnose their symptoms of STIs. They receive advice on where and how to access treatment, a probability diagnosis of their symptoms being related to a STI, relevant sexual health information and a referral letter for their doctor.

In 2017 we completed the first phase 1 of this project and now have a prototype website, which can be found at www.ispysti.org. We now plan to expand the project and create an app.

PROJECT AIMS / OBJECTIVES

Major project 1: “SOS: Shedding of Spirochaetes”.

In men who have sex with men (MSM) \geq 18 years old, who have been diagnosed with early infectious syphilis we aimed:

- a. To determine the prevalence of subclinical detection of *Treponema pallidum* (Tp) from the oral mucosa, anal mucosa, urine & semen samples, together with the load of Tp with subclinical shedding.
- b. To determine whether the detection and load of Tp on cutaneous or mucosal sites, in urine or semen samples is associated with blood levels of Tp.
- c. To quantify the load of Tp in a wide range of clinically evident lesions of early syphilis and whether these differ by lesion type, site, size and location.
- d. To compare the Tp load between clinically evident lesions and subclinical detection.
- e. To explore whether Tp load in the various compartments above are associated with transmission to male partners.
- f. To determine whether the above differ between HIV positive and HIV negative men

We plan to achieve our aims by recruiting men with early syphilis infection and collecting some non-standard clinical samples which will be tested for *T. pallidum* PCR.

Major project 2: “What is it?”

The aim of this project was to build a publicly-available self-diagnosis tool that probabilistically provides indications of the most likely sexually transmitted infections (STIs) or other conditions based on an individual's responses to a questionnaire and to prompt those with STIs to present early for treatment. The ultimate public health gain would be a shorter period of infectiousness and therefore a lower prevalence of infection through earlier treatment.

In 2017 we completed the first phase of this project and now have a prototype website, which can be found at www.ispysti.org. We now plan to create an app.

Minor projects: I have also been involved in a number of minor projects throughout 2017. The publications/outcomes of these projects are listed in “Academic Output”.

SIGNIFICANCE AND OUTCOMES

Major project 1: “SOS: Shedding of Spirochaetes”.

Early results are encouraging and we are anticipating that this research will give further significant insights into the dissemination of syphilis throughout the body and sexual transmission amongst GBM. We are hoping to answer our research questions, and make a significant contribution to the limited body of literature on syphilis transmission. It is planned that early results of this project will be presented at the IUSTI Asia Pacific Sexual Health Congress in Auckland in November 2018.

Major project 2: “What is it?”

Results: This website can diagnose a number of common STI conditions with 95% sensitivity and variable specificity. We are currently collecting more data to improve the accuracy and to add other common STI conditions in phase 2 of the project. We now plan to expand the project and create an app.

PUBLICATIONS / PRESENTATIONS

The following journal articles have been published in 2017/18. I am a first author on two and co-author on another 2 published papers.

Journal article. Clinical factors associated with syphilis concordance in men in sexual partnerships: a cross-sectional couples study. Janet M Towns, Sarah Huffam, Eric P F Chow, Ian Denham, Lei Zhang, Andrea Ryan, Clare Elizabeth Bellhouse, Melanie Bissessor, Catriona S Bradshaw, Tiffany Phillips, Stephen Graves, Christopher K Fairley, Marcus Y Chen. STI Online First, published on November 30, 2017 as 10.1136/sextrans-2017-053297.

Journal article. Jason J Ong, Janet M Towns (co-1st author), Marcus Y Chen, Christopher K Fairley. Occult syphilitic chancres of the rectum and oropharynx, Australian family Physician. Vol 46, No 9 September 2017.

Journal article. Mcallister J, Towns JM, McNulty A, Pierce AB, Foster R, Richardson R, Carr A. Dolutegravir with tenofovir disoproxil fumarate - emtricitabine as HIV post-exposure prophylaxis in gay and bisexual men. AIDS 2017 Jun 1;31(9):1291-1295.

Journal article. Needleman R, Chow EPF, Towns JM, Cornelisse VJ, Yang T, Chen MY, Bradshaw CS, Fortune R, Fairley CK. Access to sexual health services after the rapid roll out of the launch of pre-exposure prophylaxis for HIV in Melbourne, Australia: A retrospective cross-sectional analysis. Sexual Health. In press.