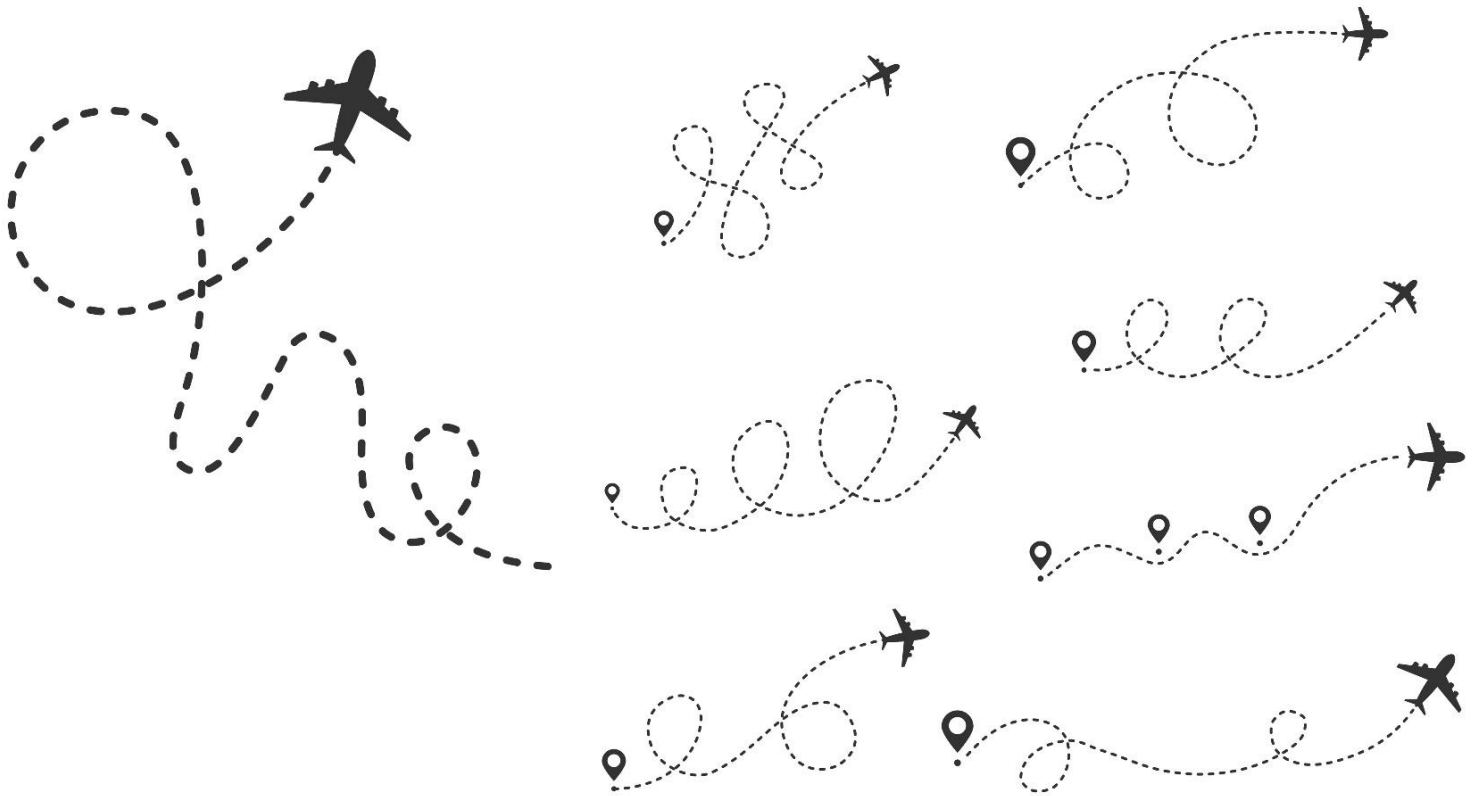




NEXUS2

A survey to collect sexual health behavioural data
from Australian men travelling to Southeast Asia

COLLABORATION FOR EVIDENCE, RESEARCH & IMPACT IN PUBLIC HEALTH

We acknowledge that this research has taken place on Country across Western Australia and pay our respects to Elders past and present. Our research team is based in Boorloo (Perth) on the lands of the Whadjuk Noongar people, who have been custodians of this boodjar since time immemorial.

We acknowledge all Traditional Custodians and their continuing connection to culture, community, land, sea and rivers.

Research team: A/Prof Gemma Crawford, Corie Gray, Dr Roanna Lobo, Dr Nang Nge Nge Phoo, Aili McMahon

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BACKGROUND

Population mobility is an increasingly important driver of HIV. In high-income countries, including Australia, population mobility has led to changes in transmission patterns of human immunodeficiency virus (HIV) and other sexually transmissible infections (STIs) and bloodborne viruses (BBVs).

In Australia, a significant proportion of diagnosed cases have been acquired overseas. Latest data suggest that, nationally, almost half (47%) of heterosexual notifications were acquired overseas (King et al., 2022). In Western Australia, overseas-acquired HIV makes up a significant proportion of all notifications, with a large number of heterosexual notifications among Australian-born men travelling to Southeast Asia.

Since 2010 (prior to its establishment) members of the Community of Practice for Action on HIV and Mobility (CoPAHM) have been undertaking an ongoing program of research (NEXUS) to understand the relationship between migration, population mobility and HIV acquisition for Australian men.

NEXUS originates in work by Professor Graham Brown and A/Prof Gemma Crawford, involving qualitative grounded theory research (interviews, observations, and content analysis) regarding HIV acquisition and HIV risk amongst men travelling to Southeast Asia (SEA) including Australian male expatriates, longer-term or frequent travellers (ELoFTs).

The NEXUS research has particularly focused on understanding how ELoFT social networks

may be harnessed for public health intervention to address HIV and other STIs and BBVs, particularly via peer education and social influence; a cornerstone of Australia's historical HIV response.

However, there is a significant gap in available data related to behavioural, social, political, economic and environmental risk factors for migrant and mobile populations, including Australian-born men who have acquired HIV overseas.

Specifically, there is little quantitative research, however, a key recommendation from much of the previous work was the roll-out of a behavioural survey to capture the outstanding information described earlier. Baseline data are needed to describe the risk profile of ELoFTs - Australian-born men who travel, work, or live in SEA, in relation to sexual health and HIV.

Addressing this gap is critical to inform the development of effective, tailored responses for populations at risk of HIV acquisition, particularly as there is a forecasted increase in international travel over the coming years post-border restrictions from the COVID-19 pandemic.

NEXUS2 is a research project which aimed to close this gap in knowledge by collecting baseline data on sexual health and HIV-related knowledge, attitudes, and practices specific to ELoFTs - Australian-born men who travel, work, or live in SEA.



PROJECT PROCESS

This study - NEXUS2 - involved the development of a survey tool, validity testing with experts and the target group, reliability testing of the questionnaire through test-retest and the reporting of results.

The project builds on previous work including:

- Crawford, G., R. Lobo, B. Maycock, and G. Brown. 2023. ["More than mateship: exploring how Australian male expatriates, longer-term and frequent travellers experience social support."](#) *International Journal of Qualitative Studies on Health and Well-being* 18 (1)
- Crawford, G., B. Maycock, R. Tobin, G. Brown, and R. Lobo. 2018. [Prevention of HIV and other sexually transmissible infections in expatriates and traveler networks: Qualitative study of peer interaction in an online forum.](#) *Journal of Medical Internet Research* 20 (9)
- Crawford, G., R. Lobo, G. Brown, C. Macri, H. Smith, and B. Maycock. 2016. [HIV, other blood-borne viruses and sexually transmitted infections amongst expatriates and travellers to low- and middle-income countries: A systematic review.](#) *International Journal of Environmental Research and Public Health* 13 (12)
- Crawford, G., R. Lobo, G. Brown, and B. Maycock. 2016. [The influence of population mobility on changing patterns of HIV acquisition: Lessons for and from Australia.](#) *Health Promotion Journal of Australia* 27 (2): 153-154.
- Brown, G., J. Ellard, J. Mooney-Somers, G. Prestage, G. Crawford, and T. Langdon. 2014. [Living a life less ordinary': exploring the experiences of Australian men who have acquired HIV overseas.](#) *Sexual Health* 11: 547-555.
- Crawford, G., N. J. Bowser, G. E. Brown, and B. R. Maycock. 2013. [Exploring the potential of expatriate social networks to reduce HIV and STI transmission: a protocol for a qualitative study.](#) *BMJ Open* 3
- Brown, G., J. Ellard, J. Mooney-Somers, Hildebrand, J., and T. Langdon. 2012. [HIV risk among Australian men travelling overseas: networks and context matter.](#) *Culture, Health & Sexuality* 14:6, 677-690.

Ethical approval to conduct the research was obtained from Curtin University's Human Research Ethics Committee [HRE2021-0748].

SEVEN STAGES:

Stage 0: Project administration

Completed November 2023, reported previously.

Stage 1: Validity testing with experts

Completed November 2023, reported previously.

Stage 2: Validity testing with target group

Completed November 2023, reported previously.

Stage 3: Reliability testing with target group

Completed April 2024, reported here.

Stage 4: Data analysis and survey refinement

Completed June 2024, reported here.

Stage 5: Development of brief report of findings

Completed July 2024, reported here.

Stage 6: Additional knowledge translation (outside current contract)

Completed by December 2024.

PARTICIPANTS

A convenience sample of Australian-born men (over 18) who had travelled to SEA in the past five years were recruited online.

Recruitment occurred through social media and email lists posted through relevant organisations, as well as posts made in relevant Facebook groups and online forums relating to travel, Australia, SEA and men.

Additional survey responses were collected via Join Us, an online register that connects community members with researchers managed by the University of New South Wales (Join Us, 2021).

To boost participation, panel responses were purchased through PureProfile, a research platform that connects with consumers (PureProfile, 2024).

Demographics: collected year of birth, assigned male at birth, postcode, country currently living in and length of time in this country, occupation, work-based travel, language/s spoken, cultural and ethnic background and sexual orientation. Questions relating to employment and education were from the 2021 Australian Census (Australian Bureau of Statistics, 2021), with small changes made in response to the validity testing.

Travel characteristics: collected travel to other regions in the last five years, SEA countries visited in most recent trip, timing of last trip to SEA, length of time in SEA, travel companions on most recent trip, reason for most recent trip, and frequency of visits in the past five years. Questions drew on Heywood et al. (Heywood et al., 2012).

Knowledge: collected knowledge of common STIs and BBVs and modes of transmission and sexual health advertising awareness. Questions drew on Goesch et al. (Goesch et al., 2010) and Casten et al. (Casten et al., 2022).

Behaviour: collected vaccination, where medical/health advice was sought prior to travel, sexual behaviour while in Southeast Asia, awareness and use of post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP). Questions drew on O'Mullan et al. (O'Mullan et al., 2015), the Gay Community Periodic Survey (Chan et al., 2024) and Heywood et al. (Heywood et al., 2012)

Attitudes: collected intention to have casual sex, intention to use condoms, worry about contracting an STI, where travel was usually booked and where pre-travel information was sought. Questions drew on O'Mullan et al. (O'Mullan et al., 2015) and Manieri et al. (Manieri et al., 2013).

MEASURES

An initial draft survey tool was developed. The survey tool was written in English and delivered online through Qualtrics software (Qualtrics, 2024). Survey questions were broadly adapted from a previous survey involving fly-in-fly-out workers in Queensland (O'Mullan et al., 2015), with other sources described below.

The draft survey tool contained 79 questions across five sections: demographics (10 questions), travel characteristics (8 questions), sexual health knowledge (9 questions), sexual health behaviour (35 questions) and attitudes (17 questions).

An initial screening question determined that the participant identified as male, was born in Australia, had travelled to Southeast Asia in the last five years and was over the age of 18.

PROCEDURE

VALIDITY TESTING

Content validity adapted procedures by Polit et al. (Polit, 2014). Eight experts working in sexual health (mostly male) participated (from research, government, and non-government).

Experts reviewed each question providing a score of 1 ('question not necessary'), 2 ('useful but not essential') or 3 ('necessary') along with any pertinent remarks. Experts were invited to complete this individually or with a research team member online.

Several questions were removed through this process, related to condoms, alcohol and other drug use. Other questions were included, such as being assigned male at birth and questions relating to work-related travel and sexual health testing pre- or post-travel. The survey tool was revised by the research team.

Ten members of the target group were sought complete and provide feedback on the tool. At the bottom of each section, the question 'Is the language in this section easy to understand?' was posed with a 'Yes'/'No, provide a comment' response. An open-ended question was also included. The survey was distributed through the research team's networks.

Three responses were collected, with no issues reported on language or any comments received. The final survey tool contained 61 questions across five sections: demographics (13 qs), travel characteristics (8 qs), sexual health knowledge (9 qs), sexual health behaviour (26 qs) and attitudes (4 qs).

RELIABILITY TESTING

Participants who completed the initial survey were invited to retake the survey and prompted to provide their email address. Participants were contacted via email 14 days after completing their original survey and provided with the retest survey link. On completing the survey for a second time, participants could

choose to enter a prize draw to win one of four \$50 gift vouchers.

A final sample of 35 were included in the reliability analysis. Test-retest reliability was assessed using an intraclass correlation coefficients (ICC) test. Only questions to which the full sample had responded were included. Questions with multiple choice were not included. Test-retest reliability was described as good (ICC 0.75-0.90), moderate (ICC 0.50-0.75) and poor (ICC <0.50) (Polit, 2014).

The highest ICC result was 0.98 (0.95 – 0.99 95% CI), '*What is the highest level of education you have completed?*'. The lowest ICC result was 0.71 (0.42 – 0.86 95% CI), '*How long did you stay during your most recent trip to Southeast Asia?*'. Overall, the results indicated considerable to high agreement in the initial and repeat tests.

DATA ANALYSIS

Data were exported from Qualtrics to Excel. Data cleaning (consistency in spelling and punctuation of free-text answers) was performed in Excel. IBM SPSS Version 27 was used for data analysis (IBM Corp, 2020).

For knowledge questions about modes of transmission, each correct answer was scored as '1' to calculate a knowledge score. Pearson's Chi-square test was used to examine associations between selected sociodemographic, travel, knowledge, and behavioural variables, at an alpha level 0.05.

ICC was computed for at least one variable from each survey domain. Free text-answers were coded into themes. For example, descriptions of sexual health advertisements were coded under eight themes, including safe sex and screening/testing.

Three hundred and seventy-four participants started the survey; 224 were excluded at screening, and 14 did not complete the survey. A final sample of 136 participants was included: 17 recruited through networks, 13 via JoinUs, and 106 using an online panel.

KEY FINDINGS

DEMOGRAPHICS

Most participants were living in Australia. The two participants outside of Australia had been living in Thailand and Vietnam for more than 5 years. Participants in Australia were mostly located in NSW (32.4%, n=44), Victoria (20.6%, n=28), Queensland (16.9%, n=23) or Western Australia (15.4%, n=21), with the remaining from South Australia (n=9) and Tasmania (n=3). Over half the participants had a tertiary degree and almost two-thirds were employed full-time. Just under half of the sample were aged between 30-49 years. Sixteen percent had travelled internationally for work.

n=136 unless otherwise stated, # indicates multiple response option		n (%)
Location		
Australia		134 (98.5)
Overseas		2 (1.5)
Age range (n=128)		
18 to 29 years		15 (11.7)
30 to 39 years		37 (28.9)
40 to 49 years		25 (19.5)
50 to 59 years		17 (13.3)
60 to 69 years		21 (16.4)
70 years and older		13 (9.6)
Education status (n=135)		
Did not complete high school		2 (1.5)
Up to Year 10		7 (5.2)
Up to Year 12		22 (16.3)
TAFE qualification (including trade certificate)		27 (20)
Undergraduate tertiary degree		51 (37.8)
Postgraduate tertiary degree		26 (19.3)
Current employment status (n=135)*		
Casual		7 (5.2)
Full-time		85 (63)
Part-time		8 (5.9)
Unemployed		5 (3.7)
Self-employed		11 (8.1)
Retired		19 (14.1)
Other		6 (4.4)
Current occupation (n=103)		
Manager		19 (18.4)
Professional		41 (39.8)
Technicians and Trades Workers		7 (6.8)
Community and Personal Service Workers		10 (9.7)
Clerical and Administrative Workers		5 (4.8)
Sales Workers		11 (10.7)
Machinery Operators and Drivers		7 (6.8)
Labourers		3 (2.9)

Most participants did not speak a language other than English and identified as Caucasian or Anglo-Saxon. Common languages spoken other than English included Cantonese, Chinese or Mandarin (n=6) and Vietnamese (n=5). Common cultural or ethnic backgrounds included Asian (n=5) and Chinese (n=4). Most participants identified as heterosexual.

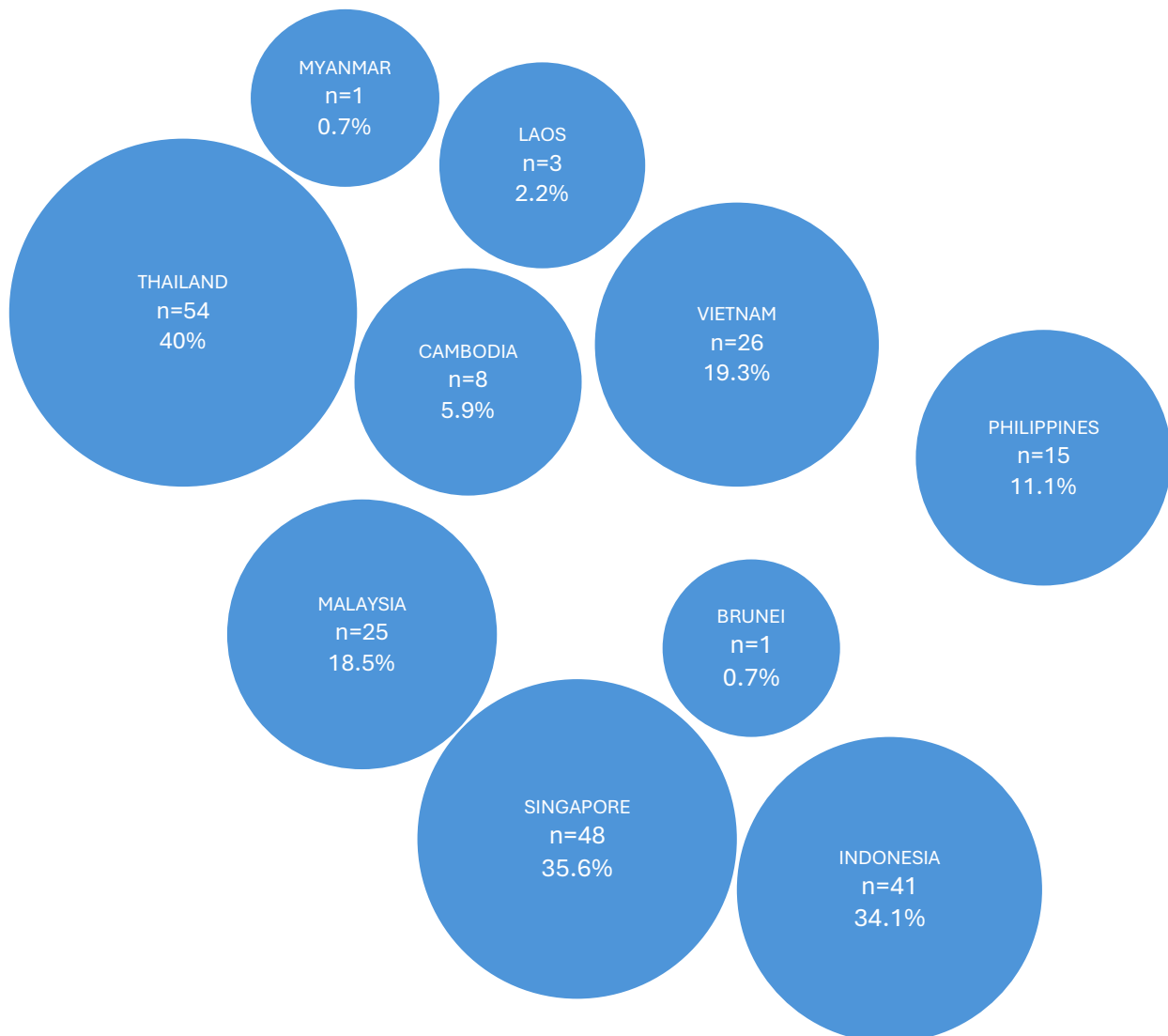
Travel as part of employment (n=112)	
No travel internationally	94 (83.9)
Travelled internationally	18 (16.1)
Speaks a language other than English (n=134)	
No	114 (85.1)
Yes	20 (14.9)
Cultural or ethnic background (n=131)[#]	
Caucasian / Anglo-Saxon	111 (84.7)
Aboriginal and/or Torres Strait Islander	4 (3.1)
A different background	21 (16)
Sexual orientation (n=135)[#]	
Heterosexual	116 (85.9)
Gay	11 (8.1)
Bisexual or pansexual	8 (5.9)

OVERSEAS TRAVEL

During the most recent trip to SEA, Thailand, Singapore, and Indonesia were most commonly visited countries. Just under two-thirds of participants had only travelled to one SEA country in the past five years, with around one in five travelling to two countries.

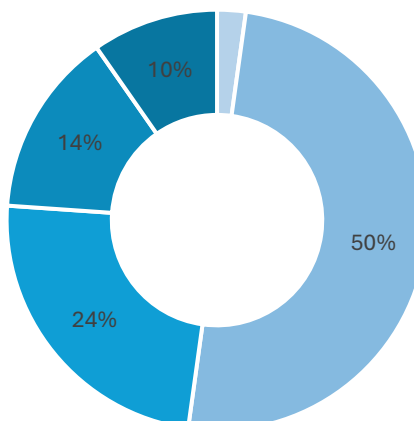
Half of participants had travelled to SEA within the last 12 months, with one-quarter in the last one to two years. During their most recent trip, most had stayed less than 1 month, or between 2 to 6 months. Just under half of participants had travelled to SEA two to four times in the last five years.

SEA countries visited in last trip (%) (n=135)[#]



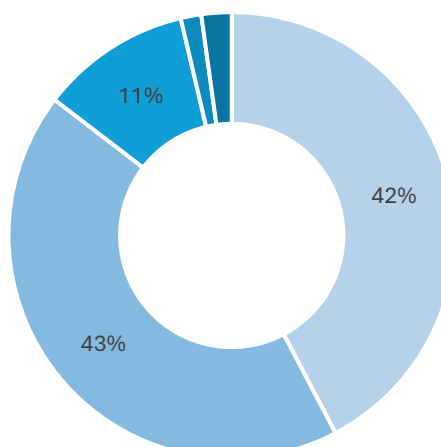
Time since most recent trip to SEA (%) (n=134)

- I currently live in SEA (n=2)
- Less than 12 months (n=67)
- 1-2 years (n=32)
- 3-4 years (n=19)
- 5 years or more (n=13)



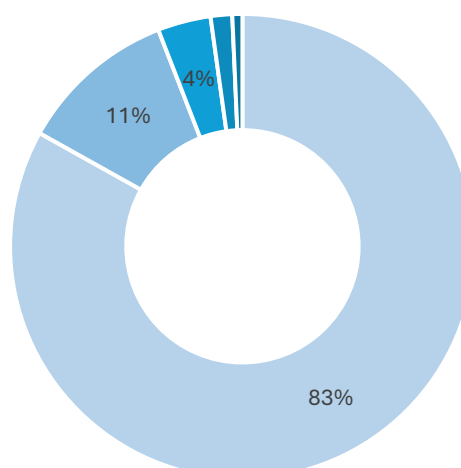
Times visited SEA in past 5 years (%)

- Once (n=58)
- 2-4 times (n=59)
- 5-10 times (n=11)
- More than 10 times (n=2)
- I have stayed in SEA for past 5 years (n=3)



Length of stay in SEA country during recent trip (%)

- Less than 1 month (n=113)
- 2-6 months (n=15)
- 7-11 months (n=5)
- 1-2 years (n=2)
- More than 2 years (n=1)



Approximately one-third of participants had travelled alone; with holiday the most common reason for travel. In addition to SEA, more than half of participants had also travelled to another region in the last 5 years.

Most participants had only travelled to one other region, commonly Europe and/or North America and Central Asia, Northeastern Asia and/or Oceania.

n=136 unless otherwise stated, # indicates multiple response option	n (%)
Travel companion(s) during most recent trip (n=135)#	
None	39 (28.9)
Friend(s)	24 (17.8)
Family including children and/or parent(s)	23 (17.0)
Partner(s)	49 (36.3)
Work colleague(s)	5 (3.7)
Other traveller(s)	5 (3.7)
Reason(s) for most recent travel#	
Work	18 (13.2)
Holiday / tourism	106 (77.9)
Visiting family and/or friends	22 (16.2)
Living there / residence	4 (2.9)
Military or Peacekeeping exercise	2 (1.5)
Volunteering	3 (2.2)
Retirement	2 (1.5)
Study	3 (2.2)
Other	3 (2.2)
Travel to a region other than SEA in the past 5 years (n=135)#	
None	53 (39.3)
Europe and/or North America	55 (40.7)
Central Asia, Northeastern Asia and/or Oceania	48 (35.6)
North Africa and/or the Middle East	6 (4.4)
Eastern and/or Southern Africa	6 (4.4)
Western and/or Central Africa	1 (0.7)
Latin America and/or the Caribbean	1 (0.7)

Over sixty percent of participants had booked directly with a service provider (airline, hotel). Slightly fewer than half had booked via a general holiday booking website (e.g., booking.com).

Almost half of participants had sought pre-travel information via a general practitioner (GP) or via a government website. One-fifth had sought information via an online travel / expatriate forum.

# indicates multiple response option	n (%)
Travel booking service providers (n=130)#	
Directly with service providers (e.g. airline and/or hotel/villa)	82 (63.1)
A general holiday booking website (e.g. booking.com, sky scanner etc)	55 (42.3)
Via a travel company or agent	34 (26.2)
Via a home sharing or owners letting site (e.g. Airbnb, Owners Direct)	7 (5.4)
Source(s) of pre-travel information about the destination (n=131)#	
I do not seek this information	19 (14.5)
My general practitioner	65 (49.6)
A travel doctor	13 (9.9)
Family & Friends	22 (16.8)
Pharmacist	5 (3.8)
Travel Agent	11 (8.4)
Government websites	56 (42.7)
Online travel / expatriate forums	29 (22.1)
Social media	13 (9.9)
Embassy	6 (4.6)
Tourism Office	6 (4.6)

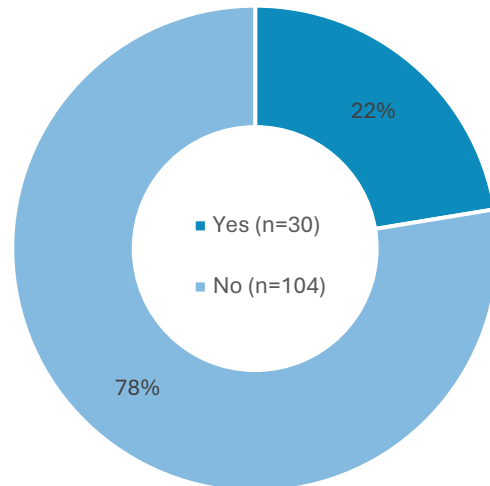
SEXUAL HEALTH ADVERTISING AWARENESS

Around one in five participants reported seeing advertisements about sexual health in the past 3 months.

Most reported seeing something on social media or television.

Of those who saw an advertisement, most believed it intended to encourage condom use and/or safe sex practices, to raise awareness about STIs/BBVs or to encourage sexual health testing.

Seen any sexual health advertisements in the past 3 months (n=134)



Location (s) where sexual health advertisements were seen (n=29) #

Social media:
n=12 (41.4%)



TV:
n=10 (34.5%)



Radio:
n=6 (20.7%)

Web: n=5 (17.2%)

Poster:
n=4 (13.8%)

Billboard:
n=3 (10.3%)

DATING APP
n=2 (6.9%)

# indicates multiple response option	n (%)
Perceived message of the advertisements towards sexual health (n=29) #	
To raise awareness about STIs/ BBVs while travelling	13 (44.8)
To raise awareness about STIs/ BBVs	16 (55.2)
To encourage condom use and/or safe sex practices	22 (75.9)
To encourage sexual health testing	15 (51.7)
Unsure/ don't know	1 (3.4)

Just over a third reported the advertisements made participants think about their behaviour, with most considering wearing a condom.

# indicates multiple response option	n (%)
Did the advertisements make participants think about changing their behaviour (n=29)	
Yes	19 (65.5)
No	10 (34.5)
What behavioural changes did participants think about after seeing advertisements (n=10)[#]	
Talking to my sexual partners about STIs/BBVs	3 (30.0)
Wearing a condom	9 (90.0)
Having a sexual health test	3 (30.0)
Did participants think advertisements were intended for them (n=29)	
Yes	18 (62.1)
No	11 (37.9)

More than half believed the advertisements were intended for people like them. However around one in ten disagreed.





	n (%)
Description of the advertisements about sexual health (n=31)	
Safe sex	12 (38.7)
Screening/ testing	4 (12.9)
About the diseases/ its impact	3 (9.7)
Feedback about sexual health service provider(s)	3 (9.7)
Increasing STI incidence rates	2 (6.5)
Where the advertisement was seen	1 (3.2)
Negative description	1 (3.2)
Invalid answers	2 (6.5)
Cannot remember	3 (9.7)

KNOWLEDGE & ATTITUDES

Participants had mixed knowledge of STI and BBV transmission.

Around half of participants recognised vaginal sex as a mode of transmission for HPV, hepatitis B and hepatitis C. Anal sex was recognised as a mode of transmission for HIV, gonorrhoea, syphilis and genital herpes, but less known for the remainder of STIs/BBVs. Around half of participants recognised oral sex as a mode of transmission for STIs.

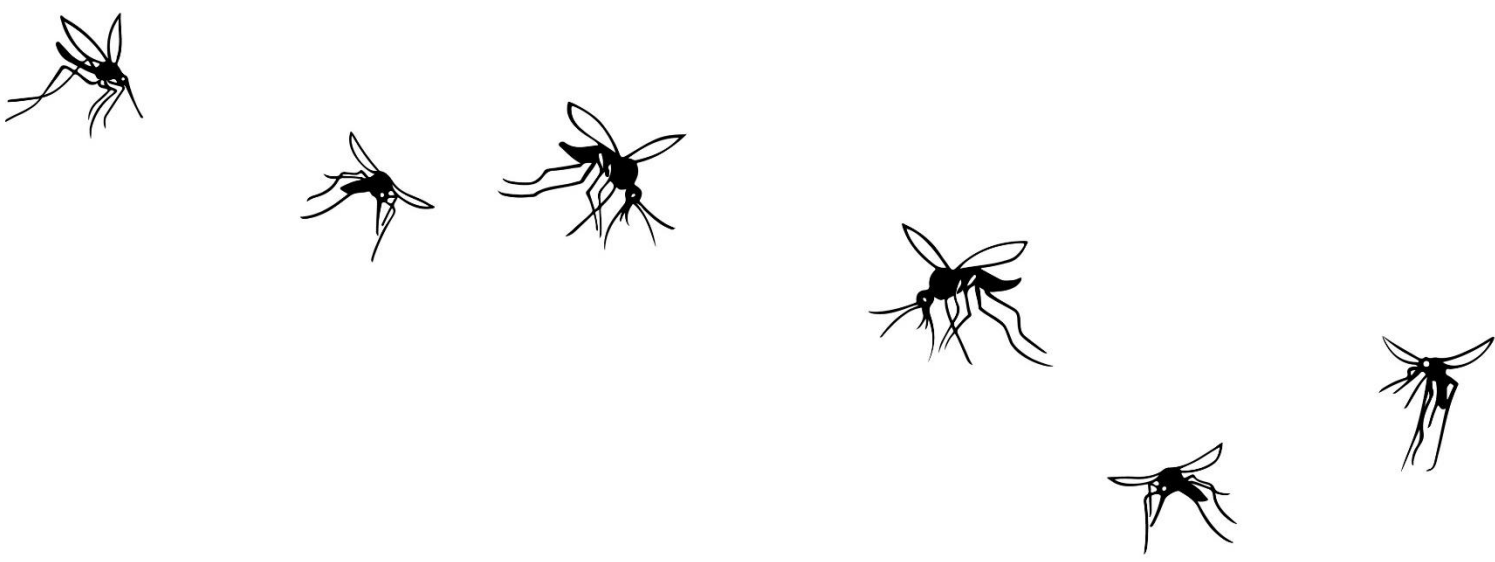
Blood contact and sharing used needles was recognised as a mode of transmission for HIV, hepatitis B and hepatitis C for most participants.

	Mosquito bite	Vaginal sex	Anal sex	Oral sex	Blood contact	Airborne	Sharing needles
Chlamydia	14 (16.3)	100 (78.7)	68 (53.5)	55 (45.5)	35 (28.0)	3 (5.1)	26 (20.8)
Genital herpes	16 (18.6)	102 (80.3)	83 (65.4)	70 (57.9)	39 (31.2)	4 (6.8)	26 (20.8)
Gonorrhoea	15 (17.4)	105 (82.7)	86 (67.7)	64 (52.9)	44 (35.2)	5 (8.5)	28 (22.4)
HPV	24 (27.9)	73 (57.5)	59 (46.5)	55 (45.5)	43 (34.4)	24 (40.7)	41 (32.8)
Syphilis	16 (18.6)	103 (81.1)	83 (65.4)	66 (54.5)	48 (38.4)	10 (16.9)	41 (32.8)
Hepatitis B	39 (45.3)	69 (54.3)	65 (51.2)	51 (42.1)	88 (70.4)	16 (27.1)	93 (74.4)
Hepatitis C	40 (46.5)	67 (52.8)	70 (55.1)	49 (40.5)	90 (72.0)	16 (27.1)	97 (77.6)
HIV	28 (32.6)	102 (80.3)	108 (85.0)	60 (49.6)	103 (82.4)	6 (10.2)	106 (84.8)

Two thirds of participants thought it was important to discuss sexual health history with a sexual partner. Less than half of participants were worried about acquiring an STI or BBV while travelling or had intended to use a condom on their most recent trip.

About a third had intended to have casual sex on their most recent trip, with around one in five intending to purchase sexual services.

	n (%)
I intended to have casual sex on my last trip to SEA (n=130)	42 (32.3)
I intended to purchase sexual services on my most recent trip to SEA (n=131)	24 (18.3)
I intended to use a condom when I engaged in sexual activity in SEA (n=130)	55 (42.3)
I worry about contracting an STI or BBV while travelling, working or living to SEA (n=131)	54 (41.2)
I think it is important to discuss my sexual health history with any partner I have sex with (n=130)	91 (69.5)



PRE-TRAVEL HEALTH PRACTICES

Most participants had received a vaccination for influenza, COVID-19, tetanus and measles, mumps and rubella.

Less than a third reported ever receiving a vaccination for HPV, m-pox and herpes zoster.

Vaccinations most reported as up-to-date included influenza, COVID-19 and tetanus.



	Ever vaccinated (n=132)	Vaccinations up-to-date (n=121)
	n (%)	n (%)
Influenza	120 (90.9)	100 (82.6)
Hepatitis A	80 (60.6)	73 (60.3)
Hepatitis B	84 (63.6)	67 (55.4)
Tetanus	114 (86.4)	91 (75.2)
Measles, mumps and rubella	113 (85.6)	63 (52.1)
Polio	94 (71.2)	59 (48.8)
Typhoid fever	58 (43.9)	54 (44.6)
Cholera	47 (35.6)	47 (38.8)
HPV	31 (23.5)	35 (28.9)
Herpes Zoster	27 (20.5)	36 (29.8)
COVID-19	118 (89.4)	92 (76.0)
m-pox	29 (22.0)	27 (22.3)

Prior to travel, just over half of participants had sought medical or health advice from a GP. One in four did not seek any medical advice. Participants under the age of 50 were more likely to seek medical advice prior to travel (82.7% under 50-years old compared to 64.9% if over 50, p -value 0.027).

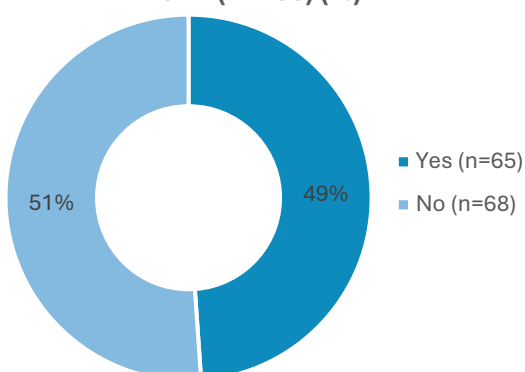


	n (%)
Where medical/ health advice was sought prior to most recent travel to SEA (n=132)*	
General Practitioner	76 (57.6)
Sexual Health Clinic	6 (4.5)
Hospital	4 (3.0)
Travel Clinic	11 (8.3)
Online government or travel websites	25 (18.9)
Family or friends	15 (11.4)
Social media	1 (0.8)
Other	1 (0.8)
Did not seek advice	36 (27.3)

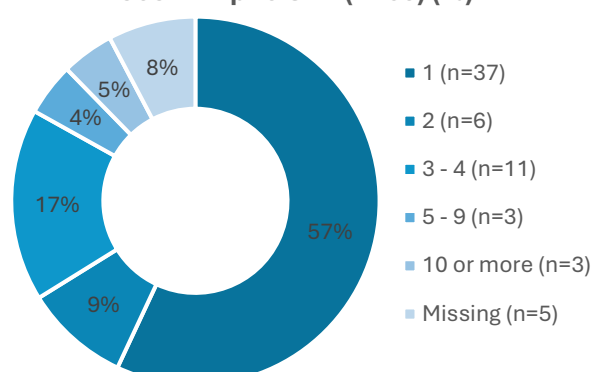
SEX WHILE TRAVELLING

Most participants reported having sex with women in the past 12 months. Around one in two participants reported having sex on their most recent trip. Of those, around one in three reported more than one sexual partner. Participants who travelled alone were more likely to have sex with more than one partner (76.9% alone compared to 27.7% of participants not alone, p -value = 0.003).

Had sex during the most recent trip to SEA (n=133) (%)



Number of sexual partners, during most recent trip to SEA (n=65) (%)



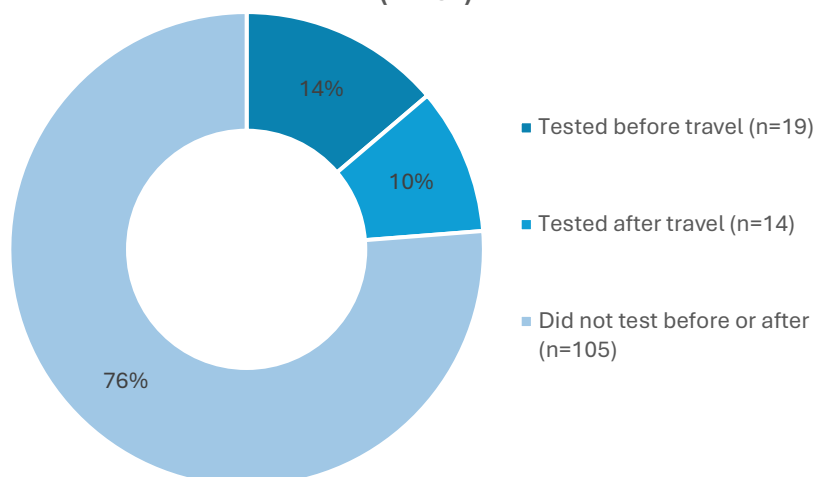
Two-thirds of participants reported sex with someone they travelled with, while one-fifth reported sex with someone they just met. Less than half consistently used a condom. Participants who had sex with more than one partner were significantly more likely to report always wearing a condom (61% compared to 32.5% who only had one sexual partner, p -value=0.028). Around one in four participants had received sexual services while in SEA; over a third did not use a condom during their last encounter. Participants who received sexual services were significantly more likely to also report having sex with more than one partner during their most recent trip (65% compared to 24% who didn't have more than one sexual partner, p -value<0.001).

# indicates multiple response	n (%)
Gender of sexual partner(s) in the past 12 months (n=133)#	
Men	17 (12.8)
Women	94 (70.7)
Transwomen	2 (1.5)
Did not have sex	24 (18.0)
Relationship with sexual partner during the last time having sex in SEA (n=65)#	
Someone I travelled with	43 (66.2)
Someone I had sex with previously but did not travel with	5 (7.7)
Someone I had just met	12 (18.5)
A sex worker	8 (12.3)
Used condoms during the last trip to SEA (n=65)	
Yes, always	27 (41.5)
No, not at all	29 (44.6)
Sometimes	7 (10.8)
Received sexual services during time in SEA (n=136)	
Yes	32 (23.5)
No	99 (72.8)
Missing	5 (3.7)
Used condoms during last time receiving sexual services in SEA (n=32)	
Yes	20 (62.5)
No	12 (37.5)

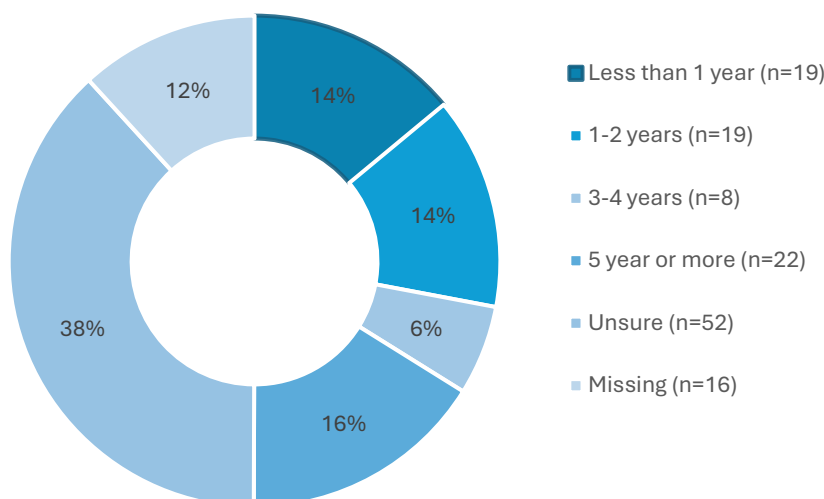
SEXUAL HEALTH TESTING

Most participants had not received a sexual health test before or after travel. About one-third had previously tested for hepatitis C, hepatitis B or HIV. Around one in 10 had been diagnosed with an STI or BBV, including HIV (n=1), chlamydia (n=4), gonorrhoea (n=5), syphilis (n=1) and HPV (n=4).

Sexual health testing before most recent travel to SEA (%)
(n=131)[#]



Last STI or BBV test (%)



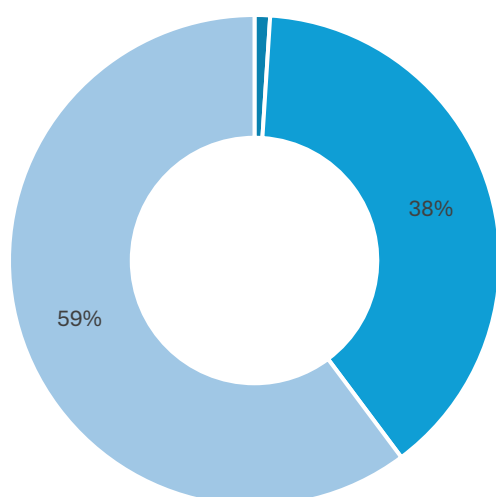
	n (%)
Ever diagnosed with an STI or BBV	
Yes	17 (12.5)
No	114 (83.8)
Missing	5 (3.7)
Recency of diagnosis with an STI or BBV (n=17)	
Less than 12 months ago	1 (5.9)
1 to 2 years ago	3 (17.6)
3 to 4 years ago	2 (11.8)
5 or more years ago	11 (64.7)

TREATMENT AS PREVENTION

Over half of participants were unaware of PEP. Two participants had used it prior, for condomless sex with a person living with HIV and for condomless sex with a person who might have HIV. Around one in three had heard about PrEP; five had previously used it. Participants who had been diagnosed with an STI/BBV in the past were significantly more likely to be aware of PrEP (59% of people who had been diagnosed compared to 30% who hadn't, p -value=0.018).

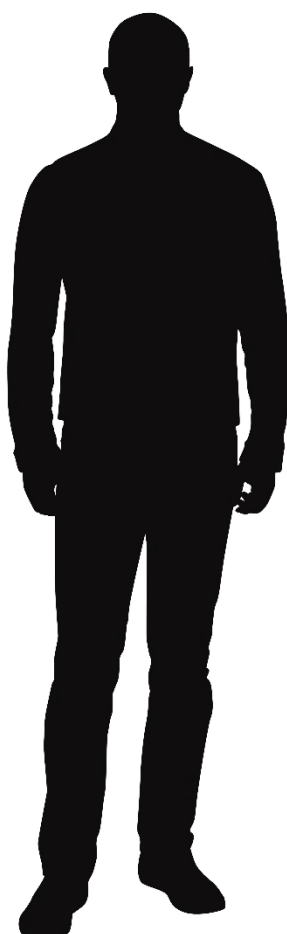
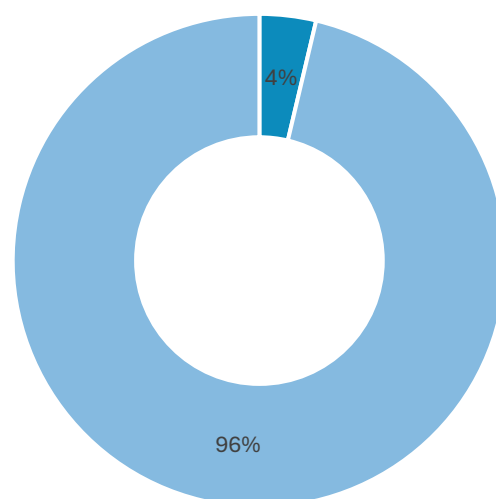
Ever used PEP (%)

- Yes, I have used PEP before (n=2)
- No, but I am aware of what PEP is (n=52)
- No, I was not aware of what PEP is (n=77)



Used PrEP in the last 12 months (%)

- Yes (n=5)
- No (n=131)



	n (%)
Ever heard about PrEP	
Yes, I've heard about it	44 (32.4)
No, I have not heard of it	87 (64.0)
Frequency of PrEP use in the last 12 months (n=5)	
Daily/ most days	3
Around the time of sex (on demand)	2
Where PrEP was obtained (n=5)	
Chemist	4
Other	1
Reason(s) for using PrEP (n=5)	
I was having regular sex with someone living with HIV	2
I was having regular sex with multiple partners	2
I was having sex with someone new	1

SUMMARY

This study sought to develop a valid and reliable survey tool to gather baseline data regarding travel, sexual health and bloodborne virus-related knowledge and practices amongst Australian ELoFTs.

Our study found that the survey tool is broadly fit for purpose. Testing suggests that most questions had high agreement and are reliable.

Our sample of 136 Australian men was broadly well-travelled, well-educated, employed, spoke English as their primary language and identified as heterosexual and Caucasian or Anglo-Saxon. Participation was distributed across most jurisdictions, however there were no participants from the territories. Participants in this study were older and more educated than respondents in the study of Australian FIFO workers in Queensland airports (O'Mullan et al., 2015); though had a similar educational profile to those in another survey of Australian travellers in Bangkok and Sydney airports (Heywood et al., 2012). An older cohort was also observed in a 2022 study of 1200 Australian travellers (McGuinness et al., 2023).

Much of the previous literature in systematic reviews on sexual health and international travel has focused on younger travellers (35 years or younger) (Shiferaw et al., 2024; Svensson et al., 2018; Vivancos et al., 2010); though have included Australian travellers. This research suggests that older populations also have similar knowledge, attitudes and sexual behaviours as younger travellers, however, there appears to be less research (and fewer health promotion campaigns) for this cohort.

The following are some key insights regarding sexual health and travel for Australian-born men including implications and possible future actions.

KEY INSIGHTS

OVERSEAS TRAVEL

As expected, participants were generally well-travelled, and most had travelled within the last 12 months. Common countries visited (Thailand, Singapore, and Indonesia) were reflective of broader Australian data on overseas travel (Australian Bureau of Statistics, 2024).

While most had stays shorter than a month, more than half of participants had visited SEA two or more times within the last five years, suggesting a familiarity with the region. Over half of the participants had also visited other regions in the past five years, commonly Europe and/or North America, and Northeast Asia, Central Asia and/or Oceania – suggesting broader familiarity with international travel. Travel trends may likely be reduced due to the COVID-19 travel restrictions compared to historical five-year periods. Five-year travel frequency was comparable with a recent study which also reported an older average age (McGuinness et al., 2023), which may suggest a high frequency of travel among older Australians.

ADVERTISING AWARENESS

Awareness of sexual health advertising was relatively low. This finding is generally consistent with levels of unaided campaign awareness found in a review which reported levels between 18% and 37% (Friedman et al., 2016). Higher levels of awareness would likely be seen of prompted specific campaign recognition, consistent with the literature.

The level of awareness is unsurprising given the generally ad-hoc nature of sexual health campaigns as part of comprehensive health promotion approaches in Australia. Pleasingly, of those who had seen advertising materials, around one in three suggested it prompted them to act. Theory-based, targeted campaigns may be associated with behavioural change, such as HIV testing, however, literature suggests a high-level of

exposure and engagement is necessary to achieve long-term behaviour change (Habarta et al., 2017).

Three historical studies have evaluated sexual health information distributed to international travellers. Gehring et al. displayed HIV promotional material at an international airport targeting heterosexuals (Gehring et al., 1998). Another study distributed a leaflet on 'sex tourism' and HIV to patients seeking pre-travel advice (Gagneux et al., 1996). Neither study found a change in sexual behaviour while overseas. Conversely, a study by Croughs et al. who distributed leaflets on STIs to patients seeking pre-travel advice reported a significant increase in casual travel sex (Croughs et al., 2008).

The lack of publicly available evaluation data for population-level sexual health campaigns in the last decade make comparisons difficult. However, given the likely media buy and spend, lower levels of awareness are consistent with campaigns for some other areas of public health.

Whilst some investment has been made in travel-related sexual health advertising materials, the relatively limited campaign footprint, modest investments, cluttered advertising landscape and lack of targeted and tailored materials for men who travel (including heterosexually-identifying men) may limit any potential reach and cut-through.

Future action could focus on more targeted, comprehensive and theory-driven awareness-raising strategies, interrogating current investments through impact evaluation and gathering richer insights from the target group to support formative work to develop effective messages.

KNOWLEDGE AND ATTITUDES

Participants had mixed knowledge of STI and BBV transmission. Positively, most recognised vaginal sex as a mode of transmission for common STIs (other than HPV), as well as sharing used needles and blood contact as a mode of transmission for BBVs. However,

participants were less likely to recognise anal and oral sex as a mode of transmission for STIs. Less than half recognised vaginal or anal sex as a mode of transmission for hepatitis B. There was no significant difference in knowledge scores by demographics or sexual behaviour. Findings in this study regarding low knowledge of hepatitis B transmission were consistent with several other studies (Frew et al., 2017; Streeton & Zwar, 2006) of travellers, but slightly lower than in the Australian Study of Health and Relationships (ASHR2) (62%) (Richters et al., 2014). Knowledge that gonorrhoea could be transmitted through oral sex was also slightly lower than the ASHR2 (67%) (Richters et al., 2014). A lack of targeted sexual health education for older Australians may have contributed to slightly lower STI and BBV knowledge; however, different knowledge variables between studies make it difficult for direct comparison.

Participants had mixed expectations regarding their overseas sexual intentions. Around one in five intended to purchase sexual services, around one in three intended to have casual sex and less than one in two intended to use a condom.

Findings regarding intention towards casual sex are consistent with finding from a Canadian study of young travellers (Gareau & Phillips, 2022) but are lower than in previous research where around one in two men had expectations regarding casual sex (Croughs et al., 2008) or use of sex workers (Manieri et al., 2013) overseas. Intentions to engage in casual sex while travelling is associated with increased casual sex (Croughs et al., 2008).

Knowledge findings should be considered in the context of inconsistent condom use, low PrEP use, higher HIV prevalence and intention to have casual sex or purchase sexual services whilst overseas.

PRE-TRAVEL HEALTH PRACTICES

This study found that over four-fifths of participants had sought pre-travel health advice, most commonly via a general

practitioner (GP) or a government website. Findings from a previous review suggested that the use and experience of pre-travel health advice varied between 4% and 90% of participants (Crawford et al., 2016). One study suggested that males may be less likely than females to seek pre-travel health advice (Angelin et al., 2014). In studies with high-levels of help seeking, for example (Zuckerman & Hoet, 2008), more than half of participants sought advice from a GP, consistent with this study, suggesting opportunities for GPs to discuss sexual health behaviours and testing practices as discussed by other authors (Cornelisse et al., 2019; Santaolaya et al., 2024).

In this study, one in five participants had sought pre-travel health information from an online travel / expatriate forum. Online forums facilitate peer exchanges, such as social, emotional and health-seeking (including HIV and STI advice) functions (Crawford et al., 2018). Such forums and peer networks could be utilised to diffuse messaging around safe sex, working with key influencers within the online space (Crawford et al., 2018).

In the context of the present study, one in ten participants had sought advice from a travel doctor. Further training may be warranted for travel health clinicians given the findings (above) from a recent study of travel health clinicians which suggested a high level of interest in professional development to support their work (Warzywoda et al., 2024). In Croughs et al. study, reading a leaflet on STIs received during a pre-travel consultation was associated with engaging in protected sex (Croughs et al., 2008); however a more recent follow-up study found that only half of participants read the sexual health resource provided, though this was significantly higher among men than women (Croughs et al., 2017). Delivery of sexual health resources through travel health clinics, alongside the capacity building for doctors to discuss sexual health and undertake screening, is worth exploring.

SEX AND TRAVEL

Around one in two participants reported having sex on their most recent trip. Consistent with findings from a previous review (Crawford et al., 2016), this study's participants most commonly reported one sexual partner.

A quarter of participants in this study reported purchasing sexual services overseas. This finding was much higher than reported in both the O'Mullans study (5.1%) (O'Mullan et al., 2015) and in ASHR2 (17%) (Richters et al., 2014). Additionally, in our study, less than two-thirds had used a condom during their last sexual services, which may put them at higher risk of acquiring an STI or BBV. For example, HIV prevalence among sex workers in Thailand is estimated at 1.1% and 2.2% in Indonesia (UNAIDS, 2023a, 2023b).

Around two in five participants reported using condoms during their last sexual encounter overseas. Our finding was higher than results from ASHR2 which reported a quarter of Australian men used condoms during their last sexual encounter (de Visser et al., 2014); and that of the O'Mullans study (20%) (O'Mullan et al., 2015). Differences in how condom use was captured between surveys are to be noted when interpreting the data. Condoms remain an important strategy in STI and BBV prevention, particularly while travelling overseas (Cornelisse et al., 2019). In the Croughs et al. study, carrying condoms was associated with protected sex, theorising that condoms may be less readily accessible in some countries (Croughs et al., 2008). Distribution of condoms in key venues (such as through GPs and travel clinics, at airports, and in bars/clubs in-situ) may improve access (and thereby use) while overseas.

SEXUAL HEALTH TESTING

Despite intentions to have sex overseas and inconsistent condom use, overall, participation in sexual health testing was relatively low. Only around one in three participants had previously tested for STIs and/or BBVs. This finding is consistent with

findings regarding lifetime testing for HIV in ASHR2 (36%) (Grulich et al., 2014).

Findings from the current study indicated that around one in 10 participants had been diagnosed with and STI and/or BBV. This finding is slightly lower than the proportion of men reporting diagnosis in ASHR2 (15.6%) (Grulich et al., 2014).

Few participants had received a sexual health test before or after travel. As noted above, these findings are supported by those of a recent study of travel medicine providers which indicated that only around one in five reported consistently conducting a sexual and or reproductive health history/STI risk assessment for patients (Warzywoda et al., 2024). Given that over half of this study's participants had sought pre-travel advice from a GP or travel doctor, findings point to opportunities to work with GPs or travel health clinics to offer sexual health testing before or after international travel.

TREATMENT AS PREVENTION

Awareness of options for treatment as prevention was moderate. Few participants had used either PEP or PrEP. Whilst knowledge about PrEP is high amongst gay and bisexual men in Australia (King, 2023) with its uptake contributing to the virtual elimination of HIV transmission in some parts of the country (Grulich et al., 2021), this finding highlights a lack of data on PrEP amongst heterosexually-identifying men, particularly in the context of inconsistent condom use and sex overseas in locations with higher HIV prevalence.

The broader literature supports this finding with heterosexually-identifying men featuring infrequently in studies. However, in Australia, PrEP use is recommended for heterosexual men considered at high risk of acquiring HIV (ASHM, 2019), though data is lacking regarding the impact of on-demand PrEP for this population (Bhatti et al., 2021). These findings point to a need for strategies to enhance awareness and uptake of treatment as prevention.

Given the lack of awareness of sexual health advertising, a more sophisticated and comprehensive approach may be required to address overseas STI and other BBV acquisition in the context of travel, which extends beyond campaigns.

Investigating the utility of strategies to build professional capacity amongst GPs and travel health providers may be warranted given broader findings which suggest that clinicians do not commonly consider heterosexually-identifying men as PrEP users (Smith et al., 2022) along with increasing outreach efforts to men who travel both in Australia through face-to-face and online social networks engagement and consideration of greater partnerships with destination countries (Brown et al., 2012; Brown et al., 2014; Crawford et al., 2023).

In addition, further research may be beneficial which examines perceptions of acceptability and feasibility of PrEP use amongst heterosexually-identifying men in Australia.

STRENGTHS AND LIMITATIONS

We note several strengths and limitations related to the study. To the best of our knowledge, this is the first Australian survey to assess the sexual health knowledge and practices of Australian male ELoFTs. A valid and reliable survey tool is critical to safeguard accurate data collection, reduce participant burden, ensure survey completion, and increase broad application of findings. Findings suggest that the survey has the potential to capture reliable and valid survey responses among the target group.

Due to recruitment challenges, a survey panel was purchased in March 2024 (n=100). Challenges in accessing participants for online surveys have been experienced in a range of other Australian public health cross-sectional surveys (Lavrakas et al., 2022), including travel surveys (McGuinness et al., 2023). The online survey panel yielded the majority of

participants. Utilising a combination of panel and other sampling methods is recommended in future surveys.

We had smaller than expected numbers for validity testing, however, no feedback was received from those who participated. The expert validity testing involved Australian-born men who likely share some similarities with the target group. Additionally, experts had worked with the target group, including several who previously designed cross-sectional surveys on men's sexual health.

It is likely that some additional modifications may be made before larger-scale roll-out. Providing numerous multiple-choice questions made it difficult to analyse some data (including running test-retest analysis); as did offering many response options. While this was more inclusive of a variety of responses and supported by experts, we note that questions with a large number of response options were, generally, more likely to be skipped. Limiting responses (and overall survey length) may improve the completeness of data, as suggested by the literature (Mirzaei et al., 2022).

While we were led by experts in removing or re-wording some questions, significant changes means that survey questions are no longer comparable. For example, we captured knowledge using a matrix table of STIs/BBVs and modes of transmission – this allowed us to identify specifically where some knowledge may be lacking (such as the low knowledge around oral sex and STIs) and may be helpful for the development of health promotion campaigns. However, the ASHR2 study, as well as the Australian National Survey of Secondary Students and Sexual Health (SSASH) survey capture knowledge using statements, meaning our data were not comparable. Questions around drug use and alcohol use were removed based on feedback from the experts; however, the literature recognises these as significant risk factors for STI transmission while overseas (Shiferaw et al., 2024; Svensson et al., 2018; Vivancos et al., 2010). Future survey iterations should better consider the

balance between existing literature and health promotion expertise.

CONCLUSION

The subsequently developed survey has the potential to facilitate periodic, data collection which can be used to inform public health strategies, service provision, prevention programs, and health education related to sexual health and blood-borne viruses in the target population. It is anticipated that interest in the refined survey tool will be sought for implementation in other jurisdictions.

While Australia continues to see success in key HIV populations (men who have sex with men, sex workers, and people who inject drugs), less success has been demonstrated among those who travel overseas. Given changing travel patterns and increased mobility, the virtual elimination targets for 2030 and the priority populations of the new set of national STI and BBV strategies, overseas-acquired HIV will continue to be an ongoing focus for research, policymakers and health promotion practitioners.

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