

# IMPACT OF ALCOHOL CONSUMPTION ON TUBERCULOSIS TREATMENT OUTCOMES



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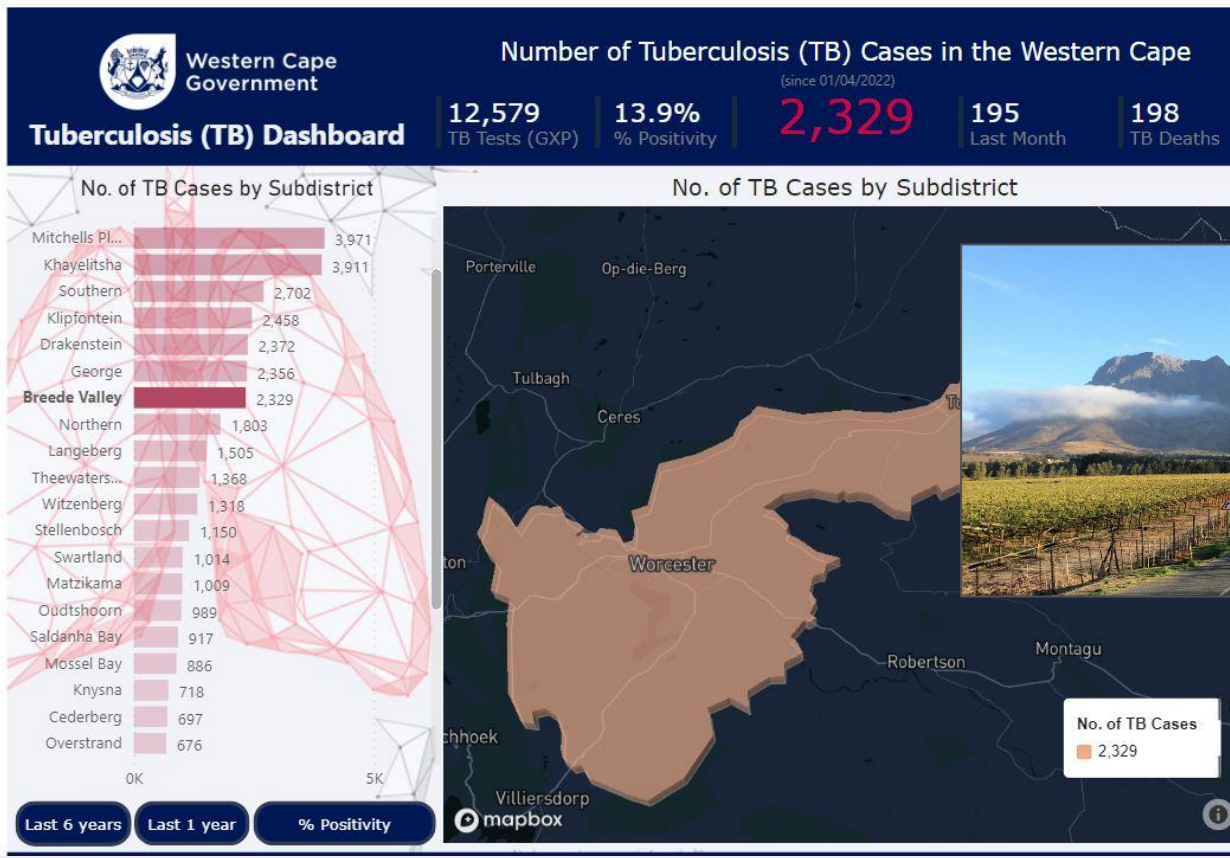
## Funding

Burroughs Wellcome Fund-ASTMH  
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# PREVALENCE OF TB IN WORCESTER



# BACKGROUND

- Ten percent of tuberculosis (TB) deaths are attributable to problem alcohol use globally
- Problem alcohol use in key populations is a major driver of poor TB treatment response
- Heavy episodic drinking, is associated with delayed culture conversion and higher rates of treatment failure, relapse and death
- High prevalence of alcohol and other drug use in the WC, especially in the rural farming regions

# AIMS

## AIM 1

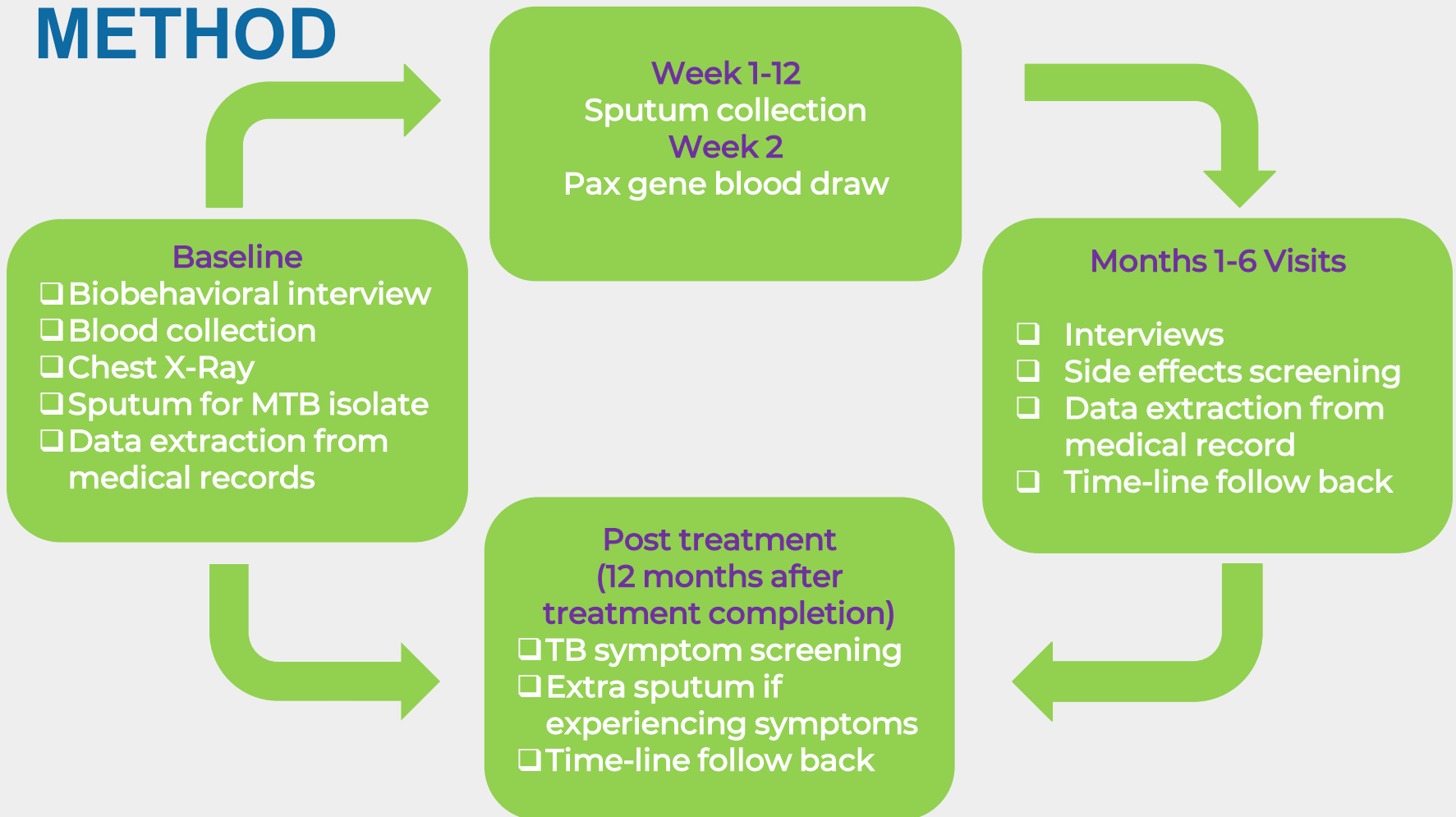
To (i) examine the associations between problem alcohol use and TB treatment outcomes, and (ii) demonstrate that these associations persist independent of adherence to TB treatment



## AIM 2

To evaluate the effect of problem alcohol use on the PK/PD of TB drugs among participants not living with HIV

# METHOD



# INNOVATIONS: CAPTURING ALCOHOL CONSUMPTION

## Self-report

Alcohol Use Disorders Identification Test (AUDIT),  
Time-Line Follow Back (TLFB)

## Biomarker

Blood, Phosphatidylethanol (PEth) test

## Repeated Measures

(changes over time)



### Quantities of different drinks that are the same as ONE standard drink

1 glass wine (125ml)



1 single measure spirits (25ml)



1 bottle beer/cider (330ml)



1 can beer/cider (330ml)



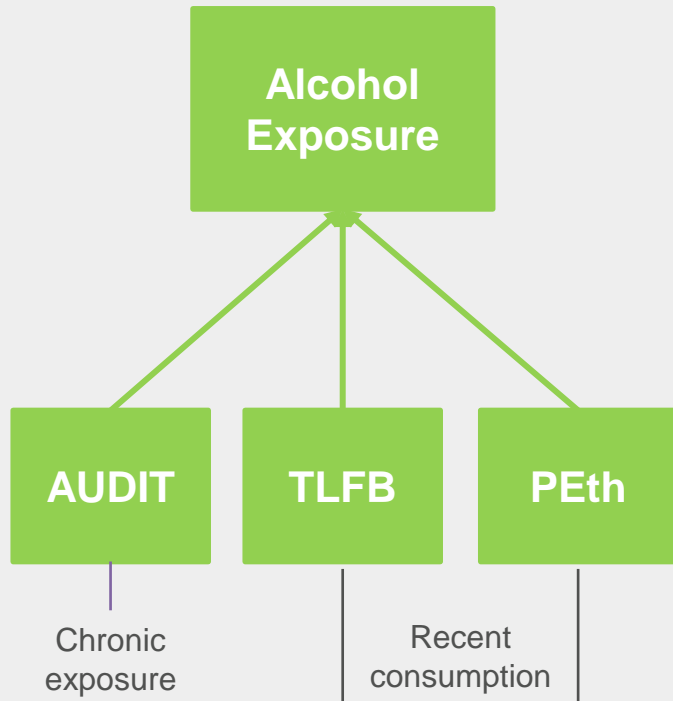
1 carton ijuva (1L)



R2-00 jar isiqatha/injemane



# CLASSIFICATION OF ALCOHOL EXPOSURE



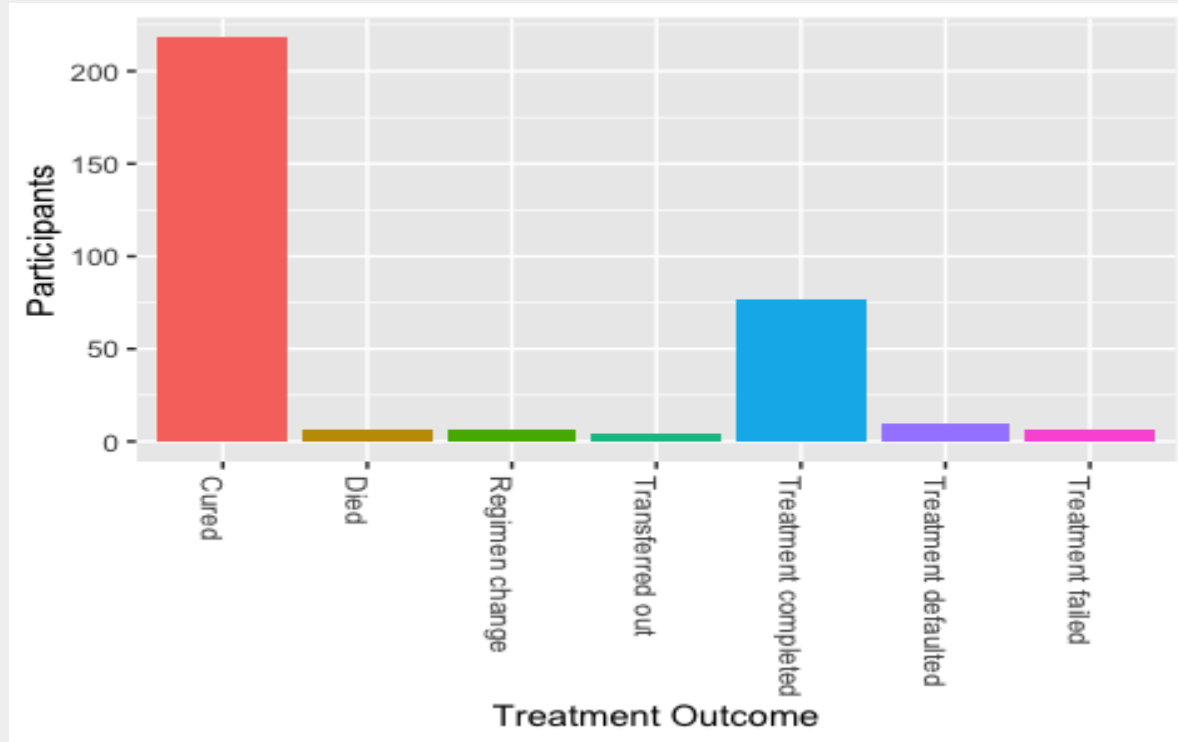
Peth (ng/mL)	
< 50	Low
50-200	Moderate
> 200	High
AUDIT risk	
Low risk	scores < 8
Harmful to hazardous	scores of 8–20
Dependence	scores ≥ 8
Heavy alcohol use (TLFB)	
Men	≥96 g AA (8 standard drinks)
Women	≥72 g AA (six standard drinks)



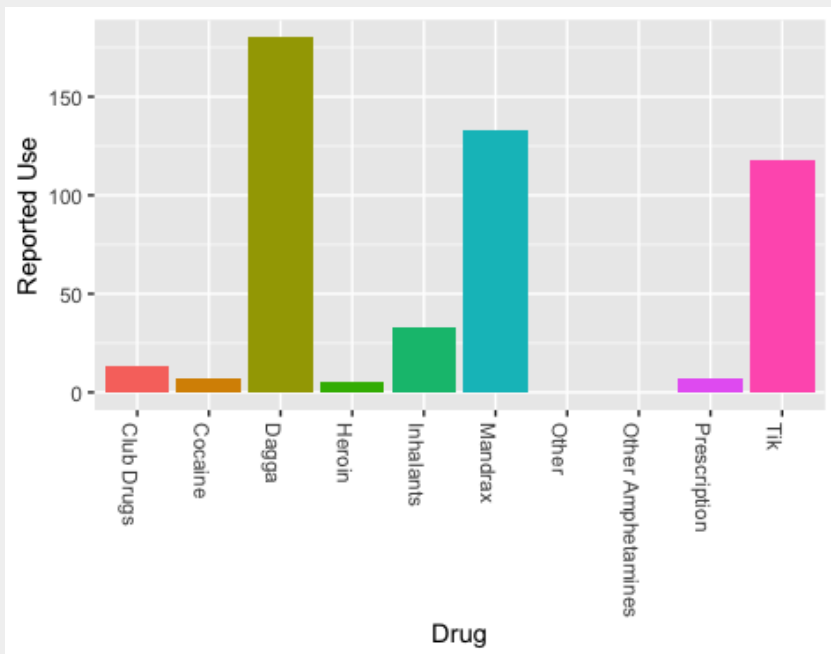
# BASELINE DEMOGRAPHICS (N=392)

	No. (%) or Median (Q1,Q3)		
	Problem Alcohol Use (N=221)	No Problem Alcohol Use (N=171)	p value
<b>Male at Birth</b>	133 (60.2%)	103 (60.2%)	0.992
<b>Age, years</b>	40 (31, 49)	35 (25, 48)	0.020
<b>BMI</b>			0.938
Underweight (<18.5)	137 (62.0%)	109 (63.7%)	
Normal weight (18.5-25)	73 (33.0%)	54 (31.6%)	
Overweight & obese (>25)	11 (5.0%)	8 (4.7%)	
<b>Race, self identified</b>			
Cape Coloured (Mixed Ancestry)	210 (95.0%)	157 (91.8%)	
Black African	9 (4.1%)	9 (5.3%)	
Indian/Asian	0 (0.0%)	1 (0.6%)	
White	0 (0.0%)	1 (0.6%)	
Other	2 (0.9%)	3 (1.8%)	
<b>Education &lt; 9<sup>th</sup> Grade</b>	104 (47.1%)	62 (36.3%)	0.032
<b>Unemployed</b>	145 (65.6%)	119 (69.6%)	0.405
<b>Previous incarceration</b>	67 (30.3%)	57 (33.5%)	0.499
<b>Depression Risk</b>			0.633
High depression risk	146 (66.1%)	109 (63.7%)	
Low depression risk	75 (33.9%)	62 (36.3%)	
<b>Household Hunger</b>			0.408
Moderate to severe	101 (45.7%)	71 (41.5%)	
Little to none	120 (54.3%)	100 (58.5%)	

# TREATMENT OUTCOMES



# DRUG USE AT BASELINE



Drug	N (%)
Dagga	177 (45.15)
Tik	117 (29.85)
Cocaine	8 (2.04)
Heroin	5 (1.28)
Mandrax	132 (33.67)
Inhalants	34 (8.67)
Ecstasy/Club drugs	14 (3.57)
Prescription drugs	8 (2.04)

# PEOPLE WHO SMOKE DRUGS (55% OF COHORT), TB DISEASE BURDEN AND INFECTIOUSNESS IN CLINIC SETTING



Bronwyn Myers

Association Between Smoked Substance Use and Baseline <b>Time to Positivity</b> (N=239)			
	Adjusted Hazard Ratio	95% CI	p value
Smoked drug use	1.48	(1.10, 1.97)	0.008

\*Adjusted for age, gender, HIV, tobacco  
 \*Reference group: no smoked substance use

Association Between Smoked Substance Use and <b>Smear Positivity</b> (N=302)			
	Adjusted Odds Ratio	95% CI	p value
Smoked substance use	2.28	(1.22, 4.34)	0.011

\*Adjusted for age, gender, HIV, tobacco  
 \*Reference group: no smoked subst

Association Between Smoked Substance Use and <b>Cavitation</b> , (N=293)			
	Adjusted Odds Ratio	95% CI	p value
Smoked substance use	1.08	(0.62, 1.87)	0.799

\*Adjusted for age, gender, HIV, tobacco, and previous TB  
 \*Reference group: no smoked substance use, no previous TB

Myers B, et al, *IJTL*, in press

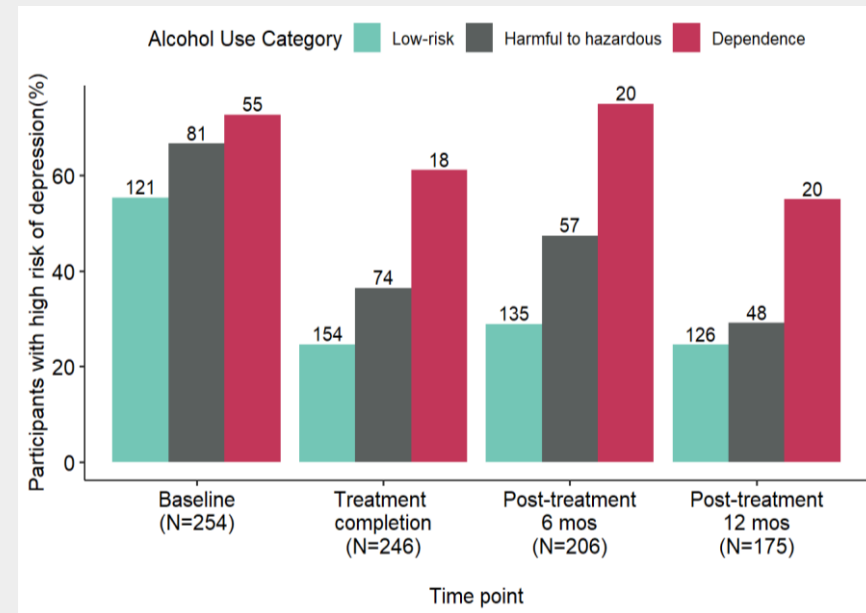
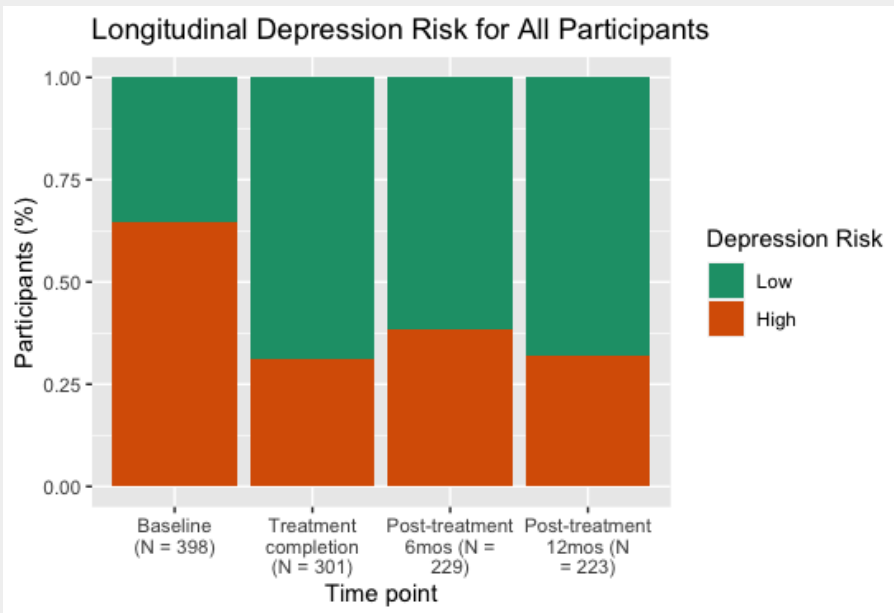
Methamphetamine

Mandrax



Cannabis

# DEPRESSION RISK TRAJECTORIES BY ALCOHOL USE



# QUALITATIVE STUDY AIM



- To explore participants' and key stakeholders' perceptions of the relationship between alcohol use and TB disease
- To identify the reasons for changes in alcohol consumption during illness and throughout treatment and
- To explore readiness of participants who consume alcohol to partake in reduction or cessation programs during TB treatment

# PERCEPTIONS OF ALCOHOL USE & TB

**Perceived increased transmission of TB among those who use alcohol**

“It is something that you pick up while using alcohol- drinking out of one glass. The guys coughs right in your face”-Male participant

**Awareness of the effect of alcohol on TB related outcome**

“Many people take their medication and go and drink or smoke and that has an effect on them. They get dizzy, get attacks shake etc.”-

**Male participant**

**Alcohol associated with decreased medication adherence**

“After 2-3 months of treatment then they feel fine. That’s when they start drinking again. They feel fine but the TB is still inside their system.”

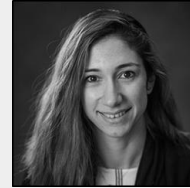
**(Male Participant, FG1)**

# CONCLUSION

- Patients with an alcohol use disorder have a higher incidence of adverse reactions
- Higher than expected prevalence of TB disease among people who smoke illicit drugs in a high TB burden setting
- Depression risk associated with alcohol dependence
- Drivers of problem alcohol use were poverty, violence and the normalization of heavy episodic drinking.



# INVESTIGATOR & RESEARCH TEAM



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