Results 134 CT-positive patients were diagnosed before and 116 were diagnosed after service introduction. Of these, 2 (1.5%) and 8 (6.9%) respectively were treated elsewhere and excluded. Average time to treatment decreased from 6.5 to 4.1 days ($p = 0.09$). When we excluded patients treated as contacts of CT (before NAAT result was available) the time to treatment decreased from 8.7 to 5.1 days ($p < 0.001$). The reduction in time to treatment decreased significantly more in women; 11.3 to 6.1 days ($p < 0.001$) than men; 6.8 to 4.7 days ($p = 0.27$).

Conclusions Introduction of a rapid STI service significantly reduced time from testing to treatment of CT. Availability of microscopy for symptomatic men allows immediate treatment of urethritis, a common presentation of CT in men. This probably explains why men were treated earlier than women. Earlier treatment is expected to reduce both asymptomatic CT transmission, and risk of CT complications, particularly in women.

P340 POTENTIAL EFFECTS OF ANTIBACTERIAL MOUTHWASH ON NEISSERIA GONORRHOEA TRANSMISSION AMONG MEN WHO HAVE SEX WITH MEN: A MATHEMATICAL MODELLING STUDY

^{1,2,3}X Xu, ^{2,3,4}E Chow, ¹M Shen, ¹Z Zou, ⁵C Wang, ^{1,2,3}J Ong, ^{1,2,3}C Fairley, ^{1,2,3}L Zhang*. ¹Xi'an Jiaotong University, Xi'an City, China; ²Melbourne Sexual Health Centre, Melbourne, Australia; ³Monash University, Melbourne, Australia; ⁴The University of Melbourne, Melbourne, Australia; ⁵Zhengzhou University, Zhengzhou City, China

10.1136/sextrans-2021-sti.390

Background Three randomised controlled trials have either reported that mouthwash may increase the susceptibility of the oropharynx to *Neisseria gonorrhoeae* or potentially decrease its transmissibility. We modelled these potential impacts on gonorrhoea incidence.

Methods We calibrated a susceptible-infected-susceptible compartmental model to examine the effectiveness of antibacterial mouthwash on the transmission of *Neisseria gonorrhoeae* in men who have sex with men (MSM). Four scenarios include: (1) mouthwash had no effect; (2) mouthwash increased the susceptibility of the oropharynx to *Neisseria gonorrhoeae*; (3) mouthwash reduced the transmissibility of *Neisseria gonorrhoeae* from the oropharynx; (4) we combined the effect of mouthwash from scenarios 2 and 3.

Results Under scenario 1, the overall incidence of gonorrhoea was 44 (95% CI: 37–50)/100 person-years (PY). Site-specific incidence/100 PY at the oropharynx, anorectum and urethra were 26 (22–31), 9 (8–11) and 8 (5–12). Under scenario 2, with between 20–80% mouthwash coverage in the MSM population, the incidence increased at all three anatomical sites by between 7.4% (5.9–60.8%) and 136.6% (108.1–177.5%). Under scenario 3, with the same coverage, the incidence decreased at all anatomical sites by between 11.6% (10.2–13.5%) and 99.8% (99.2–100%). Under scenario 4, changes in the incidence depended on the efficacy of mouthwash on the transmissibility and susceptibility with both leading to large increases of nearly 130% or large declines of almost 100%.

Conclusions The effect of mouthwash on gonorrhoea incidence is largely predictable depending on whether it increases the susceptibility to or reduces the transmissibility of *Neisseria gonorrhoeae*, highlighting an urgent need for further empirical investigation.

P341 PREDICTING THE DIAGNOSIS OF HIV AND SEXUALLY TRANSMITTED INFECTIONS AMONG MEN WHO HAVE SEX WITH MEN USING MACHINE LEARNING APPROACHES

^{1,2}N Medland, ^{1,2,3}C Fairley, ⁴J Wu, ⁴X Wu, ^{1,2,4}E Chow, ^{1,2,3}X Xu, ²Z Ge, ⁵X Zhuang, ^{1,2,3}L Zhang*. ²Melbourne Sexual Health Centre, Melbourne, Australia; ⁴Monash University, Melbourne, Australia; ¹Xi'an Jiaotong University, Xi'an, China; ³The University of Melbourne, Melbourne, Australia; ⁵Nantong University, Nantong City, China

10.1136/sextrans-2021-sti.391

Background We aimed to develop machine learning models and evaluate their performance in predicting HIV and sexually transmitted infections (STIs) diagnosis based on a cohort of Australian men who have sex with men (MSM).

Methods We collected clinical records of 21,273 Australian MSM during 2011–2017. We compared accuracies for predicting HIV and STIs (syphilis, gonorrhoea, chlamydia) diagnosis using four machine learning approaches against a multivariable logistic regression (MLR) model.

Results Machine learning approaches consistently outperformed MLR. Gradient boosting machine (GBM) achieved the highest area under the receiver operator characteristic curve for HIV (76.3%) and STIs (syphilis, 85.8%; gonorrhoea, 75.5%; chlamydia, 68.0%), followed by extreme gradient boosting (71.1%, 82.2%, 70.3%, 66.4%), random forest (72.0%, 81.9%, 67.2%, 64.3%), deep learning (75.8%, 81.0%, 67.5%, 65.4%) and MLR (69.8%, 80.1%, 67.2%, 63.2%). GBM models demonstrated the ten greatest predictors collectively explained 62.7–73.6% of variations in predicting HIV/STIs. STIs symptoms, past syphilis infection, age, time living in Australia, frequency of condom use with casual male sexual partners during receptive anal sex and the number of casual male sexual partners in the past 12 months were most commonly identified predictors.

Conclusions Machine learning approaches are advantageous over multivariable logistic regression models in predicting HIV/STIs diagnosis.

P342 THE IMPACT OF COVID-19 ON THE SEXUAL HEALTH OF YOUTH IN THE NETHERLANDS

H De Graaf, F Joemmanbaks*, J Heijne, S Meijer, J Polet. *Rutgers, Utrecht, The Netherlands*

10.1136/sextrans-2021-sti.392

Background Coronavirus disease (COVID-19) changed people's life drastically, due to restrictions to reduce transmission such as social distancing and the limited number of social contacts. The objective is to gain insight in the impact of the COVID-19 pandemic on the sexual health of youth in the Netherlands.

Methods We conducted two cross sectional surveys targeting Dutch youth aged 16–20 year old during the pandemic. Recruitment occurred via social media and a youth sexual health website (sense.info). Both studies included a questionnaire about dating, relationships, sexual- and help seeking behavior and mental health. We identified 4 different time periods: (i) 6 months before the pandemic (pre pandemic), (ii) first lockdown, (iii) between lockdowns, and (iv) second lockdown.

Results The samples consisted of 5218 and 4091 participants. The study showed that less singles had sex during the first (40%) and second (52%) lockdown period compared to pre