

COVID-19 affects the transmission of *C. trachomatis* among men who have sex with men: a mathematical modelling study

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Background: The COVID-19 outbreak in the Netherlands in March 2020 led to measures for social distancing, resulting in changes in sexual behaviour. STI testing has been limited due to healthcare facilities being overwhelmed by COVID-19 activities and because of fear to acquire COVID-19 when presenting at STI testing locations. We investigated the impact of the COVID-19 measures on *C. trachomatis* (CT) transmission among men who have sex with men (MSM).

Methods: We developed a pair-formation model that describes transmission of CT among MSM. We examined the following changes in the first three months of the COVID-19 measures: (1) Testing: no testing for asymptomatic cases; the time between infection and testing was doubled for symptomatic cases. (2) Sex behaviour: MSM with a steady partner had no casual contacts, but had 25% more condomless anal intercourse acts with their steady partner; singles had 90% less casual contacts and no new steady partnerships were formed.

Results: Accounting only for delays in testing, CT prevalence increased from 4.97% to 6.07% in 2020. Five years after ending the measures, CT prevalence was still higher than the respective prevalence without the COVID-19 outbreak. The reduced sex contacts resulted in a decline in CT prevalence, from 4.97% without the measures, to 3.27% with changes in sex behaviour only, or to 3.94% with changes in sex behaviour and testing.

Conclusions: The COVID-19 measures have possibly restricted CT transmission due to reduced sexual contacts, but the scarcity of CT testing has allowed chains of transmission which could have been terminated if MSM had regular tests as before the outbreak. The continuous limitations in CT testing due to COVID-19 inhibit good monitoring of CT transmission.