

# Tuberculosis case notifications in Brazilian prisons: a national interrupted time series analysis of COVID-19 disruptions

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**Background:** People in prison have a particularly high risk of tuberculosis. With an incarcerated population of over 900,000 people, tuberculosis in prisons is an urgent and growing public health concern in Brazil. The effect of COVID-19-related disruptions on TB case notifications has not been specifically analysed in Brazil's incarcerated population.

**Methods:** We used data from Brazil's national tuberculosis registry to conduct a national interrupted time series (ITS) analysis of weekly national and state-level drug-susceptible tuberculosis (DS-TB) notifications among people in prison in Brazil (2017-2023), with the declaration of the state of emergency due to COVID-19 in Brazil (20 March 2020) as the interruption point. Separate negative binomial models were fit nationally and for each state. Fourier terms were used to model seasonality. Residual autocorrelation was assessed using autocorrelation function (ACF) plots and accounted for using Newey-West standard errors. State-level mean differences in predicted values under the observed vs counterfactual (absence of COVID-19) scenarios were regressed on mean state-level COVID-19 Stringency Index values during the first pandemic year.

**Results:** 74,977 DS-TB cases were notified among people in prison in Brazil between 2017-2023. The national ITS showed that case notifications decreased by 20% immediately after the March 2020 interruption (IRR: 0.80, 95% CI: 0.75-0.84). However, there was substantial heterogeneity across states. Observed-counterfactual differences in state-level case notifications during the first pandemic year were only weakly correlated with mean state-level Stringency Index ( $R^2=0.107, p=0.095$ ).

**Conclusion:** Our findings highlight a marked national drop in prison DS-TB case notifications during COVID-19, with gaps between observed and counterfactual notifications persisting into 2023 in several states. These patterns suggest persistent underdetection of TB in prisons, a key population for TB control.

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