

# TIME TRENDS AND FACTORS ASSOCIATED WITH THE USE OF INTRAUTERINE DEVICES IN SAO PAULO, BRAZIL: AN ECOLOGICAL STUDY

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## Introduction

In developing countries, there is a pressing need of over 200 million women and girls who want to avoid, space, or delay becoming pregnant and yet have no access to or knowledge of effective contraception methods.

Among the available methods, intrauterine devices (IUDs) are considered being highly effective. Despite global efforts in removing barriers to the access and use of contraceptives, the situation is only slowly progressing in the use of IUDs.

This research aims at gaining better understanding of the current trends in and factors associated with the use of IUDs in the city of Sao Paulo, Brazil.

## Methods

Population-level data on IUD usage rates among female aged 15 to 54 years, socio-demographic variables as well as factors describing the history of childbearing or motherhood were extracted from Sao Paulo's municipal website "TabNet." Data was aggregated at subprefecture level and stratified by age and year. Descriptive analysis, as well as linear mixed effect models were used to characterize time trends in IUD use. In addition, leveraging on recent developments in supervised machine learning, so called random forests were fitted to the data to assess variable importance for predicting IUD usage levels based on the ecological factors considered in this study.

## Results

An increase in IUD use was observed across 31 out of 32 subprefectures of the city of Sao Paulo between 2017 and 2019 (average annual increase: 6/10,000; 95% confidence interval: 5/10,000 to 7/10,000). IUD uptake was largely heterogeneous across subprefectures and age groups. The random forest model explained 83% of the variability in IUD usage rates. The most critical predictor variables identified as age, marital status, number of previous children, and gestational age distribution at delivery for women with previous births.

## Conclusion

Despite the descriptive and associational nature of the findings of this study, the results indicate that implementation of IUD procedures (and their uptake) varies largely across areas within the city of Sao Paulo. Within the local context of the metropolitan, lessons on how to increase IUD uptake may be learned from areas that were identified of having higher and faster growing IUD usage rates.