Male Sterilization and the Persistence of Violence: Evidence from the Emergency in India

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March 26, 2026

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Abstract

Do coercive state-led programs have persistent effects on interpersonal violence? This paper investigates the impact of a government-mandated male sterilization program introduced in India on the rise of violence. Launched in April 1976, the program predominantly targeted men and saw heterogeneous implementation across India over 10 months. Using various household surveys and newly digitized historical data sources, we study whether the program triggered unintended effects on violence, measured by crime rates. Using a difference-in-differences strategy by exploiting geographical variation in coercion intensity, we find that an increase in exposure to the program led to an increase in only violent crime rates of 8.6% for the average-coerced district, which persisted over time. Violent crimes against women primarily drive the increase in crime rates, as rapes are increasing by 32% for the average district. We find that the program was ineffective in reducing fertility, so we hypothesize that a forced sterilization program targeting men may increase violence against women through two main channels: the program inducing trauma and impacting perceptions of masculinity. In line with those channels and using several representative household surveys, we see that districts with high coercion intensity correlate with more harmful gender norms: higher levels and acceptance of intimate partner violence, lower bargaining power of women,lower contraception adoption, and higher life dissatisfaction from men.

JEL Classification Numbers: J13, N35, N45, 012, and 020

Keywords: Male Sterilization, Violence, Gender, Persistence

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We are extremely grateful to Siwan Anderson, Renaud Bourlès, Claudio Ferraz, Matt Lowe, Nathan Nunn, Avner Seror, and Roberta Ziparo for their support and guidance during this project. We thank Marcella Alsan, Lydia Assouad, Benjamin Marx, Timothée Demont, Maëlys de la Rupelle, Yannick Dupraz, Romain Ferrali, Nathalie Ferrière, Garance Génicot, Pauline Grosjean, Sara Lowes, Jérémy Lucchetti, Pushkar Maitra, Federico Masera, Eva Raiber, as well as participants at seminars at VSE, BU, Columbia, Harvard, AMSE, UNSW and at CEPR, ASREC, LAGV, ICDE, World Cliometrics, EDGE conferences and workshops for very helpful comments. Thank you to the researchers at the Centre for Human Sciences for their help in gathering the data and feedback. We also want to thank Andréa Renk and Balasubramanyam Pattath who kindly shared data with us and Ravi and Julie-Marie Biffe for exceptional research assistance. This work was also supported by the French National Research Agency Grant ANR-17-EURE-0020 and from the Excellence Initiative of Aix-Marseille University – A*MIDEX.

1 Introduction

Throughout history and across regions, many state-led interventions have relied on coercion and human rights violations. Whether through demographic planning, public health mandates, or the control of labour and land, governments have repeatedly exercised power over bodies, communities, and environments. These patterns reveal a persistent reliance on coercion as a tool of governance, highlighting the tension between state authority, individual autonomy, and social justice.

Extensive literature exists on the negative influence of forced program implementation and coercion on trust, health, and economic consequences (Lowes and Montero, 2021; Nunn, 2008; León-Ciliotta et al., 2025), as well as how it leads to backlashes against the intended goals of such programs (Fouka, 2019; Wheaton, 2020). However, one natural yet unexplored channel is how such coercive programs may generate anger, humiliation, and trauma that spill over into broader patterns of interpersonal and societal violence.

In this paper, we examine how a coercive male sterilization campaign in India from April 1976 to February 1977 influenced subsequent violence. Implemented during a state of emergency declared by the Indian government to address poverty, the campaign aggressively pursued male sterilizations using coercion, intimidation, and sometimes outright violence. The program resulted in sterilizing 8.1 million people, comprising 6.2 million men, as compared to 1.5 million in the previous year, one of the largest compulsory sterilization programs in history. We focus on this unique episode to study how forced fertility control for males may influence violent behavior. Forced fertility policies may influence violence through several mechanisms, including the potential for reduced fertility leading to changes in gender roles and ratios, the possibility of trauma induced by the procedure, and the impact on perceptions of masculinity that may increase the propensity for violent responses. We aim to fill the gap in the link between forced fertility for males and violence by addressing the following question: Could coercive male sterilizations lead to a rise in male-perpetrated violence?

We create a novel dataset by digitizing district-level government and administrative documents on sterilizations and crime rates, from 1972 to 2013. We measure the degree of districts' implementation of coercive methods with the growth rate of sterilizations conducted between 1975-76 and 1976-77, which approximates the surplus sterilizations performed during that period, meaning that a high increase in sterilizations during 1976-77 indicates coercion (Pelras and Renk, 2023). We use static and dynamic difference-in-differences strategies with geographical variation in coercion intensity to investigate the impact of exposure to the program on crime rates.

We find that exposure to coerced sterilization increases violent crime rates by 9% for the average district, which persists over many years. This effect is primarily driven by rapes, which increased by 32% in the average district that experienced a fivefold increase in the sterilized share of couples, and by as much as 165% in the most exposed districts. We document that rapes are likely committed by younger cohorts rather than the ones directly targeted by the program of forced vasectomies and that the effect remained significant in highly exposed districts until 2013, the end of our study, pointing to the possibility of inter-

generational and cultural transmission of violence against women. We also find a small effect on murders, which increase by 5.4% on average. Additionally, we observe a reduction in the female population in the more heavily impacted districts, hinting at potential gender–based violence targeting women.

Our dynamic difference-in-differences setting documents that the parallel trends assumption holds, indicating that the results are causal. To test the robustness of the results, we use alternative treatment measures. We first incorporate past sterilization achievements in the measure, the growth rate between the mean of yearly sterilization rates between 1970 and 1976 and the sterilization rate in 1976-77. We then use only the differences in sterilization rates between 1976 and 1977. The causal link between the sterilization program and the increase in violent crimes remains robust.

Finally, we explore plausible mechanisms through which a forced sterilization program targeting men may influence violence towards women. First, reduced fertility could lead to changes in gender roles and ratios and predict an increase in domestic violence (Aizer, 2010; Anukriti, 2014). However, using a representative household survey, we demonstrate that heightened coercion intensity slightly increased birth rates, indicating that the program did not reach its intended goal of reducing fertility. Then, the procedure could have induced trauma, and impacted perceptions of masculinity, triggering violence (Bosson et al., 2009; Scott, 2014). In line with these channels, we use the 1999 Demographic and Health Survey to study whether high coercion intensity districts are correlated with more harmful gender norms for women. We indeed find that coercion intensity correlates with higher levels and acceptance of Intimate Partner Violence, lower bargaining power of women, and lower contraception adoption, suggesting more harmful attitudes against women.

The contribution of this paper is threefold. First, we add to the literature on the backlash of forced interventions and their long-lasting effects (Nunn, 2008; Lowes and Montero, 2021; Alsan and Wanamaker, 2018; Liu and Han, 2023; Fouka, 2019; Wheaton, 2020; De la Rupelle and Zhang, 2023). Extensive research in this literature consistently demonstrates that interventions characterized by coercion or violence, are often associated with detrimental effects on health, education, and wealth outcomes. In terms of wealth outcomes, forced interventions have been found to perpetuate cycles of poverty, hindering economic progress within targeted populations. Closer to our setting, León-Ciliotta et al. (2025) study the long-run effects of a coercive family planning program in Peru that sterilized 300,000 women, highlighting the negative impact of the usage of contraceptives on children's health. Our paper is the first to study that forced programs can lead to an increase in interpersonal violence and to find a positive impact of forced sterilizations targeting men on violence against women.

Second, this paper also contributes to the literature on cultural norms, identity and violence. Previous studies have shown that men's behaviour can be heavily influenced by norms surrounding masculinity (Akerlof and Kranton, 2000) and that men may be more likely to engage in violent or aggressive behaviour to defend their honour or assert their masculinity. For example, Cao et al. (2021) study the impact of honour norms on crime and show that areas with a stronger culture of honour have higher rates of violent crime, especially among men. Baranov et al. (2023) study how the shortage of women during Australia's colonial past led to the emergence of a hyper-masculine identity among men, which resulted in higher crime rates and poorer mental health for men and boys. Forced sterilization could also have negative consequences on masculinity

norms and thus negatively impact well-being. Our study contributes to this literature by examining the impact of a possible shock on men's sense of virility (Scott, 2014) on violent behaviour, using the historical context of the forced vasectomies policy in India. We find that forced intervention on men's bodies or fertility abilities is associated with a rise in violence against women.

Finally, we also add to the literature on the impact of sterilization on well-being (Rao, 1997; De la Rupelle and Dumas, 2020; Anukriti, 2014; Byker and Gutierrez, 2021), that have demonstrated worse health outcomes for women and increased incidents of domestic violence stemming from female sterilization. Regarding *Emergency India*, Sur (2023) and Pelras and Renk (2023), find it led to higher mistrust in medicine and institutions, lower demand for public healthcare, and worse child health outcomes. While the literature has often focused on the impacts of fertility control on women, little is known about the consequences for men when they become the primary targets of reproductive coercion. We contribute to this literature by showing that the implementation of a coerced male sterilization program was ineffective in achieving its intended goal of reducing fertility but moreover created a violent backlash against women from men not targeted by the program, remaining relevant for more than 35 years after the implementation of the program.

This paper is organized as follows. Section 2 gives the historical background of the Emergency period. Section 3, presents the datasets used for this paper. Section 4 states our empirical strategies. Section 5 shows the results. Section 6 shows robustness tests. In section 7, we explore potential mechanisms that would drive the results. Section 8 concludes.

2 Emergency and Forced Sterilizations: Historical Background

2.1 Policy Objectives During the Emergency Period

During the late 1960s and early 1970s, India underwent a period characterized by economic and political turmoil. Following the Green Revolution, food production declined. The international oil crisis of 1973 had amplified the cost of imported oil, leading to a sharp decline in export revenues and a record-high inflation rate (Jaffrelot and Anil, 2021). Moreover, in June 1975, the conviction of Indira Gandhi, the Prime Minister of India and leader of the Indian National Congress, by the Allahabad High Court for electoral malpractices during the 1971 national election put her Prime Ministerial position in jeopardy.[1] In response, she declared a National Emergency on June 25th, ostensibly to stabilize internal disorder (Gwatkin, 1979; Jaffrelot and Anil, 2021).

In June 1975, the government initiated incentivized sterilization, offering radios or payment as incentives; however, the program faced participation rates that were deemed insufficient to meet their intended targets. In February 1976, the government introduced a comprehensive five-point program encompassing family planning, tree planting, a ban on dowry, an adult education program known as "each-one-teach-one," and

[1] Frequent strikes within the Indian National Congress due to diverging viewpoints resulted in its split in 1969. Indira Gandhi won the 1971 central elections with the radical slogan "garibi hatao" (eradicate poverty).

the abolition of social caste distinctions.[2] Emphasizing the critical necessity of population control, the government argued that family planning was consistent with all religious beliefs, and therefore, no individual should be exempted from sterilization on religious grounds (Mehta, 2012). These assertions were notably supported by Western nations, with the World Bank providing 66 million US dollars in humanitarian aid to India between 1972 and 1980 to support the implementation of sterilization programs (Gupte, 2017). Consequently, compulsory sterilization became integrated into a broader poverty reduction initiative.

2.2 Practical Implementation Methods

Prior to the Emergency, states had the authority to decide on family planning, and although the prospect of implementing compulsory sterilization was considered in certain states, no definitive actions were taken. However, with the imposition of the Emergency, Indira Gandhi introduced Constitutional amendments, centralizing the authority for formulating family planning programs within the central government. Subsequently, the National Population Policy was drafted in 1976, prompting the central government to rally state political leadership and local administration to establish sterilization targets and camps. These targets were computed based on past sterilization accomplishments, with each state being assigned quotas to be fulfilled by any means necessary. [3]

The central government advocated for state-level incentives and disincentives for family planning, and it decided to allocate aid to states based on their family planning performance. Additionally, it authorized and endorsed coercive measures for sterilization. State governments had the authority to withhold employee promotions and payments, including those of school teachers, until they either underwent sterilization themselves or met their assigned quotas. This was enforced through the threat of employment termination to ensure compliance. Furthermore, the government mandated the presentation of sterilization certificates for access to basic amenities such as housing, irrigation, ration cards, and public healthcare facilities. Households with two or three children were notably pressured into sterilization through a combination of monetary incentives and disincentives (Tarlo, 2003; Schlesinger, 1977; Jaffrelot and Anil, 2021). This aggressive family planning program resulted in 8.3 million sterilizations in 1976–77, the majority of which (6.2 million) were vasectomies, a substantial increase compared to the 1.5 million vasectomies performed in 1975-76. Approximately 2,000 men lost their lives due to botched procedures. Figure 1 illustrates the district-level spatial distribution of sterilizations conducted during 1976-77.

The procedure entailed the surgical interruption of the vas deferens, the conduits for sperm. This involved a minor incision in the scrotum, where the vas deferens were either cut or obstructed. At the time, vasectomies were considered a definitive sterilization method as reverse procedures were not performed.

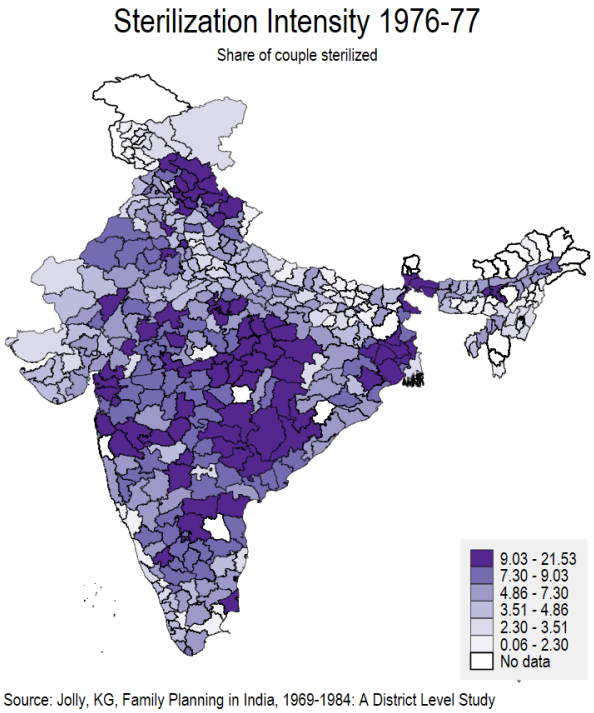
While some district and state leaders were aligned with Indira Gandhi's objectives, others may have complied out of fear, given the prevalent practice of imprisoning political opponents without trial at the time.

[2] Among these, the family planning program stood out as the most significant point and was the primary focus of implementation within the five-point program.

[3] District officers and police commissioners were commended with gold medals for their dedicated efforts in achieving these set targets (Gupte, 2017).

Additionally, Sanjay Gandhi planned to visit various districts and states, exerting pressure on local governments to employ coercive methods to demonstrate quota fulfilment (Jaffrelot and Anil, 2021). The specific channels guiding districts in opting for coercive methods lack clear identification. Section 5 studies potential channels for the implementation of coercive methods.

Figure 1: Spatial distribution of sterilization intensity in 1976-77



Notes: This map shows the district-level geographical variation of the percentage of sterilized couples in 1976-77, the year of implementation of the forced sterilization program. Darker shades indicate that more individuals underwent sterilization during the program. Source: Jolly (1986)

There are documented instances of police violence, perpetrated against both men and women, as a means to coerce men into undergoing vasectomies. Scott (2014) presents evidence of various police brutalities, including the use of weapons and tear gas. She emphasizes that both men and women lived in a constant state of fear due to the actions of the authorities.

2.3 Perceptions of the Emergency

Scott (2014) examines the perspections of the Emergency of various actors in Indian society. She initially highlights the lack of coherent planning in this program, indicating that states and districts were encouraged to compete with each other, leading to a sense of gamification.

In *The Shah Commission Final Report: General Observations* (1990), several official complaints from civilians who were wrongfully coerced into undergoing vasectomies are documented. The study reports that 548 unmarried men were forced into the procedure, and almost 2,000 men died as a result of botched

surgeries. Additionally, Guha (2007) reports instances where individuals of all ages and even those who were physically incapacitated were forcibly taken to sterilization camps. Numerous testimonies from men attest to the coercive nature of the program.

> "The officers said you could keep your job only if you get sterilised. I didn't have time to think. When I reached my duty we were told this... I agreed to it because I had to save my job and bring up my family."
> – Tarlo (2003)

Scott (2014) underscores that men were primarily targeted for two main reasons. Firstly, the urgent pressure from the government on states and districts compelled them to prioritize vasectomies due to their less invasive and quicker nature compared to tubectomies (female sterilizations). Secondly, men, particularly state workers, were predominantly threatened through their employment, as fewer women were working at the time.

The program engendered a sense of emasculation among men for three primary reasons. Firstly, the state's imposition of fertility control undermined the traditional masculine role of determining the ideal number of children for the family. Secondly, the threat posed to the masculine identity as breadwinners destabilized their traditional role. Finally, the invasive nature of vasectomies, coupled with the stigma surrounding them and the perceived risk of loss of sexual abilities, further compounded feelings of emasculation. The masculine response to this program is documented by the emergence of the anti-Emergency slogan:

> "Indira Hatao, Indira Bachao"
> 'Abolish Indira and Save Your Penis'
> – Scott (2014)

2.4 Transition and the Post-Emergency Landscape

In 1977, a series of widespread protests erupted across India, demanding an end to the Emergency and the initiation of new elections. In response, Indira Gandhi, under counsel, opted to terminate the Emergency period and the forced sterilization program, subsequently paving the way for the organization of elections. The public voted her out of power, electing two opposition party politicians from the Janata Party, Morarji Desai (1977-79) and Charan Singh (1979-80), as successive Prime Ministers, who did not re-conduct the sterilization program.

In 1978, the new Government appointed a commission of inquiry, led by Justice Jayantilal Chhotalal Shah, to investigate any illegal practices during the Emergency period. *The Shah Commission Final Report: General Observations* (1990) uncovered numerous illicit practices, particularly concerning coerced vasectomies. The commission documented complaints from unmarried and elderly men who were coerced into undergoing vasectomies, highlighting the pervasive confusion and forced nature of that era.

Despite discontent about the program, Indira Gandhi was reelected for the fourth time as Prime Minister in 1980. During this last term, she faced escalating opposition from Jarnail Singh Bhindranwale, an orthodox Sikh leader gaining popularity. In 1983, Bhindranwale was accused of plotting terrorist activities against India and amassing weaponry within the Golden Temple, his religious headquarters. In June 1984, after failed negotiations between the National Congress Party and Jarnail Singh Bhindranwale, Indira Gandhi authorized the Indian army to carry out "Operation Blue Star," leading to his removal and subsequent death. A few months later, Indira Gandhi herself was assassinated by two of her Sikh bodyguards, triggering a wave of violent unrest in India, known as the "anti-Sikh riots" (Das and Rohilla, 2020).

3 Data

3.1 Treatment: the growth rate of sterilized married couples between 1975-76 and 1976-77

To construct our treatment variable, we rely primarily on the comprehensive dataset provided by Jolly (1986), which documents the percentage of couples sterilized in all Indian districts spanning from 1970 to 1980. Complementing this dataset, we extend our research to include the data on tubectomies and vasectomies obtained from the Government's State or District statistical abstracts, covering approximately 66% of the total districts.[4] Furthermore, we supplement our analysis with information extracted from the annual yearbooks of the Ministry of Health and Family Welfare spanning the years 1971-72 to 2000-2001[5], providing state-level insights into the prevalence of vasectomies, tubectomies, and the average age of men undergoing vasectomies.

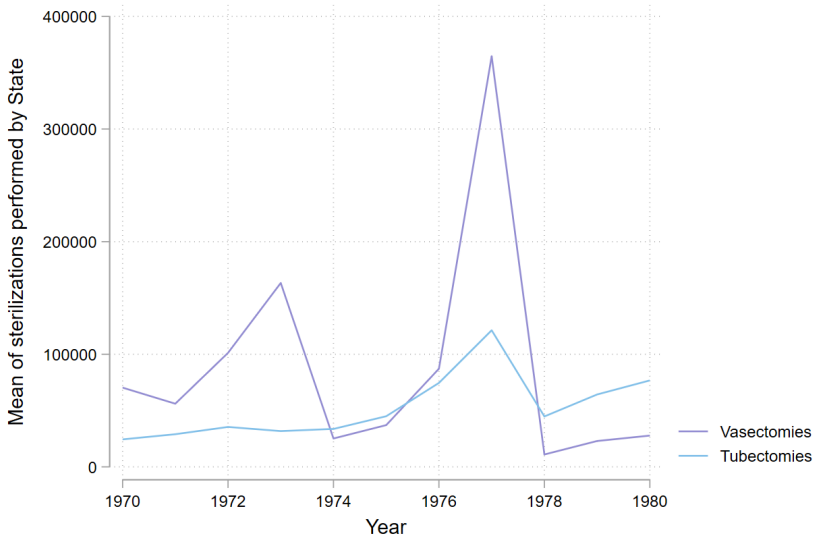
Through analysis of state-level yearbooks, we observe from Figure 2 that vasectomies were the primary form of sterilization during this period. This indicates that the proportion of sterilized married couples can be used as a suitable proxy for understanding the spatial distribution of vasectomy rates in different districts. This enables us to examine the effects of the forced sterilization program across Indian districts. In Figure 3, we display the linear relationship between sterilizations on the left and vasectomies on the right. We sourced this data from the government's state or district statistical abstracts, where the percentage of married couples from Jolly (1986) is multiplied by the district-level population from the Indian Census of 1971. These graphs confirm the reliability of the Jolly (1986) dataset for studying sterilizations in India and its suitability as a proxy for vasectomies during the same period.

We acknowledge that the intense administrative pressure during the Emergency raises concerns about the accuracy of sterilization data. At the same time, historical accounts emphasize both the extensive monitoring

[4] This extensive sterilization dataset was collated through joint efforts with fellow researchers Balasubramanyam Pattath, Charlotte Perlas, and Andréa Renk. The dataset, alongside the one from Jolly (1986) that we digitized specifically for this study, is employed in Pelras and Renk (2023).

[5] Digitized by Andréa Renk for Pelras and Renk (2023)

Figure 2: Average of vasectomies and tubectomies performed in India 1970-80



Notes: Authors' computation using the annual state-level yearbooks of the Ministry of Health and Family Welfare. This graph represents the average of vasectomies and tubectomies performed in India between 1970 and 1980. It shows that most of the forced sterilizations performed in 1976-77 were vasectomies and that there was a considerable increase in the number of vasectomies performed compared to previous years. The peak of vasectomies in 1973 was the result of the introduction of a voluntary vasectomy program.

of program implementation and the widespread use of coercive measures Jaffrelot and Anil (2021), suggesting that recorded variation reflects meaningful differences in exposure. While some degree of over-reporting may have occurred, available evidence indicates that this was limited. To the extent that sterilizations were overstated in some districts, this would tend to attenuate our estimates by compressing true variation in exposure—effectively misclassifying some less exposed districts as highly exposed and as a result attenuate the estimated effects and bias them toward zero. We further assess data consistency by comparing multiple sources: Figures 3a and 3b show strong alignment between book reports and official state-level aggregates. Finally, to ensure that extreme observations do not drive our results, we winsorize the coercion intensity measure at the 1% level.

For the empirical analysis, we define district-level coercion intensity as:

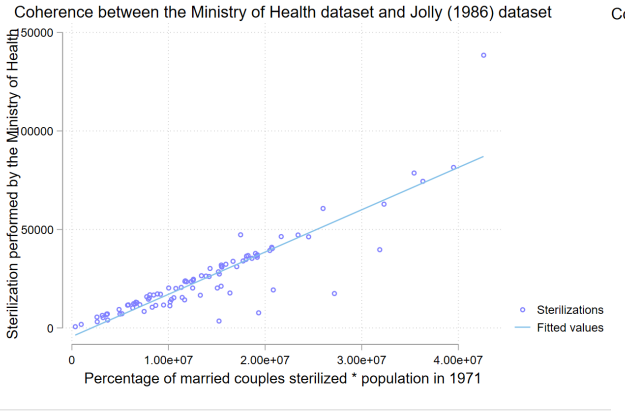
$$CI_d = \frac{Ster_d^{77} - Ster_d^{76}}{Ster_d^{76}}$$

Where Ster_d^{77} and Ster_d^{76} are percentages of sterilized couples in the year 1976-1977 and 1975-1976 respectively.

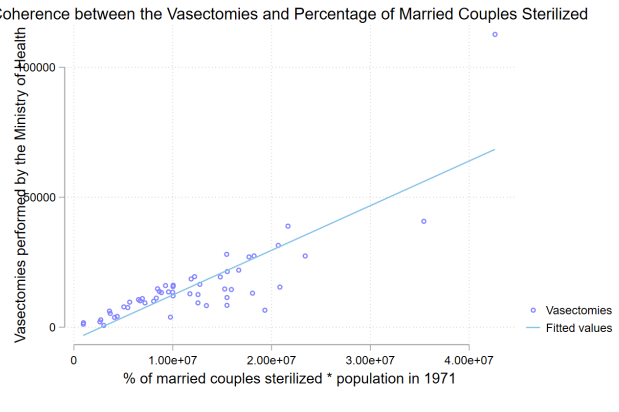
The variable CI_d can be interpreted as the number of tims the percentage of couples who were sterilized between the years 75-76 and 76-77 were multiplied by. It indicates coercion intensity, with higher values

Figure 3: Coherence between the Ministry of Health Dataset and Jolly (1986) 1976-77

(a) Sterilizations performed and percentage of sterilized married couples



(b) Vasectomies performed and percentage of sterilized married couples



Notes: These graphs show the linear regression between the number of sterilizations and vasectomies performed using the source of the Indian Health Ministry, and Jolly (1986) that we use for our treatment variable, the share of sterilized couples, times the population at the district level in 1976-77. These graphs validate the relevance of the source of data for our treatment variable to study vasectomies.

suggesting districts significantly increased sterilization performed because of pressure, likely implying the use of coercive methods to promote vasectomies. Figure 4 shows the spatial distribution of the coercion intensity index, the measure goes from times -0.84 to 26.72 times more sterilizations. Here, a value of 1 implies that the number of sterilizations doubled. We discuss several alternative measures in Section 6.

3.2 Main outcome: crime rates at the district-level from 1972 to 2013

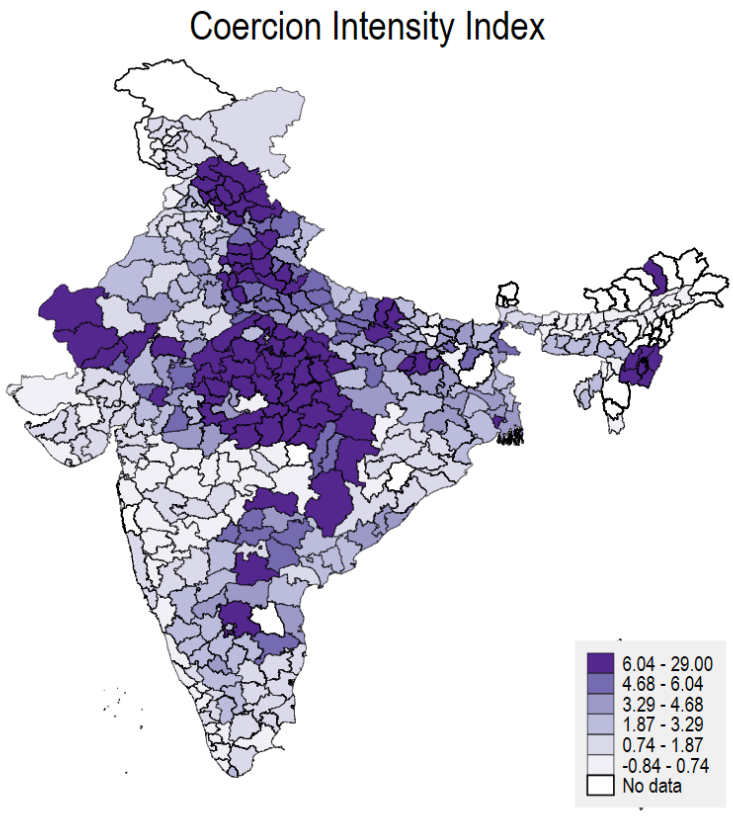
We digitized district-level crime data available on the Indian National Bureau of Crimes website, detailing annual reports of crimes reported to or by police forces, all under the Indian Penal Code, from 1972, the first year available, to 2013.

Gender information of perpetrators and victims at the district level is unavailable, but state-level aggregates are computed by gender. These tables reveal that men commit crimes at rates ranging from 4 to 4485 times more than women, with a mean of 90 times higher.

We categorize crimes into different types: violent crimes (murder, rape, and kidnapping), property crimes (robbery, counterfeiting, theft, dacoity[6], burglary, and trust), riots, and cheating crimes and then we run separate regressions for each category. The descriptive statistics of this dataset can be found in Table 1. Rape crimes encompass all reported instances of rape. However, it's important to note that the Indian Penal Code excludes certain forms of rape, such as marital rape and same-sex crimes. Additionally, all sexual

[6]Equivalent of banditry.

Figure 4: Coercion Intensity Index: All India



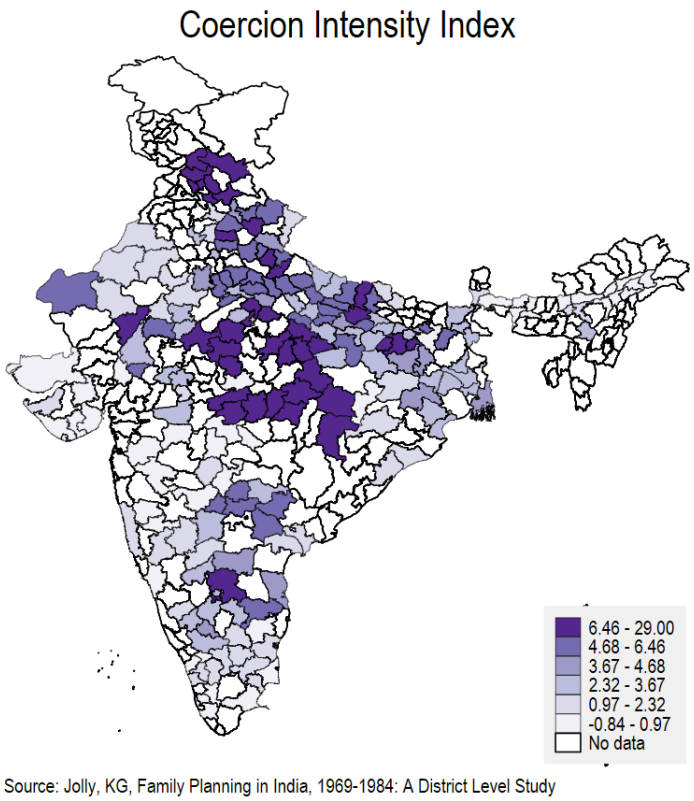
Notes: This map represents the geographical variation of our treatment variable, coercion intensity in India. The coercion intensity index is defined as the growth rate of the share of sterilized married couples between 1975-76 and 1976-77. A value of 1 implies a 100 percent increase, or a doubling, of the sterilization share in 1977 relative to 1976. Darker shades indicate a higher use of coercion in the district.

activity with a minor below the age of sixteen is considered rape under the law.

We are able to follow 197 districts each year from 1972 to 2013 out of approximately 360 districts in 1972. If one year the district was not present in the official records, due to missing reports or forgetfulness, we dropped it from the database, except for the four districts of Delhi which were lacking for one or two years, as the capital is an important place to keep in our analysis. We could match this data to the sterilization dataset, represented in Figure 5. We then winsorize each crime and the coercion intensity variables at the 1% level (removing the botton and top 1 percent to avoid the effect being driven by extreme values.) We then have a total of 8225 observations, except for property crimes that were removed from the online-available dataset from 2000 to 2012, which restricts the analysis to 5873 observations.

Although we recognize the potential for under-reporting in crime data, especially for sexual and violent offences, researchers working with Indian police data generally assume a consistent pattern of under-reporting each year (Anderson and Genicot, 2015). Hence, we proceed with the common assumption that analyzing variations in reported crimes reflects actual variations in the occurrence of these crimes.

Figure 5: Coercion intensity Index: Crime Dataset



Notes: This map represents the geographical variation of our treatment variable, coercion intensity, focusing on the districts present in our analysis of crime rates. The coercion intensity index is defined as the growth rate of the share of sterilized married couples between 1975-76 and 1976-77. Darker shades indicate a higher use of coercion in the district.

We note that the total number of crimes observed does not align with the sum of individual crime categories. This discrepancy arises because the records from the National Bureau of Crimes do not distinctly categorize every type of crime in their documents. Therefore, the differences between the observed total and the sum of individual categories account for other types of crimes, such as defamation cases, which are not explicitly delineated in the records.

To assess whether the districts included in our analysis differ from those excluded due to our cleaning process, we perform a test of the difference of means between the two groups, as presented in Table 2, utilizing various variables from the 1971 Indian Census. Our findings indicate that the districts retained in the analysis are generally representative of the overall population. However, it is noteworthy that the number of farmers and the population of scheduled castes are overrepresented in the crime dataset.

Table 1: Descriptive statistics of crime rates 1972-2013

	Mean
Total crimes	2294.02
Violent crimes	92.45
Property crimes	828.21 +
Riots	141.93
Rapes	17.23
Cheating	37.54
Murders	47.10
Observations	8225

Notes: This table presents the yearly average numbers of crime rates per 1 million inhabitants in India from 1972 to 2013 for the districts of our analysis. +For property crimes, the dataset is available from 1972 to 2000, and the total number of observations is 5873.

Table 2: Summary statistics of districts by presence in the final dataset

	(1)	(2)	(3)	(4)
	Mean in the dataset	Mean not in the dataset	Difference 2-1	P-value
Total population - 1971	1691862	1523772	-168091	0.15
Main Workers - 1971	558320	500139	-58181	0.13
Farmers - 1971	407749	325191	-82559	0.00
Household industry - 1971	20054	17099	-2955	0.13
Literates: ages 25-34 - 1971	75188	83783	8596	0.33
Literates: ages 35+ - 1971	107447	116828	9381	0.46
Primary school or higher- 1971	306778	337486	30707	0.39
Middle school or higher- 1971	141507	160846	19339	0.34
Total scheduled caste pop - 1971	270297	193308	-76989	0.00
Total scheduled tribe pop - 1971	98183	129516	31333	0.20
Observations	188	151	339	339

Notes: This table shows correlations between state and district-level demographic and political variables and our coercion intensity measure. This shows that the implementation of coerced vasectomies is only correlated with the share of middle school achievers, which historically makes sense as coercion mainly took the form of threats towards state workers, more likely to achieve higher education. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.3 Additional variables and covariates

We consider that districts with strong state capacity, which have a high ability to implement programs, may have been able to implement more forced vasectomies and may be the ones with more crime rates reporting due to more police forces presence. While our approach does not necessitate random treatment, factoring in

state capacity helps us explore links between administrative capabilities and forced vasectomies, enriching our understanding of their connection to crime rates. To do this, we digitized state-level police force data from the National Bureau of Crimes website for 1972-2013. This dataset was not available after 2013, which makes it the last year of our study.

Oldenburg (1992) previously showed a positive correlation between male-female ratios and crimes, particularly murders. As the crime dataset does not provide any information on the specific characteristics of victims, studying the censuses could shed light in some areas. We use the 1971, 1981 and 1991 Indian censuses to compute sex ratios. We also track two age groups, specifically those aged 0-5 and 5-10 years old in 1971, as they would correspond to the 20-25 and 25-30 age groups in 1991. Due to our census data limitation which categorizes individuals as 35 and older, we were unable to follow older cohorts.

4 Empirical Strategy

4.1 Main specification

To understand the effect of the 1976-77 forced sterilization campaign on crime rates, we use spatial differences in coercion intensity and time variation. Our dataset spans 1972 to 2013, offering insights into long-term crime trends. We employ a two-way fixed effects approach.

We use a difference-in-differences analysis:

$$Y_{d,s,t} = \theta_t + \eta_d + \beta * CI_d * Post_t + X_{s,t} + v_{d,s,t} \tag{1}$$

$Y_{d,s,t}$ is the crime rate per 1 million inhabitants, of violent and property crimes, murders, riots, cheating and rapes, in district d at time t. θ_t and η_d are time and district-fixed effects. CI_d is the Coercion Intensity Index at the district level. $Post_t$ takes 1 starting in 1976, as the shock of forced vasectomies lasted 10 months starting April 1976. Finally, $X_{s,t}$ is the state-level control, including only the number of total police forces. Time and district fixed effects help us control for individual and time-specific variations, enabling us to estimate the causal effects of coercion intensity on crime rates. β is the coefficient of interest.[7]

This identification strategy accounts for any district-level characteristics that may influence the outcome, assuming the parallel trends assumption holds. [8]

Finally, we examine sex ratios at the district level to gain deeper insights into the demographics of crime victims, given that crime data do not specify this information. We use a similar difference-in-differences

[7] The coefficient β divided by the mean of the outcome indicates the percentage increase in the outcome for every 1 percentage point increase in the coercion intensity variable after the forced vasectomy period.

[8] The recent difference-in-differences literature (de Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021) does not impact our study. Our treatment, coercion intensity, was applied simultaneously to all districts in the same year, eliminating staggered implementation. Importantly, the possibility of negative weights for the coefficients does not pose a threat to our identification.

analysis as in equation 1, With $Y_{d,s,t}$ being the number of men divided by the number of women in district d at time t. CI_d is the coercion intensity measure, and $Post_t$ takes 1 for the census waves of 1981 and 1991, i.e. after the forced vasectomies episode. A positive and significant β means that the number of men increased compared to the number of women in districts with high coercion intensity.

4.2 Threats to identification

The crucial assumption in difference-in-differences models is that treatment and control districts follow similar trends in the absence of treatment (parallel trends assumption). To validate our assumptions, we conduct event-study designs in both analyses to examine pre-treatment trends.

To assess the parallel trends assumption, we introduce a treatment dummy variable for coercion intensity in our analysis. This variable must accurately reflect districts with high exposure while maintaining a balance between those with low and high coercion intensity. The median value of coercion intensity is 3.38%, implying a 3.38% rise in the proportion of sterilized married couples between 1975-76 and 1976-77. Since this value does not represent a significant increase in coercion, we opted to assign a value of 1 to districts with coercion intensity exceeding the mean of 5.1%. Subsequently, we re-examine the outcomes for districts with the highest coercion intensity, the top 25% of our sample, denoting coercion intensity above 6%.

$$Y_{d,s,t} = \theta_t + \eta_d + \beta_t \times Dci_d \times \sum_{i=1972}^{2013} \mathrm{P}_t + X_{s,t} + v_{d,t} \tag{2}$$

In equation 2, we use event study methodology to analyze crime rates per 1 million inhabitants by regressing them on year-specific dummy variables. $Y_{d,s,t}$ is the number of crimes per 1 million inhabitants in district d in year t. Instead of using a single dummy variable set to 1 after 1976, we now employ a dummy variable P_t, which equals 1 for each year from 1972 to 2013 (excluding 1976). The event study design illustrates the $\beta_{d,t}$ coefficients for each year, helping us compare high and low coercion intensity districts. Dci_d is a dummy that takes 1 if the district had a coercion intensity, CI_d above the mean, 5.1. We also do the regression for the 25% most exposed district, Dci_d, then takes the value 1 for a coercion intensity above 6. θ_t and η_d are time and district fixed effects. $X_{s,t}$ is a state-level control variable, which is the total police force at the state level in year t.

Another potential concern is the presence of other interventions that may have targeted the same districts over the years, especially in our long-term analysis of crime patterns. However, we find this threat to be unlikely for several reasons. First, there were no subsequent similar programs in India during the period we examined. Second, it is less likely that a program capable of influencing violence would have been implemented with the same intensity in the same regions due to various factors, such as political changes and shifts in the state's workforce. In fact, Pelras and Renk (2023) suggests that households more exposed to the program were more likely to vote for incumbent parties, indicating a change in representation after the Emergency period. Finally, the other programs initiated by Sanjay Gandhi during the Emergency were not

implemented with the same intensity or proven efficacy and are unlikely to have had an impact on violence.[9]

5 Results

We first study the implementation of coercion intensity to have a better understanding of this program, then we present the results on crime rates.

5.1 Investigating the implementation process of coercion intensity

While our identification strategy enables us to estimate the causal impact of the program on crime rates regardless of whether its implementation was random, we still provide background on how the intensity of coercion was determined. We correlate 1977 forced vasectomies and several socio-economic variables from the 1971 Indian Census, Ministry of Health Reports, and the Lok Sabha elections of 1971. These variables include population size, the proportion of farmers and workers, the share of the literate population, the number of achievers of primary education and middle education, the share of scheduled tribes and finally the share of candidates from the same party as Indira Gandhi, the Indian National Congress (INC), elected at the state level. Correlating these variables with our measure of coercion intensity gives insights into the factors determining the implementation of forced vasectomies.

In Table 3, the implementation is observed to correlate with a higher proportion of middle school achievers, presumably due to the reliance of the program on educated state workers, who are more likely to have attained middle school education. Coercion intensity also exhibits correlations with a lower population, a higher proportion of the farming population, and a greater number of scheduled castes. However, these correlations are relatively small and do not suggest a direct pathway through which violence could evolve. Surprisingly, the absence of a clear association between the share of political leaders from the Indian National Congress, the party of Indira Gandhi, and the program's implementation raises intriguing questions. Although this lack of correlation does not explicitly uncover the reasons behind the varying implementation of the reform across districts, it provides insight into the absence of discernible mechanisms that could establish the exogeneity of the treatment. However, as discussed in Section 4, the potential endogeneity of the treatment does not pose a threat to our identification strategy.

[9]The other programs announced were tree planting, a ban on dowry, an adult education program known as "each-one-teach-one", and the abolition of social caste distinctions.

Table 3: Correlations between coercion intensity and 1971 district and state-level variables

	(1) Coercion Intensity
Population	-0.0463***
	(0.0151)
Farming population	0.131*
	(0.0674)
Working population	-0.0515
	(0.0647)
Household Industry	0.319
	(0.264)
Primary school achievers	-0.0892
	(0.0552)
Middle school achievers	0.238***
	(0.0818)
Scheduled castes	0.0964***
	(0.0244)
Scheduled tribes	0.00595
	(0.0142)
Literate population - 25 years old	0.230
	(0.347)
Literate population - 35 years old	-0.137
	(0.171)
Share of candidates from the INC, state level	6.286
	(4.896)
Observations	315

Notes: This table shows correlations between state and district-level demographic and political variables and our coercion intensity measure. This shows that the implementation of coerced vasectomies is only correlated with the share of middle school achievers, which historically makes sense as coercion mainly took the form of threats towards state workers, more likely to achieve higher education. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors are in the parentheses and clustered at the district level.

5.2 Impact of coercion intensity on crime rates

We present the results of the regressions on crimes, up to 2013. As reliable data regarding police forces at the state level were not accessible beyond 2013, making it challenging to control for this fact, we conclude our analysis at 2013.

In Table 4, we observe a long-term positive relationship between coercion intensity and violent crimes. Specifically, when sterilizations doubled due to coercion compared to the previous year, it resulted in an increase of 1.6 violent crimes per 1 million inhabitants. For the average district in our sample, where coercion intensity is 5.1 (indicating a fivefold increase in sterilizations relative to the previous year), the program is associated with an increase of approximately 8.16 violent crimes per 1 million inhabitants. This represents a 9% rise in violent crime rates compared to the pre-Emergency average of 92.45 crimes per million inhabitants. Furthermore, in Table 5, we find that when sterilizations doubled due to coercion compared to the previous year, it resulted in an increase of 1.1 rapes per 1 million inhabitants. For the

Table 4: Impact of forced vasectomies on crime categories 1972-2013

Dep. Var.: rates of	(1) Total crimes	(2) Property Crimes	(3) Violent Crimes
Coercion Intensity × Post	22.10	-0.58	1.57**
	(13.93)	(5.15)	(0.58)
Observations	8225	5873	8225
Year Fixed Effects	Yes	Yes	Yes
District Fixed Effects	Yes	Yes	Yes
Mean	2294.02	828.21	92.45

Notes: This table presents the results of running the static difference-in-differences specification shown in equation 1 of coercion intensity on crime rates per 1 million inhabitants. The unit of observation is the district. We control for police forces at the state level. Standard errors are in the parentheses and clustered at the district level. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

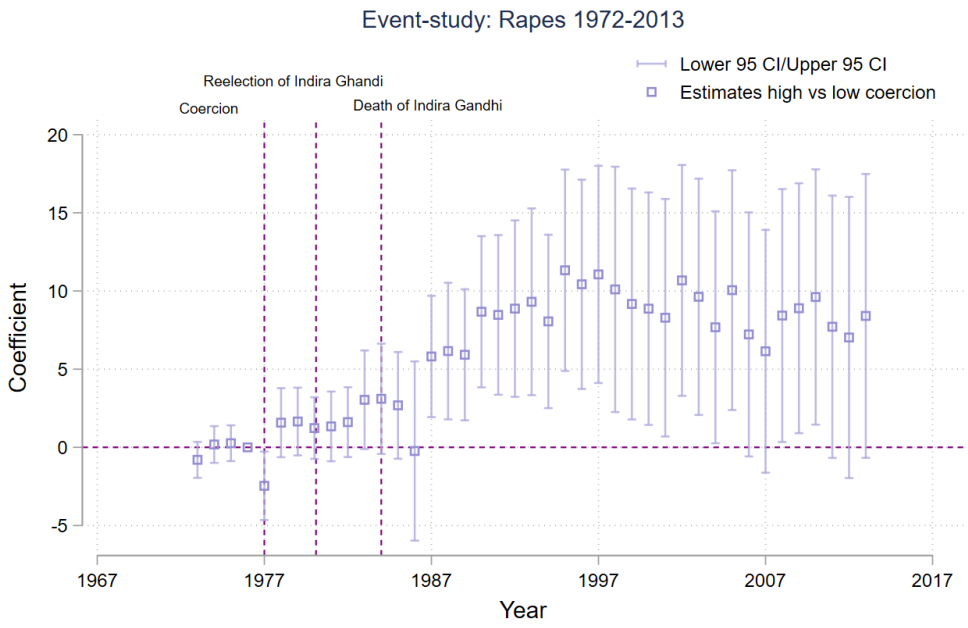
Table 5: Impact of forced vasectomies on crime rates 1972-2013

Dep. Var.: rates of	(1) Rapes	(2) Murders	(3) Cheating	(4) Riots
Coercion Intensity × Post	1.09***	0.50**	-1.32***	-0.69
	(0.34)	(0.24)	(0.39)	(0.69)
Observations	8225	8225	8225	8225
Year Fixed Effects	Yes	Yes	Yes	Yes
District Fixed Effects	Yes	Yes	Yes	Yes
Mean	17.23	47.10	37.54	141.93

Notes: This table presents the results of running the static difference-in-differences specification shown in equation 1 of coercion intensity on crime rates per 1 million inhabitants. The unit of observation is the district. We control for police forces at the state level. Standard errors are in the parentheses and clustered at the district level. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

average district with a fivefold increase in sterilizations, rapes increased by 32%, murders by 5.4%, and incidents of cheating decreased by 17.9%. The districts that experienced the highest coercion saw a 27-fold increase in the sterilized share of couples (coercion intensity value of 26.7). For these districts, rapes increased by 165% relative to the pre-Emergency average of 17.23 rapes per million inhabitants.

Figure 6: Event Study: Impact of coercion intensity on rapes 1972-2013

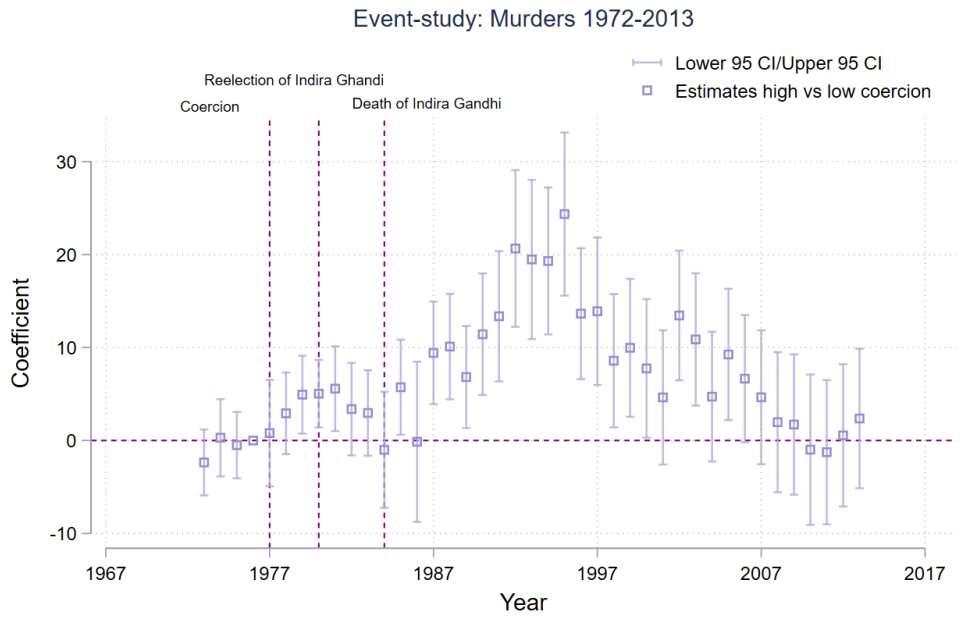


Notes: This figure plots the estimated β coefficients from a regression of the form given in equation 2. The dependent variable is the number of rapes per one million inhabitants. The event is centered on the year 1977, and the coefficient for 1976 is normalized to zero. Vertical lines represent 95% confidence intervals. The treatment group includes districts where the share of couples sterilized increased by at least 5 units—corresponding to an increase of 500% or more—between 1975–76 and 1976–77. The control group consists of districts with smaller or no increases. Each coefficient reflects the difference in the outcome between treated and control districts at a given event year, relative to the pre-policy year (1976). The model includes district and year fixed effects, and standard errors are clustered at the district level. We also control for the size of the state-level police force.

Figures 6, 7 and 8 show event-study plots for rapes, murders and riots. We first note that the pre-treatment trends in rapes and murders appear parallel across treatment and control groups, lending support to the parallel trends assumption. However, this is not the case for riots, where the pre-trends diverge and the slope is positive. After the coercive policy, we find a decline in riots, as targeted districts appeared to have lower rates of political opposition against the police or the state. This is most likely due to the atrocities or the fear of police retaliation experienced during the implementation of the coercive policy in 1976-77.

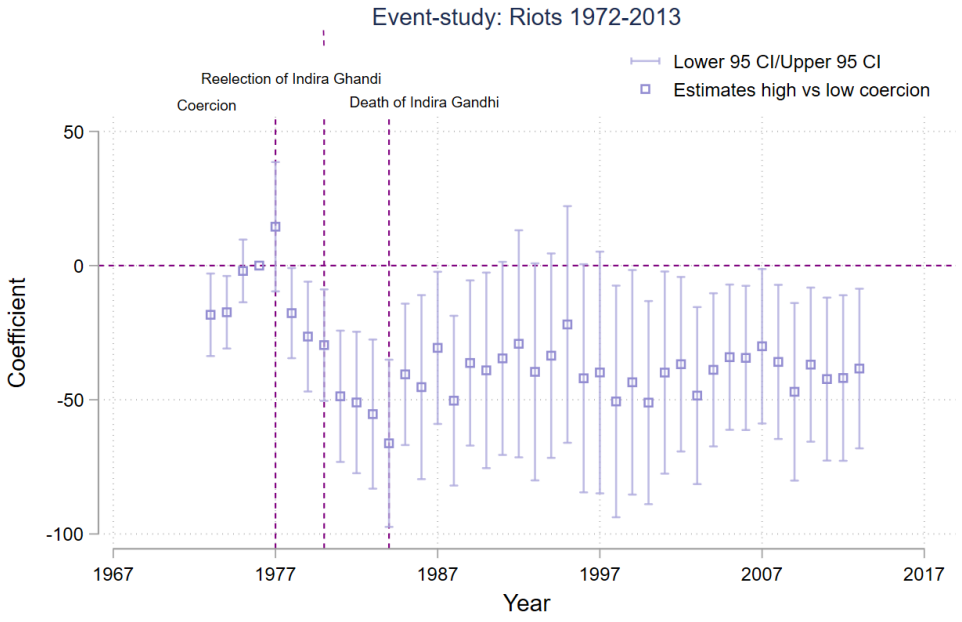
In Figures 6, 7, we can see a change in trends following 1977 that becomes significant after 1985. The assassination of Indira Gandhi in 1984 marked a turning point in Indian history, with the ensuing violent episodes, the anti-Sikh riots, potentially contributing to a surge in violence during that period and a relish of violence. It could also be the symbol of the end of this dark episode in India's history, and the end of the fear that such a program would happen again. However, in Figure 10, we analyzed the age groups of rape perpetrators in India using data from the Bureau of Crimes (1988-2020). It is evident that the most common age groups for committing rapes are 18-30 and 30-50 years old. Notably, the Ministry of Health's reports indicate that the average age of men who underwent vasectomies in 1977 was 35. This suggests that the individuals committing the crimes are more likely to be a different generation from those directly targeted by forced vasectomies, as the latter group would have been 46 years old in 1988, potentially implicating their

Figure 7: Event Study: Impact of coercion intensity on murders 1972-2013



Notes: This figure plots the estimated β coefficients from a regression of the form given in equation 2. The dependent variable is the number of murders per 1 million inhabitants. The event is centered on the year 1977, and the coefficient for 1976 is normalized to zero. Vertical lines represent 95% confidence intervals. The treatment group includes districts where the share of couples sterilized increased by at least 5 units—corresponding to an increase of 500% or more—between 1975–76 and 1976–77. The control group consists of districts with smaller or no increases. Each coefficient reflects the difference in the outcome between treated and control districts at a given event year, relative to the pre-policy year (1976). The model includes district and year fixed effects, and standard errors are clustered at the district level. We also control for the size of the state-level police force.

Figure 8: Event Study: Impact of coercion intensity on riots 1972-2013

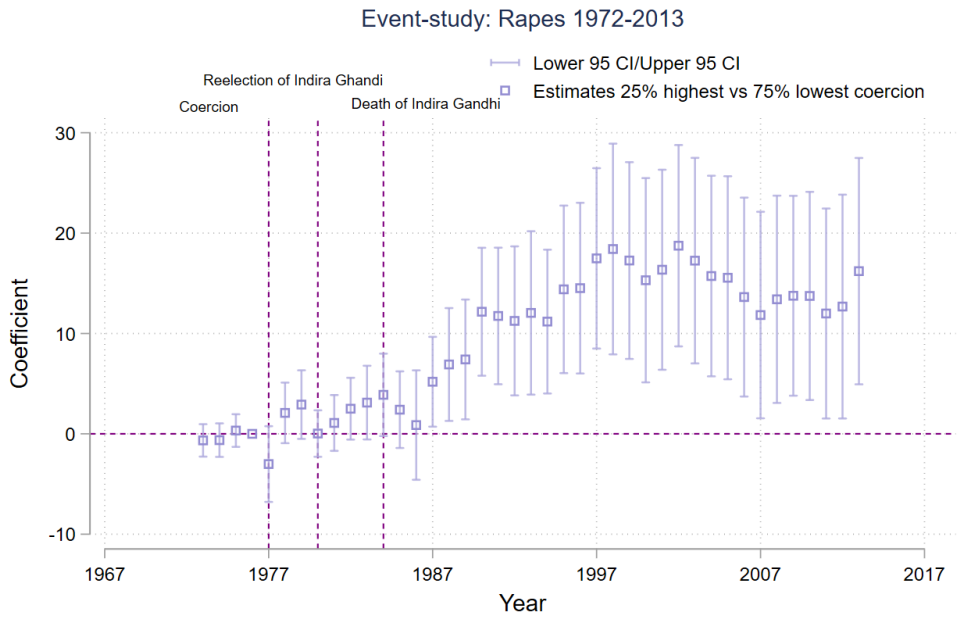


Notes: This figure plots the estimated β coefficients from a regression of the form given in equation 2. The dependent variable is the number of riots per 1 million inhabitants. The event is centered on the year 1977, and the coefficient for 1976 is normalized to zero. Vertical lines represent 95% confidence intervals. The treatment group includes districts where the share of couples sterilized increased by at least 5 units—corresponding to an increase of 500% or more—between 1975–76 and 1976–77. The control group consists of districts with smaller or no increases. Each coefficient reflects the difference in the outcome between treated and control districts at a given event year, relative to the pre-policy year (1976). The model includes district and year fixed effects, and standard errors are clustered at the district level. We also control for the size of the state-level police force.

children, who start to commit crimes once they are of adult age. This observation aligns with a growing body of literature on the relationship between exposure to violence during childhood and adolescence and the display of violence in early adulthood (Mrug et al., 2016). We observe a strong pattern of increase in rapes, persistent until the end of our study in 2013, which spans over 35 years since the program's implementation.

We conduct the event study for the top 25% most exposed districts (Figure 9). The influence of coercion intensity on rape rates in these districts remains as well significant until the end of our study in 2013.

Figure 9: Event Study: Impact of coercion intensity on rapes for the 25% more exposed districts

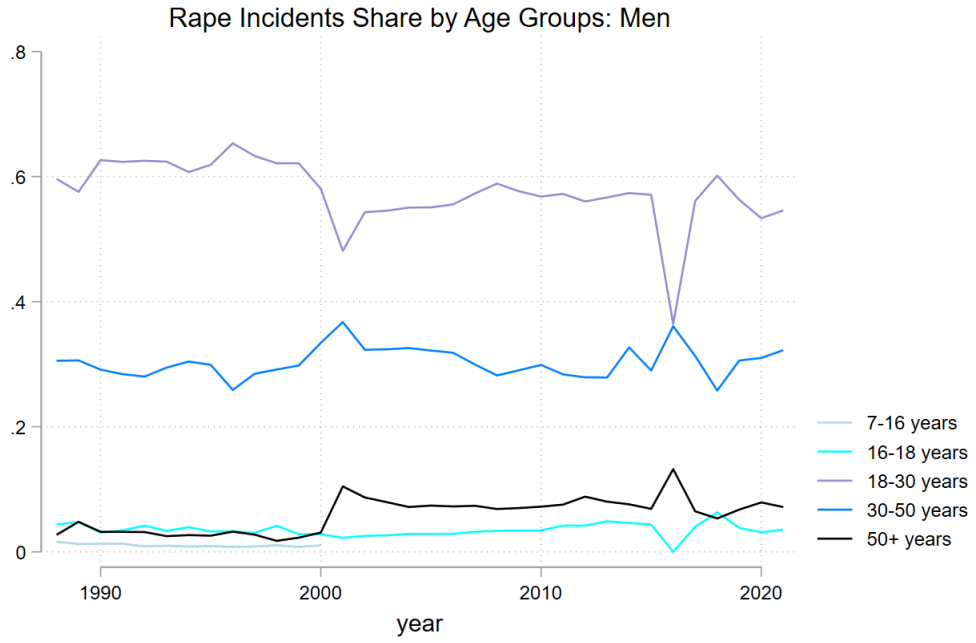


Notes: This figure plots the estimated β coefficients from a regression of the form given in Equation 2. The dependent variable is the number of rapes per 1 million inhabitants. High coercion districts, or treatment districts, are defined as the top 25% of our sample, where coercion intensity is at least 6, corresponding to a minimum 600% increase in the sterilized couple share. The control group consists of districts with smaller or no increases. Each coefficient reflects the difference in the outcome between treated and control districts at a given event year, relative to the pre-policy year (1976). The model includes district and year fixed effects, and standard errors are clustered at the district level. We also control for the size of the state-level police force.

Although individual characteristics data is absent in the Indian crime dataset, it is important to note that within this dataset, rape is categorized as an offence against women. To better understand if the observed effect on murders, albeit small (Figure 7), might also target women, we analyze the sex ratios from the Indian censuses in 1971, 1981, and 1991. Oldenburg (1992) has previously shown a positive correlation between male-female ratios and murders in Uttar Pradesh, suggesting that murders could potentially be a form of violence that disproportionately impacts women.

In Table 6, we find that a 100 percent increase in coercion intensity (coercion intensity value of 1) is associated with a small increase in sex ratios over time, for the overall population. We find that this result is also significant for the two age groups we were able to follow. These results suggest that murders could

Figure 10: Age-groups of rape perpetrators in India, 1988-2020



Notes: This figure shows the percentage of rapes that are committed by different age groups in India, from 1988 to 2021. Men belonging to the 18-30 years and the 30-50 years age groups are the ones who commit around 90% of rape incidents in India.

Table 6: Sex ratios and coercion intensity

	(1)	(2)	(3)
Dep. Var. Sex ratio of the	Total population	0-5 y.o in 1971	5-9 y.o in 1971
Coercion Intensity × Post	0.0007**	0.003***	0.002**
	(0.0003)	(0.0009)	(0.001)
Observations	991	966	966

Notes: This table presents the results of running the static difference-in-differences specification shown in equation 1 of coercion intensity on the sex ratios in India, defined as male relative to female. The unit of observation is a district. A positive coefficient means a decline in the population of women relative to men. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

be directed against women as well. Murders increase by 4.7% for the average district. This translates to an increase of 2.21 murders per 1 million inhabitants per year per district, totaling 750 murders per year overall. Assuming an average of 750 murders per year from 1977 to 1991, the last year of available census data would result in an additional 12,000 murders in total. If these murders were disproportionately targeted at women, the male-to-female sex ratio would marginally increase from 107.50 men for every 100 women in 1971 to 107.51, indicating a negligible change, at the size of the effect we find in Table 6.

The prominence of crimes against women in our analysis suggests that the forced vasectomies program of 1976-77 may have played a role in shaping or reinforcing prevailing concepts of masculinity, thereby

influencing patterns of violence in society (Bosson et al., 2009). We discuss this mechanism further in Section 7.

6 Robustness

To ensure the robustness of our findings, we employ alternative treatment measures. While we believe our measure strongly represents coercion and is also used by Pelras and Renk (2023), a potential critique is the possibility that coercive methods might have been applied in districts that were already reaching high numbers of voluntary vasectomies in 1976. To address this concern, we introduce a new approach: we calculate the growth rate between the annual mean achievements spanning from 1970 to 1976 and the achievements specifically in 1977. This adjustment allows us to factor in the influence of prior achievements on our analysis.

Table 7: Impact of forced vasectomies on crime categories with an alternative treatment measure

Dep. Var.: rates of	(1) Total crimes	(2) Violent crimes	(3) Property crimes	(4) Riots
Coercion Intensity × Post	6.510	1.439*	5.869	-0.00639
	(17.59)	(0.842)	(4.635)	(0.683)
Observations	8267	8267	5903	8267
Year Fixed Effects	Yes	Yes	Yes	Yes
District Fixed Effects	Yes	Yes	Yes	Yes
Mean	2526.83	112.78	846.20	127.47

Notes: This table presents the results of running the static difference-in-differences specification shown in equation 1 of coercion intensity on crime rates per 1 million inhabitants with an alternative measure for coercion intensity, the growth rate between sterilization share in 1976-77 and the mean of past sterilization shares. The unit of observation is the district. We control for police forces at the state level. Standard errors are in the parentheses and clustered at the district level. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

We can see in Table 7 that the effect on violent crimes persists with this new measure. Especially, in Table 8 and Figure 11 we see that the persistent effect remains on rapes. This alternative treatment confirms that the causal impact of coercive sterilization on rapes is not driven by districts with previous low sterilization achievements.

Table 8: Impact of forced vasectomies on crime rates with an alternative treatment measure

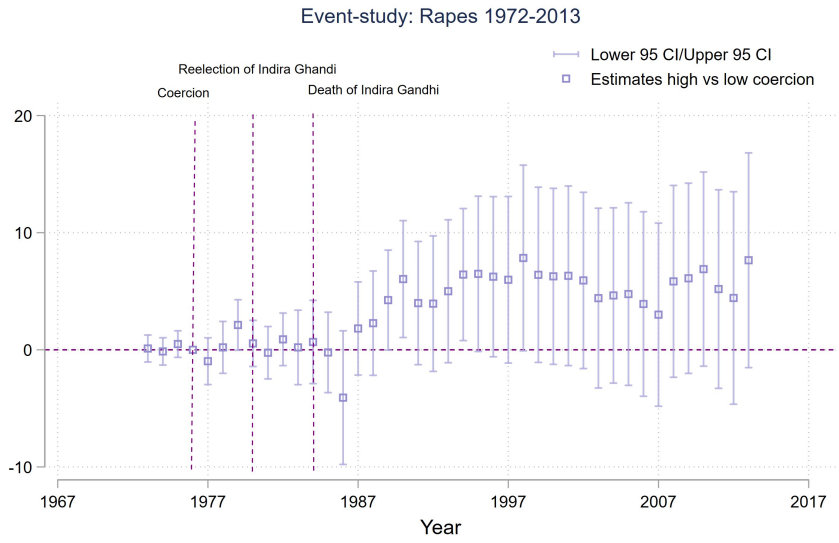
Dep. Var.: rates of	(1) Rapes	(2) Murders	(3) Cheating
Coercion Intensity × Post	0.852*	0.514	-0.729
	(0.441)	(0.347)	(0.541)
Observations	8267	8267	8267
Year Fixed Effects	Yes	Yes	Yes
District Fixed Effects	Yes	Yes	Yes
Mean	32.24	49.00	52.90

Notes: This table presents the results of running the specification shown in equation 1 of coercion intensity on crime rates per 1 million inhabitants with an alternative measure for coercion intensity, the growth rate between sterilization share in 1976-77 and the mean of past sterilization shares. We control for police forces at the state level. Standard errors are in the parentheses and clustered at the district level. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Another potential critique of our main treatment variable is that the growth rate will give more weight to small increases in low-sterilization districts. For example, if sterilizations doubled in 1977 where the sterilization share was 1% in 1976 may not necessarily be because of the use of coercive measures but would mean a growth rate of 100% with our main variable. To overcome that, we simply use the differences between sterilization rates between 1976 and 1977. A higher difference would also indicate higher coercion but with a restricted range compared to the growth rate. We can see in Figure 12 that the persistent effect remains on rapes. This alternative treatment confirms the causal impact of forced vasectomies on the increase of rapes.

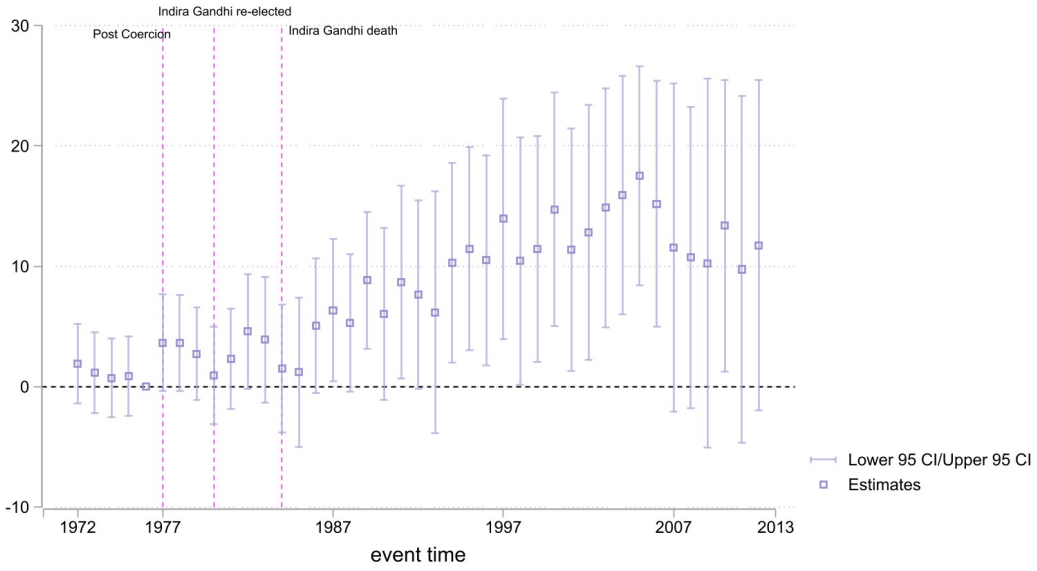
In Table A1, we assess the robustness of our findings to controlling for pre-treatment district characteristics that could drive differential trends in violent crime. Since the intensity of coercion may be correlated with baseline traits that also shape crime dynamics, we include a set of covariates–Scheduled Caste share, male literacy rate, urban share, share of population with primary school education, Hindu population share, and population density in 1961, interacted with year fixed effects. The estimated effects are stable with the inclusion of these controls, suggesting they are not driven by differential trends associated with observed district characteristics.

Figure 11: Event Study: Impact of coercion intensity on rapes with an alternative measure: growth rate incorporating past achievements



Notes: This figure plots the estimated β coefficients from a regression of the form given in equation 2, with high coercion district being above the mean of an alternative measure taking into account past achievements of sterilization. The dependent variable is the number of rapes per 1 million inhabitants. The event takes place in 1977. The coefficient of 1976 is normalized to zero. The vertical lines reflect the 95% confidence intervals. We control with police forces at the state level.

Figure 12: Event Study: Impact of coercion intensity on rapes with an alternative measure: differences in sterilization achievements



Notes: This figure plots the estimated β coefficients from a regression of the form given in equation 2, with high coercion district being above the mean of an alternative measure only using differences between sterilization shares. The dependent variable is the number of rapes per 1 million inhabitants. The event takes place in 1977. The coefficient of 1976 is normalized to zero. The vertical lines reflect the 95% confidence intervals. We control for police forces at the state level.

7 Mechanisms

We hypothesize that the compulsory male sterilization program may affect violence against women from younger generations than the one of coerced individuals through several distinct channels.

First, reduced fertility may alter intra-household allocations of time, with women spending less time on childcare and increasing their labor market participation. These shifts may generate male backlash, potentially leading to higher levels of domestic violence, consistent with the existing literature (Aizer, 2010; Erten and Keskin, 2018; Bhalotra et al., 2021; Anukriti, 2014). Beyond contemporaneous effects, such changes may also induce a broader shift in gender norms within the household. Children exposed to increased conflict or to a reconfiguration of gender roles during formative years may internalize these dynamics, leading to persistent changes in attitudes toward women. In particular, the normalization of violence or the reassertion of patriarchal norms may translate into higher levels of sexual violence among younger cohorts who grew up in these environments.

Second, beyond contemporaneous effects, we emphasize an intergenerational channel. Exposure to coercive sterilization may generate lasting psychological trauma within households, particularly affecting children who were raised in an environment marked by fear, coercion, and state violence. A growing body of evidence suggests that early-life exposure to trauma can shape long-term behavioral outcomes, including aggression and criminality towards women (Oehme et al., 2012; Becker-Blease and Freyd, 2005; Mrug et al., 2016). In our setting, this implies that younger cohorts may exhibit higher propensities to engage in violent behavior, reflecting the persistence of childhood trauma into adulthood.

Third, the program may have directly targeted male identity by undermining masculinity (Scott, 2014). Importantly, this channel may also operate intergenerationally. Children growing up in households where male authority was forcibly challenged may internalize a perceived threat to masculinity during formative years. This can lead to overcompensation through the adoption of more rigid gender norms and increased reliance on violence as a means of reaffirming masculinity, in line with theories of masculine overcompensation (Baranov et al., 2023; Bosson et al., 2009).

One potential concern is that the observed increase in violence against women reflects changes in reporting rather than actual incidence. For instance, one might argue that if men experienced emasculation (Scott, 2014), women may have felt more empowered to report violence. While this hypothesis cannot be directly tested, we consider it unlikely for two reasons. First, the Emergency period was characterized by widespread state repression and documented abuses by police forces, which likely eroded trust in institutions and discouraged reporting. Consistent with this, Pelras and Renk (2023) documents substantial political turnover in districts more heavily exposed to forced sterilization, suggesting diminished institutional trust. Second, increased reporting driven by reduced male authority would run counter to the masculinity channel described in Section 7.2, which predicts compensatory reinforcement of patriarchal norms.

We examine the fertility, trauma, and masculinity channels in the sections that follow, with particular emphasis on the intergenerational transmission of trauma and gender norms among cohorts exposed during

childhood.

7.1 Fertility and labour force participation

7.1.1 Data

To study the effect of coercion intensity on fertility, we use the National Sample Surveys (NSS) of 1986-87, 42nd round. The dataset is the Survey on Maternity, Child Care, Family Planning, and Utilisation of the Public Distribution System. We restrict the sample to include only the immediate family of the head of the household because the data only gives a clear characterization of the children of the head of the household. This leaves us with 75% of the sample and 54,044 households.[10].

Outcome variables. Our primary outcome variable focuses on the count of births to examine the program's effects on fertility. This count encompasses all mothers within the age range of 15 to 50, who are either spouses of the household head or household heads themselves.

Control variables. The 42nd round of NSS encompasses a comprehensive set of individual and household characteristics, which we utilize for controlling factors such as age, sex, education levels of household members, caste, and occupation sectors in our analysis. Detailed summary statistics of the sample are presented in Table 9. Additionally, we augment these variables with district controls from the 1971 census.

Table 9: Summary Statistics: Maternity Survey

	N	Mean	s.d.
Household Characteristics			
Hh with 1 child before 1976	54173	0.31	0.46
Hh with 2 children before 1976	54173	0.23	0.42
Hh with 3 children before 1976	54173	0.20	0.40
Hh with $\geq$4 children before 1976	54173	0.14	0.35
Educated males	50937	0.49	0.46
Educated females	54173	0.27	0.41
Low caste	54173	0.26	0.44
Rural	54173	0.66	0.47
Hh size	54173	5.72	2.59
Mother Characteristics			
Age	54794	39.27	10.11
At least 8 years of education	54794	0.26	0.44
Husband has at least 8 years of education	54794	0.41	0.49
No. of living children	54794	2.81	1.74
Husband salaried or self-employed	54794	0.73	0.45

Notes: This table presents the summary statistics of our sample for the fertility and education study.

[10]For example if household i has two daughters-in-law and three grandchildren, we will not be able to distinguish the mothers based on the serial number of grandchildren because all grandchildren have the same serial number i.e. 6

We also use the 1961, 1971, 1981 and 1991 Indian censuses to compute the share of female labour force participation, defined as the share of working women in the population of women older than 15 at the district level.

7.1.2 Empirical strategy

To assess the effect of the excessive sterilization in 1976-77 on the number of births, we utilize spatial differences in coercion intensity and household-level variation in the number of children a couple had prior to the coercive campaign. Since the program primarily targeted husbands with children, we focus on children born after 1977 in households with already existing children before 1977, specifically in districts with high coercion intensity. These households were most likely affected by the program, making it the key area to observe its effects.

We run the following regression equation:

$$\begin{aligned} \text{Post_N}_{i,d} = \alpha + \sum_{n=1}^{\geq 4} \text{Pre_N}_{i,d,n}\, \beta_n + \gamma\, \text{CI}_d + \sum_{n=1}^{\geq 4} (\text{CI}_d \times \text{ Pre_N}_{idn})\, \mu_n \\ + \psi_1\, \text{MAge}_{i,d} + \psi_2 \text{MAgesq}_{id} + \mathbf{X'_{1}}_i\, \phi_1 + \mathbf{X'_{2}}_d\, \phi_2 + \delta_s + \varepsilon_{ids} \end{aligned} \tag{3}$$

where Post_N_{id} is the number of children born post-1976 in household i in district d. Pre_N_{idn} is the dummy that takes the value 1 if the number of children born before 76 is equal to n where $\text{n} \in \{1,2,3,\geq 4\}$, for household i in district d. *MAge* is the mother's age, and *MAgesq* is the mother's age squared in 1976. The vectors $\mathbf{X_1}$, $\mathbf{X_2}$ comprise household and district level controls, δ_s is state fixed effects, and the standard errors are clustered at the district level.[11] Including the state and time-fixed effects with a district-level treatment variable, helps pinpoint the treatment's effect within districts while accounting for state and time variations.

We implement the following event-study design (similar to crime rates) to understand the effect on number of births at the district level:

$$Y_{d,t} = \theta_t + \eta_d + \beta_t \times CI_d \times \sum_{t=1972}^{\geq 1985} \text{P}_t + v_{d,t} \tag{4}$$

In contrast to our primary analysis, where a dummy variable took the value of 1 after 1976, we now employ P_t, a dummy variable that equals 1 for a specific year t ranging from 1972 to 1985. We exclude 1976, one year prior to the treatment, following the convention in event study literature.[12] The event study graph plots the coefficients $\beta_{d,t}$, which represent the effect of a one-unit increase in coercion intensity on the number of

[11] Household controls include: the share of educated females in the household, the share of educated males in the household, caste and urban sector dummies. District-level controls include a share of the scheduled caste population in 1971, the share of the scheduled tribe population in 1971, the share of the literate population in 1971 and the share of the urban population in 1971.

[12] We also conduct an alternative exercise where, instead of using CI_d, we use Dci_d, a treatment dummy for "high" coercion intensity. Districts with coercion intensity above the mean value of 4.5 are assigned a value of 1. The difference in mean values between the crime and fertility analyses arises because the fertility analysis includes all districts, while the crime analysis covers only 197 districts. Figure **??** presents the event study graph using this binary treatment.

births in year t, relative to the omitted year, 1976.

For the labour force participation, we use the same regression as the main specification, equation 1. The variable post takes 1 for the 1981 and 1991 waves, 0 otherwise.

7.1.3 Impact of coercion intensity on fertility and labour force participation

We find that when sterilizations doubled in 1976, it led to a very small positive increase in fertility post-1976.[13] By splitting the sample between households that yet did not have sons before 1976 and the ones that did, we see in columns 3 and 4 of Table 10 that this result is mostly driven by families who did not have a son. These results indicate that there was a backlash on the number of births in districts with higher forced vasectomies and that parents were afraid of not being able to have sons. This result contributes to a large literature on son preference in India (Sen, 1992). As well, we see an increase in births in families with three children who already have a son, meaning that large families also feel pressure to have more children. We also split the sample between households belonging to dominant castes versus oppressed castes; those belonging to dominant castes may be more likely to have information about the current crisis in India and would be more likely to anticipate a potential re-implementation of the program. We see in Table A9 and Table A11 that the effect on the number of births is almost entirely coming from the dominant castes, which may indicate a potential fear of re-implementation of the program.

To better understand the fertility results, we conducted an event study analysis. As seen in Figure 13, the increase in fertility became noticeable in 1983, aligning with Indira Gandhi's fourth term in office during a period of heightened tensions with Sikh religious militants. This suggests that households in the districts previously affected by the 1976-77 forced vasectomies may have been concerned about a potential re-implementation of such a program.

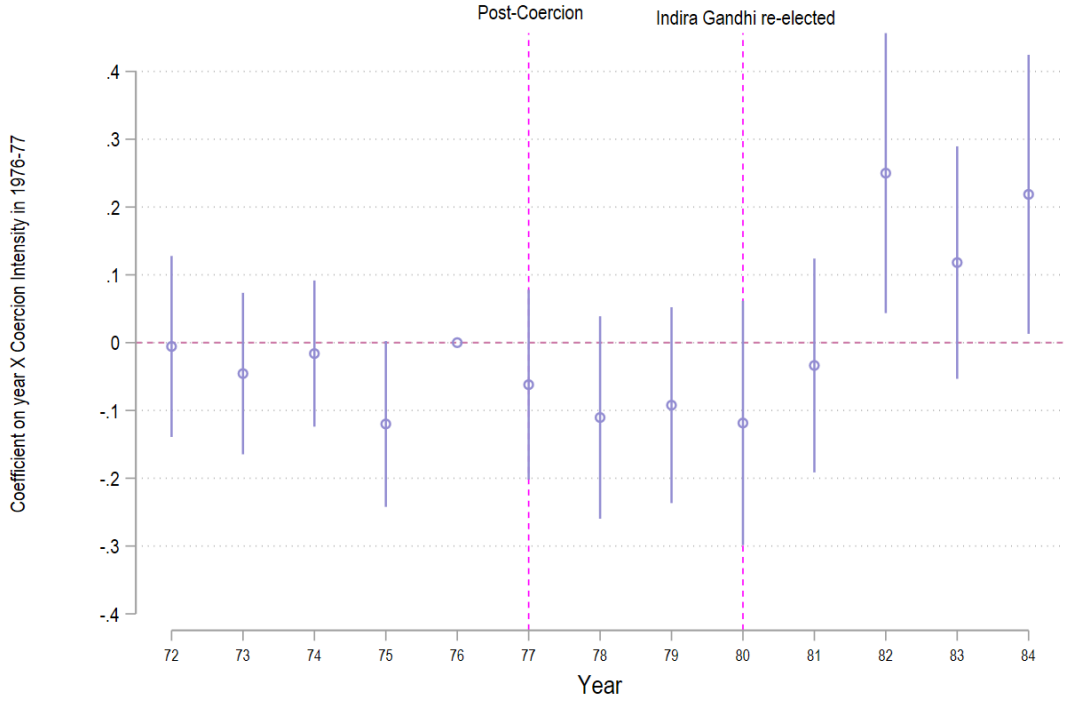
Although we find a small positive effect of coercion intensity (measured as the growth in sterilizations between 1975–76 and 1976–77) on the number of births, we do observe a negative short-run effect on fertility when using the percentage of the population sterilized as the measure of exposure. This effect is concentrated among households that were potentially most impacted. The results are provided in Table A13. This negative evidence on fertility shows that a household's exposure to sterilization is jointly determined by the district of residence and the number of children the household had before 1976.

One other mechanism we test is the effect of coercive sterilization on female labor force participation. The rationale is that reduced fertility or a reallocation of time previously spent on child rearing could have altered women's economic roles, potentially contributing to the backlash. We see in Table 11 that female labor force participation decreased by 0.3 percentage points when sterilizations doubled in 1977 due to coercion.[14]

[13] We also observe that coercion intensity increased the probability of having at least one child after the program happened. Results can be found in Table A10. When sterilizations doubled due to coercion, it led to a 0.2 percentage point increase in the probability of couples who already had one child having another, consistent with the results regarding the number of children.

[14] This result echoes the work of Prasad (2022) who studies the link between the female sterilizations performed during the program and labour force participation, using the 1993 Demographic and Health Survey to create a measure of the fraction of women who were sterilized in a district in a year during the Emergency period. While this treatment measure has potential issues

Figure 13: Event Study: Births 1972-1985



Notes: This figure plots the estimated β coefficients from a regression of the form given in equation 4. The dependent variable is the number of births. The event takes place in 1977. The coefficient of 1976 is normalized to zero. The vertical lines reflect the 95% confidence intervals.

Table 10: Impact of forced vasectomies on number of births

	Whole sample		No sons born pre 1976		At least one son pre 1976	
	(1)	(2)	(3)	(4)	(5)	(6)
	Poisson	OLS	Poisson	OLS	Poisson	OLS
Coercion intensity	-0.01***	-0.01	-0.01***	-0.01	-0.01***	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
One child pre 76 × Coercion intensity	0.01***	0.01**	0.01***	0.01**		
	(0.00)	(0.00)	(0.00)	(0.00)		
Two children pre 76 × Coercion intensity	0.02***	0.01**	0.02***	0.02*	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Three children pre 76 × Coercion intensity	0.03***	0.02***	0.01	0.02	0.02***	0.01**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Four children pre 76 × Coercion intensity	0.02**	0.01	-0.02	-0.02	0.01	-0.00
	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)
Observations	54044	54044	23129	23129	30915	30915
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes
District Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var.	1.234	1.234	1.695	1.695	0.888	0.888

Notes: This table presents the results of a static difference-in-differences specification state in equation 3 of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts, and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Given that the program had no effect on fertility and led to a decrease in female labor force participation, we rule out changes in demographic or labor supply factors as plausible mechanisms for observed violence.

7.1.4 Robustness on fertility: Placebo tests and alternative treatments

We conduct a placebo analysis to assess the robustness of our main fertility results and to ensure they are not driven by pre-existing trends. In our main specification, treatment is defined as the interaction between district-level coercion intensity in 1976–77 and whether a household had two or more children in 1976—the year when coercive sterilization policies were implemented and the target criteria became relevant. To validate this, we hold coercion intensity fixed at its 1976–77 level but manipulate the timing of household eligibility by redefining treatment based on whether households had two or more children in earlier years (e.g., 1963, 1964) or later years (e.g., 1979, 1982)—periods when coercive sterilization and its targeting criteria were not a concern. If the observed fertility effects are genuinely due to the Emergency sterilization campaign, we would expect no significant effects in the pre-Emergency years.

The results for each year are summarized in Tables A2 to A8. Consistent with this, we find no significant

of misrepresentation at the district level and may not be reflective of the forced program that targeted men, we also find with our measure that the program led to a decrease in female labour force participation.

Table 11: Female labour force participation and coercion intensity

Dependant Variable:	Female Labour Force Participation
Coercion Intensity × Post	-0.003***
	(0.0005)
Observations	1301
Mean	0.28

Notes: This table presents the results of running the static difference-in-differences specification shown in equation 1 of coercion intensity on female labour force participation in India, defined as the share of female workers in the total population of women. Standard errors are in the parentheses and clustered at the district level. The unit of observation is the district. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

effects in the years prior to the Emergency, with the exception of 1973, a year marked by intensified voluntary sterilization efforts. In later years, such as 1979 and 1982, significant effects may reflect lingering behavioral responses to coercion, such as backlash, mistrust, or fear of public programs. These reactions could potentially lead to higher fertility among households with fewer children.

We also explore an alternative measure of coercion intensity. In 1973, as illustrated in Figure 2, there was a notable surge in sterilization procedures, mostly vasectomies, largely attributable to the commencement of incentivized sterilization initiatives in India. To assess coercion intensity differently, we calculate the growth rate between 1972 and 1973 as a control variable to see the effect on births of a voluntary vasectomy program. Figure A1 shows the geographic variation in "placebo" coercion intensity in the year 1973.[15] While the sterilization intensity in 1973 was comparatively lower than that in 1977, our analysis in Table A12 reveals that incentivized sterilization programs resulted in reduced offspring numbers for households residing in districts with higher sterilization shares. This finding adds to our understanding of why the coercive measures implemented during the 1977 sterilization episode did not yield the anticipated impact on fertility. Several factors may contribute to this phenomenon: potential resistance towards forced government policies, or concerns among families where husbands did not opt for vasectomy, that the program might resurface in subsequent years, motivating them to have more children.

7.2 The role of trauma and masculinity in inducing violent behaviours against women

It is important to consider the concept of masculinity and its potential role in explaining the increase in crimes during this period. The forced vasectomy campaign, which targeted men as a means of population control, may have threatened traditional notions of masculinity and provoked a sense of emasculation among some individuals (Scott, 2014). The resulting feelings of insecurity, loss of power, and diminished social

[15] When compared to 1976-77, we see that there are differences in the districts that were exposed to higher intensities in 1973 versus 1976.

status could have contributed to a heightened propensity for engaging in criminal behaviour as a means of reestablishing a sense of control or asserting dominance. There is a large and diverse psychology literature that documents the link between manhood and the use of aggression and violence. Bosson et al. (2009) review theories and evidence highlighting that manhood is a status that must be earned and demonstrated throughout life. This means that a possible shock to gender roles could impact men in reasserting masculinity norms. They suggest that this urge to affirm masculinity can lead to the use of aggression from men, as violence is identified as being a manly and visible behaviour.

Additionnaly, extensive psychological research suggests a connection between male violence towards women and exposure to childhood and adolescent trauma (Oehme et al., 2012; Becker-Blease and Freyd, 2005; Mrug et al., 2016). Although our findings do not directly identify the age of the perpetrators of crimes in high-coercion districts, evidence indicates that a majority of rape cases in India are committed by younger men, suggesting that they would have been children or adolescents during the *Emergency*. It is conceivable that witnessing the government's threat to their fathers or experiencing violence at home during that period could be considered traumatic exposures, potentially leading to increased levels of violence in adulthood.

7.2.1 Masculinity norms

While our dataset does not allow us to definitively establish a causal link between forced vasectomies and disruption in masculinity norms or domestic abuse, we seek to address this gap through a compensatory approach. We conducted a simple difference analysis using the 1999 Demographic and Health Surveys, which is the first household-level survey in India to include inquiries on domestic violence. Leveraging this dataset, we explore the correlation between coercion intensity and various variables, such as Intimate Partner Violence (IPV), bargaining power, and fertility dynamics.

We faced challenges conducting an age group analysis because the dataset only covers women aged 15 to 49 years old, leaving a 22-year gap between 1977 and 1999. This gap made it difficult to target the exact cohort of women affected by the 1977 program. Additionally, by 1999, masculine norms would have already diffused, making it challenging to identify a specific age group more affected than others. Consequently, we could not establish a direct age-related causal connection.

Our study focuses on married women who are either household heads or are spouses of household heads, resulting in a dataset comprising 27,449 observations. Employing a simple difference analysis, we incorporate several household and district-level controls to uncover correlations between exposure to forced vasectomies and various factors related to violence, female empowerment, and fertility dynamics.

$$Y_{isd} = \alpha + \beta \text{Coercion Intensity}_d + \gamma X_d + \kappa X_i + \theta_s + \varepsilon_{isd} \tag{5}$$

The outcome variables in Table A14 includes dummy variables for violence at home that take 1 if a woman has already been beaten by a boyfriend or family members, and several dummy variables related to acceptance of violence. The questions asked are "Is it acceptable for husbands to beat their wives if the wife ..."

and ask if she's being unfaithful, if she shows disrespect, if she goes out without asking him, if she neglects the house or the children and if she does not cook properly. A positive result indicates a positive response. In Table A15, the two four columns of outcome variables are questions about decision-making, 1 indicates that the wife takes part in the decision-making process and 0 that she has no word in it. Columns 3 and 4 are questions about if the wife needs permission from her husband to go to the market or visit family, 1 indicates that she does. Column 6 is a categorical variable that takes 5 if the wife brings almost all the income of the household and 1 if the husband does. Finally, in Table A16, Column 1 indicates if the wife is sterilized, Column 2 if the couple talks about male sterilization and Column three the total number of children ever born.

$CoercionIntensenty_d$ in the same variable used in Figure 4, our measure of coercion intensity. X_d represents a number of district-level controls such as the literate population, the middle school achievers, the Hindus, the social caste and social tribe percentages and finally the farmer population. X_i represents a set of individual-level control variables such as age, age squared, the partner's age and the number of living children (excluded in Table A16 Column 3). Finally, θ_s indicates State fixed-effects.

In Table A14, we see that districts with a higher incidence of forced vasectomies demonstrate an association with elevated levels of Intimate Partner Violence (IPV) and higher acceptance of such violence. This correlation suggests that the coercive nature of the sterilization program may have had broader negative implications for gender dynamics and relationships within these districts. Additionally, in Table A15, the presence of higher coercion intensity is linked to lower bargaining power for women in health decisions but higher in cooking decisions, indicating a potential gender-divided specialization with women focusing more on domestic decisions. In addition, women seem to experience lower ability to visit markets or family members.

Furthermore, in Table A16, we see the coerced vasectomy campaign seems to correlate with diminished rates of female sterilization within the affected districts. This trend may be attributed to a heightened prevalence of male sterilization, which in turn reduces the utilization of female-based contraceptive techniques. Additionally, discussions and discourse pertaining to vasectomies appear to be more prevalent within these communities, maybe due to a direct cause of the program and memory. Within these districts, households seem to have more children, in line with the results on the backlash on fertility.

These patterns suggest that coercion intensity may be associated with more traditional and rigid gender norms—potentially aligning with a more masculine ideal of household authority. The persistence of such norms may have harmful implications for women, limiting their autonomy, mobility, and ability to negotiate key aspects of family and economic life. This could reflect a broader cultural backlash, wherein the trauma and state-driven control of reproductive choices contribute to a social environment that is more accepting of male dominance and control.

7.2.2 Trauma

To explore the mechanisms further, we examine whether exposure to coercive sterilization is associated with long-run changes in psychological well-being and individual behavior, that would be the case with higher trauma within the population. We use data from the Longitudinal Ageing Study in India (LASI), a nationally representative survey of individuals aged 45 and above conducted in 2017–2018. Focusing on male respondents, we merge individual-level data with district-level measures of coercion intensity. The outcomes capture multiple dimensions of well-being and behavior, including a binary measure of depression, self-reported life dissatisfaction, a broader life satisfaction score, and an index of risk behaviors combining smoking and alcohol consumption. These outcomes are informative about longer-run consequences of the policy for individual well-being and may also reflect persistent shifts in identity and social roles, including dimensions of masculine identity linked to autonomy, status, and life evaluation.

We use the same specification as 5. All specifications include individual controls (religion, caste, rural residence, age, education, marital status, and self-reported health), district-level controls from the 1971 Census, and state fixed effects, with standard errors clustered at the district level.

Table **??** reports the results. We find that higher coercion intensity is associated with significantly worse subjective well-being. Columns (2) and (3) show that individuals in more exposed districts report higher levels of life dissatisfaction and lower life satisfaction, with statistically significant coefficients. One interpretation is that the policy generated persistent dissatisfaction and reduced life evaluation, which could potentially disrupt identity and perceived social roles, including aspects of masculine identity.

8 Conclusion

Can forced program implementations lead to a backlash on violence? In this paper, we study the impact of a unique historical event, the implementation of a male coercive sterilization program in India from April 1976 to February 1977, on violence. The program used coercive methods -and sometimes resorted to violence- to implement a Malthusian policy in India during a state of emergency declared by the government to fight against poverty.

Using newly digitized district-level governments and administrative documents on sterilizations and crime rates, we employ a two-way fixed effect strategy to find the causal impact of forced vasectomies, proxied by the growth rates of the share of sterilized couples between 1975-76 and 1976-77, on crime rates in India.

We find that an increase of 1 percentage point in coercion intensity leads to an increase of 8.6% of violent crimes for the average district, while it does not impact other crime categories. Rapes drive the increase in violent crime rates, increasing respectively by 32% for the average district. The increase in rapes is persistent through time and remains significant until 2013, the end of our study, for the 25% districts more exposed to forced vasectomies. Murders increase slightly with coercion intensity. We document that the murders may be directed towards women, as we see a decline in the number of women related to men in

high coercion intensity districts.

We study plausible mechanisms and observe that the implementation of the program did not result in reduced fertility, its intended goal, but rather a small increase in births. This suggests a spillover effect stemming from households' fear of a potential second implementation of the program. Additionally, we find that highly exposed districts are associated with more harmful gender norms towards women, suggesting a reaction to trauma and threat towards masculinity.

This paper provides, to the best of our knowledge, the first empirical evidence that the implementation of a compulsory male sterilization program resulted in increased violence against women, with a cultural transmission through time. Our contribution adds to the extensive economic literature that highlights the adverse repercussions of enforced measures and their limited efficacy.

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Appendix

Table A1: Effect of coercion intensity on crimes

	(1) Total Crimes	(2) Violent Crimes	(3) Rapes	(4) Murder
Coercion Intensity × Post	22.87	1.75*	1.17***	0.62
	(25.22)	(1.02)	(0.41)	(0.43)
Observations	8183	8183	8183	8183
SE controls^{1961} x $\mathbf{I}_t$	Yes	Yes	Yes	Yes
District & Year FE	Yes	Yes	Yes	Yes
Mean of dep. var.	2541.3	102.8	21.9	49.2

Notes: This table presents the results of running the static difference-in-differences specification shown in equation 1 of coercion intensity on crime rates per 1 million inhabitants. The unit of observation is the district. We control for police forces at the state level. All columns include district fixed effects, time fixed effects and socioeconomic controls interacted with the year dummy. Socioeconomic controls from the year 1961 include population density, share of Scheduled Caste (SC) population, share of rural population, share of population with primary school education, share of Hindu population, and share of literate males in the population. Standard errors are in the parentheses and clustered at the district level. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A2: Effect of coercion on number of births post-1967

	Poisson (1)	OLS (2)
Coercion intensity	-0.00	0.00
	(0.00)	(0.00)
# children pre 67=1 × Coercion intensity	0.00	-0.00
	(0.00)	(0.00)
# children pre 67=2 × Coercion intensity	0.00	-0.01
	(0.00)	(0.01)
# children pre 67=3 × Coercion intensityy	0.00	-0.01
	(0.01)	(0.01)
# children pre 67=4 × Coercion intensity	-0.01	-0.01
	(0.02)	(0.01)
Observations	39356	39356
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	2.024	2.024

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A3: Effect of coercion on number of births post-1968

	Poisson (1)	OLS (2)
Coercion intensity	-0.00	-0.00
	(0.00)	(0.00)
# children pre 68=1 $\times$ Coercion intensity	0.00	-0.00
	(0.00)	(0.00)
# children pre 68=2 $\times$ Coercion intensity	0.00	-0.00
	(0.00)	(0.01)
# children pre 68=3 $\times$ Coercion intensity	0.00	-0.01
	(0.01)	(0.01)
# children pre 68 $\geq$4 $\times$ Coercion intensity	-0.01	-0.01
	(0.02)	(0.01)
Observations	40853	40853
State Fixed Effects	Yes	Yes
Mean of dep. var.	1.967	1.967

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

$$\begin{aligned} \text{Post_N}_{id} = \alpha + \sum_{n=1}^{\geq 4} \text{Pre_N}_{idn}\,\beta_n + \gamma\,\text{CI}_d + \sum_{n=1}^{\geq 4} (\text{CI}_d \times \text{Pre_N}_{idn})\,\mu_n \\ + \psi_1\,\text{MAge}_{id} + \psi_2 \text{MAgesq}_{id} + \mathbf{X}'_{\mathbf{1}i}\,\phi_1 + \mathbf{X}'_{\mathbf{2}d}\,\phi_2 + \delta_s + \varepsilon_{ids} \end{aligned} \tag{6}$$

In Table A5, *Post_N* is the number of children born post-1970 in household i in district d in state s. *Pre_N* is the dummy that takes the value 1 if the number of children born before 70 is equal to n where n $\in \{1, 2, 3, \geq 4\}$. *MAge* is the mother's age, and *MAgesq* is the mother's age squared in 1970.

Table A4: Effect of coercion on number of births post-1969

	Poisson (1)	OLS (2)
Coercion intensity	-0.00	-0.00
	(0.00)	(0.00)
# children pre 69=1 × Coercion intensity	0.00	0.00
	(0.00)	(0.00)
# children pre 69=2 × Coercion intensity	0.01**	0.01
	(0.00)	(0.01)
# children pre 69=3 × Coercion intensity	0.01	-0.00
	(0.01)	(0.01)
# children pre 69=4 × Coercion intensity	0.00	-0.01
	(0.01)	(0.01)
Observations	42465	42465
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	1.883	1.883

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A5: Effect of coercion on number of births post-1970

	Poisson (1)	OLS (2)
Coercion intensity	-0.00**	-0.00
	(0.00)	(0.00)
# children pre 70=1 × Coercion intensity	0.00**	0.00
	(0.00)	(0.00)
# children pre 70=2 × Coercion intensity	0.01***	0.01
	(0.01)	(0.01)
# children pre 70=3 × Coercion intensity	0.01	-0.01
	(0.01)	(0.01)
# children pre 70 $\geq$4 × Coercion intensity	0.01	-0.00
	(0.01)	(0.01)
Observations	44762	44762
State Fixed Effects	Yes	Yes
Mean of dep. var.	1.817	1.817

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A6: Effect of coercion on number of births post-1973

	Poisson (1)	OLS (2)
Coercion intensity	-0.01**	-0.00
	(0.00)	(0.00)
# children pre 73=1 × Coercion intensity	0.01***	0.01*
	(0.00)	(0.01)
# children pre 73=2 × Coercion intensity	0.02***	0.02***
	(0.00)	(0.01)
# children pre 73=3 × Coercion intensity	0.02**	0.01
	(0.01)	(0.01)
# children pre 73=4 × Coercion intensity	0.01	-0.00
	(0.01)	(0.01)
Observations	49631	49631
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	1.581	1.581

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A7: Effect of coercion on number of births post-1979

	Poisson (1)	OLS (2)
Coercion intensity	-0.01***	-0.01***
	(0.00)	(0.00)
# children pre 79=1 × Coercion intensity	0.01**	0.01*
	(0.00)	(0.00)
# children pre 79=2 × Coercion intensity	0.02***	0.02***
	(0.00)	(0.00)
# children pre 79=3 × Coercion intensity	0.03***	0.02***
	(0.01)	(0.00)
# children pre 79=4 × Coercion intensity	0.03***	0.02***
	(0.01)	(0.01)
Observations	55383	55383
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	0.858	0.858

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A8: Effect of coercion on number of births post-1982

	Poisson (1)	OLS (2)
Coercion intensity	-0.02***	-0.01***
	(0.01)	(0.00)
# children pre 82=1 × Coercion intensity	0.01**	0.01**
	(0.01)	(0.00)
# children pre 82=2 × Coercion intensity	0.03***	0.01***
	(0.01)	(0.00)
# children pre 82=3 × Coercion intensity	0.03***	0.01***
	(0.01)	(0.00)
# children pre 82=4 × Coercion intensity	0.04***	0.01***
	(0.01)	(0.00)
Observations	55344	55344
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	0.454	0.454

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A9: Effect of coercion on number of births post-1976 for mothers of dominant caste

	OLS	
	(1)	(2)
Coercion intensity	0.005*	-0.006
	(0.002)	(0.004)
children pre 76=1 × Coercion intensity		0.009**
		(0.003)
children pre 76=2 × Coercion intensity		0.018**
		(0.007)
children pre 76=3 × Coercion intensity		0.024***
		(0.008)
children pre 76=4 × Coercion intensity		0.008
		(0.008)
Observations	40060	40060
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	0.207	0.207

Notes: This table presents the heterogeneity results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A10: Effect of coercion on probability of birth post-1976

	OLS	
	(1)	(2)
Age of mother in 1976	-0.019***	-0.019***
	(0.002)	(0.002)
Coercion intensity	-0.000	-0.002**
	(0.001)	(0.001)
children pre 76=1 × Coercion intensity		0.004***
		(0.001)
children pre 76=2 × Coercion intensity		0.002
		(0.001)
children pre 76=3 × Coercion intensity		0.003**
		(0.001)
children pre 76=4 × Coercion intensity		0.002
		(0.001)
Observations	54044	54044
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	0.213	0.213

Notes: This table presents the robustness results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A11: Effect of coercion on probability of birth post-1976 in mothers of oppressed caste

	OLS	
	(1)	(2)
Age of mother in 1976	-0.010***	-0.010***
	(0.003)	(0.003)
Coercion intensity	0.000	-0.001
	(0.001)	(0.001)
children pre 76=1 × Coercion intensity		0.004*
		(0.002)
children pre 76=2 × Coercion intensity		0.001
		(0.002)
children pre 76=3 × Coercion intensity		0.001
		(0.002)
children pre 76=4 × Coercion intensity		-0.000
		(0.002)
Observations	13984	13984
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	0.229	0.229

Notes: This table presents the heterogeneity results on the impact of coercion intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A12: Effect of placebo intensity (1972-73 spike) on number of births post-1976

	Poisson	OLS
	(1)	(2)
Placebo Coercion intensity	0.02***	0.02*
	(0.01)	(0.01)
# children pre 76=1 × Placebo Coercion intensity	-0.03***	-0.03**
	(0.01)	(0.01)
# children pre 76=2 × Placebo Coercion intensity	-0.05***	-0.04***
	(0.02)	(0.01)
# children pre 76=3 × Placebo Coercion intensity	-0.11***	-0.06***
	(0.02)	(0.01)
# children pre 76≥4 × Placebo Coercion intensity	-0.10***	-0.04**
	(0.02)	(0.02)
Observations	53057	53057
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	1.234	1.234

Notes: This table presents the robustness results on the impact of volontary sterilization intensity on births. The unit of observation is the household. District controls include literacy rates, workers' share, farmers' share, household industry, middle school achievements, scheduled casts and tribes. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A13: Impact of sterilization on number of births

	Poisson	OLS
	(1)	(2)
Sterilization 1976-77 (%)	-0.00	-0.00
	(0.00)	(0.00)
1 child pre 1976 × Sterilization	-0.02***	-0.02***
	(0.00)	(0.01)
2 children pre 76 × Sterilization	-0.03***	-0.03***
	(0.01)	(0.01)
3 children pre 76 × Sterilization	-0.03***	-0.02***
	(0.01)	(0.01)
4 children or more pre 76 × Sterilization	-0.02*	-0.01
	(0.01)	(0.01)
Observations	58,928	58,928
Household Controls	Yes	Yes
District Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Mean of dep. var.	1.190	1.190

Notes: This table presents the results on the impact of sterilization intensity on the number of kids born post-1976. The unit of observation is the household. The specifications in col. (1) is estimated using Poisson & col. (2) using OLS. Household controls include the share of educated females in households, the share of educated males in households, and caste and urban sector dummies. District-level controls include the share of SC pop., ST pop., and literate pop. & urban pop. in 1971. Robust standard errors, clustered by district. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Table A14: Intra-household violence and IPV acceptance

	Violence		Acceptance	
	(1)	(2)	(3)	(4)
	Boyfriend	Other Family	No Dowry	Goes Out
Coercion Intensity	0.0005^{+}	0.0008*	0.0021^{+}	0.0029**
	0.0004	0.0005	0.0013	0.0014
Observations	5844	5844	27417	27413
Mean	0.003	0.012	0.109	0.385

Standard errors in parentheses

Notes: This table presents the results of a static difference specification stated in equation 5 of coercion intensity on variables related to gender norms, using the 1999 Demographic and Health Survey. +, *, **, and *** represent statistical significance at 15%, 10%, 5%, and 1% levels. Columns 1 and 2 indicate the likelihood of receiving violence from her boyfriend and from other family members (not including mother, father, brother...). Columns 3 and 4 indicate acceptance towards domestic violence if the woman's family does not give money to the husband and if she goes out without telling him. A positive coefficient indicates more violence and more acceptance.

Table A15: Decision-making and work

	Decision		Permission		Income
	(1)	(2)	(3)	(4)	(5)
	Cook	Health	Market	Visit	Share
Coercion Intensity	0.0016***	-0.0049***	0.0078***	0.0026***	-0.0298***
	0.0006	0.0009	0.0014	0.0009	0.0041
Observations	27418	27418	27409	27409	7397
Mean	0.931	0.515	0.776	0.765	2.798

Standard errors in parentheses

Notes: This table presents the results of a static difference specification stated in equation 5 of coercion intensity on variables related to gender norms, using the 1999 Demographic and Health Survey. +, *, **, and *** represent statistical significance at 15%, 10%, 5%, and 1% levels. Columns 1 and 2's outcomes take 1 if the woman is taking part in the decision regarding cooking and health. Columns 3 and 4 if the wife needs permission to go to the market or to visit relatives, 0 indicates that she does not need permission, 1 that she does and 2 indicates that she is not allowed to go. Comumn 5 indicates the income share she brings, 5 being the most and 1 the least.

Table A16: Sterilization and Fertility

	(1)	(2)	(3)
	Sterilized	Discussion Vasectomies	Number of children
Coercion Intensity	-0.0025***	0.0007*	0.0050**
	0.0009	0.0004	0.0023
Observations	27418	27408	27418
Mean	0.453	0.0576	3.824

Standard errors in parentheses

Notes: This table presents the results of a static difference specification stated in equation 5 of coercion intensity on variables related to gender norms, using the 1999 Demographic and Health Survey. +, *, **, and *** represent statistical significance at 15%, 10%, 5%, and 1% levels. Column 1 indicates if the wife is sterilized, Column 2 if the couple talks about male sterilization and Column three the total number of children ever born.

Table A17: Correlation between coercion intensity and individual well-being and life satisfaction

	(1) Depression	(2) Life Dissatisfied	(3) Life Not Satisfied Score	(4) Risk Behavior
Coercion Intensity	-0.000	0.003***	0.007**	-0.001
	(0.001)	(0.001)	(0.003)	(0.001)
Individual Controls	Yes	Yes	Yes	Yes
District Controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Observations	20224	20224	20224	20224.000

Notes: This table presents the correlation results between coercion intensity and individual well-being and life satisfaction of people who were between the ages of 0 to 40 during the Emergency period. All columns include individual and district controls, and state fixed effects. District controls from the year 1971 include population density, share of Scheduled Caste (SC) population, share of urban population, share of literate population, and share of agricultural population. Standard errors are in the parentheses and clustered at the district level. *, **, and *** represent statistical significance at 10%, 5%, and 1% levels.

Figure A1: Placebo Intensity Index: 1973

