



Department of  
**Geography and  
Environment**

Papers in Economic Geography and Spatial Economics

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Paper No. 31

Geography and Environment Discussion Paper Series

April 2022

# **The Councilwoman's Tale. Countering Intimate Partner Homicides by electing women in local councils.**

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**Abstract.** Intimate Partner Homicides (IPHs) represent the most extreme violence against women, yet evidence on their socioeconomic determinants is scarce. This paper contributes to fill this gap focusing on Italy, where the ratio IPHs over total female homicides increased by more than 20% in ten years. We build a unique microregional dataset of IPHs between 2012 and 2019. Our instrumental variable model finds that the share of local female political representatives had a substantial negative effect on IPHs. As instrument we exploit exogenous geography of soil composition given its persistent effects on gender-biased cultural norms through historical agricultural practices. Places with more women in local public office experience lower IPHs, due to more gender-equal cultural norms. Spatial spillovers of female political representation do not play any effect. Results have policy implications, as they suggest that female political representation might have positive effect in IPHs reduction, by influencing the transmission of gender norms.

**JEL codes:** I1, J12, J16, N53, Z1

**Keywords:** Domestic violence, gender inequality, cultural norms, persistence, geography

This paper has been accepted for publication in the G&E Discussion Paper series because it is part of Dr Daria Denti's PhD Thesis submitted in the framework of an Erasmus Agreement between the LSE Department of Geography and Environment and the GSSI co-supervised by LSE's Professor Simona Iammarino who endorsed the submission.

## **1 Introduction**

This paper investigates the effect of female political empowerment on the observed geography of intimate partner homicides (IPHs thereafter).

IPHs are female homicides in which the victim was intentionally killed by a current or former spouse or boyfriend (Garcia-Moreno, Guedes, & Knerr, 2012; Miller & Segal, 2019). They are the most extreme form of violence against women and girls and a leading cause of their death. IPHs account for 38% of all murders of women globally (WHO, 2021) and for more than 47% of all murders of women in Western European Countries (European Institute for Gender Equality, 2020b). These figures convey the extensive social, economic and ethical implications and invoke major policy responses.

IPHs have strong spatial heterogeneity, also at subnational level, suggesting that local socioeconomic features might play a role in explaining these observed geographies. Descriptive

evidence supports an association between IPHs and local socioeconomic factors, such as low number of women in elected government (Garcia-Moreno et al., 2012; Heise & Kotsadam, 2015; Palma-Solis, Vives-Cases, & Álvarez-Dardet, 2008) and economic imbalance between men and women (Heise & Kotsadam, 2015). This evidence does not consider the subnational spatial variation in IPHs.

So far, the economics literature has analysed the determinants of intimate partner violence in general, with little focus on IPHs. This work complements existing research by focusing on the most extreme form of intimate partner violence. Analysing IPHs also alleviates concerns on measurement bias affecting the outcome variable. Research on intimate partner violence needs to identify measures accounting for the high rate of under reporting of the majority of sexual crimes to avoid biased estimates (Denti & Iammarino, 2022; González & Rodríguez-Planas, 2020; Miller, Segal, & Spencer, 2020). Measures of IPHs do not suffer from this (Miller & Segal, 2019).

The relationship between IPHs and local female political empowerment is a relevant topic. Local female political empowerment is an acknowledged manifestation of attitudes towards gender roles (Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2009; Duflo, 2012; Garcia-Moreno et al., 2012), and the latter are speculated to be the fundamental driver of IPHs (Garcia-Moreno et al., 2012; Heise & Kotsadam, 2015). However, the relationship between local female political empowerment and IPHs is barely investigated.

Different strands of research provide support for this investigation. A first strand gives evidence of a causal link between traditional gender-role norms and intimate partner violence (Alesina, Brioschi, & La Ferrara, 2020; González & Rodríguez-Planas, 2020; Tur-Prats, 2019). This evidence is mainly at cross-country level, hence ignoring the observed strong sub-national heterogeneity. An exception is Tur-Prats (2019, 2021) who provides the first results supporting a causal effect between sub-national traditional gender-role norms and intimate partner violence for Spain. However, with no evidence on IPHs. A second strand shows that share of women in local politics accurately reveals local traditional gender-role norms (Baskaran & Hessami, 2018; Duflo, 2012; Hessami & da Fonseca, 2020; Lassébie, 2020; Le Barbanchon & Sauvagnat, 2018). Our investigation bridges these strands of research by assessing the role of local traditional gender-role norms on IPHs, using female political empowerment at the municipal level as a measure for local gender-role norms. This approach has interesting policy implications, since understanding the role of local female political representation in reducing IPHs contributes to the evidence-base on policy effectiveness in countering gender-violence.

Clearly, to have consistent evidence of a link between local female political participation and IPHs we face the relevant challenge of identification. Reverse causality, self-selection and unobservables are important threats to consider. We address them by estimating an instrumental variable model and

by controlling for confounding features. Our instrumental variable strategy draws from literature using exogenous geographic variation in the type of soil, since this variability defines the historical relative female social value. The type of soil affects its workability and the technology used in land preparation (Alesina, Giuliano, & Nunn, 2013, 2018; Carranza, 2014; Galor, Zak, & Sarid, 2017; Giuliano, 2015, 2017, 2020)<sup>1</sup>. When women can make little contribution to the agricultural value of the land, their perceived social value changes (Boserup, 1970) and this change is extremely persistent (Alesina et al., 2018). Following Carranza (2014), we consider soil classification into loamy and clayey. Loamy soils allow deep tillage which diminishes the need for transplanting, fertilizing, and weeding, tasks usually done by women. The same does not apply in clayey soils where deep tillage is not viable and where women's role is more important. Hence loamy soils are conducive of traditional gender-role attitudes pivoting around masculinity, while clayey soils are not.

Our empirical setting is Italy between 2012 and 2019. Italy is an interesting case for its trend of IPHs (ISTAT, 2021b, 2021a) and the strong pervasiveness of gender stereotypes (Eurostat, 2016; ISTAT, 2019). Overall, Italy is among the worst performing Western European countries in terms of gender equality (European Institute for Gender Equality, 2020a; World Economic Forum, 2021). Operationally, we use a unique micro-regional database of IPHs for the 611 Italian Local Labour Market Areas (LLMAs) that we designed collecting and cross-checking geolocalized data from several sources, so to reduce important measurement bias that arise when only one source is considered<sup>2</sup>.

We find that places with higher shares of women elected in local institutions exhibit lower incidence of IPHs also when we control for potential endogeneity threats. Results are robust to the inclusion of confounding features and to several robustness tests. We also show that cultural transmission of persistent gender norms appears as a sound channel in explaining why places that elect more women in their local institutions have lower IPHs.

This paper makes several contributions to existing literature. First, to our knowledge, we are the first to investigate the effect of gender norms on IPH separating correlation from causality, since existing works stop at correlational evidence (Garcia-Moreno et al., 2012; Heise & Kotsadam, 2015). Second, our paper contributes to the economic analysis of intimate partner violence (Aizer, 2010;

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<sup>1</sup> Alesina, Giuliano and Nunn (2013, 2018) measure the relevance of traditional agricultural practices for gender norms and political participation. Carranza (2014) for child sex ratio. Galor et al. (2017) for gender bias in languages. Giuliano (2015) provides for historical agricultural practices to influence parental authority, inheritance rules, women's freedom. Giuliano (2018, 2020) reviews further evidence supporting the effect of traditional agricultural practices on gender norms and other socioeconomic outcomes.

<sup>2</sup> For instance, some sources list as IPH some female homicides that are classified as potential IPH in the preliminary stages of investigation to be classified as non IPH as investigation proceeds and vice versa. Also, some IPHs are reported by some sources but not by others. Overall, we find that each source does not account for around 10% of IPHs episode per year.

Anderberg, Rainer, Wadsworth, & Wilson, 2016; González & Rodríguez-Planas, 2020; Tur-Prats, 2019), adding micro-regional causal evidence on Italy. Third, this paper relates to the literature on the geographic origins of gender-related behaviours (Carranza, 2014; Galor et al., 2017; Giuliano, 2017, 2020). Forth, it contributes to the literature analysing the effect of female political representation at the local level (Beaman, Duflo, Pande, & Topalova, 2012; Duflo, 2012; Hessami & da Fonseca, 2020), supporting a beneficial effect in countering IPHs.

In policy terms, our findings suggest that increasing local female political representation reduces IPHs. In this dimension, we contribute to the literature analysing the effect of existing policies in diminishing intimate partner violence. Current works mainly focus on the effect of different policies on decreasing under-reporting of gender-based crimes (Aizer & Dal Bó, 2009; Amaral, Bhalotra, & Prakash, 2021; Denti & Iammarino, 2022; Iyer, Mani, Mishra, & Topalova, 2012; Jassal, 2020; Miller & Segal, 2019). Other works have focused on the effects of policies in reducing the actual incidence of gender-based crimes, considering the impact of panic buttons (Tumen & Ulucan, 2019), divorce laws (Brassiolo, 2016; García-Ramos, 2021), transfer programs targeting women (Bobonis, González-Brenes, & Castro, 2013; Roy, Hidrobo, Hoddinott, & Ahmed, 2019), war-service (Cesur & Sabia, 2016) and mass media campaigns (Green, Wilke, & Cooper, 2020).

## **2 Conceptual Framework**

### **A. Cultural norms and female political representatives at the local level.**

Traditional gender-role attitudes pivoting around masculinity, patriarchal and “hyper-masculine” ideologies relate to sexual violence against women as they encourage men to be violent (*i*) in the name of masculinity (Murnen, Wright, & Kaluzny, 2002; O’Neil & Harway, 1997) and (*ii*) to comply to the community culture (Stanaland & Gaither, 2021). When these attitudes are prevalent at the community level, they also reduce the social pressure to condemn violent acts against women, increasing perpetrators’ irresponsibility (Gage & Lease, 2021).

The same traditional gender-role attitudes also affect women’s behaviours, pressing them to fit in the traditional feminine gender role. This hinders women’s willingness to be empowered and independent, hence making it harder for them to acknowledge that they are victims of gender violence and to leave an abusive or potentially abusive partner (Garcia-Moreno et al., 2012; González & Rodríguez-Planas, 2020; Heise & Kotsadam, 2015). When traditional gender-role attitudes are pervasive at the community level, they also imply high risk of social stigma and retaliation for victims, together with lack of support outside the intimate relationship. This further reinforces male privilege and female dependency (Iyer et al., 2012). Finally, pervasive traditional gender-role attitudes also imply increased aggressiveness towards women who deviate from traditional feminine

gender role norms (Reidy, Shirk, Sloan, & Zeichner, 2009), due to the urge to preserve the social status-quo.

On the contrary, communities with more gender-equal cultural norms are characterized by alternative forms of masculinity (Flecha García, Puigvert Mallart, & Ríos González, 2013; Giuliano, 2020; Lapsansky & Chatterjee, 2013) and are less keen on justifying abuse.

Evidence from applied research strongly supports the influence of cultural gender norms on intimate partner violence. Cross-country data on Europe (González & Rodríguez-Planas, 2020) and Africa (Alesina et al., 2020; Pulerwitz et al., 2015) show that cultural gender norms are a strong cause of intimate partner violence. Sub-national data on Spain (Tur-Prats, 2019, 2021) and Africa (Pulerwitz et al., 2015) show that accounting for the local heterogeneity of cultural norms provides a more comprehensive understanding of their effects on intimate partner violence.

These traditional gender-role attitudes can be reasonably proxied by women's political empowerment (Alesina et al., 2013; Duflo, 2012; Giuliano, 2020), since traditional gender-role attitudes within the couple reflect into women and men having different social roles (Duflo, 2012; Iyer et al., 2012). The literature provides for a great influence of traditional gender-role attitudes on women's low presence in politics (Bracic, Israel-Trummel, & Shortle, 2019; Hessami & da Fonseca, 2020). Stereotypes and bias affect both voters' preferences and potential candidate self-evaluation (Bhavnani, 2009). This speculation is supported by broad evidence showing that high presence of women in local public office relates to voters' attitude which are not rooted in the patriarchal culture (Baskaran & Hessami, 2018; De Paola, Scoppa, & Lombardo, 2010; Hessami & da Fonseca, 2020; Kerevel & Atkeson, 2015; O'Brien & Rickne, 2016). Hence, we follow these works and we use female political representation as manifestation for traditional gender-role attitudes.

We also account for the strong local dimension of cultural norms (Becker, Boeckh, Hainz, & Woessmann, 2016; Guiso, Sapienza, & Zingales, 2016; Pitlik & Rode, 2017), a features that is confirmed also with respect to traditional gender-role attitudes (Carranza, 2014; Grosjean & Khattar, 2019; Tur-Prats, 2021). So, we consider female political representation at the local level.

## **B. The Italian case**

Italy is an appealing country to analyse given its figures on both IPHs and women in local public offices. Considering female IPHs, the national trend of their incidence has not decreased between 2002 and 2019 (ISTAT, 2021b), while other types of homicides were dropping. Between 2002 and 2019, female homicides unrelated to an intimate-partner relation decreased by 86.7% and the incidence of overall homicides decreased by 48% (ISTAT, 2021a). So, the general reduction of the

ultimate form of violence against the person was not benefitting women killed by current or former intimate partners.

Italy is also among the worst performing Western European countries in terms of gender equality. According to the European Union Gender Equality Index<sup>3</sup>, Italy scores 4.4 points lower than the EU's score, with only Portugal and Belgium having lower marks among EU Western countries (European Institute for Gender Equality, 2020a). Italy ranks among the worst performing Western European countries also for the World Economic Forum Gender Gap Index, being 63<sup>rd</sup> out of 156 countries globally (World Economic Forum, 2021).

Italy has high volumes of gender stereotypes. In a recent national survey, more than 51% of respondents indicated gender stereotypes such as “*the woman considered to be an object*”, “*the man needing to reaffirm his superiority*” and “*annoyance at women's empowerment*” as motives for gender violence (ISTAT, 2019). As much as 39.3% of Italian respondents believe that “*a woman can escape sexual intercourse if she really does not want to*”, against an European average of 10% (Eurostat, 2016). Further, 23.9% of Italian respondents think that “*women induce sexual violence*”, and 15.1% believe that “*a woman who suffers sexual violence when drunk or under the influence of drugs is at least partly responsible*” (ISTAT, 2019). As the volumes of gender stereotypes is high, the share of Italian female politicians in municipalities is between 2012 and 2019 is only 19,83%, 3 points below the average share of female members of municipal councils in EU Western countries (European Institute for Gender Equality, 2021).

### **3 Evidence**

#### **A. Data and descriptive statistics**

Micro-regional data on IPHs are not available from Italian official statistics, while they are monitored by various subjects: regional institutional observatories, newspapers, women's rights organizations and other NGOs. We have collected these databases and we also extracted geolocalized data on IPHs from Google News using “*femminicidio*” (the Italian for IPH) as keyword (see Table A1 in the Appendix for detailed data sources). Then, we have cross-checked the information contained in these different repositories to reduce non-negligible measurement errors due to double-counting, lack of data and miss-classification.

Our final data on IPHs account for 999 episodes between 2012 and 2019, that we have mapped at the micro-regional level across the 611 Italian Local Labour Market Areas (LLMAs) and weighted

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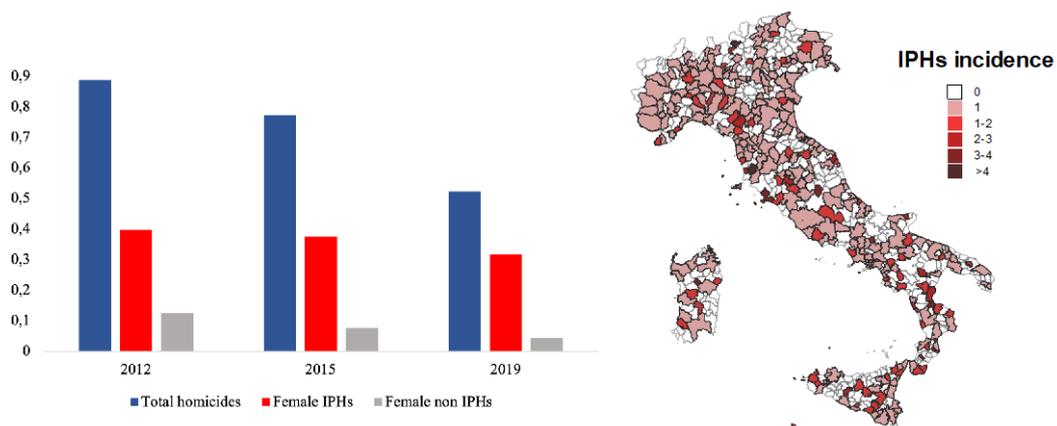
<sup>3</sup> The Gender Equality Index is a composite indicator measuring gender equality. It is used to benchmark gender equality across the EU over time based on the EU policy framework. Similarly, the World Economic Forum Gender Gap Index gives a composite measure gender-based gaps ranking more than 150 countries globally. Both indexes include political empowerment among their key dimensions.

the resulting count by the local female population. We consider LLMA as the appropriate micro-regional unit for this investigation. LLMA are functional areas based on commuting and the majority of IPHs mainly happens either at victims' house or in her working place.

Following the economics literature on violent deaths (Becker & Woessmann, 2018), we averaged IPHs and female population between 2012 and 2019 to reduce noise due to random jumps in IPH incidents. We did not include IPHs from 2020 onwards due to the acknowledged specific effects of COVID-19 on gender violence (i.a. Arenas-Arroyo, Fernandez-Kranz, & Nollenberger, 2021; Berniell & Facchini, 2021; Bullinger, Carr, & Packham, 2021; Leslie & Wilson, 2020).

While homicides and non-intimate partner homicides perpetrated against women displayed sizeable declining trends between 2012 and 2019, the same is not true for female IPHs. In 2012, female IPHs accounted for 44.7% of total homicides, while in 2019 they were 60.6% of total homicides. These figures support the relevance of IPHs in the Italian case. Also, female IPHs have strong spatial heterogeneity. Descriptive statistics show that the average incidence rate of IPHs across Italian LLMA was 0.41 per 100,000 women, ranging between 0 to 4.82. Of the 611 LLMA, nearly 50% had zero IPHs. The average incidence rate of IPHs in the remaining LLMA was 0.84 per 100,000 women (Figure 1).

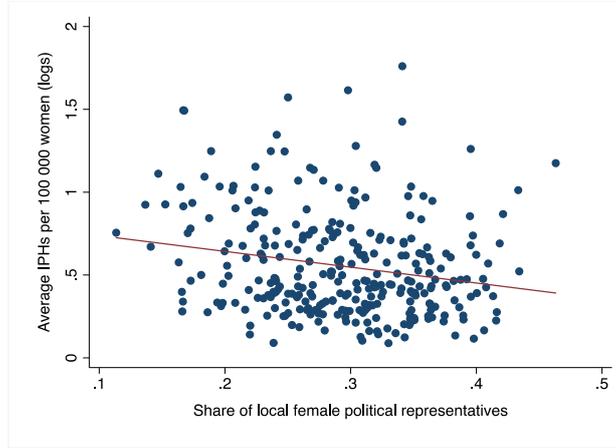
*Figure 1. Female Intimate Partner Homicides in Italy.*



We measure local female political representation using administrative data from the Italian Ministry of Interior containing information on gender of all the members of Italian Municipal Councils elected from 2012 to 2019 (Ministero Dell'Interno, 2021). From this data, we measured the share of elected women in municipal committees over the total number of elected members and we aggregated these values for each LLMA, being that LLMA are super-municipal spatial units. The average share of local female representatives in LLMA was 28.3% between 2012 and 2019. Again, there is substantial variation across LLMA, ranging from 11.4 to 46.3% female elected officials.

Preliminary summary statistics support a negative association between the incidence of IPHs and different shares of women elected in local councils (Figure 2).

Figure 2. Raw incidence of IPHs and share of local female political representatives



Other administrative data, including Census data, provide information on the considered control variables, which account for existing works on intimate partner violence, that we again mapped at LLMA level. We consider female population, crime rates, calls to helpline for sexual and domestic violence, separated/divorced population, foreign population, unemployment, wage, literacy level, violent crime (see Tables A1-A2 in the Appendix for details on the different data sources and summary statistics).

## B. Basic Evidence

We assess the association between local political representation and IPHs in a multivariate setting through a simple least-squares model<sup>4</sup>

$$IPH_i = \alpha + \beta ELECTED_i + X_i\gamma' + \lambda_i + \varepsilon_i \quad (1)$$

where  $IPH_i$  is the incidence of IPHs (number of IPHs per 100 000 women) in LLMA  $i$ ,  $ELECTED_i$  is the share of women elected in local councils in the LLMA,  $X_i$  is a set of control variables, and  $\lambda_i$  is a province fixed effect since each LLMA is nested in a province. To the extent that there is unobserved spatial heterogeneity, province dummies should capture most of its substance (Voth, 2021). Our most basic set of controls includes the size of female population in LLMA and the share

<sup>4</sup> Our results are confirmed in Poisson regression models that use the number of IPHs rather than IPH incidence as the dependent variable (see Table A3 in the Appendix).

of population that is single (separated, divorced, widowed and never married). Such measures are established demographic risk factors in the analysis of IPHs (Garcia-Moreno et al., 2012; Heise & Kotsadam, 2015), intimate partner violence (Tur-Prats, 2019) and other causes of violent death (Becker & Woessmann, 2018). In richer models, we will also consider a host of additional possible correlates of gender violence and IPHs as control variables: female and male unemployment and wage (Aizer, 2010; Anderberg et al., 2016), gender violence episodes (Miller & Segal, 2019), local level of literacy (Heise & Kotsadam, 2015), violent crimes and foreign population (Aizer, 2010; Anderberg et al., 2016).

Table 1 summarizes estimates from the baseline model specification with different sets of control variables. Table 1.a presents estimate when all the 611 Italian LLMAAs are considered. Table 1.b outlines results considering only the subset of 302 Italian LLMAAs with at least one episode of IPH. The first column of Table 1.a shows the strong negative association between the share of female local political representation and the incidence rate of IPHs. An increase of 1 p.p. in the share of women elected in the local council decreased the incidence of IPHs by more than 4%. Not surprisingly, IPHs have a positive association with the size of female population. The positive sign of the association between IPHs and the share of population that is single might be interpreted following the literature on traditional gender norms since women that deviate from the dominant patriarchal culture are a trigger for retaliatory violence (Murnen et al., 2002; Reidy et al., 2009). Column 2 adds the list of economic variables. The significant negative association between the share of female local political representation and IPHs remains unchanged and the economic controls are not significant. Qualitatively, estimates on male and female unemployment support the “male backlash” theory (Macmillan & Gartner, 1999) and relates to similar findings for Spain (Tur-Prats, 2021) and Cambodia (Erten & Keskin, 2021): when man fears reduced dominance in economic terms, violence may be used to restore his authority over his partner.

Column 3 adds a list of social variables which could be relevant predictors of IPHs. While the significant negative association between the share of female local political representation and IPHs holds, these controls do not display significant association with IPHs. Finally, column 4 uses IPH proportion—the number of IPHs divided by the total homicide in the same period—as an alternative dependent variable. This measure allows to consider that average violent mortality rates differ across places (Becker & Woessmann, 2018). Again, we find a significant association of locale female political representation with IPHs. The lower coefficient is in line with the smaller value range of this variable (see Table 1). Table 1.b shows estimates when only LLMAAs with at least one episode of IPH are considered. Estimates are confirmed also in this restricted subset of 302 LLMAAs.

Table 1. Share of local female political representatives and IPHs in Italy

<i>a. All Local Labour Market Areas (LLMAs)</i>				
Dependent Variable	IPH incidence (100 000 women)			IPH proportion
	(1)	(2)	(3)	(4)
Share of elected women in local council	-4.283*** (0.357)	-4.441*** (0.421)	-4.330*** (0.387)	-0.229*** (0.035)
Female population (logs)	0.074*** (0.013)	0.069*** (0.021)	0.072** (0.028)	-0.010 (0.004)
Share of single population	4.227*** (0.358)	4.381*** (0.425)	4.177*** (0.418)	0.225*** (0.042)
Share of male unemployment		0.018 (0.02)	0.02 (0.02)	0.003 (0.002)
Share female unemployment		-0.008 (0.011)	-0.011 (0.012)	-0.001 (0.001)
Wage		0.001 (0.012)	0.003 (0.012)	0.002 (0.002)
Helpline calls per 100 000 women			0.021 (0.018)	-0.0002 (0.002)
Share of adult literacy			-0.624 (0.504)	-0.063* (0.037)
Violent crimes per 100 000 inhabitants			-0.002 (0.001)	-0.00001 (0.00009)
Share of foreign population			0.156 (1.024)	-0.028 (0.115)
105 Province dummies (NUTS3)	YES	YES	YES	YES
Observations	611	611	611	611
R-squared	0.176	0.179	0.186	0.253
<i>b. Local Labour Market Areas (LLMAs) with at least one IPH</i>				
Dependent Variable	IPH incidence (100 000 women)			IPH proportion
	(1)	(2)	(3)	(4)
Share of elected women in local council	-2.034*** (0.337)	-1.979*** (0.427)	-2.37*** (0.504)	-0.166*** (0.063)
Female population (logs)	-0.176*** (0.023)	-0.184*** (0.032)	-0.085* (0.044)	-0.01* (0.005)
Share of single population	1.836*** (0.168)	1.705*** (0.308)	2.263*** (0.586)	0.128** (0.061)
Share of male unemployment		0.018 (0.022)	0.009 (0.02)	0.002 (0.002)
Share female unemployment		-0.018 (0.013)	-0.012 (0.014)	-0.002 (0.002)
Wage		0.006 (0.012)	0.004 (0.012)	0.002 (0.002)
Helpline calls per 100 000 women			-0.13** (0.045)	-0.012* (0.007)
Share of adult literacy			-0.618 (0.679)	-0.101 (0.064)
Violent crimes per 100 000 inhabitants			0.011** (0.004)	0.001 (0.001)
Share of foreign population			0.201 (1.238)	-0.007 (0.161)
99 Province dummies (NUTS3)	YES	YES	YES	YES
Observations	302	302	302	302
R-squared	0.608	0.615	0.650	0.731

*Ordinary least squares (OLS) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Data for Italian LLMAs from IPH statistics from Google news, observatories, newspapers and NGOs, other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

### **C. Identifying exogenous variation in the share of local female political representatives**

To identify the effect of local female political representation on IPHs, we need proper identification and address several fundamental challenges. Self-selection bias might be a threat: people with preferences for gender-equal communities could migrate to places with low incidence of IPHs. Also, reverse causality might be at work. Great local incidence of IPHs works as a signal that female independence and empowerment are risky and not welcomed in those communities. This could deter women from running for public offices. Existing studies argue that women's acceptance of gender discrimination may be higher in places where violence against women is more common (Garcia-Moreno et al., 2012; González & Rodríguez-Planas, 2020; Heise & Kotsadam, 2015). Finally, there might be correlation with unobservables components affecting both female participation in local politics and IPHs. These types of threats are common in the applied investigation of gender violence and are addressed by a growing number of works in economics (i.a. Giuliano, 2018, 2020; González & Rodríguez-Planas, 2020; Tur-Prats, 2019).

To identify the effect of local female political representation on IPHs, we refer to the literature on long-term historical determinants of gender roles within communities (Giuliano, 2017). Within this literature, we consider geography as the ultimate determinant of gender differences (Giuliano, 2020). In practical terms, we refer to existing works showing that certain type of soil strongly correlates to societal differences in the role of women (Carranza, 2014; Giuliano, 2017, 2020). By influencing the land preparation process, soil texture determines the gender division of labour and the social relevance of women (Basant, 1987; Giuliano, 2017). This point aligns with Boserup (1970)'s hypothesis that differences in gender roles stem from historical agriculture practices (Giuliano, 2014). According to Boserup, places where deep tillage is required have reduced demand for female labour relative to male labour and this has a negative impact on the social values of women in the family and in the community (Boserup, 1970). Following Carranza (2014), we consider the classification between loamy and clayey soils. Loamy soils allow deep tillage thus diminishing the relative social value of women. In clayey soils deep tillage is not viable, hence women have higher value (Basant, 1987).

This approach relates also to the seminal works of Alesina et al. (2013, 2018) showing the impact of historical plough-use on current gender inequality. The authors refer to Boserup's hypothesis to build an instrumental variable for plough-use which is based on the suitability of the soil to the plough. Since soil suitability depends on the type of soil, it appears reasonable to simply consider the geography of soil types as correlated to societal differences in the role of women (Giuliano, 2017, 2020). This approach is introduced in the seminal work by Carranza (2014) and adopted in the present investigation.

This methodology might look surprising when applied to Italy, since the country has long overcome traditional agricultural practices. However, there is an established literature providing for the persistence of gender norms (Giuliano, 2017) and the significant impact of historical agricultural practices in shaping them also in developed countries (Alesina et al., 2013; Hansen, Jensen, & Skovsgaard, 2015).

Practically, we design our instrument on the geography of soil types using the database “*Topsoil physical properties for Europe*” (Ballabio, Panagos, & Montanarella, 2016), which is based on the LUCAS topsoil data collected by the European Soil Data Centre (European Soil Data Centre, 2020). The database gives information on soil property exploiting soil point data from the LUCAS soil survey for European countries (Jones, Fernández-Ugalde, & Scarpa, 2020). The database contains soil classification according to the USDA soil textural class (Yolcubal, Brusseau, Artiola, Wierenga, & Wilson, 2004), which divides soils in categories depending on the prevalence of loam, clay and sand (Ballabio et al., 2016). For each Italian LLMA we calculate the percentage of loamy, clayey and sandy soil. We use these shares to design our instrument, which is given by the clay over loam and sand ratio weighted by the amount of land suitable for agriculture. Soil suitability for agriculture is measured through data on soil relief and roughness from the European Soil Data Centre “*Landform Classification*” database (European Soil Data Centre, 2008; Meybeck, Green, & Vörösmarty, 2001), which classifies soils considering mountains, hills, plains and plateaus and their roughness. Formally, the instrumental variable is given by  $Z_{cLLMA_i} = w_{LLMA_i} \left( \frac{x_{cLLMA_i}}{x_{iLLMA_i} + x_{sLLMA_i}} \right)$ , where  $w_{LLMA_i}$  is the amount of land in LLMA  $i$  that is suitable for agriculture,  $x_{cLLMA_i}$  is the share of clayey soils in LLMA  $i$ ,  $x_{iLLMA_i}$  and  $x_{sLLMA_i}$  are the shares of loamy and sandy soils in LLMA  $i$ .

The exogeneity of land composition alleviates reverse causality and self-selection threats (Carranza, 2014). We also consider place fixed effects and socioeconomic controls to reduce concerns on correlation on unobservables. We will further address correlation on unobservables in the assessment of the validity of the instrumental variable strategy.

Table 2 reports results of the IV estimation of the effect of the local share of female political representation on IPHs. The share of clayey soils is a strong instrument for the share of female political representation in a Local Labour Market Area, as is evident from an F-statistic of the instrument in the first stage of 85. A 0,1 hectare increase in the share clayey soils relative to sandy and loamy soils is associated with a share of local female politicians that is 6 percentage points higher (column 1). The second stage uses only that part of the variation in shares of local female politicians that is due to the share of clayey soils to predict IPHs.

Table 2: Share of local female political representatives and IPHs in Italy: IV Estimates

<i>a. All Local Labour Market Areas (LLMAs)</i>			
Dependent Variable	First stage		Second stage
	Share of elected women in local council	IPH incidence (100 000 women)	IPH proportion
	(1)	(2)	(3)
Share of elected women in local council		-3.482*** (1.252)	-0.315*** (0.118)
Soil clayeyness index	0.603*** (0.018)		
Female population (logs)	0.006*** (0.001)	0.066** (0.028)	0.0003 (0.003)
Share of single population	0.956*** (0.047)	3.365*** (1.278)	0.307*** (0.117)
Share of male unemployment	0.0007 (0.0007)	0.019 (0.018)	0.003 (0.002)
Share female unemployment	-0.00003 (0.0001)	-0.011 (0.011)	-0.001 (0.001)
Wage	0.0003 (0.0003)	0.003 (0.011)	0.002 (0.001)
Helpline calls per 100 000 women	-0.0002 (0.0005)	0.022 (0.016)	-0.0003 (0.002)
Share of adult literacy	0.016 (0.017)	-0.631 (0.45)	-0.062* (0.033)
Violent crimes per 100 000 inhabitants	0.00001 (0.00003)	-0.002* (0.001)	-0.00001 (0.00008)
Share of foreign population	-0.014 (0.021)	0.176 (0.919)	-0.03 (0.103)
105 Province dummies (NUTS3)	YES	YES	YES
Observations	611	611	611
<i>Cragg-Donald Wald</i> -statistic (instrument)		85.63	85.63
<i>b. Local Labour Market Areas (LLMAs) with at least one IPH</i>			
Dependent Variable	First stage		Second stage
	Share of elected women in local council	IPH incidence (100 000 women)	IPH proportion
	(1)	(2)	(3)
Share of elected women in local council		-2.188*** (0.478)	-0.215*** (0.076)
Soil clayeyness index	0.550*** (0.048)		
Female population (logs)	0.007*** (0.001)	-0.086** (0.037)	-0.01*** (0.005)
Share of single population	0.893*** (0.120)	2.102*** (0.45)	0.172*** (0.062)
Share of male unemployment	0.001 (0.001)	0.009 (0.016)	0.002 (0.002)
Share female unemployment	0.0005 (0.0006)	-0.013 (0.011)	-0.002 (0.001)
Wage	0.0001 (0.0003)	0.004 (0.01)	0.002 (0.002)
Helpline calls per 100 000 women	-0.002 (0.002)	-0.13*** (0.036)	-0.012** (0.005)
Share of adult literacy	0.051 (0.050)	-0.627 (0.536)	-0.098* (0.051)
Violent crimes per 100 000 inhabitants	0.0002 (0.0002)	0.011*** (0.003)	0.001** (0.0004)
Share of foreign population	-0.050 (0.069)	0.21 (0.987)	-0.009 (0.127)
99 Province dummies (NUTS3)	YES	YES	YES
Observations	302	302	302
<i>Cragg-Donald Wald F</i> -statistic (instrument)		11.75	11.75

*Instrumental variable (IV) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Data for Italian LLMAs from IPH statistics from Google news, observatories, newspapers and NGOs, other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

The countering effect of the share of local female politicians on IPHs is highly robust in the IV specification (column 2). A 1 percentage point increase in the share of local female politicians in a Local Labour Market Area decreases IPHs incidence by 3.48 IPHs per 100 000 women. Findings hold also when we consider IPH proportion—the number of IPHs divided by the total homicide in the same period—as an alternative dependent variable (column 3).

#### **D. Validity of the Instrumental Variable Strategy**

Soil geography has the advantage of being exogenously determined and estimates from the IV model support the strength of the instrumental variable, as summarized by the F-statistic of the instrument in the first stage in Table 2. At the same time, there are concerns on the validity of the instrument that we need to consider.

First, existing literature provides for soil composition and the consequent gender division of labour to have persistent effect on specific features that might influence IPHs: female participation in the workplace and female literacy (Alesina et al., 2013; Galor et al., 2017; Rodríguez-Planas & Tanaka, 2021). Therefore, we must address an interpretation issue on the possibility that these other outcomes led to a decrease in IPHs rather than female local political representation. We account for this by conditioning the effect of female local political representation on IPHs on the shares of female unemployment and female literacy. Table 3 shows that the estimated effect of female local political representation remains negative and significant. This suggests that any effect of soil composition and the consequent gender division of labour on female employment and literacy do not affect the effect of female local political representation on IPHs. This conclusion is supported also by the inclusion of additional controls for other dimensions of socioeconomic development, such as wage, the propensity to report sexual violence, violent crimes. No measure affects the estimate on local female political representation and only violent crimes display a mild significance. Overall, findings appear most consistent with a strong effect of local female political representation per se on IPHs.

Second, a broader concern is the validity of the exclusion restriction. Soil composition and the consequent social role assigned to women could impact IPHs through channels than differ from gender norms embodied by the share of women in local councils. For instance, it could influence economic independence of women by affecting informal norms ruling women's wealth accumulation within the households (Deere & Doss, 2006). Also, it could influence social independence of women through their fertility choices (Alesina, Giuliano, & Nunn, 2011). Overall, concerns on both the exclusion restriction and correlation with unobservables must be dealt with. We address worries on exclusion restriction drawing on “plausible exogeneity” analysis (Conley, Hansen, & Rossi, 2012). Threats posed by correlation with unobservables are dealt with using the “imperfect instrumental

variable” method (Nevo & Rosen, 2012). In doing so, we align to Tur-Prats (2019), who encountered similar points in the evaluation the validity of her historical instrumental variable on intimate partner violence in Spain.

Table 3: Validity of IV strategy: conditioning on potential confounders

<i>a. All Local Labour Market Areas (LLMAs)</i>			
Dependent Variable	First stage	Second stage	
	Share of elected women in local council	IPH incidence (100 000 women)	IPH proportion
	(1)	(2)	(3)
Share of elected women in local council		-3.447*** (1.285)	-0.311*** (.12)
Soil clayeyness index	0.607*** (0.022)		
Female population (logs)	0.006*** (0.001)	0.066** (0.028)	0.0004 (0.003)
Share of single population	0.956*** (0.046)	3.332** (1.302)	0.303** (0.12)
Share of male unemployment	0.001 (0.001)	0.019 (0.018)	0.003 (0.002)
Share of female unemployment	-0.00003 (0.0001)	-0.011 (0.011)	-0.001 (0.001)
Wage	0.0003 (0.0003)	0.003 (0.011)	0.002 (0.001)
Helpline calls per 100 000 women	-0.0002 (0.0005)	0.022 (0.016)	0.0002 (0.002)
Share of female adult literacy	-0.015 (0.024)	-0.495 (1.023)	-0.056 (0.093)
Share of male adult literacy	0.029 (0.038)	-0.147 (0.839)	-0.008 (0.08)
Violent crimes per 100 000 inhabitants	8.75e-06 (0.00003)	-0.002* (0.001)	0.00002 (0.00009)
Share of foreign population	-0.009 (0.0156)	0.211 (0.942)	-0.025 (0.109)
105 Province dummies (NUTS3)	YES	YES	YES
Observations	611	611	611
<i>Cragg-Donald Wald F-statistic (instrument)</i>		86.17	86.17

*Instrumental variable (IV) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Data for Italian LLMAs from IPH statistics from Google news, observatories, newspapers and NGOs, other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

“Plausible exogeneity” analysis enables valid inference for strong instruments when the exclusion restriction is relaxed and the instrumental variable is allowed to directly impact the dependent variable (Conley et al., 2012). Notably, estimation consents the failure of the exclusion restriction when the instrumental variable is not weak (Conley et al., 2012). Failure must be restricted to some range (Clarke & Matta, 2018), that in practical terms we address through the “union of confidence interval” approach and the “local to zero” approach (Clarke & Matta, 2018; Conley et al., 2012).

In the “union of confidence interval” approach, we replace the original exclusion restriction assumption with an assumption regarding the minimum and maximum values for the coefficient for the instrumental variable, that is now allowed to have a direct impact on the dependent variable. We get the confidence intervals for the coefficient of the potentially endogenous variable for a range of

models, which have different value for the coefficient of instrumental variable from a binned range. We then check how these estimated bounds on the endogenous variable relate to the estimated coefficient for the endogenous variable from our main IV model. Results shows that estimated bounds contain only negative values and do not overlap with zero, supporting that the share of women elected in local councils reduces IPHs even when we allow for plausible amounts of imperfect exogeneity regarding the exclusion restriction (see Table A6-A7 in the Appendix).

The “local to zero” approach also allows the coefficient for the instrumental variable to have a direct impact on the dependent variable, while it replaces the original exclusion restriction assumption with a distributional assumption for the coefficient for the instrumental variable (Clarke & Matta, 2018). Bounds on the coefficient of the share of women in local councils can be calculated using the entire assumed distribution for the coefficient for the instrumental variable. Results confirm a significant and negative impact of the share of women elected in local councils on IPHs (see Table A8 in the Appendix).

Another approach to assess the validity of our estimates accounting for potential violation of exogeneity is the “imperfect instrumental variable” method (Nevo & Rosen, 2012). In this case, we assess the validity of our instrumental variable regarding potential correlation with unobservables. More into details, the “imperfect instrumental variable” method substitutes the standard zero correlation assumption between the instrumental variable and the unobserved error term with an assumption on the sign of this correlation (Clarke & Matta, 2018; Nevo & Rosen, 2012). Our assumption is a positive correlation, to reflect that women’s socioeconomic independence might be favoured in places where soil composition shaped persistent higher social value for women. Also in this case, estimates provide for a negative and significant effect of the share of elected women in local councils on IPHs (see Table A9 in the Appendix).

Overall, estimates from the “plausible exogeneity” approach and from the “imperfect instrumental variable” approach support the 2SLS results to be robust to departures from the strict exogeneity assumption for the instrumental variable. Further support for the validity of the instrument is given by the reduced form estimates (Angrist & Pischke, 2014), which provide for a statistically significant lower incidence of current IPHs in places with higher intensity of clayey soils (see Table A10 in the Appendix).

## **E. Robustness Analysis**

The empirical results prove very robust to several tests. Results hold when we control for additional control variables such as family size and spatial spillovers of local female political

representation (Table A3 in the Appendix). We have also tested several interactions between the share of female local political representation and other variables to find that they are non-significant.

Up to now, the investigation has considered local female political representation using the bulk of locally elected women, without discriminating between female councillors and female mayors. It appears interesting to check whether the effect of elected women in local councils on IPHs depends on women being represented in more influential roles at the top level of local governance, or by large scale representation at the lower level. Hence, we isolate each category to check whether there are specific effects.

First, we consider the effect of female councillors on IPHs to see that it aligns to our main findings. An increase of 1 p.p. in the share of female councillors determines a decrease in IPHs incidence of 3.7% and the relevance of the instrumental variable holds (Table 4 columns 1-2). Then, we measure the effect of female councillors when there is at least one female mayor in the LLMA. Also in this case our main findings are confirmed. Estimates provides for the strongest effect of local female representation on IPHs reduction: an increase of 1 p.p. in the share of female councillors when there is at least one female mayor determines a decrease in IPHs incidence of 4.25% (Table 4 columns 3-4). Finally, we measure the effect of female mayors alone. In this case, the effect of female mayors on IPHs is still negative, but not significant. As further check, we also estimate the effect of alderwomen, which are not elected but appointed by the mayor and have executive role. As for female mayors, their effect on IPHs is still negative, but not significant (Table A4 in the Appendix).

This apparently surprising result actually aligns to existing evidence providing for large scale female representation in local councils to have a greater effect in gender crime deterrence than higher-level leadership (Iyer et al., 2012). A possible explanation can be found in representatives at the lowest level of governance to better represent social beliefs and bias in the community (Iyer et al., 2012). Hence, the community degree of traditional gender norms is better captured by the share of female councillors than by the share of female mayors. Another possible explanation resides in the different electoral rules governing mayors and councillors in Italy. According to Italian law, mayors are elected through a majoritarian mechanism which is acknowledged to discourage women as its level of competitiveness collides with women's risk aversion (Hessami & da Fonseca, 2020; Profeta & Woodhouse, 2021). Hence, even with moderate and low level of traditional gender norms, it is possible women are more likely to run for councillors to avoid the personalized winner-takes-all mayoral race.

Table 4. Robustness checks. Share of local female political representatives and IPHs in Italy: IV Estimates for subsets of female local council members

<i>a. All Local Labour Market Areas (LLMAs)</i>						
Dependent Variable	First stage	Second stage	First stage	Second stage	First stage	Second stage
	Share of female councillors	IPH incidence (100 000 women)	Share of female councillors with female mayor	IPH incidence (100 000 women)	Share of female mayors	IPH incidence (100 000 women)
	(1)	(2)	(3)	(4)	(5)	(6)
Share of female councillors		-3.717*** (1.423)				
Share of female councillors with female mayor				-4.254** (1.976)		
Share of female mayors						-1.523 (.991)
Soil clayeyness index	0.565*** (0.059)		0.584*** (0.095)		1.366 (1.328)	
Female population (logs)	0.005* (0.002)	0.062** (0.027)	0.005 (0.003)	0.103*** (.036)	0.016 (0.011)	0.061* (0.035)
Share of single population	1.085*** (0.059)	4.069** (1.613)	0.942*** (0.121)	4.485** (1.972)	0.267* (0.142)	0.21 (0.515)
Share of male unemployment	0.0019 (0.0015)	0.024 (0.02)	0.003 (0.002)	0.06*** (0.022)	0.002 (0.006)	0.022 (0.021)
Share of female unemployment	-0.0008 (0.0008)	-0.014 (0.012)	-0.001 (0.001)	-0.028** (0.014)	-0.004 (0.004)	-0.017 (0.013)
Wage	-0.0003 (0.0007)	0.001 (0.011)	0.0002 (0.0008)	-0.001 (0.013)	0.002 (0.004)	0.008 (0.013)
Helpline calls per 100 000 women	-0.0002 (0.002)	0.021 (0.019)	-0.006* (0.003)	-0.00003 (0.053)	-0.002 (0.006)	0.017 (0.016)
Share of adult literacy	0.008 (0.036)	-0.658 (0.457)	-0.005 (0.039)	-1.294*** (0.501)	-0.127 (0.142)	-0.842 (0.53)
Violent crimes per 100 000 inhabitants	0.00005 (0.0001)	-0.001 (0.001)	0.003* (0.001)	0.001 (0.003)	0.00006 (0.0004)	-0.001 (0.001)
Share of foreign population	-0.049 (0.058)	0.042 (0.958)	-0.025 (0.060)	0.386 (1.049)	-0.061 (0.282)	0.129 (0.962)
105 Province dummies (NUTS3)	YES	YES	YES	YES	YES	YES
Observations	611	611	415	415	611	611
<i>Cragg-Donald Wald F-statistic (instrument)</i>		90.28		18.33		3.86

*Instrumental variable (IV) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Data for Italian LLMAs from IPH statistics from Google news, observatories, newspapers and NGOs, other data from the 2011 Population Census, and other official statistics, family types data from Todds (1990). See main text and the Appendix for details*

## 4 Transmission channels

Our results suggest a strong effect of the share of women elected in local councils on observed incidence of IPHs and the instrumental variable estimation provides for cultural transmission of persistent gender norms as the channel that enables this relationship. At the same time other transmission channels could explain our findings and we account for them in this section.

A possible alternative explanation for our results could be that higher shares of female local political representation relates to lower incidence of overall crimes, which in turns benefits also IPHs. To this respect, existing works provide for higher share of female council members to have a positive impact on welfare and security policy (Hessami & da Fonseca, 2020). Hence, it could be that policies designed through a female perspective promote safer communities for all citizens, including reduction of types of crime that are not determined by local gender norms. Although our estimates already account for the rate of violent crimes among confounders, we perform several placebo-outcome tests. We estimate the effect of the local share of female local representation on total homicides and thefts. Results, summarized in Table 5, provides for non-significant relationships between female local political representation and these types of crime. Same results hold when drug crimes are considered (see Appendix Table A5, column 1). Overall, this evidence suggests no meaningful effect of female local political representation and crimes, corroborating that higher share of female local political representation lowers IPHs since local gender role norms favour more gender equality.

Table 5: Falsification tests. Share of local female political representatives and other crimes in Italy: IV Estimates for homicides and thefts

<i>All Local Labour Market Areas (LLMAs)</i>			
Dependent Variable	First stage	Second stage	
	Share of elected women in local council	Homicide incidence (100 000 inhabitants)	Theft incidence (1 000 inhabitants)
	(1)	(2)	(3)
Share of elected women in local council		-31.581 (163.39)	427.601 (559.97)
Soil clayeyness index	0.603*** (0.018)		
Control variables	YES	YES	YES
105 Province dummies (NUTS3)	YES	YES	YES
Observations	611	611	611
R-squared		0.950	0.945
<i>Cragg-Donald Wald F-statistic (instrument)</i>		85.63	85.63

*Instrumental variable (IV) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Data for Italian LLMAs from homicides and thefts statistics from ISTAT, other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

Another possibility is that places with high shares of local female representation are more tolerant regarding all minorities and disempowered groups. To address this issue, we have estimated the effect

of the share of locally elected women on hate crimes against ethnic minorities. Results show no statistically significant difference for hate crimes depending on the share of local female representation, also controlling for relevant confounders such as foreign population, literacy, and unemployment (see Appendix Table A5, column 2). This finding further supports the cultural transmission channel of gender norms as the underlying mechanism explaining why more elected women in local councils determine few IPHs.

We then check for the influence of institutions, considering two types of institutions that are acknowledged to have a relevant influence on gender norms: family and historical institutions (Giuliano, 2017; Tur-Prats, 2019).

In her seminal work on the microregional determinants of intimate partner violence, Tur-Prats (2019) shows that the types of traditional family structure are a determinant of intimate partner violence. Her findings provide for the Spanish geography of historical family types to determine current rates of intimate partner violence. This evidence corroborates the strong influence of family in transmitting gender norms at the local level. We account for this by estimating our instrumental variable model with family-types dummies among controls. Family-types dummies are designed drawing on the established classification of family types across Western Europe done by Todds (1990)<sup>5</sup> (see Figure A1 in the Appendix).

Results outlined in Table 6 show that the share of clayey soils remains a strong instrument for the share of female political representation in a Local Labour Market Area (column 1) and that the estimated effect of female local political representation remains negative and significant (column 2). Further, our findings support an association between stem families and lower IPH incidence, confirming what Tur-Prats (2019) found for Spain and Alesina et al (2020) for Africa. Overall, this evidence supports the cultural transmission channel through the historical gender division of labour driven by ancient agriculture.

In the Italian case, it is also important to check for the influence of formal institutional environment, which has been highly regionalized until quite recently. Until 1861, Italy was organized in several pre-Unitarian states (Denti, Crociata, & Faggian, 2021; Guiso et al., 2016), whose persistent effect on several socioeconomic outcomes is well documented (Di Liberto & Sideri, 2015). Different institutional settings could have influenced internal beliefs about gender roles (Tur-Prats, 2019). To address this issue, we create a set of dummies corresponding to the different pre-Unitarian state

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<sup>5</sup> Todd's classification divides family in: communitarian, stem, incomplete stem and absolute nuclear and egalitarian nuclear (Duranton, Rodríguez Pose, & Sandall, 2009). In stem families, women have more time to work on the farm and a consequent higher social value since the mother-in-law supports with childcare. On the contrary, nuclear families cannot rely on childcare support from other family members, pushing women in a domestic regime where they have low social value (Tur-Prats, 2019).

resulting from the Peace of Cateau-Cambrésis (1559) as already done by previous works<sup>6</sup> (Denti et al., 2021; Di Liberto & Sideri, 2015) (see Figure A2 in the Appendix). Estimates from instrumental variable model with pre-Unitarian state dummies among controls support our main findings.

Table 6. Robustness checks. Share of local female political representatives and IPHs in Italy: IV Estimates accounting for family types and historical institutions

<i>a. All Local Labour Market Areas (LLMAs)</i>				
Dependent Variable	<i>Family types among controls</i>		<i>Pre-unitarian states among controls</i>	
	First stage	Second stage	First stage	Second stage
	Share of elected women in local council	IPH incidence (100 000 women)	Share of elected women in local council	IPH incidence (100 000 women)
	(1)	(2)	(3)	(4)
Share of elected women in local council		-3.515*** (1.266)		-3.574*** (1.134)
Soil clayeyness index	0.603*** (0.018)		0.603*** (0.019)	
Female population (logs)	0.006*** (0.001)	0.066** (0.028)	0.006*** (0.002)	0.066** (0.028)
Share of single population	0.956*** (0.047)	3.405*** (1.291)	0.955*** (0.049)	3.482*** (1.177)
Share of male unemployment	0.0006 (0.0007)	0.02 (0.018)	0.0006 (0.0007)	0.023 (0.019)
Share of female unemployment	-0.00004 (0.0001)	-0.012 (0.011)	-0.0003 (0.0003)	-0.014 (0.011)
Wage	0.0003 (0.0003)	0.004 (0.011)	0.0003 (0.0003)	0.005 (0.011)
Helpline calls per 100 000 women	-0.0002 (0.0006)	0.021 (0.016)	-0.0002 (0.0005)	0.018 (0.014)
Share of adult literacy	0.016 (0.017)	-0.668 (0.453)	0.018 (0.019)	-0.669 (0.481)
Violent crimes per 100 000 inhabitants	0.00001 (0.00003)	-0.002* (0.001)	8.73e-06 (0.00003)	-0.001 (0.001)
Share of foreign population	-0.0143 (0.0221)	0.108 (0.92)	-0.0171 (0.026)	1.091 (0.816)
Communitarian family	0.0014 (0.0016)	0.171 (0.124)		
Incomplete stem family	0.0017 (0.002)	-0.297*** (0.058)		
Stem family	0.0009 (0.0006)	-0.590*** (0.073)		
105 Province dummies (NUTS3)	YES	YES	NO	NO
31 Pre-unitarian state dummies	NO	NO	YES	YES
Observations	611	611	611	611
<i>Cragg-Donald Wald F-statistic (instrument)</i>		85.13		80.70

*Instrumental variable (IV) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Nuclear family type is used as base category and therefore not included. Data for Italian LLMAs from IPH statistics from Google news, observatories, newspapers and NGOs, other data from the 2011 Population Census, and other official statistics, family types data from Todds (1990). See main text and the Appendix for details*

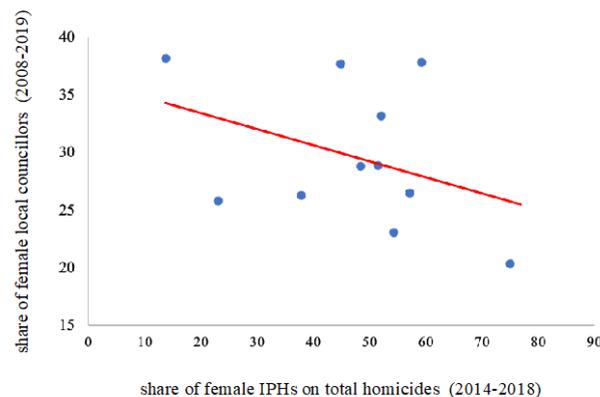
The share of clayey soils remains a strong instrument for the share of female political representation in a Local Labour Market Area (Table 6 column 3) and the estimated effect of female local political representation remains negative and significant (Table 6 column 4). Estimates summarized in Table 6 support geography as the ultimate determinant of gender norms (Alesina et

<sup>6</sup> The institutional setting from the Peace of Cateau-Cambrésis lasted for nearly a century. This is a sufficiently long period for an historical legacy. Also, it is remarkably longer than any other geography of pre-Unitarian states after 1659 (Denti et al., 2021)

al., 2013; Carranza, 2014), at the same time corroborating the cultural transmission channel in shaping the impact of female local political representation on IPHs. These results align to evidence showing that the legacy of historical agricultural practices on female labour participation is way more relevant than historical political events such as the advent of Protestantism (Hansen et al., 2015).

Our results refer to Italy, implying concerns on their external validity. Addressing this issue has important limitations due to data constraints. Micro-regional data on IPHs are generally unavailable from official statistics (European Institute for Gender Equality, 2019) and need to be collected referring to other sources, which are currently absent in many countries. Also, there is no uniform official definition of IPHs across countries, which impose further limitations in cross-country comparison (European Institute for Gender Equality, 2019). Notwithstanding these limitations and using available IPHs data at the European level, we can show summary statistics of a negative correlation between IPHs and share of female councillors. Figure 3 summarizes this descriptive evidence, which has a negative correlation coefficient of -0.4. Similar evidence exists with respect to a set of 61 countries, including Western Europe (Palma-Solis et al., 2008).

*Figure 3. IPHs and local female political representation in European countries<sup>o</sup>.*



<sup>o</sup> Own calculations using data for IPHs on total homicides from European Institute for Gender Equality (2020b), data for the share of female local councillors from Ceciari (2019)

## 5 Conclusions

In this paper we analyse the effect of local female political representation on the incidence of female Intimate Partner Homicides focusing on Italy. Our hypothesis is that places with high shares of elected women in local councils are endowed with lower pervasiveness of traditional gender norms and this allows for lower levels of extreme violence against women.

To test our hypothesis, we construct a unique database from micro-regional female Intimate Partner Homicides and women elected in local institutions for Italy, that we use to provide a

quantitative measure of the effect of local female political representation. Results show that places with higher shares of female local political representation exhibit lower incidence of female IPHs. To address potential endogeneity concerns, we perform an instrumental variable estimation that instruments female local political representation using soil composition, as the latter relates to the historical gender division of labour in agriculture, whose persistent effects last also today. Results are also robust to a rich set of controls for demographic, economic, educational, and social factors. Overall, this investigation supports the cultural dimension as the main determinant of intimate partner violence against the alternative perspective that assigns the most relevant role to the economic dimension (Aizer, 2010; Anderberg et al., 2016).

We also examine the efficacy of the different forms of local political representation, comparing the effects of female mayors and female councillors. Results show that it is large scale representation of women as local councillors that affects female IPHs more than their representation as mayor. This finding relates to theories of representatives at the lowest level of governance to better represent social beliefs and bias in the community (Matson & Fine, 2006). It also aligns to existing evidence on local female political representativeness as enabler of women's empowerment regarding gender violence (Iyer et al., 2012).

Finally, we perform several tests to assess our hypothesis of the cultural transmission of gender norms against alternative hypothesis. First, we test the policy hypothesis, checking whether more elected women in local councils relate to safer communities where all crimes are lower. Second, we check the tolerance hypothesis, assessing whether our results are determined by local cultural norms favouring tolerance towards all disempowered groups, rather than gender-equality per se. We also test the role of institutional channels, considering both family and historical formal institutions. None of these alternative hypotheses finds empirical support, corroborating persistent gender norms rooted in historical agriculture as determinant of the observed patterns of female IPHs.

Our results appear to support existing theories of long-time persistence of gender norms. This investigation provides for geography and its impact on historical gender labour division to be a fundamental determinant of the relative social value of women (Giuliano, 2017), whose influence persist even after family and formal institutions are set.

From a policy perspective, our results suggest addressing the cultural dimension at the local level as an effective way to counter IPHs. Further, results imply that interventions aimed at increasing the number of female councillors could contribute to offset murders of female partners, by disrupting local gender norms. This policy implication aligns with existing works showing that exposure to women elected in local public offices helps voters overcoming gender stereotypes (Beaman et al., 2009, 2012; Bhavnani, 2009; Duflo, 2012; O'Brien & Rickne, 2016).

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## Appendix

*Table A1: Data Sources*

Variable	Source
Female Intimate Partner Homicides	Google news, Repubblica, Corriere della Sera, Osservatorio Femminicidio della Regione Campania, Unione Donne Italiane, ProsMedia
Women elected in local council	Italian Ministry of Interior
Single population	ISTAT
Unemployment	ISTAT
Wage	ISTAT
Helpline calls	ISTAT
Adult literacy	ISTAT
Crime: homicides, thefts, drugs, violent crimes	ISTAT
Hate crimes	Lunaria
Foreign population	ISTAT
Soil texture, Land classification	Ballabio et al., 2016; ESDAC; Joint Research centre of the European Commission - Land Resource Management Unit (Institute for Environment & Research)

*Table A2. Summary statistics*

Variable	Obs	Mean	SD	Min	Max
IPHS per 100 000 women	611	0.4137	0.6418	0	4.8093
IPHS on total homicides	611	0.0176	0.0392	0	0.6071
Share of elected women in local council	611	0.2836	0.0643	0.1136	0.4632
Female population (logs)	611	10.0558	1.1181	7.3963	14.4649
Share of single population	611	0.4004	0.0376	0.2255	0.5513
Share of male unemployment	611	9.9456	5.4065	0.9882	23.7994
Share female unemployment	611	14.9685	7.7338	1.9110	36.3953
Wage	611	22.2524	3.8868	14.1571	35.0515
Helpline calls per 100 000 women	611	1.9012	3.1480	0.01074	31.6657
Share of adult literacy	611	0.4358	0.0626	0.2409	0.6193
Violent crimes per 100 000 inhabitants	611	34.7044	51.4117	0.1630	454.0883
Share of foreign population	611	0.0580	0.0378	0.0027	0.1640
Soil clayeyness index	611	0.0050	0.0700	0	1

Table A3: Model specification tests for the estimation of the association between IPHs and the local share of female political representatives. Poisson model (column 1); OLS model with different sets of control variables (columns 2-5)

	Poisson		OLS		
	(1)	(2)	(3)	(4)	(5)
Share of elected women in local council	-7.693*** (1.829)	-4.223*** (0.333)	-4.336*** (0.389)	-4.315*** (0.402)	-4.222*** (0.449)
Female population (logs)	0.057 (0.135)	0.074** (0.029)	0.072** (0.029)	0.076*** (0.028)	0.0723** (0.0282)
Share of single population	6.664*** (1.261)	4.104*** (0.361)	4.182*** (0.43)	4.168*** (0.443)	4.102*** (0.426)
Share of large families (+4 children)				-3.886 (3.177)	
Share of male unemployment	0.081 (0.08)		0.02 (0.02)	0.02 (0.02)	0.021 (0.02)
Share female unemployment	-0.05 (0.048)		-0.011 (0.012)	-0.011 (0.012)	-0.012 (0.012)
Share of unemployment		0.003 (0.007)			
Wage	0.029 (0.049)	0.001 (0.012)	0.003 (0.012)	0.003 (0.013)	0.004 (0.013)
Helpline calls per 100 000 women	0.137 (0.089)	0.023 (0.019)	0.022 (0.018)	0.017 (0.019)	0.025 (0.02)
Share of adult literacy	-2.99 (1.847)	-0.535 (0.478)		-0.756 (0.483)	-0.652 (0.51)
Share of female adult literacy			-0.502 (1.147)		
Share of male adult literacy			-0.133 (0.952)		
Violent crimes per 100 000 inhabitants	-0.011* (0.006)	-0.002 (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.002 (0.001)
Share of foreign population	0.418 (5.088)	0.174 (1.01)	0.192 (1.049)	0.297 (1.012)	0.215 (1.008)
Spatial spillovers of elected women					-0.583 (0.896)
105 Province dummies (NUTS3)	YES	YES	YES	YES	YES
Observations	611	611	611	611	611

*Ordinary least squares (OLS) estimation. Robust standard errors in parentheses. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.01. Data for Italian LLMA from IPH statistics from Google news, observatories, newspapers and NGOs, other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details. Spatial spillovers of elected women are measured using the share of elected women in the 4 closest LLMA to each LLMA i*

Table A4: Robustness check. IV Estimates for alderwomen and IPHs

<i>a. All Local Labour Market Areas (LLMAs)</i>				
Dependent Variable	First stage	Second stage	First stage	Second stage
	Share of alderwomen in local council	IPH incidence (100 000 women)	Share of alderwomen in local council with female mayor	IPH incidence (100 000 women)
	(1)	(2)	(3)	(4)
Share of alderwomen in local council		-4.451 (5.476)		
Share of alderwomen in local council with female mayor				-5.106 (7.189)
Soil clayeyness index	0.472 (0.520)		0.489 (0.581)	
Control variables	YES	YES		YES
Province dummies (NUTS3)	YES	YES	YES	YES
Observations	611	611	415	415
R-squared		0.4585		0.5969
<i>Cragg-Donald Wald F-statistic (instrument)</i>		1.69		2.11

*Instrumental variable (IV) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Data for Italian LLMAs for alderwomen from Italian Ministry of Interior, data for soil clayeyness index from European Commission-European Soil Data Centre (ESDAC), European Commission Joint Research Center (JRC), other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

Table A5: Falsification tests. Share of local female political representatives and other crimes in Italy: IV Estimates for drug crimes and hate crimes

<i>b. All Local Labour Market Areas (LLMAs)</i>			
Dependent Variable	First stage	Second stage	
	Share of elected women in local council	Drug crimes incidence (10 000 inhabitants)	Hate incidence (1 0000 inhabitants)
	(1)	(2)	(3)
Share of elected women in local council		-10.954 (100.382)	-3.351 (3.153)
Soil clayeyness index	0.603*** (0.018)		
Control variables	YES	YES	YES
105 Province dummies (NUTS3)	YES	YES	YES
Observations	611	611	611
R-squared		0.9598	0.8344
<i>Cragg-Donald Wald F-statistic (instrument)</i>		85.63	85.63

*Instrumental variable (IV) estimation. Robust standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Data for Italian LLMAs from drug crimes from ISTAT, data from hate crimes by Lunaria, other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

Through the “plausible exogeneity” approach, we can check the validity of our IV estimates when we relax the assumptions regarding the exclusion restriction. Formally, we consider a generalized model which allow additional predetermined or exogenous regressors as follows (Conley et al., 2012)

$$y = \alpha + \beta x + \delta z + \gamma X + \epsilon \quad (A1)$$

$$x = \pi z + \xi X + \mu \epsilon + \varepsilon \quad (A2)$$

Where  $y$  is the dependent variable (incidence of IPHs),  $x$  is the potentially endogenous share of elected women in local council,  $z$  is the instrument, *i.e.* the soil clayeyness index. Looking at eq. (A1) it is clear that the instrument is allowed to have a direct impact on the dependent variable and that this effect is measured by  $\delta$ . First, we apply the “union of confidence interval” approach to the generalized model summarized by eqs. (A1-A2) (Clarke & Matta, 2018; Conley et al., 2012). Table A6 reports OLS estimates of eq. (A1). The estimated coefficient for the instrument is used by the “union of confidence interval” approach to define the support range for the exclusion restriction (Clarke & Matta, 2018).

*Table A6: IV validity tests. Plausible exogeneity approach*

Dependent variable	IPH incidence (100 000 women)
Share of elected women in local council	-4.477*** (0.372)
Soil clayeyness index	0.600 (0.884)
Control variables	YES
Province dummies (NUTS3)	YES
Observations	611
R-squared	0.185

*OLS estimation. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data for Italian LLMA from IPH statistics from Google news, observatories, newspapers and NGOs, data for soil clayeyness index from European Commission-European Soil Data Centre (ESDAC), European Commission Joint Research Center (JRC), other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

Given the estimate for the coefficient of soil clayeyness index, we allow the exclusion restriction to have support of different ranges from (0, 0.08) to (0, 2). For each support, we estimate the lower and upper bound 90% confidence intervals of the coefficient for the share of elected women in local council. Estimates are reported in Table A7. Each pair of bounds contains only negative values and always contains the estimated value for  $\beta$  (Table 2, column 2, Table A6). Hence, it appears that the impact of the share of women elected in local councils on IPHs is negative and statistically significant, even when we allow for plausible amounts of imperfect exogeneity.

Table A7. Confidence Intervals of the effect of local female representatives on IPH Relaxing the Exogeneity Assumption of the Instrument

Support for possible values of $\delta$	90% confidence interval	
	Coefficient for Share of elected women in local council ( $\beta$ )	
	Lower bound	Upper bound
$\delta \in (0, 0.8)$	-6.472	-0.257
$\delta \in (0, 1)$	-6.822	-0.256
$\delta \in (0, 1.2)$	-7.172	-0.257
$\delta \in (0, 2)$	-8.575	-0.257

*90% confidence lower and upper bounds are estimated according to the approach proposed by Conley et al. (2012). All estimates include the entire set of controls as in Table 2, and clustered standard errors at the province (NUTS3) level. Estimation following Clarke (2020)*

Then, we adopt the Local to Zero approach to “plausible exogeneity” analysis. In this case, rather than assuming simple maximum and minimum values for  $\delta$ , we formulate a distributional assumption (Clarke & Matta, 2018). So, bounds on  $\beta$  can be calculated using the entire assumed distribution for  $\delta$ . We specify the exclusion restriction to fall within a normal distribution mean of 0.6 and variance of 0.01. Also in this case, bounds on the endogenous variable  $x$  contain the estimated value for  $\beta$ , as outlined by Table A8, which corroborates the negative and significant impact of share of women elected in local councils on IPHs.

Table A8: IV validity tests. Local to Zero approach to “plausible exogeneity”

Dependent variable	IPH incidence (100 000 women)
Share of elected women in local council (confidence interval)	-3.469** (-6.351, -0.588)
Control variables	YES
Province dummies (NUTS3)	YES
Observations	611

*OLS estimation. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data for Italian LLMA from IPH statistics from Google news, observatories, newspapers and NGOs, data for soil clayeyness index from European Commission-European Soil Data Centre (ESDAC), European Commission Joint Research Center (JRC), other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

Table A9: IV validity tests. “Imperfect instrumental variables” estimates

Dependent variable	90% confidence interval	
	Coefficient for Share of elected women in local council ( $\beta$ )	
	Upper bound estimator	Upper bound confidence interval
Share of elected women in local council	-1.847	-0.369

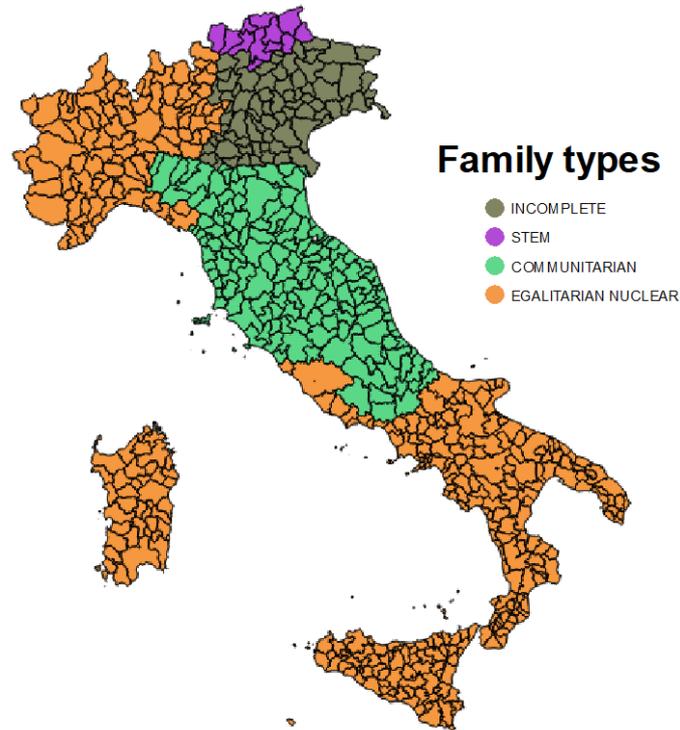
*90% confidence lower and upper bounds are estimated according to the approach proposed by Nevo and Rosen (2012). Estimation following Clarke (2020). Since the first-stage coefficient is positive, only upper bounds are returned. Estimates include the entire set of controls as in Table 2, and clustered standard errors at the province (NUTS3) level*

Table A10: IV validity tests. Reduced-form estimates

	IPH incidence (100 000 women)
Soil clayeyness index	-2.099** (0.868)
Controls	YES
Province dummies (NUTS3)	YES
Observations	611

*OLS estimation. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data for Italian LLMAs from IPH statistics from Google news, observatories, newspapers and NGOs, data for soil clayeyness index from European Commission-European Soil Data Centre (ESDAC), European Commission Joint Research Center (JRC), other data from the 2011 Population Census, and other official statistics. See main text and the Appendix for details*

Figure A1. Family types across Italian Local Labour Market Areas<sup>o</sup>



<sup>o</sup> own calculations using Todd (1990) data.

*Figure A2. Pre-Unitarian States after the Peace of Cateau-Cambrésis across Italian Local Labour Market Areas<sup>°</sup>*



<sup>°</sup> own calculations using Treccani (2010) data.

# Editorial Board

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## **Published by**

Department of Geography and Environment  
London School of Economics and Political Science  
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London  
WC2A 2AE

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