

Coming Out of the Woods. Do local support services influence the propensity to report sexual violence?

Abstract. Sexual crimes against women are severely underreported to the police, allowing for impunity of perpetrators. Observers suggest that a stimulus towards reporting the crime comes from nearby support services for victims of sexual offences - like refuges and advisors. Still, the evidence about the effects of nearby support on the reporting of sexual crimes remains scattered and mainly qualitative. This paper provides quantitative evidence on this effect, by exploiting the uneven geography of local support services which resulted in the UK after the introduction of the austerity program. Findings highlight a positive net effect of the provision of local support services on the victims' propensity to report. The positive effect holds also in the aftermath of a space-neutral high-impact media campaign empowering women to report sexual violence. This evidence relates to relevant policy implications, given that in some countries the austerity-driven cuts to public budgets have reduced and dispersed the local availability of support services, making digital support and/or helpline the only available options in many places.

Keywords: women, gender violence, austerity, policy evaluation, devolution, synthetic control, territorial injustice
JEL: H75, I12, I18, J16, J78

1. Introduction

Sexual violence, labelled as a “*global public health problem of epidemic proportions*” by the World Health Organization (WHO, 2013), has extremely high rates of underreporting (Bureau of Justice Statistics, 2018), which are associated to a high likelihood of repeated victimization, growing numbers of victims of the unreported offenders and high level impunity of perpetrators (Felson et al., 2005; González and Rodríguez-Planas, 2020). The impunity granted by underreporting makes the socioeconomic cost of sexual violence persistently high: at the European level, the annual cost of sexual violence amounts to 228 billions of euro, corresponding to 1.5% of the EU GDP (Bonnewit and DeSantis, 2016). Hence, understanding which initiatives are effective in countering the underreporting of sexual crimes is an open and highly policy-relevant question needing sound answers (Kelly, 2018; Uggen et al., 2021), but not yet supported by established evidence on the impact of the different initiatives adopted by governments (Miller and Segal, 2019).

This paper provides a contribution on the estimated impact of local support services on the victims' propensity to report, comparing changes in reporting in places where local support services are available to changes in reporting in places where local support is not provided. We target local Violence Against Women and Girls (VAWG) support services since practitioners and institutions consider the provision of evenly geographically distributed and 24/7 available VAWG support services as valuable policy to stimulate reporting by victims (Council of Europe, 2011; Council of the European Union, 2012; European Parliament, 2017; United Nations and European Commission, 2018).

Qualitative investigations on US and Europe support this perspective, showing that survivors feel more empowered after referring to a specialized support service (British Medical Association, 2014), and that specialized service relates to an improved willingness of framing the violence as a crime (Bettio and Ticci, 2017). Survey evidence on the UK and the US indicates that women using specialized services are more willing to report sexual violence to the police (Brooks and Burman, 2017; Equality and Human Rights Commission, 2020; Hester, 2018; Thiara and Roy, 2020; Xie and Baumer, 2019). Other evidence shows that the positive association between survivors' usage of specialized support and crime reporting depends on support being locally available. According to survey data from Europe and the US, survivors exposed to searching and travelling cost to find specialized support are discouraged from both seeking help and disclosing the incident (Bonnewit and DeSantis, 2016; Coy et al., 2011; Macy et al., 2010). Other evidence on Europe confirms that the lack of a nearby VAWG support service is a factor behind under-reporting (Bettio & Ticci, 2017; Imkaan, 2013). Similar seminal evidence on the US relates the provision of nearby services to an increase in reporting (McVeigh et al., 2003; Zweig et al., 2003). Scholars increasingly acknowledge the need to go beyond this small-scale qualitative evidence to get a quantitative measure of the impact of support services, (Xie and Baumer, 2019; Xie and Lynch, 2017).

Extant contributions do not convey any measure of the impact of nearby VAWG support services on the victims' propensity to report. Impact measures are important for the policymakers who are working to prioritize local VAWG support services, since these services are disappearing from many places as a consequence of the combination of austerity-driven reduction in the government spending on VAWG initiatives and of the devolution of these initiatives to the local level (GREVIO, 2019; Sanders-McDonagh et al., 2016). Evidence on the impact of VAWG support services on crime reporting is also needed to contribute to the assessment of their overall effectiveness, given that their even spatial distribution is specified as mandatory by the Istanbul Convention, the first regional legally binding instrument covering all forms of violence against women in Europe (Council of Europe, 2011). Finally, evaluating their

impact also contribute to increase the information-base on the effect of different types of policy in promoting reporting by female victims of sexual violence, allowing to detect policy complementarities as well as potential redundancies. Recent contributions have analysed the role of female police officers in the US, Brazil and India (Amaral et al., 2019; Miller and Segal, 2019; Perova and Reynolds, 2017), and in the law and enforcement stages of sexual crime reporting in Peru (Kavanaugh et al., 2017). This paper contributes to building-up this information base by estimating the effects of locally provided VAWG support services on sexual crime reporting in England and Wales. Due to the fine-grained spatial perspective used in the analysis, the paper cannot consider individual features, which are increasingly investigated in their role in sexual violence (González and Rodríguez-Planas, 2020) but are available only at higher spatial scales.

We target England and Wales for several reasons, starting from their high level of sexual offences which contributes to the UK ranking third among European countries for the share of women having experienced sexual violence (European Union Agency for Fundamental Rights, 2014). Second, following the 2010 austerity programme, the UK experienced a structural shift in the policy framework addressing VAWG, appointing local authorities as the public body in charge for the discretionary choice on the provision of VAWG support service and the consequent funding. Before 2011, VAWG support service, although already non mandatory, were financed through government grants; after 2011, only Scotland decided to shield national public grants benefitting VAWG support services, whereas England and Wales devolved the funding to the local level, at the same time slashing the flow of government grants that was overall benefitting local budgets (Hirst and Rinne, 2012)¹. The introduction of this local policy choice implied a relevant trade-off for local authorities, since it meant choosing whether to prioritize VAWG support services against other policies under tight budget constraints (Gray and Barford, 2018; Simmonds, 2016). Most local authorities did not devote local budget spending to VAWG support services, resulting in many services shutting down and in a relevant reduction in their spatial distribution, to the point that the coefficient of spatial variation jumped from 58 to nearly 83 (See Figure S1 in the Appendix).

England experienced the most significant decrease in the number of women's shelter places among European countries after 2011 (WAVE, 2013). Figures show a 15% drop between 2012 and 2010: from 4 200 to 3 577 shelter places (WAVE, 2012, 2011, 2010). Many remaining

¹ Between 2011 and 2015, the Government committed almost £40 million of ring-fenced funding to counter VAWG, dedicated to national helpline, media campaigns, and services that are activated only after a victim reports to the police, such as services within the Criminal Justice system and forensic services (All-Party Parliamentary Group on Domestic and Sexual Violence Inquiry, 2018)

shelter's places were replaced by general homelessness units where users with different needs (including men) compete for the same bed (Imkaan, 2013; Women's Aid, 2013). Further, services experienced longer waiting lists, reduced opening hours, increased use of volunteers with consequent reduction of professional support and higher rejection of victims with complex needs (Hirst and Rinne, 2012; Taylor, 2013). The decommissioning choices pursued by the majority of English local authorities caused more than 12 000 referred victims turned away from required support in 2016, amounting to the 60% of referrals (Miles and Smith, 2019; Women's Budget Group, 2019). The resulting spatially fragmented outlook of VAWG support services does not comply with the Istanbul Convention, making the UK the last Western European country to still ratify the legally binding agreement (Council of Europe, 2020). This picture combines with the concurrent reduction in Government funding for local authorities, by far the largest cut performed under austerity and impacting the scale of local welfare support, with reduction of specialized services, higher eligibility thresholds and competition between different vulnerable groups across all sectors (Gray and Barford, 2018).

Our analysis takes advantage of the shift in the policy framework for the provision of VAWG support service, and of the resulting different policy choices made at the local level. The spatial heterogeneity in nearby VAWG support services resulting from the distinctive choices made by local councils in 2011 gives room for a comparative case study to assess the impact of the local policy for VAWG support services on crime reporting. This impact can be inferred as follows. First we estimate the changes in the propensity to report sexual crimes to the police in a place that adopted a local policy to shield the local support services after the termination of Government support. Then, we compare these changes with the changes in the propensity to report sexual crimes in places that are similar to this place, except for the choice of shielding the existing local provision of support services. To identify the treated place and the places used for comparison, we mapped the local authorities of England and Wales along two dimensions. First, we recorded the places that implemented a local policy for VAWG support services after 2011, collecting spatially fine-grained data about the changing landscape of VAWG service provision from different sources (Coy et al., 2011; Grierson, 2018; The Bureau of Investigative Journalism, 2017; Towers and Walby, 2012). Second, given that our chosen proxy for the victims' propensity to report is given by police records as done in the related literature² (Card and Dahl, 2011; Hagan

² It is important to recall that another established proxy used to measure the propensity to report sexual crimes is evidence from victimization surveys (Miller et al., 2020). The Crime Survey for England and Wales addresses sexual violence with the primary aim of providing national-level estimates. It does not provide robust information at the local authority level, due to sample-design limitations applied to assure the anonymity of respondents (ONS, 2020). Therefore, it is not a suitable option to investigate reporting of sexual violence at the local level, which is the purpose of this study.

et al., 2018; Lindo et al., 2018), we also mapped the places where sexual crime records represent an accurate measure for reporting to the police before and after austerity, since they do not suffer from misrecording/unrecording and other biases that may affect police activity (Long, 2019). By designing a novel database containing evidence on these two dimensions, we are capable of identifying Brighton and Hove as the appropriate place to scrutinize.

After 2011, the Brighton and Hove Council devoted a share of local budget spending for the provision of VAWG support services notwithstanding the sizeable austerity-driven cuts in the government grants flowing to the local budget (National Audit Office, 2019). Figures show that the trend in police records on sexual crimes against women aged 16 and above in Brighton and Hove after 2011 is steadily above the same trend for England and Wales, and the local police force displays a good quality in the management of the reports of sexual offences, alleviating concerns about measurement bias on our proxy for the propensity to report. Through the Synthetic Controls Method (Abadie et al., 2010), we estimate the evolution of reporting in Brighton and Hove against the evolution of reporting in a synthetic counterfactual designed from a weighted average of places that were similar to Brighton and Hove before the introduction of the local policy. We further assess the robustness of the results through the Generalized Difference-in-Difference approach and the Trajectory Balancing approach, which are competing statistical approaches to assess the impact of the policy intervention (Hazlett and Xu, 2018; Varian, 2016).

Our estimates highlight that the introduction of the policy resulted in increased reporting for each year after the introduction of the policy. The results hold to the inclusion of local socioeconomic features which may contribute to influencing the propensity to report sexual assaults, as well as to the inclusion of the potentially competing policy initiatives. Further, results appear robust to different sample sizes of the local authorities used to design the synthetic counterfactual. This alleviates “cherry picking” concerns inherent to the Synthetic Controls Method approach. Findings show that the positive effect of the local provision of support services is not substituted for by the high-profile media campaign supporting victims of sexual offences that happened in the UK between the end of 2012 and the beginning of 2013. This campaign, labelled the “*Yentree effect*”, is considered as a trigger in women’s propensity to report sexual offences (Office for National Statistics - ONS, 2018a) and it relates to the analogous “*Weinstein effect*” (Maddaus, 2018), introduced after the global media reach of the #*MeToo* movement. Our results show that although the “*Yentree effect*” actually boosted the propensity to report, the local provision of VAWG support services still determined a higher propensity to report compared to places which experienced only the “*Yentree effect*”.

This paper expands on previous research along several dimensions. First, it adds quantitative evidence on the beneficial effect of VAWG support services on reporting to the existing qualitative evidence (Bettio and Ticci, 2017). Second, it integrates existing evidence within the economics of crime literature on institutions and violence against women by analysing the role of the local provision of support services (*i.a.* Amaral et al., 2019; Miller and Segal, 2019). Notably, our results hold when we include the already identified positive effect exerted by other policies. Third, it provides information on how to reduce underreporting, which is a major barrier to obtaining reliable estimates of the prevalence of sexual violence (Ellsberg and Heise, 2005; Miller et al., 2020; Xie and Baumer, 2019). Forth, the paper contributes to the quantitative investigation of crime reporting as an outcome in the social sciences, a topic which is acknowledged as relevant but still under investigated (Aizer and Dal Bó, 2009; Hagan et al., 2018; Small, 2018). Fifth, it contributes to the evidence on the geographies of territorial injustice resulting from the austerity (Gray and Barford, 2018). Finally, it also refers to the literature analysing the role of local policies and local conditions in influencing population behaviours (Wright et al., 2020).

The remaining of the paper is organized as follows. First, we provide a background description of the effect of VAWG support services in supporting survivors, together with the recent history of the provision of VAWG support services in England and Wales and the description on the selected case for the case study analysis. Then, we explain the proposed empirical approach and we detail the characteristics of the database. Results are then presented and discussed and, finally, conclusions are detailed.

2. Relevant Literature and Case Selection

2.1 Effective policy for VAWG support services and policy approach in England and Wales

This section begins with a review of existing literature and qualitative evidence showing that local VAWG support services are associated to higher propensity to report sexual offences to the police. Afterwards, it describes why England and Wales represent an interesting case study to perform a quantitative investigation to provide a measure of the impact of local VAWG support service on the reporting of sexual violence.

VAWG support services provide confidential and dedicated support including safe locations to stay, legal advice and psychological help (Walker et al., 2019; Xie and Lynch, 2017). Through safe housing provision and legal/psychological advice, VAWG support services counter two of

the main reasons beyond nonreporting: fear of retaliation and fear of stigma/blame by the police (Wolitzky-Taylor et al., 2011). Survey evidence shows that survivors of sexual crimes are more willing to report the crime after receiving actual information on the reporting process (including dispelling of prejudices) and assistance towards independence by VAWG support services (Boba and Lilley, 2009; Fahmy et al., 2016; Hester, 2018; Hester and Lilley, 2018). Notably this happens notwithstanding that VAWG support services do not require the survivors to report offences to the police. Qualitative evidence on Scotland (Brooks and Burman, 2017) and England (Hester, 2018) correlates usage of specialised services with higher likelihood of reporting the crime to the police. The same association is supported also by evidence on the US (Xie and Baumer, 2019) and other European countries (Bettio and Ticci, 2017). Interview data on UK minoritized women shows that cultural and linguistic mediation is another relevant way through which VAWG services lead to a proactive attitude towards police reporting (Thiara and Roy, 2020). Overall, this bulk of qualitative evidence suggests that usage of specialized services increases reporting to the police. Hence, there is room for a thorough quantitative investigation on the role of support services in influencing police reporting, as called for by researchers (Xie and Baumer, 2019).

Further evidence relates the positive effect of VAWG support services in stimulating reporting with their geographic distribution. In particular, data outline that the positive association between survivors' usage of specialized support and crime reporting depends on support being locally available. Surveys on the US and the UK highlight that survivors looking for help are discouraged by searching, travelling and waiting (MacDonald et al., 2020; Miles and Smith, 2019; Xie and Lynch, 2017), to the point of not disclosing the incident even when it implies remaining with an abusive partner (Coy et al., 2011; Miles and Smith, 2019). Descriptive evidence on Europe further support the negative effect of searching and travelling cost on the propensity to seek help and disclose the incident by victims (Bonnewit and DeSantis, 2016). Other data on Europe confirm that the lack of a nearby VAWG support service is a risk factor behind under-reporting (Bettio & Ticci, 2017; Imkaan, 2013). Similarly, seminal evidence on the US relates the provision of nearby services for victims to an increase in reporting (McVeigh et al., 2003; Zweig et al., 2003). Novel spatial evidence on reporting delay on the US supports the negative effect of unavailable local support on the reporting of sexual crimes by providing an association between delay in reporting rape and federal holiday, when many services are likely to be closed (Klemmer et al., 2021).

These bulks of evidence support scholars and institutions in arguing that the effectiveness of VAWG support services depends on them being evenly geographically distributed and 24/7 available (Christofi et al., 2017; Kelly, 2018; Macy et al., 2010). The local availability of VAWG

support services also signals that there is a local commitment to a culture of respect of women, which can contribute to reducing the perception of socio-cultural prejudices (Ellsberg et al., 2015; Iyer, Mani, Mishra, & Topalova, 2012). Nonetheless, the geography of VAWG support services has been negatively affected by the cuts to the public budgets driven by austerity (GREVIO, 2019; United Nations and European Commission, 2018), increasing territorial injustice for survivors and the high cost paid by women (Holly, 2017).

In England and Wales, the provision of VAWG support service is insufficient both in terms of overall capacity and of geographic evenness. Both nations fail to meet the Istanbul Convention requirements. As a consequence of the austerity cuts, in 2015 England was short of 1 646 out of 5 233 refuge places for women having experienced a sexual crime, corresponding to a 31.51% shortage (House of Lords House of Commons, 2015); Wales displayed a shortage of around 25% (Lesur, Stelmaszek, & Iris, 2014). In 2016, figures worsened: nearly 12 000 referred female survivors were turned away from refuges, amounting to the 60% of referrals (Miles and Smith, 2019). Alongside the overall lack of capacity with respect to actual needs, also the uneven spatial distribution of VAWG specialised services in England and Wales is a source for concern (Taylor, 2013), and the situation of survivors of social violence was labelled as a “*a postcode lottery*”, due to the critical impact of the place of residency on the availability of support (Simmonds, 2016).

The outlook of VAWG support service in England and Wales follows from the 2011 shift in the policy framework for the provision of VAWG support service due to the austerity program. Before 2011 the funding of VAWG support services pivoted on state-level ring-fenced grant flowing to local authorities on the basis of the local assessment of need (Heady et al., 2011; Hirst and Rinne, 2012), although with no mandatory commitment for local authorities on the provision. Figures show that the provision of VAWG support services grew across places (Towers and Walby, 2012). In 2011, the state level austerity programme introduced a structural shift from state-level funding to local commissioning, overall devolving to the local authorities the scope, the scale, the nature and the funding of the local VAWG services endowment (Hirst and Rinne, 2012). While stressing the local commissioning, the austerity programme also imposed relevant cuts to local public budget spending through the reduction of the overall flow of state-level grants to local budgets (Gray and Barford, 2018; Hastings et al., 2015). Hence, local authorities had to decide whether or not to realize and finance VAWG support services considering their tight budget decisions about which services to either prioritise or cut (Hirst and Rinne, 2012).

The sizeable impact of the severe budget cuts on the local availability of VAWG support services has prompted several investigations to collect spatial evidence about the effect of

austerity on the supply of specialized services for female survivors of sexual violence (Coy et al., 2009; Grierson, 2018; Holly, 2017; The Bureau of Investigative Journalism, 2017; Towers and Walby, 2012). By collecting and analysing this evidence, it emerges that: (i) more than 75% of England's local authorities slashed their spending on VAWG services between 2011 and 2017 (Women's Budget Group, 2019); (ii) a 18% net reduction was recorded in the number of local VAWG support services between 2009 and 2017; (iii) the drop in the spatial coverage of services was around 25%. This “*postcode lottery*” of VAWG support services was also recently acknowledged by the First Report of the Joint Committee on the Draft of the Domestic Abuse Bill (House of Commons Education Committee, 2017), suggesting that the 2011-2015 implementation of the cross-governmental strategy to tackle violence against women and girls had not been effective in countering the spatial thinning of specialised services fuelled by austerity, due to both the strong reduction of public funding³ and the lack of mandatory duty for local authorities (UK All-Party Parliamentary Group on Domestic and Sexual Violence Inquiry, 2015).

Given that the provision of VAWG support services was not mandatory, local authorities were allowed to choose whether to prioritise them or not in the light of the reduced flows of government grants. This local policy choice was not only a measure through which the local level public spending substitutes for the state-level spending, but also a measure that prioritises VAWG services against other services within the local budget. In fact, alongside the reduction to state-level public spending for VAWG specialised services, the austerity also implied a reduction in the state-level grants which were previously contributing to the total budget of local governments (Gray and Barford, 2018). Local authorities councils across England and Wales made different decisions, with the majority of them deciding not to prioritise the implementation of local policies for VAWG support services (Women's Budget Group, 2019). Notably, all types of VAWG services providers – public and private – were depending on the implementation of a financed local policy⁴ (Heady et al., 2011; Women's Aid, 2015).

After the different choices on the implementation of the local policy resulted in a strongly uneven geography of support services, a relevant space neutral event occurred – anecdotally related to an increase in the propensity to report sexual crimes –, namely the high-impact media

³ The 2003-2009 state-level dedicated grants for VAWG specialised support in the supporting People Programme amounted to £68.8 million (Ashton and Hempenstall, 2009). The 2011-2015 cross-governmental strategy to counter VAWG had a total endowment of almost £40 million mainly devoted towards state-level programmes and towards services that activate only after a survivor enters the criminal justice system (UK All-Party Parliamentary Group on Domestic and Sexual Violence Inquiry, 2015). The financial support to local commissioning had to share the remaining state resources with other purposes, such as state-level campaigns and international schemes, children abuse and youth gang (Home Office, 2014).

⁴ On average, more than 50% of funding for non-statutory organisations providing VAWG support services comes from the local authority (Women's Aid, 2015).

campaign on sexual violence labelled “*Yentree effect*” (Office for National Statistics - ONS, 2018a). Starting from an ITV programme broadcasted at the end of 2012 which featured five women recounting being abused by the late television presenter Jimmy Savile during the 1970s, a police investigation – labelled “*Operation Yentree*” – started to subsequently broaden to include other perpetrators due to hundreds of survivors coming forward to report sexual assaults committed by other people. High-profile media coverage of sexual offences is conjectured to exert a positive influence on women’s willingness to report sexual offences by reducing the feeling of isolation (Mendes et al., 2018). This effect is not spatially limited, due to the national and/or global reach. Our analysis allows to gauge some evidence on whether this effect acts as a substitute for the provision of nearby VAWG support services in influencing survivors’ propensity to come forward.

2.2 Case selection: Brighton and Hove

This section presents the design of the comparative case study through which we measure the impact of VAWG support services on the reporting of sexual violence. We provide a description of the sample selection procedure, followed by a detailed account on the choice of Brighton and Hove as unit of investigation.

Considering the spatial heterogeneity in the discretionary choice of implementing a local policy for the provision of VAWG support services across England and Wales, we build our comparative case study approach starting from the identification stage to detect a place that implemented the local policy (treated unit) and the places against which we compare the treated unit. We begin with the design of the database mapping England and Wales according to places that adopted the policy against places that decommissioned, collecting data on the local authorities’ decisions on whether or not to implement the local policy for VAWG support services after 2011 through various sources (Coy et al., 2011; Grierson, 2018; Holly, 2017; The Bureau of Investigative Journalism, 2017; Towers and Walby, 2012). These decisions were adopted at the Upper-Tier Local Authority (UTLA) level (for their geography, see Appendix Figure S2.a). According to the collected evidence, 12 UTLAs decided to adopt a local policy for specialized support for victims of sexual offences after 2011 (Appendix Figure S3.a).

In the second step of the database construction, we identified our proposed measure for the propensity to report sexual offences in England and Wales following the established literature in using police records (Card and Dahl, 2011; Lindo et al., 2018). Thus, we collected data from 2004 to 2016 on police records referring to sexual crimes (rape and sexual assaults) against women aged 16 and above. These data are available from the UK Home Office and they are collected at the Community Safety Partnerships (CSP) level. The 315 CSPs are statutory bodies for

England and Wales and the smallest spatial units on which data on records of sexual crimes against women are available (Appendix Figure S2.b). We discarded data relating to 2003 backwards since they were classified differently and cannot be compared with subsequent years. Being the propensity to report the focus of our investigation, we consider the CSPs as the spatial units for our comparative case approach. Hence, we map the policy choices adopted by each UTLA on the corresponding CSP. Out of the 12 UTLAs which adopted a local policy for specialized support for victims of sexual offences after 2011, 11 UTLAs correspond to a single CSP each. The remaining UTLA – Hertfordshire – corresponds to 6 CSPs, thus we mapped the policy choice on each one of the 6 CSPs. These 17 CSPs constitute the potential group of treated units for our comparative case study, leaving the remaining 298 CSPs as potential contributors to the donor pool.

As third stage, we checked for the accuracy of police record data as proxy for the propensity to report, in order to avoid measurement bias. We exploited the independent annual audit reports on the police force areas by Her Majesty's Inspectorate of Constabulary (2014), which is a rolling programme of inspections on the integrity of sexual crime data. The audit classifies police force by three areas of risk in handling reports of sexual crimes: misrecording, misclassification, and incorrect cancellation. Based on this classification, the audit grades police force according to five relevant categories: (i) "Outstanding", (ii) "Good", (iii) "Requires Improvement without causes of concern", (iv) "Requires Improvement with causes of concern", (v) "Inadequate". Grades (i)-(iii) do not have causes of concern in the handling of sexual crimes reports (Her Majesty's Inspectorate of Constabulary, 2018). Therefore, we kept all the CSPs whose police force fell in these three categories. We dropped the CSPs whose police force was classified in categories (iv) and (v). Overall, we discarded 176 CSPs in which the local police force suffered from inaccuracy in the handling of the records referring to sexual offences (Appendix Figure S3.b). In the 139 remaining CSPs characterized by suitable proxies for measuring the propensity to report sexual crimes, only 2 out of the 17 CSPs which adopted the local policy remained, namely Brighton and Hove and Waltham Forest. The latter was discarded, since it may be affected by spatial spillovers due to its belonging to the London area, where VAWG support services provided by the different London Boroughs are reachable with limited travelling and searching costs.

Thus, through stages 1-3 we identified Brighton and Hove as our treated place. Brighton and Hove City Council chose to allocate local budget shares to the provision of VAWG support service to accomplish the goals of its 2011 Sustainable Community Strategy. This strategy pursued the provision of local services for residents' well-being even in time of austerity (Brighton & Hove City Council, 2011; Safe in the City, 2011). Gender equality and the

commitment to respect to women were among the well-being goals, to be fulfilled also upgrading existing policies against sexual violence (Brighton & Hove City Council, 2018a; Safe in the City, 2017, 2011). The 2011 Sustainable Community Strategy had a section on VAWG support services which was sustained by a comprehensive needs' analysis to get a more informed understanding of the demand for services, what worked, and what needed to change (Brighton & Hove City Council, 2012; Safe in the City, 2011). This analysis informed the subsequent development of commissioning for VAWG services, which assured increasing expenditure from 2011 to 2016 (Appendix Table S1.a) (Brighton & Hove City Council, 2020a, 2020b, 2018b, 2018a, 2015). The allocated budget allowed for yearly upgrades in both capacity and quality of the existing services – a rape centre, domestic violence specialized support, sexual assault health support – which were previously financed through government grants (Brighton & Hove City Council, 2012).

The post-2011 local policy secured also the provision of new services. First, a drop-in safe space to access information and specialized advice run by the local sexual violence charity and police force (Brighton & Hove City Council, 2014). Second, independent sexual violence advisors (Safe in the City, 2012), to provide victims with non-statutory consultants tailoring available support to them and co-ordinating the available services on their behalf, reducing attrition with statutory agency and searching and waiting time. Third, a local “one-stop-shop” providing a single point of access for local specialized advice and support (Brighton & Hove City Council, 2018a). Forth, community engagement activities to expand the local commitment in countering sexual violence. These activities also included free training and ongoing support to enable residents to start conversations about abuse, knowing where help is available (Brighton & Hove City Council, 2016a) and a program to engage schools (Safe in the City, 2012). Fifth, awareness campaigns to spread the knowledge on the local help available, with specific actions targeting minoritized women and university students (Brighton & Hove City Council, 2012).

Overall, the local policy broadened the receiving capacity of VAWG support service, allowed answers to specific survivors' needs, and increased the services' visibility and signalled commitment. According to sexual violence literature, these features stimulate service usage by reducing searching, travelling and waiting costs for survivors (Bettio and Ticci, 2017; Bonnewit and DeSantis, 2016; Ellsberg et al., 2015). This seems to apply also in Brighton and Hove, as outlined by comparing figures on service usage between 2010 and 2016 with the local prevalence of sexual violence. With the introduction of the local policy, VAWG support services usage grew by more than 50%, highly specialized support by 150% (Appendix Table S1.b), while the estimated local prevalence of sexual violence, measured through victimization survey, aligned with national average (Safe in the City, 2011), which had a declining trend (Office for National

Statistics - ONS, 2017a, 2017b). Importantly, also reporting of sexual violence to the police grew starting from 2011. This descriptive evidence suggests a positive association between the service provision granted by the local policy and reporting of sexual violence to the police, and no correlation with the local prevalence of sexual violence. This is consistent with extant survey evidence on several countries (i.a. Brooks and Burman, 2017; Hester and Lilley, 2018; Xie and Lynch, 2017), providing support for a quantitative investigation.

It is worth mentioning that Brighton and Hove did not prioritize VAWG support services at the expenses of other social services or abuse programs. Services devoted to social care, social vulnerabilities and abuse prevention were shielded (NAO, 2020), while other areas such as infrastructure, planning and culture experienced sizeable reduction in funding⁵. Also, data indicate that Brighton and Hove belongs to the share of UTLAs suffering from a higher reduction in government funding compared to the remaining UTLAs (NAO, 2019). Hence, the local policy choice of providing VAWG support services was not done benefitting from a milder impact of the austerity programme with respect to the UTLAs that decided to reduce public support to VAWG services.

Stage 4 allowed to identify the comparison group made by suitable untreated places to be exploited in the design of the counterfactual. We assessed the suitability of the comparison group according to our chosen estimation methodology, *i.e.* the Synthetic Control Method approach (Abadie, 2019; Abadie et al., 2015). Hence, we dropped places: *(i)* affected by idiosyncratic structural process that may affect the outcome of interest; *(ii)* benefitting from similar types of interventions with respect to the one that we are evaluating; *(iii)* different from the treated place with respect to the pre-2011 endowment, type and capacity of VAWG support services. We applied these criteria to our potential comparison group of 137 Community Safety Partnerships (CSPs), which provided suitable proxies for measuring the propensity to report sexual crimes and which did not implement any local policy for nearby support services after 2011. We dropped Westminster for its relevant and idiosyncratic night economy with structural consequences also on the size of sexual crimes. Westminster has the largest night economy of the UK, more than three times larger than the London average (Office for National Statistics, 2019), and one of the largest in the world. This huge night economy is acknowledged to be associated to Westminster's rate of sexual violence reports, which is the highest in the UK and more than 100% higher than both the London average rate and the Brighton and Hove rate

⁵ Between 2011 and 2016, the Brighton and Hove City Council applied the following reduction in service expenditure: Highway and Transportation -88.3%; Planning and Development -46.3%; Culture -45.3%; Environment -37.3%; Adult Social Care -11.8%. Children Social Care had a 2.1% increase in service expenditure. Temporary Accommodation services which includes refuges and shelters had a 230% increase in service expenditure (NAO, 2020). In 2010, one year before austerity, Adult and Children Social Care spending amounted to 48.6% of total service expenditure in Brighton and Hove, to reach 61.3% in 2016 (NAO, 2020).

(Appendix Figure S3.e) (Office for National Statistics - ONS, 2018a). These sizeable and structural discrepancies prevent it from being a comparable unit with the rest of England and Wales (Abadie, 2019; Abadie et al., 2015). We dropped 3 other CSPs (Preston, Lincoln and Ceredigion), because they benefitted from new rape centres financed directly by the UK Government between 2010 and 2015 (The UK Ministry of Justice, 2015). Finally, we restricted the donor pool to those CSPs having the same pre-2011 support services for victims of sexual offences as Brighton and Hove, where the local provision of VAWG support services amounted to domestic violence support services and a women’s refuge. Hence, we dropped 49 CSPs not matching these types of support, which also coincide with the CSPs not having any type of VAWG support services prior to 2011 (Coy et al., 2011, 2009, 2007). This final restriction aligns with the requirement of restricting the donor pool to places with characteristics that are similar to the treated place. It also follows from the assumption that the opportunity cost of starting a local provision of specialised VAWG support services is different between places which did not have to bear the start-up costs for providing new services and places which had to evaluate also to bear the cost of building-up services. Table 1 summarises the four stages.

Table 1. Selection of Community Safety Partnerships (CSPs) considered in the donor pool

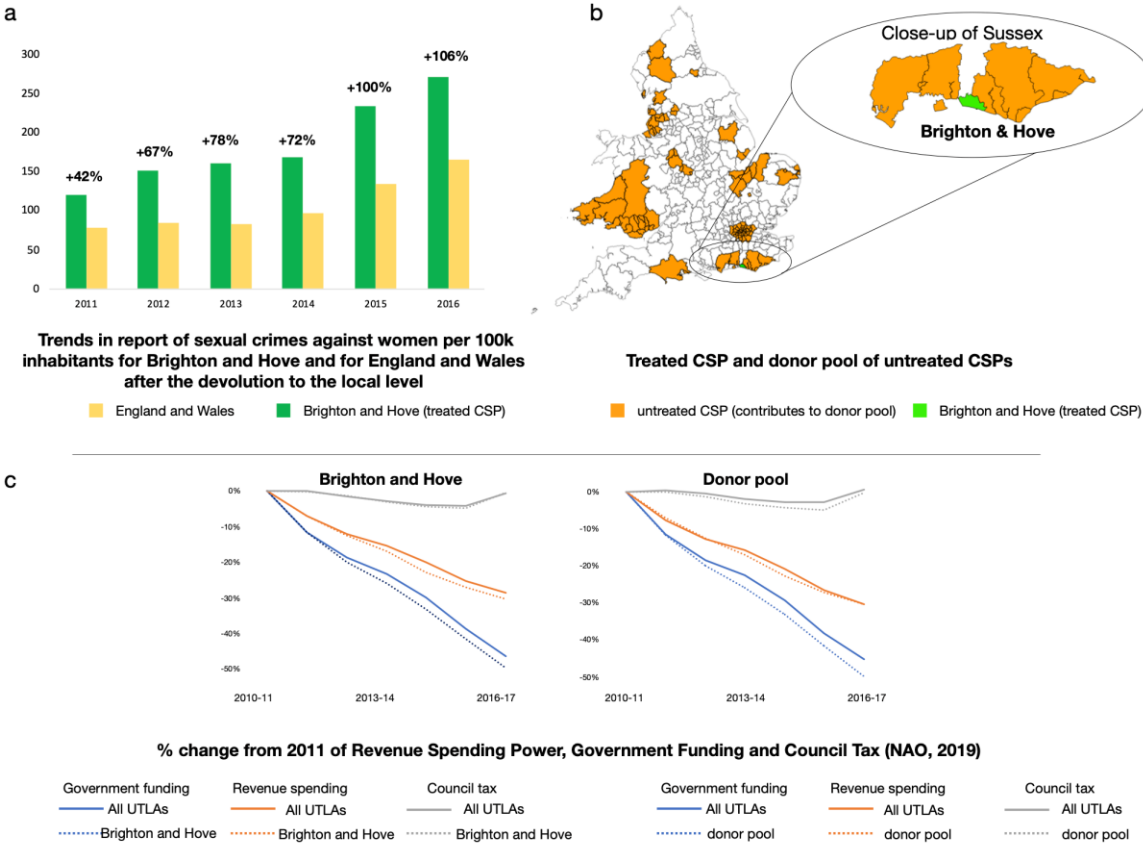
CPSs	Donor pool
Inaccurate police records	dropped
Same local policy	dropped*
Close-but-different policy	dropped ^o
Idiosyncratic shock	dropped [^]
Different types of WAVG support services before 2011	dropped
No VAWG support services before 2011	dropped
Total CSPs in the donor pool	84
Total CSPs dropped	230

* After dropping the CSPs with inaccurate police records, there is only one CSP - Waltham Forest - to be dropped due to the implementation of the same local policy.
^o 3 CSPs (Preston, Lincoln, Ceredigion) are dropped because they benefitted from new rape centers financed directly by the UK Government between 2010-2015.
[^] Westminster is dropped for its idiosyncratic night economy and the consequences on the volume of sexual assaults.

The resulting donor pool consists of 84 places (see Figure S3.c-S3.d), which will be exploited to design the counterfactual on which to assess the impact of the policy adopted by Brighton and Hove. Figure 1.b summarizes the geography of the places that contribute to our comparative case study. Figure 1.c shows the effect of austerity in the local authority budget for Brighton and

Hove and for the donor pool. It is straightforward to notice that the reduction in resources is extremely similar in both cases, alleviating from endogenous placement of the policy concerns.

Figure 1. Outline of the selected case study. Figure 1.a: Trends in the reporting of sexual crimes against women above 16 in Brighton and Hove (in green) and in England and Wales (in yellow). Figure 1.b: Map of the sample of places considered for the Synthetic Control Method. Brighton and Hove is coloured in green, the 84 places coloured in orange contribute to the design of the counterfactual unit which mimics Brighton and Hove in the absence of the intervention. Sussex is the county that comprises Brighton and Hove. Figure 1.c: 2010-2017 trends in the budget for Brighton and Hove and for the donor pool compared with the rest of local authorities.



3. Methodology and Data

Having outlined the characteristics of our comparative case-study, the next step is presenting our chosen method to estimate the impact of local VAWG support services on the propensity to report sexual crimes. This section details the empirical approach that we use in the analysis, followed by the description of the data used in the estimation.

We measure the impact of the local policy under investigation through a comparative study approach, by comparing the trend of the outcome variable of interest between the unit

experiencing the policy and a set of units that are similar to the treated unit but were not experiencing the policy. We consider the Synthetic Control Method (SCM) that compares the treated unit to a synthetic control unit designed through a combination of untreated units belonging to a donor pool (Absher et al., 2020). The SCM is an appropriate method for our case-study investigation as it has been specifically designed to quantitatively measure the impact of policy interventions affecting one (or few) sizeable unit, like a city, while only a moderate number of control units is available (Abadie, 2019; Cunningham, 2021; Cunningham and Shah, 2018; Peri and Yasenov, 2016). With respect to traditional regression analysis techniques that require large samples and many observed instances of intervention of interest, the SCM represents a suitable approach to assess the impact of a sporadic event such as policy intervention resulting from a new policy framework (Abadie, 2019). The SCM exploits a data-driven methodology to design the counterfactual, by selecting through a weighting process the combination of untreated units from the donor pool which provide the best pre-treatment match with the treated unit. Through this, the SCM accounts for a drawback of comparative case studies of this type given by the lack of formalization of the selection process for the comparison units (Abadie, 2019). Finally, compared to competing methodologies within the comparative study approach, the SCM accounts for both observed and unobserved time-varying confounding that may influence the outcome. Formally, recall that the spatial unit of observation is the Community Safety Partnership (CSP) and let D_{it} be the indicator for the local policy implemented in the CSP_i at time t . Let y_{it}^N be the counterfactual, that is the propensity to report that would have been observed for the CSP_i at time t in the absence of the policy. Then, we express the propensity to report sexual offences to the police in the CSP_i at time t as follows (Abadie et al., 2010)

$$y_{it} = \alpha_{it}D_{it} + y_{it}^N = \alpha_{it}D_{it} + (\delta_t + \theta_t X_i + \lambda_t \phi_i + \xi_{it}) \quad (1)$$

where y_{it}^N is given by the sum of a time effect, δ_t , vectors of observed and unobserved predictors of y_{it}^N not affected by the policy, X_i and ϕ_i , and the error terms, ξ_{it} . Now let the only CSP exposed to the policy be the first one, then the treatment effect of interest $\hat{\alpha}_{1t}$ is estimated by approximating y_{it}^N with a weighted average of the untreated CSPs in the donor pool,

$$\hat{\alpha}_{1t} = y_{1t} - \sum_{i=2}^{I+1} w_i y_{it} \quad (2)$$

for $t \in \{T_0 + 1, \dots, T\}$. Weights w_i are such that $0 \leq w_i \leq 1$ for $i=2, \dots, I+1$ and $w_2 + \dots + w_{I+1} = 1$. $T_0 + 1$ is the year of the policy introduction, T is the total number of considered years and $I+1$ is the total number of CSPs in the sample. Therefore, the synthetic counterfactual is the time-invariant weighted average of the available control units within the donor pool, which prior to the intervention had similar pre-intervention characteristics and outcome trajectory to the treated unit (Kreif et al., 2016). For the SCM to be effective, the synthetic counterfactual must be extremely similar to the treated unit, a feature that is assessed estimating X_i and ϕ_i in the pre-

intervention periods, at the same time accounting for potential specification issues and their potential estimation bias. To this regard, there is a trade-off about the efficiency of the SCM depending on the number of lagged values for the outcome variable to consider. By increasing the considered lags, the weights assigned to the control variables get reduced and this can reduce efficiency. At the same time, when increasing the t it is possible that the efficiency of the SCM gets reduced. But at the same time, increasing the considered lags allow to take more care of unobserved confounders (Athey and Imbens, 2017; Kaul et al., 2015). We assess this issue by estimating several SCM specifications, that differ with respect to the predictors included in X_i and ϕ_i . More into details, in each considered SCM specification we vary X_i and ϕ_i with respect to: (i) M linear combinations of y in the pre-treatment periods; (ii) r other covariates with explanatory power for y , again in the pre-treatment period. These variables are used by the SCM to compute the combination of the donor units capable of minimizing the difference of the predictors' values of the treated and the counterfactual units. Hence, by varying these variables, the SCM can attribute different weights to the CSPs in the donor pool and determining different impact for the policy (Kaul et al., 2015). To account for these specification issues, we evaluate the goodness-of-fit of our chosen SCM specification against other considered SCM specifications to check whether results and inference change (Ferman et al., 2020).

The analysis estimates also a Generalized Difference-in-Difference (GDID) model and a Trajectory Balance (TJBAL) approach, representing competing specifications to the SCM, to check whether results are robust to the distinctive assumptions associated to the different methodologies. The GDID exploits the longitudinal dimension of our data by constructing the counterfactual without assigning weights to the units belonging to the control group. Formally, we consider the following GDID model expressed through a two-way fixed effect regression model (Bertrand et al., 2004; Wing et al., 2018)

$$y_{it} = \gamma_i + \mu_t + \delta_1 D_{it} + \delta_2 X_{it} + \epsilon_{it} \quad (3)$$

where γ_i are CSP fixed effects and μ_t are year fixed effects. D_{it} is the treatment variable which is equal to one if a CSP i is treated at time t and 0 otherwise, and X_{it} is a matrix of the observed characteristics that have been considered as potential confounders in the SCM. In the GDID specification, the impact of the local policy is captured by the estimate of δ_1 . As robustness check, we also estimate a baseline Difference-in-Difference (DID) model in which we collapse the pre-intervention years on a single pre-intervention period by averaging the 2004-2010 data about each variable for each CSP and we repeat the same process for the post-intervention years. Finally, we also consider an alternative re-weighting strategy for the units in the control group with respect to SCM, given by the TJBAL approach. We consider two balancing approaches: (i)

the mean balancing, which reweights control units such that the averages of the pre-treatment outcomes and covariates are approximately equal at each point in time between the treatment and (reweighted) control groups; and (ii) the kernel balancing with intercept shift which goes beyond the mean balancing on the average trajectory by allowing for volatility and variance in the pre-treatment trajectories of the outcome and the covariates through a kernel-based feature expansion (Hazlett and Xu, 2018). These balancing approaches work properly also with short pre-treatment time periods that can reduce the SCM efficiency, rely on less stringent assumptions than the SCM on the structure of the data (Hazlett and Xu, 2018).

We apply these estimation strategies to a database containing the year observations for the 85 spatial units in the 2004-2016 time span, providing 7 years of pre-intervention data. To define the synthetic control model specification, the pre-intervention periods is set between 2004 and 2010, since the devolution to local bodies became operative in 2011. We measure the rate of sexual violence reports through the number of police records of sexual crimes on women above 16 per 100 000 women above 16, following established literature (Card and Dahl, 2011; Lindo et al., 2018). We collected analogous time-series for potential confounders for women's vulnerability and for their propensity to report, as well as proxies for the local level propensity to report violent crimes that we include in the estimation as control variables (Aizer, 2010; Anderberg et al., 2016; González and Rodríguez-Planas, 2020; Miller and Segal, 2019; Tur-Prats, 2021). To this regard we consider local level data from administrative sources on: the share of unemployment, the real wage of female workers (2001 CPI), the share of female population aged 16-44, the share of female police officers, the homicide rate, the drug possession rate and the share of foreign population (see Appendix Tables S2-S3 for Data Sources and Descriptive Statistics).

4. Results

This section presents the main findings resulting from the empirical analysis. The SCM evaluates the impact of the introduction of the local policy in Brighton and Hove by measuring the estimated difference in the propensity to report between Brighton and Hove and its synthetic counterpart. The reliability of the SCM results hinges on having a good level of affinity for the propensity to report sexual offences between Brighton and Hove and its synthetic counterpart in the absence of the local policy, so that it is reasonable to assume that the synthetic counterfactual can effectively reproduce Brighton and Hove. This is the case if the synthetic counterfactual mimics the actual Brighton and Hove before the policy intervention (Abadie,

2019). To gauge this affinity, we estimate the pre-intervention values for a set of predictors, namely several pre-intervention values for the outcomes and the other covariates which account for (i) demographics, (ii) economic features influencing women’s vulnerability, (iii) crime features, and (iv) other public policies (Aizer, 2010; Anderberg et al., 2016; Miller and Segal, 2019), and we compare them between Brighton and Hove and its synthetic counterpart.

Table 2⁶ provides these estimates, showing that the values of the predictors in the pre-intervention period are quite the same between the actual Brighton and Hove and its synthetic counterpart.

Table 2. Estimates of the pre-treatment fit between Brighton and Hove and its synthetic counterpart for the main Synthetic Control Method (SCM) specification.

Variable	Brighton and Hove	
	Real	Synthetic
Reporting sexual crimes on women in 2009	4.98830	4.9999
Reporting sexual crimes on women in 2007	4.82755	4.8377
Reporting sexual crimes on women in 2005	4.97569	4.9862
Unemployment	6.73178	6.7506
Real wage of female workers	6.28467	6.2979
Female population between the ages of 16 and 44	0.4848	0.48774
Drug possession	-0.1437	-0.14462
Female police force	0.26208	0.2616
Pre-intervention RMSPE	0.0659	

Notes: all variables, except lagged reporting of sexual crimes, are averaged for the 2004-2010 period. Reporting of sexual crimes is measured as the rate of sexual violence reports on women over age 16 per 100 000 women over age 16 in the CSP (logs). Unemployment is in share. Real wage of female workers is measured in 2001 CPI (logs). Female population between the ages of 16 and 44 is measured in share of population. Drug possessions are measured per 100 000 inhabitants (logs). The female police force is measured in share of total police force.
The synthetic Brighton and Hove is reproduced by a combination of 84 CSPs

The control variables that we included behave accordingly to extant literature (Aizer, 2010; Miller and Segal, 2019), and postestimation shows that they contribute in a balanced way to the good level of pre-intervention affinity between Brighton and Hove and its synthetic counterpart (Appendix Table S5 - column 2). Table 2 also shows that the SCM specification is characterized by a high level of goodness of fit for the pre-intervention period between the two units (Pre-

⁶ SCM and GDID estimations are performed using STATA 14. For the SCM we used **synth** (Abadie, Alberto et al., 2014) and **synth_runner** (Galiani and Quistorff, 2017) for the inference. For the GDID **xtreg, fe**. TJBAL estimation is performed using **tjbal** (Hazlett and Xu, 2018) in R.

intervention $RMSPE = 0.0659$). The affinity between the synthetic control and Brighton and Hove is robust to alternative specifications for the arrays of considered pre-intervention variables, supporting the fact that our results are not driven by a particular specification for the SCM (Ferman et al., 2020; Kaul et al., 2015) (Appendix Tables S4-S5, Figures S4 for the comparison between the alternative SCM specifications). The synthetic control is designed assigning positive weights to 66 places in the donor pool, with 10 places receiving the highest weights (Appendix Table S6, Figure S5).

Figure 2. Effects of the local policy for the provision of VAWG support services over time. Trends in rates of sexual violence reports to the police (in logs) for Brighton and Hove (black solid line) and the synthetic counterfactual (green dashed line). The vertical black dashed line marks the beginning of the local policy implementation (year 2011). The vertical red solid line marks the beginning of the country-wide high-impact media campaign referring to the “Operation Yewtree” (year 2013).

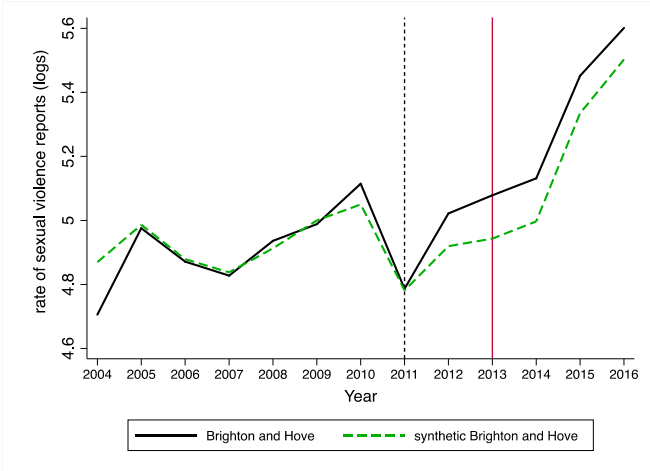


Figure 2 displays the propensity to report sexual offences for Brighton and Hove and its synthetic counterpart before and after the introduction of the local policy. The trend in the propensity to report for the synthetic control closely matches the corresponding trend for Brighton and Hove before the introduction of the local policy, as already showed by Table 2. The upward trend between 2008 and 2010 is concurrent with a commitment by the UK Government to improve VAWG support services, which was pursued through national-funded programs that were later reduced due to the economic recession (Coy et al., 2011; Hirst and Rinne, 2012). The intervention effect is given by the difference between the line representing the rate of reporting to the police in Brighton and Hove and the line representing its synthetic counterpart after the implementation of the local policy in 2011. The discrepancy between the two lines is always positive, meaning that the local policy exerted a continuous positive impact after its introduction.

Another interesting finding shows that the positive impact of local support services is not substituted for by the potential competing effect of a country-wide campaign supporting victims to come forward. Figure 2 shows a relevant increase in the propensity to report for the synthetic counterfactual between the end of 2012 and the beginning of 2013, when the high-impact media coverage of the “*Operation Yewtree*” occurred. The media coverage of “*Operation Yewtree*” is acknowledged to be related to a country-wide increase in the propensity to report sexual offences to the police (Office for National Statistics - ONS, 2018a). Notwithstanding this effect, the propensity to report in Brighton and Hove remains higher than the one in the counterfactual place, suggesting that the influence of the space-neutral campaign did not replace the role of nearby support services in helping victims to seek justice.

Figure 2 also outlines that the positive effect of the local policy narrows from 2015 onwards. A possible explanation for this can be found in the reduction in local budget for VAWG support services while service usage was growing which occurred starting from 2015 (Appendix Table S1). As a consequence, victims started experiencing longer waiting lists and stringent eligibility criteria for specialized support (Brighton & Hove City Council, 2016b). These features are acknowledged risk factors for reducing the propensity to report (Miles and Smith, 2019; Xie and Lynch, 2017), therefore they might explain why the positive treatment effect narrows over time.

4.1. Inference

The small sample nature of our case study and the absence of both randomization and probabilistic sampling restrain the application of traditional approaches to statistical inference. To overcome these limitations, the Synthetic Control Method (SCM) literature has developed an array of falsification tests, also called placebo tests, and robustness checks to provide for quantitative and qualitative inference (Abadie et al., 2015). In the previous section we have already assessed that our estimates are not driven by the choice of predictors, ruling out a relevant source for bias for this estimation strategy (Athey and Imbens, 2017; Botosaru and Ferman, 2019). In this section, following the relevant literature, we present results of placebo tests and robustness checks further supporting the validity of our results (Abadie, 2019).

First, we use an in-place placebo test to evaluate the significance of the positive treatment effect of the implementation of the local policy in Brighton and Hove. In practical terms, we iteratively estimate the SCM assigning the local policy to each unit in the donor pool (Abadie et al., 2010). This estimation gives the distribution of placebo effects, which shows how many of these are as large as the treatment effect for Brighton and Hove. Clearly, if there are many then it is quite likely that our main result happened by chance. Following extant literature (Börsch-

Supan et al., 2018; Galiani and Quistorff, 2017), we measure the proportion of units in the donor pool that have an estimated treatment effect at least as large as Brighton and Hove through pseudo p-values, calculated by dividing the estimated treatment effects by the corresponding pre-treatment match qualities. Small pseudo p-values imply that there are few control units exhibiting the same treatment effect as Brighton and Hove, corroborating the statistical significance of our main finding. Table 3 summarizes each yearly treatment effect for Brighton and Hove together with the pseudo p-value corresponding to the proportion of placebo effects that are at least as large as the yearly treatment effect. Figures shows that the pseudo p-value are always significantly small (pseudo p-value₂₀₁₁ = 0.0357; pseudo p-value₂₀₁₂ = 0.0172; pseudo p-value₂₀₁₃ = 0.0178; pseudo p-value₂₀₁₄ = 0.000; pseudo p-value₂₀₁₅ = 0.0170; pseudo p-value₂₀₁₆ = 0.0357) (see also Appendix Figure S6 and Table S7 columns 1-2). Starting from 2012, the propensity to report in Brighton and Hove is 17.8% higher than in its synthetic counterpart. The gap widens in the following years: 29.6% in 2013; 29.3% in 2014; 27.8% in 2015; 22.2 % in 2016 ($\alpha_{2011} = 0.0607$; $\alpha_{2012} = 0.1644$; $\alpha_{2013} = 0.2592$; $\alpha_{2014} = 0.2576$ $\alpha_{2015} = 0.2459$; $\alpha_{2016} = 0.2012$). These results support that the gap between the propensity to report in Brighton and Hove and its counterfactual is relevant, since it is unusually large relative to the gaps for the places that did not implement the local policy.

Table 3. Yearly estimated effects of the introduction of the local policy for the provision of VAWG support services on the rates of sexual violence reports in Brighton and Hove (in logs) together with their statistical significance for the main Synthetic Control Method (SCM) specification.

Brighton and Hove		
Post-treatment period	Estimates of the treatment effect	Pseudo P-value
2011	0.0607**	0.0357
2012	0.1644**	0.0172
2013	0.2592**	0.0178
2014	0.2576***	0.000
2015	0.2459**	0.0170
2016	0.2012**	0.0357

***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.
Estimates convey a measure of semi-elasticity since the outcome is in logs.

The positive and significant impact holds notwithstanding a potentially competing policy included within predictors, given by the share of female police officers (Miller and Segal, 2019).

The findings summarized in Figure 2 and Table 3 highlight that controlling for the potential competing policy measure given by female police officers does not offset the positive and significant impact of the provision of nearby support services. Moreover, being that the estimated treatment effect remains both positive and significant from 2013 onwards, we can further support that nearby support services are not substituted for by the “*Yentree effect*”.

Our findings hold to the inclusion of the local rate of racial violence among confounding features, to control for local anti-minority behaviours which could influence the propensity to report sexual offences through an increased fear of minority-stigma (Appendix Figure S7.a). The leave-one-out falsification tests (Abadie, 2019) show that the results are not driven by the Community Safety Partnerships receiving the highest weights in the donor pool (Appendix Figure S7.b). Placebo tests (Abadie et al., 2015) show that the findings hold also when outliers are removed from the donor pool (Appendix Table S7 columns 1-2, Figure S8.a). Findings remain consistent also when we restrict the donor pool of the places which are used by the SCM to design the counterfactual to places with a high level of detention rate related to sexual offences (Appendix Table S7 columns 3-4, Figure S8.b). This feature is acknowledged to stimulate the propensity to report by signaling a high commitment of the police force to proceed with an investigation after recording a sexual assault (Aizer and Dal Bó, 2009; Mazerolle et al., 2013; Spohn and Tellis, 2012). Also, findings are confirmed when we restrict the normalizing factor for the outcome variable to women aged between 16 and 44 (Appendix Figure S8.c). We also account for the potential existence of spillover effects such that the possibility that the local provision of nearby services in Brighton and Hove has a substantial positive effect on the propensity to report in the neighboring CSPs. The SCM estimates allows to evaluate the existence and the direction of the potential biases created by these spillovers (Abadie et al., 2015). The positive spillover effect of the local policy would provide an overestimate of the synthetic control trajectory, thus underestimating the positive impact of the local policy (Appendix Figure S7.c).

We also check whether results are affected by sample selection bias, by estimating the SCM with larger donor pools compared to our main specification. First, we keep all the CSPs with accurate police records. With respect to our main sample, this implies adding the CSPs with similar/close-but-different local policy, the CSP with the idiosyncratic night economy (Westminster), and the CSPs with different/no VAWG support services before 2011. Estimates show that our findings hold, supporting that there is no sample selection bias (Appendix Figure S9.a). Aside Westminster, all the CSPs added in this robustness check contributed close to zero to the synthetic counterfactual, further corroborating that our results are not driven by the choice of the sample (Appendix Table S8). Unsurprisingly, Westminster gets a positive weight in the

design of the synthetic counterfactual, given its huge and growing volume of sexual violence reports, which is more than 100% higher than London and England average (Appendix Figure S3.e). The size of Westminster's sexual offences which are associated to its globally distinctive night economy make it not suitable as comparison unit for the rest of English and Wales local authorities when it comes to sexual offences (Office for National Statistics - ONS, 2018a). Through this robustness check, we see that its inclusion in the donor pool does not change our results. We tested our results against another sample specification. In this case, we add to our main sample the CSPs with similar/close-but-different local policy and Westminster. Hence, we discard only the CSPs that had a different (or no) endowment of VAWG support services before 2011 compared to Brighton and Hove. Again, results hold (Appendix Figure S9.b). Finally, we assessed the robustness of our findings by restricting the donor pool compared to our main specification. We remove London CSPs from the main donor pool to account for the influence of London on nontreated units through spatial spillovers. Results still hold (Appendix Figure S9.c). Findings are also robust when we control for unobservable heterogeneity in outcome trends (Appendix Figure S9.d) (Amjad et al., 2018; Ferman and Pinto, 2016).

A further element that supports the validity of our estimates is that Brighton and Hove and its synthetic counterpart are extremely similar in the post-treatment periods in all the confounding features. The 2011-2016 values for the control variables show high levels of fit between the two units (Appendix Table S9), allowing to exclude that the post-2011 different trajectories in reporting sexual crimes are due to differences in one or more of the confounding features.

4.2 Evaluating alternative policy explanations for the increase in sexual violence reports

Importantly, the post-2011 strong affinity between Brighton and Hove and its synthetic counterpart in terms of confounding features includes similarity in the female police force. This provides further support that this policing strategy is not influencing the observed difference in reporting of sexual crimes. This section describes other policy initiatives that may explain our findings and it provides evidence showing that these alternatives do not appear to influence our results, corroborating the positive impact of specialized support services.

We start by accounting for two other policing strategies related to sexual crimes which might be relevant in influencing the propensity to report and that were implemented after 2011. In 2014, Domestic Violence Protective Orders and Domestic Violence Disclosure Schemes⁷ were

⁷ Domestic Violence Disclosure Schemes are also referred to as "Clare's Law" after the murder of Clare Wood by her former partner in Greater Manchester in 2009.

rolled out across England and Wales to increase protection of individuals against violent abuse. Domestic Violence Protective Orders are orders requested by the police to magistrates' courts that enable protective measures for victims in the immediate aftermath of a domestic violence incident where there is insufficient evidence to charge a perpetrator⁸ (Home Office, 2016). Domestic Violence Disclosure Schemes allow an individual to issue a request to the police to check whether a new or existing partner has a violent past, and the police can decide whether to disclose the requested information. High rate of execution of these types of strategies by the local police force may increase a victim's propensity to report, by signaling that the local police force is committed to protecting the victims (Iyengar, 2009; Spohn and Tellis, 2012). Therefore, we check whether the difference in the post-2011 reporting between Brighton and Hove and the counterfactual may be explained by differences in the implementation of these strategies by local police forces. We find that Brighton and Hove and its synthetic counterfactual display the same use of these protective orders by the local police (Appendix Table S10), hence we can exclude that these policing strategies have a role in the observed differences in reporting.

Other possible explanations for our results could be that the higher reporting of sexual crimes in Brighton and Hove is due to higher commissioning in community safety compared to the other local authorities, or simply to an increase in actual crimes committed. Under these alternative explanations, we would expect to find a significant post-2011 impact on reporting of several crimes for Brighton and Hove, including crimes that are not likely to respond to the local provision of VAWG support services. To check for this, we use the established placebo outcome falsification test on the Generalized Difference-In-Difference (GDID) and the Synthetic Control Method specification summarized by eq (3). We estimate the treatment effect on the reporting of homicide, racially-based crimes and theft. These crimes are more likely to be impacted by crime policy rather than by the provision of VAWG support services. Results show insignificant treatment effects, suggesting that there is no post-austerity intervention in Brighton and Hove with a significant effect on the reporting of crimes. This evidence provides for the post-2011 observed increase in the reporting of sexual crimes to be determined by a policy intervention that specifically addresses sexual offences rather than crime in general (Appendix Table S11-Figure S10).

Descriptive evidence supports that our findings do not reside in Brighton and Hove having a higher prevalence of sexual offences. According to 2011 estimates from the Brighton and Hove City Council, the local prevalence of sexual offences aligned to nation-level estimates (Safe in the City, 2011). These figures are further corroborated by 2014-2016 county-level data on

⁸ With a Domestic Violence Protective Order, the perpetrator is banned from returning home and from having contact with the victim for up to 28 days.

domestic abuse from the England and Wales Crime Victimization Survey. These estimates show that the prevalence of domestic abuse in Sussex – the county that comprises Brighton and Hove – equals 9 against a sample-average prevalence of 8.5 (Office for National Statistics - ONS, 2018b). Clearly domestic abuse does not coincide with sexual crimes, and the victimization survey refers to the county-level, which is a broader area than Brighton and Hove containing several CSPs. Nonetheless, these data corroborate that the observed higher reporting in Brighton and Hove does not relate to higher prevalence of victimization.

This last evidence adds to other data on economic and demographic confounding features and competing policy initiatives to support that our findings are not driven by Brighton and Hove under/overperforming with respect to other places. First, as already detailed in the paper, Brighton and Hove aligned to the rest of England and Wales in terms of the relevant economic and demographic confounding features. Second, Brighton and Hove did not benefit from milder austerity cuts on its local budget compared to the other local authorities (Figure 1.c). Third, its policing strategies aligned with the rest of the places (Appendix Table S9), as well as its prevalence of abuse against women as discussed above.

4.3 Supplemental analyses

In this section we conduct several additional analyses, by estimating competing model specifications to show that our findings are not dependent on the modelling strategy.

Table 4 outlines that the positive impact of the introduction of the local policy holds also when we estimate the competing specifications represented by the Generalized Difference-In-Difference model. Estimates from the GDID without covariates show an average effect of the introduction of the local policy between 2011 and 2016 equals 0.0504 (p -value = 0.001), which slightly increases to 0.059 (p -value = 0.003) adding the control variables. The overall post-treatment estimated impact in the SCM equals 0.1154. The GDID estimates hold considering several specifications, including having a CSP-specific linear time trend among regressors to account for unobserved time-varying heterogeneities which could affect the parallel trend assumption (Xu, 2017) (Appendix Table S12). Findings are confirmed also when we estimate a baseline Difference-In-Difference (Appendix Table S13). Results hold also estimating a Trajectory Balancing approach (Hazlett and Xu, 2018), which provides robust estimates with few pre-treatment periods and it relaxes some assumptions inherent to the SCM (Appendix Figure S12 and Table S14).

Table 4. Estimates of the Generalized Difference-In-Difference (GDID) model evaluating the impact of the introduction of the local policy for the provision of nearby support services on the rates of sexual violence reports to the police in Brighton and Hove.

Variable	Dependent variable: Report of sexual crimes on women to the police (for 100,000 inhabitants in logs)	
	GDID	
	(1)	(2)
Brighton and Hove × (2011-2016) (Treatment Effect)	0.0504** (0.0153)	0.0590** (0.0192)
CSP FE	YES	YES
Year FE	YES	YES
Control variables	NO	YES
No. of clusters	85	85
No. of observations	1 105	1 105
R-Squared	-	-
Within R-Squared	0.5003	0.4673

The period of observation is 2004-2016. Outcome variable is the rate of sexual violence records on women over age 16 per 100 000 women over age 16 (logs). Control variables are unemployment, real wage of female workers (logs), share of female population between the age of 16 and 44 on total population, drug possession (logs) and female police force. Standard errors are clustered at CSP level and they are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 5. Comparison of results from the Synthetic Control Method (SCM), the Generalized Difference-In-Difference (GDID) and the Trajectory Balancing (TJBAL) estimations

Method	Estimated ATT
SCM	0.1154
GDID	0.0590
GDID no outliers	0.0958
TJBAL mean balancing	0.1822
TJBAL kernel balancing	0.0839

Results refers to model specifications including the control variables. SCM refers to the main specification summarized in Figure 3. GDID refers to Table 4, column 2. GDID with no outliers refers to Table S12, column 1. The TJBALs refer to the models summarized in Figure S12. The SCM estimate measures the overall before-after treatment gap between Brighton and Hove and “Synthetic Brighton and Hove”. It is derived as the difference in before-after treatment differences of Brighton and Hove and “Synthetic Brighton and Hove” (Roesel, 2017)

Table 5 summarizes the estimated treatment effect under the different model specifications. Notably, the GDID appears to provide a lower bound to the estimates of the treatment effect, whereas the estimates from the TJBAL are close to the SCM one. The difference in the

magnitude of the GDID estimates compared to the TJBAL and the SCM can be understood recalling that the formers do not apply a weighting strategy to the untreated units, whereas both the TJBAL and the SCM do, therefore designing different counterfactuals. We can conclude that the GDID and the TJBAL results supports our evidence as robust in spite of the various caveats associated to the different methodologies (Kreif et al., 2016).

5. Discussion

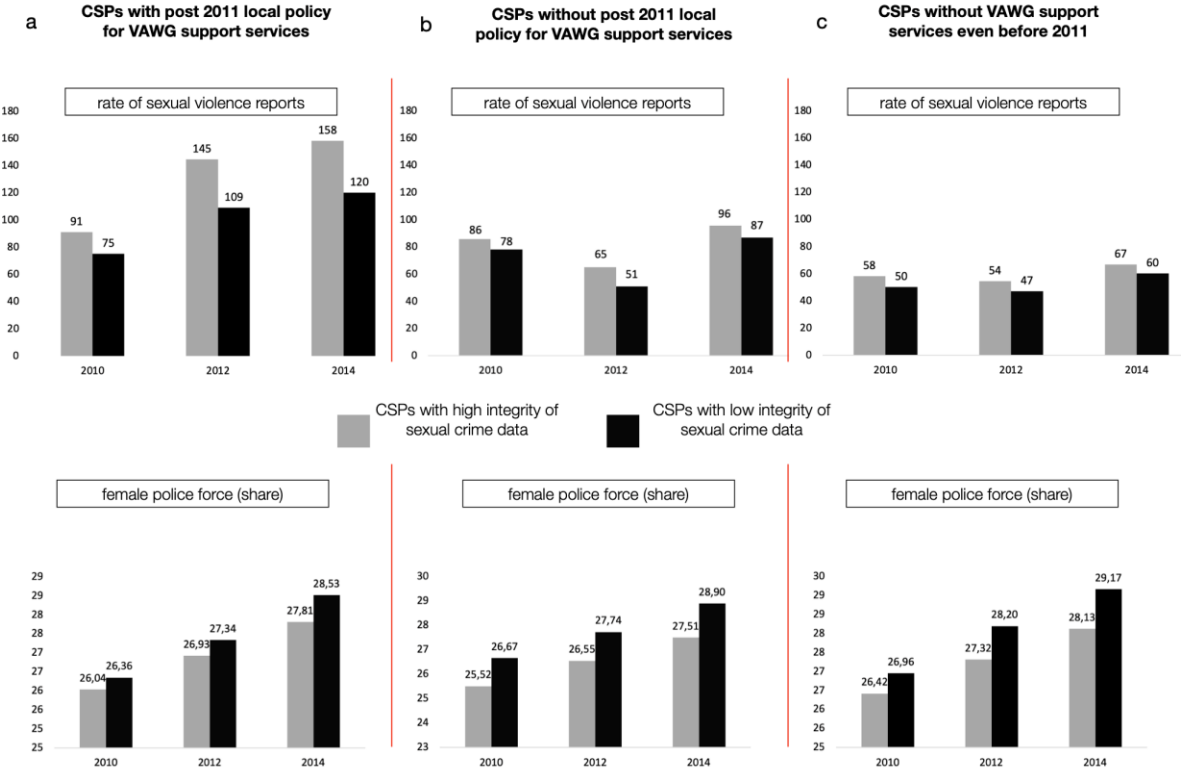
The findings in the previous section show that local provision of VAWG support services led to significant increase in the rate of report of sexual violence. This result holds to the inclusion of potential confounding features that can contribute to explain higher rate of sexual violence reports. The positive impact of VAWG support services on reporting is further confirmed after falsification tests and robustness checks, which allow to alleviate concerns of potential threats to internal validity, including sample selection bias, alternative policy explanations and the choice of the estimation method. The estimated size of the impact of local VAWG support services on the reporting sexual violence is relevant, as outlined by an Average Treatment Effect of 11.5%. The corresponding increase in budget allocated to local support amounts to 10,5%.

Clearly, having assessed the validity of our results with respect to several alternative explanations permits to reduce, but not to eliminate, all concerns about alternative potential drivers for the observed variation in reporting in Brighton ad Hove. Another threat that we discuss is that some local authorities might have persistent economic, cultural and institutional features which influence the local willingness to invest in the local provision of support services. With respect to this threat, the inclusion of local authority fixed effects and economic, demographic and policy controls at the local level in our estimations contributes to reducing concerns but may not eliminate all of them.

This evidence has to be assessed with respect to its external validity. We do so by accounting for the 176 Community Safety Partnerships (CSPs) that cannot be considered in the estimation due to their inaccurate data on sexual violence reports. Through descriptive evidence, we compare trends of sexual violence reports in CSPs with high crime-integrity to the same trends in CSPs with low crime-integrity. Figure 3 summarizes this summary evidence, which supports the external validity of our results. More into details, Figure 3 suggests that CSPs having the same policy in terms of VAWG support services display the same trends of sexual violence reports irrespectively of the level of crime integrity. Figure 3.a outlines that CSPs supporting the local policy after 2011 experienced an increase in reporting compared to the previous period,

notwithstanding the level of accuracy in crime recording. Figure 3.b shows that CSPs decommissioning VAWG support after 2011 see a decrease in reporting until 2013, when the high-impact media event Operation Yewtree triggered women’s propensity to report sexual offences (Office for National Statistics - ONS, 2018a). Figure 3.c describes reporting sexual violence for the CSPs that were without VAWG support service before and after 2011. Figure 3.b and 3.c shows that the absence of a local policy relates to the lowest rate in reporting.

Figure 3. Comparison of average trends of sexual violence reports and female police officers between Community Safety Partnerships (CSP) with low integrity of sexual crimes data and CSPs with high integrity of sexual crime data. Figure 3.a compares trends for the CSPs shielding VAWG support services after 2011 (including Brighton and Hove). Figure 3.b evaluates trends for the CSPs which decommissioned the same services. Figure 3.c compares trends for the CSPs which did not have a service even before 2011.



As expected, Figure 3 shows that sexual violence reports in the CSPs with inaccurate crime data are always lower than in the CSPs with accurate data. The documented unrecording and misrecording of survivors’ report explains the lower rate (Her Majesty’s Inspectorate of Constabulary, 2014), which could also be influenced by a reduced willingness of reporting by survivors when they believe their file is more likely to be mishandled. The lower part of Figure 3 outlines the trends in female police officers, that is a relevant confounder in our investigation. This descriptive evidence shows that female police officers increased in all CSPs, with no pattern of association with the rates of sexual violence reports.

Brighton and Hove appears to be representative of England and Wales as a whole also when the socioeconomic outlook is considered. Brighton and Hove has figures on unemployment, wage, prevalence of sexual violence and foreign population which are extremely close to those of England and Wales as a whole (Appendix Table S15).

6. Conclusions

Extant evidence details that policy initiatives can increase the propensity to report sexual offences by female victims. Yet, existing empirical works have not considered the impact of the provision of local support services, although the latter are widely acknowledged by institutions and practitioners as fundamental features in helping victims to seek justice. Results from this paper provide causal evidence supporting a positive impact of nearby support services on the propensity to report. The findings are consistent with the fact that nearby support services lower the victims' sense of isolation (Miles and Smith, 2019; Xie and Lynch, 2017), alongside providing necessary practical support such as a safe place to stay. The local availability of VAWG support services also signals to victims that there is a local commitment to a culture of respect of women, which can contribute to reducing the perception of socio-cultural prejudices (Ellsberg et al., 2015; Iyer et al., 2012). Evidence from the paper also shows that the relevance of nearby support services is only partially offset by national high-impact communication and media campaign and by other policies such as the enrollment of female police officers.

Overall, the analysis entails non-negligible policy implication by providing sound evidence supporting the policy initiatives for the provision of spatially even support services for the victims of sexual violence. Notably, the results from this paper support the aim of the Istanbul Convention, which contains specific requirements for the spatial distribution of VAWG support services (Council of Europe, 2011; Kelly, 2018).

The evidence provided in the paper results from a comparative case-study focusing on Brighton and Hove. At the same time, we provide descriptive evidence supporting the external validity of the findings with respect to England and Wales. First, all local authorities which support local services have higher rates of sexual violence reports than the ones with decommissioned services. This latter evidence is descriptive and cannot be further exploited due to the measurement bias inherent to places with low integrity of police reports. Nonetheless it shows that also the places that cannot be considered for impact evaluation align to our results on Brighton and Hove. Further, we also show that Brighton and Hove appears to be representative of England and Wales as a whole in terms of socioeconomic features that are acknowledged as being risk factors for sexual violence.

Obviously, there are questions about the generalization of these results to other countries. Also, this analysis targets a behavioral outcome observed at the spatial level and not individuals. In other terms, results refer to the impact of a local policy on the local-level reporting rate and they do not convey any information about the individual probability of reporting. Furthermore, our analysis does not account for non-public source of funding for the local provision of VAWG support services. However, figures show that public funding accounts for the majority of the financial support for these services and that collecting money from alternative source of funding such as donations is particularly difficult for charities dealing with violence against women (Heady et al., 2011).

A final remark refers to the deterrence effect of the policy. Increased reporting might act as deterrent, hence we should see a reduction in sexual violence incidence (Miller and Segal, 2019). From our results, it seems that there is no deterrence effect as police reporting increases while the incidence of violence does not decrease. However, this fact has to be assessed considering deterrence literature, which highlights that it takes time for deterrence to be effective, since offenders need to adjust prior beliefs (Paternoster, 2010). Our analysis considers 5 years after the implementation of the policy. Further works could investigate the deterrence effect on a longer time span. Also, individual characteristics matter in the effectiveness of deterrence, since they shape the perpetrators' risk perception (Nagin, 2013; Paternoster, 2010). For instance, being reported represents "a minor nuisance" to abusers who are usually out of jail in a short time (Xie and Lynch, 2017). Analyzing offenders' profile goes beyond the scope of the present investigation, but it would represent a valuable addition to the evidence discussed in our paper.

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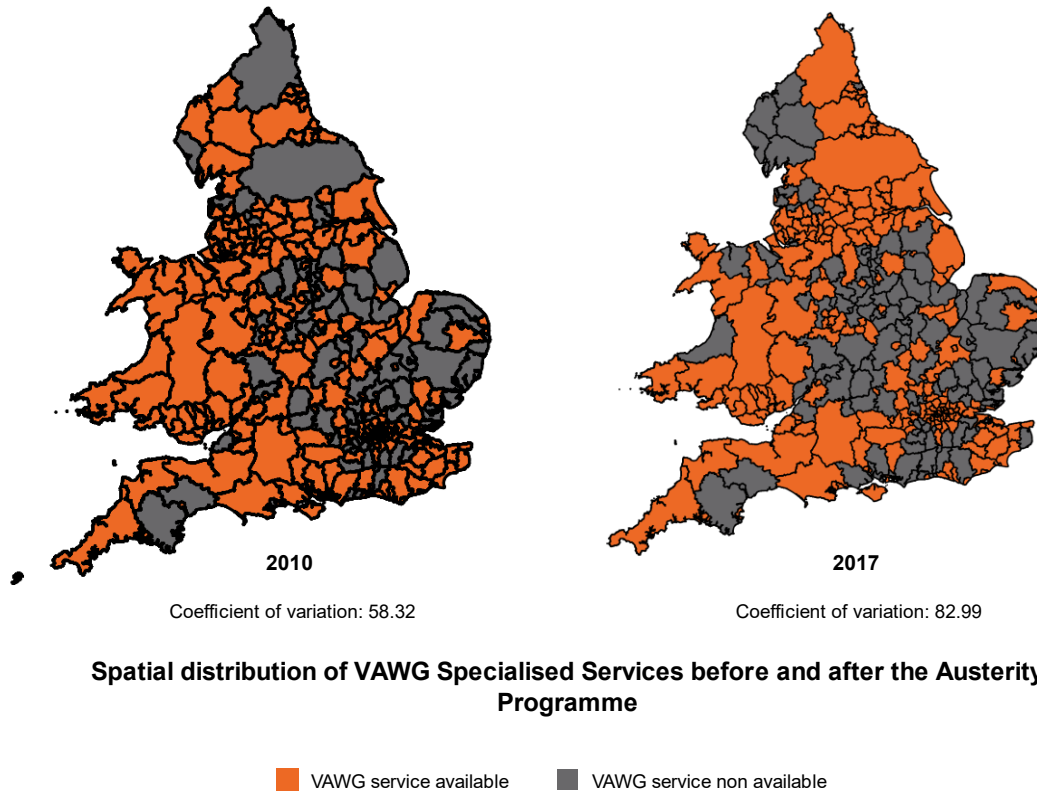
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Appendix

Figure S1. The reduction of the spatial distribution of VAWG support services in England and Wales after the austerity.



Data. The data on the local authorities' budget choices on VAWG support services are available at the Upper-Tier Local Authorities (UTLAs) level, being UTLAs the administrative authorities in England and Wales that were devolved the discretionary choice on the provision and the funding of local support services for the victims of sexual violence. In March 2019 (Office for National Statistics - ONS, 2019), the 152 English UTLAs consisted of: 27 Counties (Government Statistical System (GSS) code E10), 33 London Boroughs (GSS code E9), 36 Metropolitan Districts (GSS code E8), 56 Unitary Authorities (GSS code E06). The Welsh UTLAs consisted of 22 Unitary Authorities (GSS code W06).

The outcome variable is proxied by the police records on rape (UK Home Office crime code: 19C) and sexual assault on women aged 16 and above (UK Home Office crime code: 20A) (The UK Home Office, 2020). The Community Safety Partnerships (CSPs) are the smallest statistical geographies on which data on police records about sexual offences on women aged 16 and above are collected. There are 315 CSPs in England and Wales (GSS codes: E22, W14). The CSP coincides with the UTLA for Unitary Authorities, Metropolitan Boroughs and London Boroughs. Only for 26 Counties, a single UTLA (which is the County) includes several CSPs. In

these cases, the policy decision taken at the UTLA level is applied to every CSPs belonging to the UTLA.

Figure S2 describes the geographies of UTLAs (Figure S2.a) and CSPs (Figure S2.b) for England and Wales.

Figure S2. Statistical Geographies of England and Wales considered in the investigation.

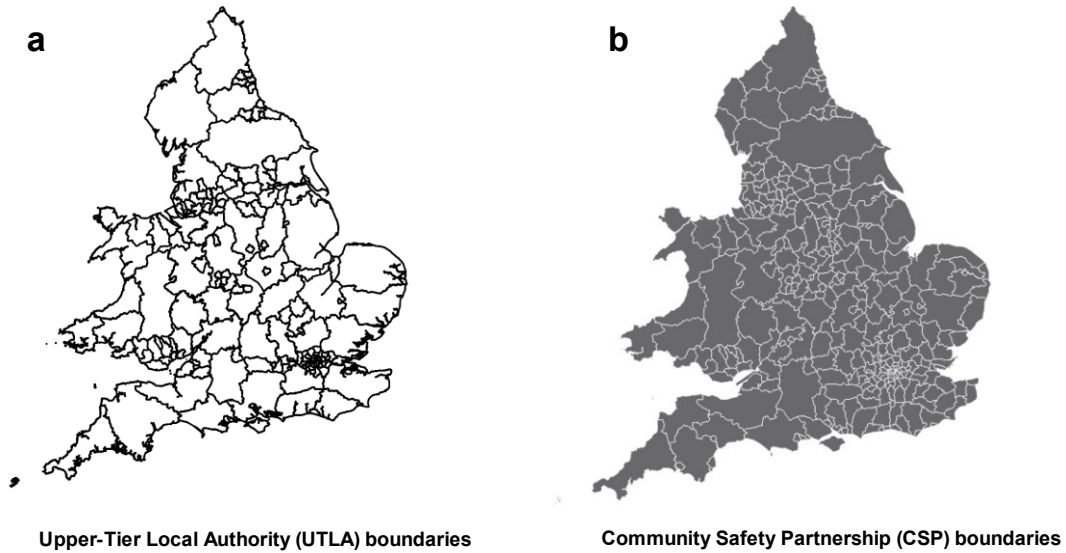


Figure S3 outlines stages 1, 3 and 4 of the design of the database to perform the SCM approach. Stage 1 refers to the mapping of the local policy choice about the provision of VAWG support services (Figure S3.a). Stage 3 is about the classification of CSPs with respect to the good management of sexual offences reports (Figure S3.b). Stage 4 is about discarding the CSPs which did not have any VAWG support service before the beginning of the austerity, the CSPs which have different types of WAVG support services before the beginning of the austerity, the CSPs benefitting from close-but different policies (Preston, Lincoln and Ceredigion benefitted from the startup of VAWG support services financed directly by the UK Government), and those CSPs characterized by idiosyncratic shock (Westminster) (Figure S3.c-S3.d). From Figure S3.d, it appears that the CSPs in the sample had similar methods for dealing with sexual violence prior to 2011. All CSPs implemented Domestic Violence policy through local service provision; aside two CSPs (Eden and Carlisle), all the others had a Women's refuge for female victims of sexual violence.

Figure S3. Selection of the suitable Community Safety Partnerships (CSPs) for the comparative case study.

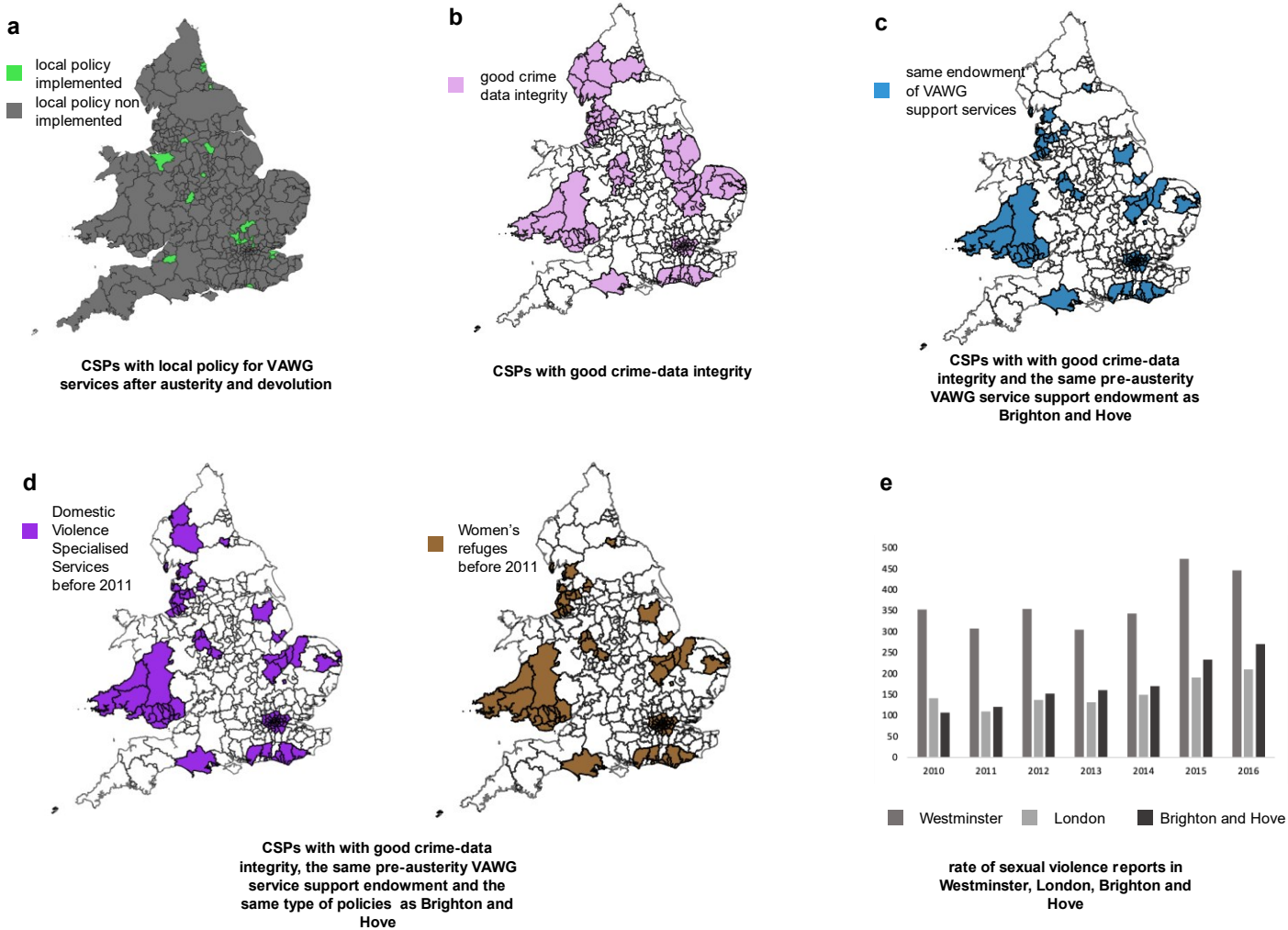


Table S1 conveys a snapshot of VAWG support services in Brighton and Hove before and after the introduction of the local policy. Table S1.a presents the City Council expenditure in VAWG support services from 2010 to 2016, where 2010 was the last year in which expenditure was funded through government grants. Table S1.b details service usage before and after the introduction of the local policy in 2011.

Table S1: Brighton and Hove City Council trends in VAWG support services between 2010 and 2016. Trends in yearly budget for VAWG support services (Table S1.a). Trends in service usage (Table S1.b).

	VAWG support services financed through Government grants	VAWG support services financed through local resources					
a. Local budget for VAWG support service (thousands of pounds)	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Refuge	143	250	250	250	250	241	241
Grants	110	110	110	110	132	108	108
Advocacy, advisory ^o	777,049	837,41	1034,267	1132,546	1123,56	875	725
Others	20	20	20	50	50	91,629	91,629
Total	1050,049	1217,41	1414,267	1542,546	1555,56	1315,629	1165,629

^oit includes crisis service (including Helpline), prevention and recovery service, advocacy, advisory, risk management

Authors' calculation using data from the following sources:

Brighton and Hove City Council Neighborhoods, Communities and Equalities Committee (2016). Summary Report: Domestic Violence and Abuse, Sexual Violence and Violence against Women and Girls. Agenda Item 40. 28th November 2016.

Brighton and Hove City Council Policy and Resources Committee (2015). Improved Domestic Violence and Sexual Violence Specialist Services from 2015/16 onwards. Agenda Item 124. 22nd January 2015.

Brighton and Hove City Council Freedom of Information Act Requests: 733/2013; 2462/2013; 0912/2014; 3737/2014; 0206/2015; 1080033/2020; 6225745/2020; 5544689/2020

b. VAWG support services usage	2009	2010	2012	2016	2010-2016 increase %
survivors reaching for VAWG support services*	1 000	1 120	1 699	1 847	55,2
high risk survivors supported [^]	-	125	263	468	274,4
survivors using highly specialistic advisory support ^o	-	231	335	635	174,9

* Survivors accessing sexual violence support centers and survivors accessing SARCs (sexual assault referral centers): specialist medical and forensic services for anyone who was raped or sexually assaulted.

[^] Survivors referred to the MARAC (Multi-Agency Risk Assessment Conference): multi-agency risk management plan for high-risk survivors with respect to their health, safety and well-being

^o Survivors using IDVA (Independent Domestic Violence Advisors) and ISVA (Independent Sexual Violence Advisors): specialists assessing the level of risk, discussing the range of suitable options, developing safety plans and advocacy.

Authors' calculation using data from the following sources:

Brighton and Hove City Council (2018). Joint Commission of Domestic Violence and Abuse and Sexual Violence Services.

Brighton and Hove City Council (2016). Addressing Sexual and Domestic Violence issues in Procurement and Commissioning.

Brighton and Hove City Council Neighborhoods, Communities and Equalities Committee (2016). Responding to Domestic and Sexual Violence and Abuse and Violence against Women and Girls: Commissioning and Partnership Priorities. Agenda Item 41(b). 25th January.

Brighton and Hove City Council (2013, 2016). Joint Need Assessment Domestic and Sexual Violence Abuse.

Brighton and Hove City Council (2012). Preventing violence against Women and Girls: an integrated strategy and action plan 2012-2017.

Safe in the City (2011). Domestic violence needs assessment. Brighton & Hove Intelligent Commissioning Pilot 2010/11.

Table S2. Data Sources

Variable	Source
Quality of police records on sexual offences	Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services
Local policy for VAWG support services after austerity and devolution	Coy et al., 2011; Grierson, 2018; Holly, 2017; Towers and Walby, 2012; The Bureau of Investigative Journalism 2017; The UK Ministry of Justice 2015
Local endowment of VAWG support service before austerity and devolution	Coy et al., 2011
Type of VAWG support service available at local level before austerity and devolution	Coy et al., 2011; (Coy et al., 2007)
Police records of sexual offences to a female older than 16	The UK Home Office
Female population	ONS
Female population aged between 16 and 44	ONS
Unemployment	The UK Labour Force Survey
Wage differential	The UK Labour Force Survey
Drug crimes	The UK Home Office
Homicides	The UK Home Office
Crimes	The UK Home Office
Share of female police force	The UK Home Office
Foreign population	ONS

Table S3. Descriptive Statistics

Variable	Obs	Mean	Std Dev	Min	Max
Police records of sexual crimes on women over age 16 per 100k women over age 16 (logs)	1 105	4.5016	0.52106	2.0364	5.8358
Share of female population aged 16-44 years	1 105	0.4053	0.0728	0.2536	0.6077
Share of unemployment (sh)	1 025	7.0701	2.8092	1.0121	22.1797
Female real wage (logs)	1 095	6.2230	0.1878	5.7347	6.7678
Homicide per 100k inhabitants (logs)	1 105	-0.1222	1.4068	-3.5572	4.0795
Drug possession per 100k inhabitants (logs)	1 103	-0.0265	0.5477	-2.5661	2.7085
Share foreign population (logs)	1 095	2.2681	1.0287	-0.0488	4.0726
Share of female police ranks	1 105	0.24959	0.02999	0.180907	0.34549

Results from Synthetic Control Method specifications and robustness checks

Figure S3 outlines the estimation results from the SCM considering alternative model specifications to account for the concern that the results may be driven by specific set of predictors (Botosaru and Ferman, 2019). Following the ongoing debate in extant literature (Athey and Imbens, 2017; Kaul et al., 2015), we considered several specifications characterized by different combination of predictors varying both the number of considered lags for the outcome variable and the set of covariates. The results summarized by Figure S4 suggest that our estimation does not suffer from “*specification-searching*” opportunities (Ferman et al., 2020), since findings remain consistent under every considered specification.

Table S4 details the pre-intervention values for the actual Brighton and Hove and its synthetic counterfactual under the different SCM specifications, showing that the good level of pre-intervention affinity between the treated unit and the counterfactual does not depend on a particular set of predictors.

Table S5 shows the weights assigned by the SCM to each considered predictors in each model specification. Overall weights appear balanced across specifications, supporting that our results are not driven by a specific predictor, such as a specific lag for the outcome variable and/or a specific combination of lags for the outcome variable. Table S5 also reports the values for the pre-intervention Root-Mean-Squared-Prediction-Error (RMSPE) for each SCM specification, which gives a measure for the goodness-of-fit of the synthetic counterfactual. All specifications appear as not suffering from poor goodness-of-fit, given the small values for the RMSPE.

Table S6 shows the weights assigned to every Community Safety Partnership in the donor pool by the main SCM specification summarized in Table 2 in the paper.

Figure S5 shows the CSPs receiving the highest weights pool by the main SCM specification summarized in Table 2 in the paper.

Figure S4. Effects of the local policy for the provision of VAWG support services over time. Trends in the rates of sexual violence reports to the police (in logs) for Brighton and Hove (black solid line) and the synthetic counterfactual (green dashed line) for the considered Synthetic Control Method (SCM) specifications. Brighton and Hove and its counterfactual behave similarly before 2011 in all the SCM specifications. After the adoption of the local policy, the rate of reports in Brighton and Hove is always higher than in the counterfactual in all the SCM specifications. (Subset of covariates: share of female population aged 16-44, real wage of female workers, drug possession, unemployment, share of female police officers; full set of covariates: share of female population aged 16-44, real wage of female workers, drug possession, unemployment, share of female police officers; homicide rate, share of foreign population)

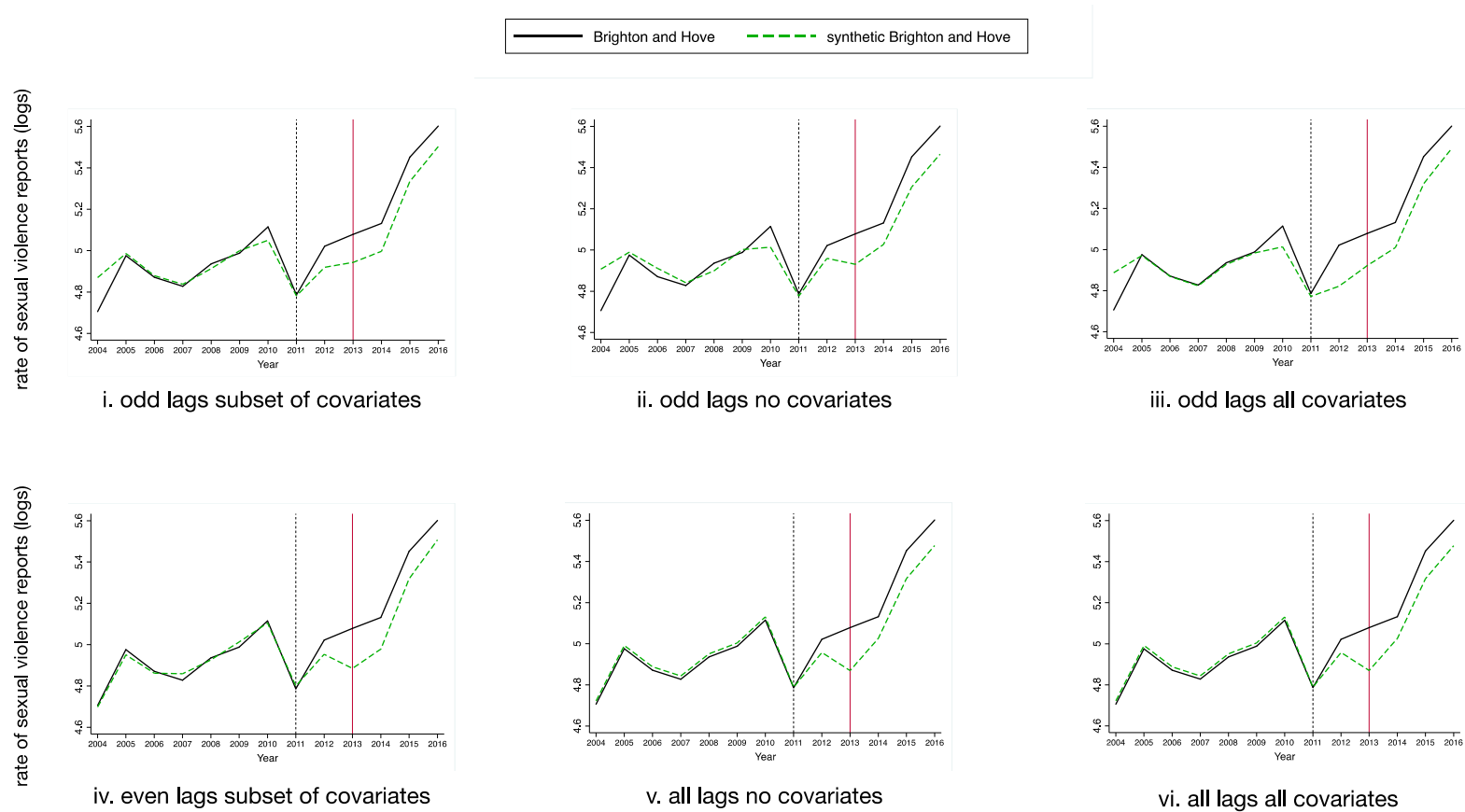


Table S4. Pre-treatment affinity measured through pre-treatment predictors means between Brighton and Hove and its synthetic counterpart for all considered Synthetic Control Method (SCM) specifications.

Variable	(1)		(2) [§]		(3)		(4)		(5)		(6)	
	Brighton and Hove		Brighton and Hove		Brighton and Hove		Brighton and Hove		Brighton and Hove		Brighton and Hove	
	Real	Synthetic	Real	Synthetic	Real	Synthetic	Real	Synthetic	Real	Synthetic	Real	Synthetic
Reporting sexual crimes on women 2010	-	-	-	-	-	-	5.11452	5.1048	5.11452	5.130736	5.11452	5.1307
Reporting sexual crimes on women 2009	4.98830	4.9834	4.98830	4.9999	4.98830	5.0019	-	-	4.98830	5.00406	4.98830	5.0041
Reporting sexual crimes on women 2008	-	-	-	-	-	-	4.93593	4.9262	4.93593	4.951149	4.93593	4.9511
Reporting sexual crimes on women 2007	4.82755	4.8235	4.82755	4.8377	4.82755	4.84115	-	-	4.82755	4.843352	4.82755	4.8877
Reporting sexual crimes on women 2006	-	-	-	-	-	-	4.87113	4.8617	4.87113	4.887707	4.87113	4.8877
Reporting sexual crimes on women 2005	4.97569	4.9709	4.97569	4.9862	4.97569	4.98951	-	-	4.97569	4.991772	4.97569	4.9917
Reporting sexual crimes on women 2004	-	-	-	-	-	-	4.70581	4.6908	4.70581	4.722115	4.70581	4.7221
Unemployment	6.7318	6.9181	6.7318	6.7506	-	-	6.73178	6.7661	-	-	6.7318	7.8589
Real wage of female workers	6.28467	6.2657	6.28467	6.2979	-	-	6.28467	6.2691	-	-	6.2847	6.2752
Female population aged 16-44	0.4848	0.48453	0.4848	0.48574	-	-	0.4848	0.48524	-	-	0.4848	0.4807
Drug possession	-0.1437	-0.14237	-0.1437	-0.14462	-	-	-0.1437	-0.14246	-	-	-0.1437	-0.1033
Homicide	-0.2581	-0.24667	-	-	-	-	-	-	-	-	-0.2581	-0.3213
Foreign population	2.6346	2.653	-	-	-	-	-	-	-	-	2.6346	2.8091
Female police force	0.26208	0.2616	0.26208	0.2626	-	-	0.26208	0.2609	-	-	0.26208	0.25623

Notes: all variables except lagged reporting of sexual crimes are averaged for the 2004-2010 period. Reporting of sexual crimes is measured by the rate of sexual violence reports on women over age 16 per 100 000 women over age 16 (logs). Unemployment is measured in share. Real wage of female workers is measured in 2001 CPI (logs). Female population is measured in share, on total population. Homicide and drug possession are measured per 100000 inhabitants (logs). The foreign population is measured in share of total resident population (logs). The female police force is measured in share of total police force.

[§] SCM main specification.

Table S5. Synthetic Brighton and Hove Predictor Weights for all considered Synthetic Control Method (SCM) specifications

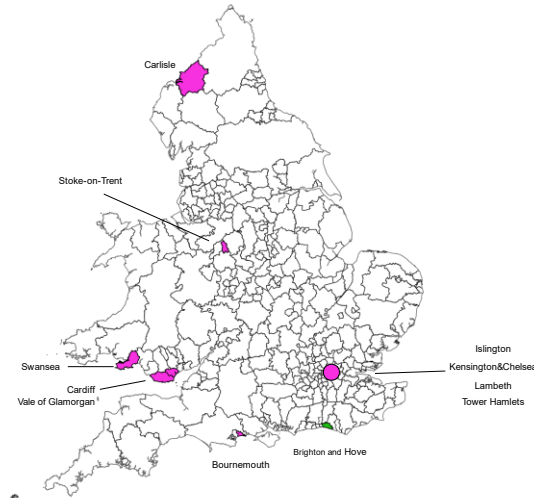
Variable	Weights					
	(1)	(2)	(3)	(4)	(5)	(6)
	odd outcome lags		even outcome lags		all outcome lags	
	all confounders	subset of confounders [§]	no confounders	subset of confounders	all confounders	no confounders
Reporting sexual crimes on women 2010	-	-	-	0.2207	0.1482	0.1482
Reporting sexual crimes on women 2009	0.3213	0.3326	0.3439	-	0.1469	0.1469
Reporting sexual crimes on women 2008	-	-	-	0.2232	0.1312	0.1312
Reporting sexual crimes on women 2007	0.2504	0.2510	0.2712	-	0.1142	0.1142
Reporting sexual crimes on women 2006	-	-	-	0.2287	0.1026	0.1026
Reporting sexual crimes on women 2005	0.3158	0.3842	0.3359	-	0.1310	0.1310
Reporting sexual crimes on women 2004		-	-	0.3093	0.2257	0.2257
Unemployment	0.0056	0.0019	-	0.0008	1.03e-27	-
Real wage of female workers	0.00723	0.0014	-	0.0044	8.57e-26	-
Female population aged 16-44	0.00415	0.0369	-	0.0030	2.62e-27	-
Drug possession rate	0.00832	0.0038	-	0.0079	1.53e-26	-
Homicide rate	0.01066	-	-		8.75e-28	-
Female police force	0.03503	0.0365	-	0.0020	6.01e-27	-
Foreign population	0.02477	-	-		1.40e-26	-
Pre-intervention RMSPE	0.0791	0.0659	0.0864	0.02100	6.83e-11	5.89e-11

[§] SCM main specification. It displays the highest goodness of fit among the SCM specifications with few lags for the outcome variables (Pre-intervention RMSPE = 0.0659). SCM specifications 1-4 do not display remarkable changes in the weights assigned to the considered predictors, which appear balanced across specifications.

Table S6. Weights given by the Synthetic Control Method (SCM) estimation to the 84 Community Safety Partnerships (CSPs) in the donor pool to design the synthetic Brighton and Hove for: the main SCM specification (Tables 2-3 and Figure 3; Appendix Table S3 column 2, Table S4 column 2 and Figure S3.i)

CSP	Weight	CSP	Weight	CSP	Weight
Barking&Dagenham	0.001	Fenland	0	Newham	0.002
Barnet	0.001	Fylde	0	Newport	0.001
Barrow-in-Furness	0	Great Yarmouth	0.001	Norwich	0.002
Bexley	0.001	Greenwich	0.001	Pembrokeshire	0.001
Blackburn&Darwen	0.001	Hackney	0.003	Pendle	0
Blackpool	0.001	Hammersmith&Fulham	0.001	Peterborough	0.002
Blaenau Gwent	0	Haringey	0.002	Powys	0.001
Boston	0	Harrow	0.001	Redbridge	0.001
Bournemouth	0.306	Hastings	0.006	Rhondda Cynon Taf	0.001
Brent	0.001	Havering	0.001	Richmond up Thames	0.001
Bridgend	0.001	Hillingdon	0.001	Rother	0.001
Bromley	0.001	Horsham	0	South Norfolk	0
Burnley	0	Hounslow	0.001	South Ribble	0
Caerphilly	0.001	Huntingdonshire	0.001	Southwark	0.002
Cambridge	0.001	Islington	0.306	St. Helens	0
Cannock Chase	0.001	Kensington&Chelsea	0.042	Stafford	0.001
Cardiff	0.074	King's Lynn W Norfolk	0	Stoke-on-Trent	0.056
Carlisle	0.013	Kingston up Thames	0.001	Sutton	0.001
Carmarthenshire	0.001	Lambeth	0.067	Swansea	0.013
Chichester	0.001	Lancaster	0.001	Tamworth	0.001
Chorley	0	Lewes	0.001	Torfaen	0.001
Croydon	0.001	Lewisham	0.001	Tower Hamlets	0.027
Darlington	0.001	Lichfield	0.001	Vale of Glamorgan	0.027
Dorset	0	Merthyr Tydfil	0	Wandsworth	0.003
Ealing	0.001	Merton	0.001	Wealden	0
Eastbourne	0.001	Monmouthshire	0.001	West Lindsey	0
Eden	0.001	Neath Port Talbot	0.001	Wirral	0
Enfield	0.001	Newcastle un. Lyme	0.001	Worthing	0.001

Figure S5: Brighton and Hove and the 10 Community Safety Partnerships (CSPs) within the donor pool receiving the highest weights for the design of the synthetic Brighton and Hove in the Synthetic Control Method (SCM) approach for the main specification (Tables 1-2 and Figure 3; Appendix Table S3 column 2, Table S4 column 2, Figure S4.i, Table S5)



Inference and Robustness

Outliers are detected measuring the value for the preintervention mean squared prediction error (MPSE) for each CSPs. Those CSPs with a MPSE five times larger than the MPSE of the treated CSP (Abadie et al., 2010) are discarded since they are outliers. Figure S6 reports the estimated pseudo p-value referring to the significance of the policy effect for 2011-2016, removing the outliers (Galiani and Quistorff, 2017).

Figure S6: p-values per period for posttreatment periods for the standardized effects of the local policy in the placebo tests.

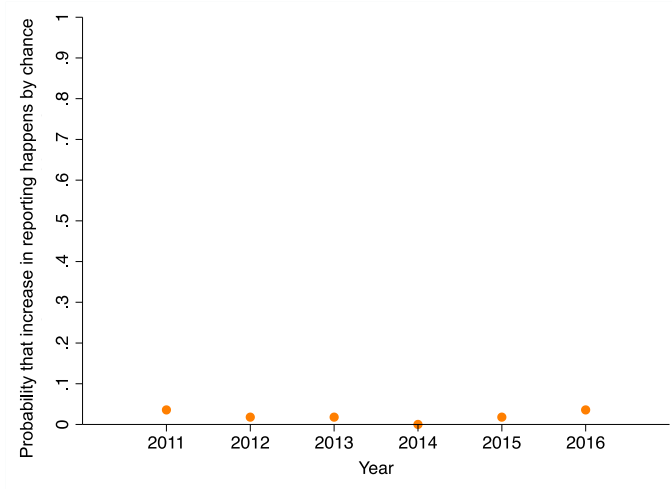


Figure S7 shows the effects of the local policy for the provision of VAWG support services under several robustness checks. First, when racially-based crime are included as potential confounder to control for the effect of anti-minority attitude (Figure S7.a). Second, results from the leave-one-out falsification tests when the CSPs receiving the higher weights in the design of the counterfactual are removed from the donor pool one per time to check whether they are influencing the results (Figure S7.b). Third, results from accounting for potential spillovers which could affect the CSPs that are neighboring with Brighton and Hove (SUTVA violation) (Figure S7.c).

Figure S7: Effects of the local policy for the provision of VAWG support services under several robustness checks. Racially-based crimes included as confounder (Figure S7.a). Leave-one-out falsification tests, when the CSPs receiving the highest weights in the design of the synthetic counterfactual are removed from the donor pool one per time (Figure S7.b). Accounting for potential spillover of the local policy on the Community Safety Partnerships (CSPs) bordering with Brighton and Hove (Figure S7.c)

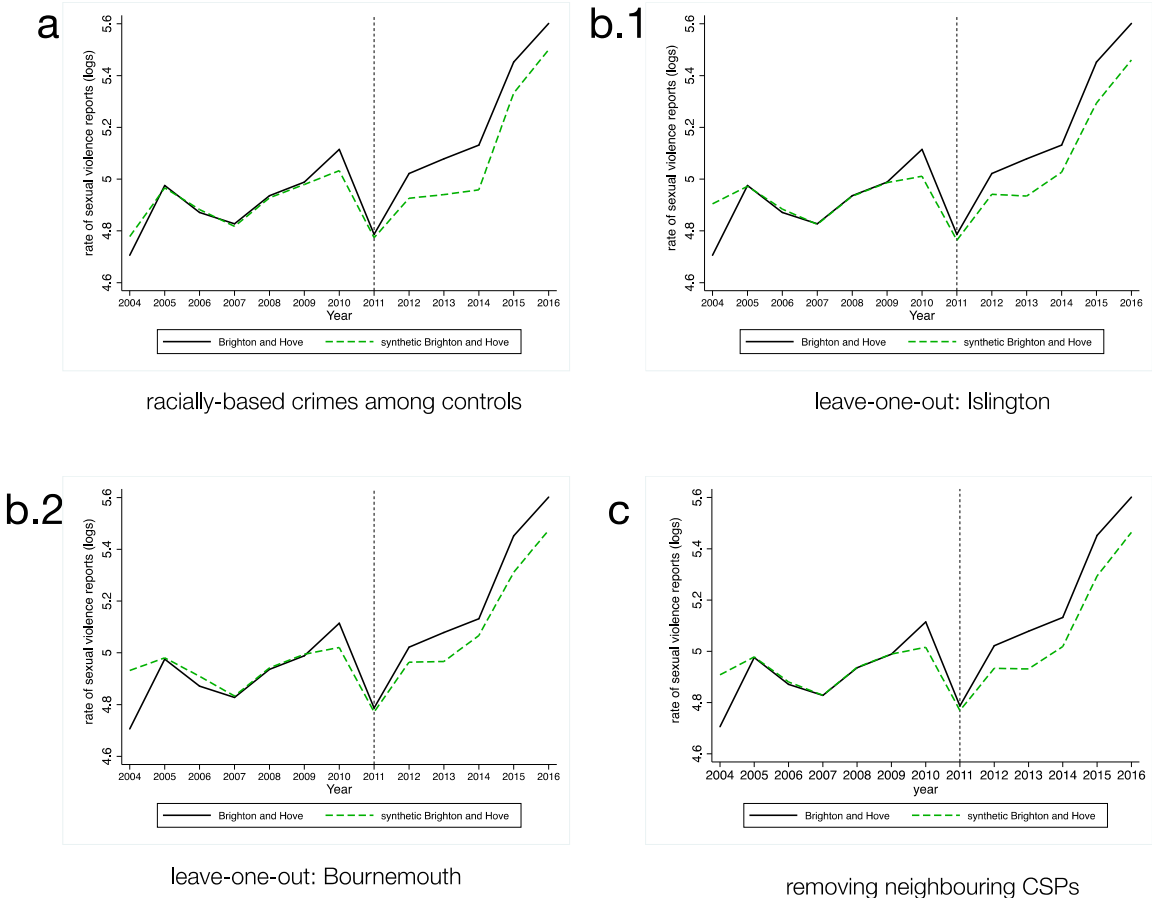


Table S7 summarizes the pre-intervention affinity designed by the SCM when we (i) remove the outliers, (ii) impose a further restriction on the donor pool discarding the CSPs with a low detention rate for sexual crimes.

Table S7. Pre-treatment affinity measured through pre-treatment predictors means between Brighton and Hove and its synthetic counterpart without outliers (columns 1-2) and with a further restriction on the donor pool (columns 3-4)

Variable	No outliers		High sanction/ detention rate for sexual crimes	
	(1) [§]		(2) [°]	
	Brighton and Hove		Brighton and Hove	
	Real	Synthetic	Real	Synthetic
Reporting sexual crimes on women 2009	4.98830	4.9430	4.98830	4.98167
Reporting sexual crimes on women 2007	4.82755	4.7831	4.82755	4.82623
Reporting sexual crimes on women 2005	4.97569	4.9299	4.97569	4.98023
Unemployment	6.7318	6.6664	6.7318	6.97829
Real wage of female workers	6.28467	6.2225	6.28467	6.30203
Female population aged 16-44	0.4848	0.4807	0.4848	0.47946
Drug possession	-	-	-0.1437	-0.12290
Female police force	0.26208	0.25961	0.26208	0.25102
Pre-intervention RSMPE	0.06101		0.08297	

[§] The donor pool used in the SCM summarized by (1) consists of 56 CSPs. The 28 CSPs that have been removed are outliers entailed with a bad pre-intervention fit (pre-intervention MSPE 5 times higher than the one of Brighton and Hove (Abadie et al., 2010)). Inference after removing the outliers delivers robust findings on the positive effect of the policy intervention. The yearly impact of the policy is positive and significant (Table 2 in the main paper, Figure S5). The model has good fit (Galiani and Quistorff, 2017) as summarized by the non-significance of the proportion of placebos that have a pre-treatment RMSPE at least as large as the average of Brighton and Hove ($avg_pre_rmspe_p = 0.982$)

[°]The donor pool used in the SCM summarized by (2) consists of 59 CSPs. The 25 CSPs that have been removed display low rate of detention/sanction rate for sexual crimes (RMP Rape Monitoring Group, 2016) and they refers to the following Police Force Areas: Cumbria, Dorset, Dyfed-Powys, Lincolnshire, Merseyside, South Wales and Staffordshire.

All variables except lagged reporting of sexual crimes are averaged for the 2004-2010 period. Reporting of sexual crimes is measured by the rate of sexual violence reports on women over age 16 per 100 000 women over age 16 (logs). Unemployment is measured in share. Real wage of female workers is measured in 2001 CPI (logs). Drug possession is measured per 100 000 inhabitants (logs). Female population aged 16-44 is measured in share of population. The female police force is measured in share of total police force.

Figure S8 outlines the estimation results from the SCM when (i) outliers are removed, (ii) when CSPs with a low detention/sanction rate for sexual crimes are discarded, and (iii) sexual violence reports are normalized by the share of resident women aged 16-44.

Figure S8: Effects of the local policy for the provision of VAWG support services over time when: (i) outliers are dropped from the donor pool (Figure S8.a); (ii) when Community Safety Partnerships (CSPs) with a low detention/sanction rate for sexual crimes are dropped from the donor pool (Figure S8.b); (iii) when the outcome variable is rate of sexual violence report per 100 000 women aged between 16 and 44 (Figure S8.c)

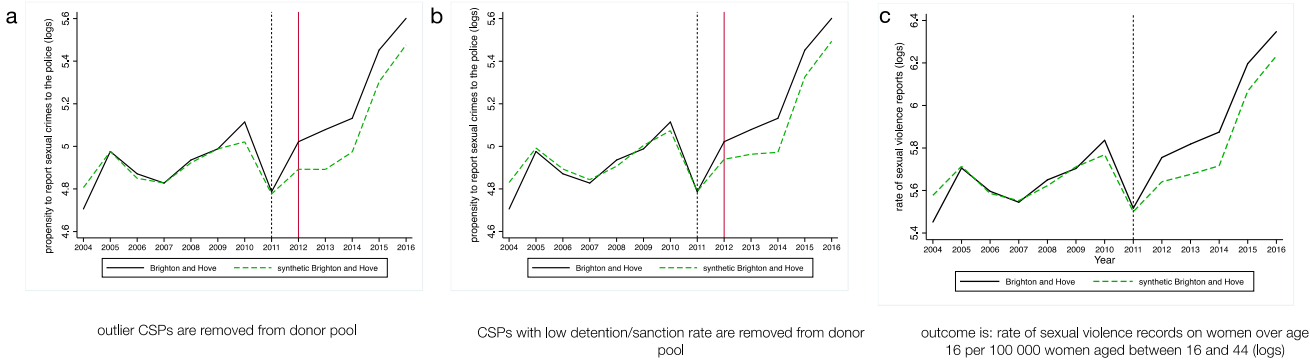
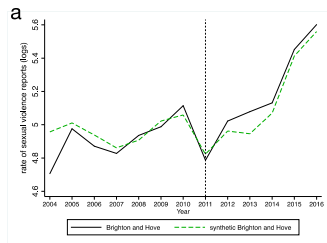


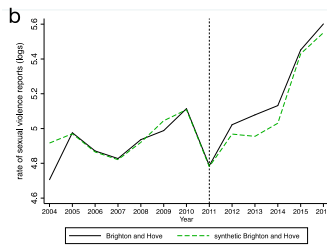
Figure S9 shows the estimation results from the SCM under several robustness checks regarding potential selection bias and secular trends in the outcome. First, when all CSPs with accurate police records are kept in the donor pool (Figure S9.a). Second, when the CSPs with the idiosyncratic shock and the CSPs with post-2011 local policy are kept in the donor pool (Figure S9.b). Third, when all London CSPs are removed from the donor pool to check for potential spillover from the London area into neighboring areas (Figure S9.c). Table S8 shows the weights assigned by the SCM to each CSP when all CSPs with accurate police records are kept in the donor pool (Figure S9.a). Finally, Figure S9.d shows the SCM results when we control for unobserved noise from transitory shocks.

Figure S9: Effects of the local policy for the provision of VAWG support services over time under several robustness checks. When all Community Safety Partnerships (CSPs) with accurate sexual crime data are kept in the donor pool (Figure S9.a). When CSPs with similar policies and CSP with idiosyncratic shock are kept in the donor pool (Figure S9.b). When all London CSPs are removed from the donor pool (Figure S9.c). When data are demeaned on pretreatment average to control for the effects of unobservable heterogeneity in outcome trends (Figure S9.d).



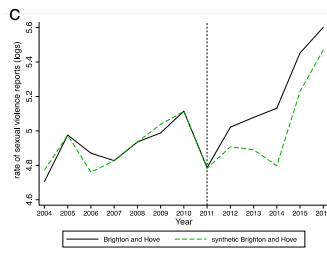
All CSPs with accurate records of sexual violence reports (138 CSPs in the donor pool).

- The donor pool includes:**
 CSPs with same local policy after 2011 as Brighton and Hove
 CSPs with close-but-different policy after 2011 compared to Brighton and Hove
 CSPs with idiosyncratic shock
 CSPs with no VAWG support service before 2011
 CSPs with different types of VAWG support service before 2011 compared to Brighton and Hove

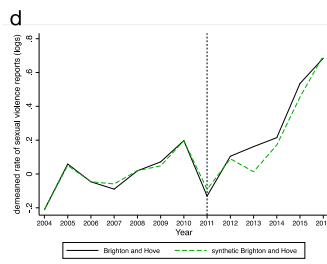


CSPs with accurate records of sexual violence reports (89 CSPs in the donor pool).

- The donor pool includes:**
 CSPs with same local policy after 2011 as Brighton and Hove
 CSPs with close-but-different policy after 2011 compared to Brighton and Hove
 CSPs with idiosyncratic shock



London CSPs are removed from donor pool in the main specification (55 CSPs in the donor pool)



demeaned data using the pre-treatment period

Table S8. Weights given by the Synthetic Control Method (SCM) estimation to the 138 Community Safety Partnerships (CSPs) when no unit is discarded from the donor pool aside the ones with inaccurate police records

						CSPs removed from main estimation			
CSP	Weight	CSP	Weight	CSP	Weight	CSP	Weight	CSP	Weight
						Different/No VAWG support before 2011			
Barking&Dagenham	0.001	Fenland	0.001	Newham	0.002	Adur	0.001	North Kesteven	0.001
Barnet	0.001	Fylde	0	Newport	0	Allerdale	0	North Norfolk	0.001
Barrow-in-Furness	0.008	Great Yarmouth	0.001	Norwich	0.012	Arun	0.001	Nottingham	0.001
Bexley	0.001	Greenwich	0.001	Pembrokeshire	0.001	Ashfield	0.001	Poole	0.001
Blackburn/Darwen	0.001	Hackney	0.001	Pendle	0.001	Basildon	0.001	Ribble Valley	0
Blackpool	0	Hammersmith&Fulham	0.001	Peterborough	0.001	Bassetlaw	0	Rochford	0
Blaenau Gwent	0	Haringey	0.001	Powys	0	Braintree	0.001	Rossendale	0.001
Boston	0	Harrow	0.001	Redbridge	0.001	Breckland	0	Sefton	0
Bournemouth	0.187	Hastings	0.001	Rhondda Cynon Taf	0.001	Brentwood	0	South Cambridgeshire	0
Brent	0.001	Havering	0	Richmond up Thames	0.001	Broadland	0	South Holland	0.001
Bridgend	0.001	Hillingdon	0.001	Rother	0	Camden	0.001	South Kesteven	0
Bromley	0.001	Horsham	0	South Norfolk	0	Castle Point	0.001	South Lakeland	0.001
Burnley	0.001	Hounslow	0.001	South Ribble	0.001	Chelmsford	0.001	South Nottinghamshire	0
Caerphilly	0.001	Huntingdonshire	0.001	Southwark	0.001	Colchester	0.001	South Staffordshire	0.001
Cambridge	0.043	Islington	0.105	St. Helens	0.001	Copeland	0.001	Southend-on-Sea	0.001
Cannock Chase	0.002	Kensington & Chelsea	0.001	Stafford	0.001	County Durham	0.001	Staffordshire Moorlands	0.001
Cardiff	0.13	King's Lynn W Norfolk	0.001	Stoke-on-Trent	0.114	Crawley	0.002	Tendring	0.001
Carlisle	0.016	Kingston upon Thames	0.001	Sutton	0.001	East Cambridgeshire	0	Thurrock	0.001
Carmarthenshire	0.001	Lambeth	0.01	Swansea	0.002	East Lindsey	0	Uttlesford	0.001
Chichester	0.001	Lancaster	0.001	Tamworth	0.002	East Staffordshire	0.001	West Lancashire	0
Chorley	0	Lewes	0	Torfaen	0	Epping Forest	0	Wyre	0
Croydon	0.001	Lewisham	0.001	Tower Hamlets	0.032	Harlow	0.025	Similar/close-but different policy	
Darlington	0.001	Lichfield	0.001	Vale of Glamorgan	0.001	Hyndburn	0.001	Ceredigion	0.001
Dorset	0	Merthyr Tydfil	0.001	Wandsworth	0.079	Knowsley	0	Lincoln	0.001
Ealing	0.001	Merton	0.001	Wealden	0	Liverpool	0.002	Preston	0.001
Eastbourne	0.001	Monmouthshire	0	West Lindsey	0	Maldon	0	Waltham Forest	0.001
Eden	0	Neath Port Talbot	0.001	Wirral	0.001	Mansfield	0	Night economy (idiosyn. shock)	
Enfield	0.001	Newcastle-under-Lyme	0.001	Worthing	0.001	Mid Sussex	0.001	Westminster	0.154

Table S9 outlines the fit between Brighton and Hove and its synthetic counterpart in the post treatment period. The table shows that the two units are really similar in terms of potential alternative explanations for the observed differences in reporting.

Table S9. Post-treatment fit between Brighton and Hove and its synthetic counterpart in terms of control variables for the main Synthetic Control Method (SCM) specification.

Variable	Brighton and Hove	
	Real	Synthetic
Unemployment	7.85297	7.17780
Real wage of female workers	6.25624	6.28079
Female population between the ages of 16 and 44	0.47742	0.48026
Drug possession	0.0279	-0.08271
Female police force	0.25974	0.26368

Notes: all variables are averaged for the 2011-2016 period. Reporting of sexual crimes is measured by the rate of sexual violence reports on women over age 16 per 100 000 women over age 16 (logs). Unemployment is in share. Real wage of female workers is measured in 2001 CPI (logs). Female population is in share. Drug possession is measured per 100 000 inhabitants (logs). The female police force is measured in share of total police force.
The synthetic Brighton and Hove is reproduced by a combination of 84 CSPs.

Table S10 show that Brighton and Hove and its synthetic counterpart are extremely similar in terms of two relevant policing strategies aimed at supporting the victims of sexual crimes that were introduced in 2014.

Table S10. Post-treatment fit between Brighton and Hove and its synthetic counterpart in terms of policing strategies introduced after 2011 that can influence the propensity to report sexual crimes to the police. Considered policing strategies: Domestic Violence Protective Orders (DVPOs) and Domestic Violence Disclosure Schemes (DVDSs)

Variable	Brighton and Hove	
	Real	Synthetic
Use of DVPOs	16.0432	16.0951
Rate of accepted DVDS requests on total DVDS requests	0.44	0.45

Notes: Use of DVPOs is averaged for the 2014-2016 period. Use of DVPOs is measured as the number of requested DVPOs per 10 000 Domestic Violence Incidents recorded by the police. Rate of accepted DVDS requests on total DVDS requests is the percentage of DVDS requests that has been accepted by the police force.
Use of DVPOs is measured through data from Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services (2019, 2017, 2015), Home Office (2016), Strickland and Allen (2018).
Rate of accepted DVDS requests on total DVDS requests is measured through data from Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services referring to 2014 (2015).
The synthetic Brighton and Hove is reproduced by a combination of 84 CSPs.

Table S11 shows the placebo outcome falsification test using the Generalized Difference-In-Difference (GDID) specification of eq(3) to measure the treatment effect in the reporting of homicides, racially-based crimes and drug-related crimes which are likely to respond to crime policies rather than to the local provision of VAWG support services. The treatment effect is always non-significant. Figure S10 shows the same placebo outcome falsification test using the Synthetic Control Method (SCM)

Table S11. Falsification tests with three placebo outcomes and Generalized Difference-In-Difference model. Considered placebo outcomes are: homicide, racially-based crimes and theft

Variable	Dependent variable: Report of other types of crimes to the police (logs)		
	Homicide	Racially-based crimes	Theft
	(1)	(2)	(3)
Brighton and Hove × (2011-2016) (Treatment Effect)	0.0091 (0.121)	0.0005 (0.0005)	0.0012 (0.116)
CSP FE	YES	YES	YES
Year FE	YES	YES	YES
Control variables	YES	YES	NO
No. of clusters	85	85	85
No. of observations	666	1 105	1 016
Within R-Squared	0.2146	0.1412	0.2447

The period of observation is 2004-2016. Homicide and Racially-based violence are measured by the rate of reports per 100 000 inhabitants; Theft is measured by the rate of reports per 1 000 inhabitants. Control variables are unemployment, real wage of female workers (logs), female population in share and female police force also in share. Standard errors are clustered at CSP level and they are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Figure S10. Falsification tests with three placebo outcomes and Synthetic Control Model. Considered placebo outcomes are: homicide, racially-based crimes and theft

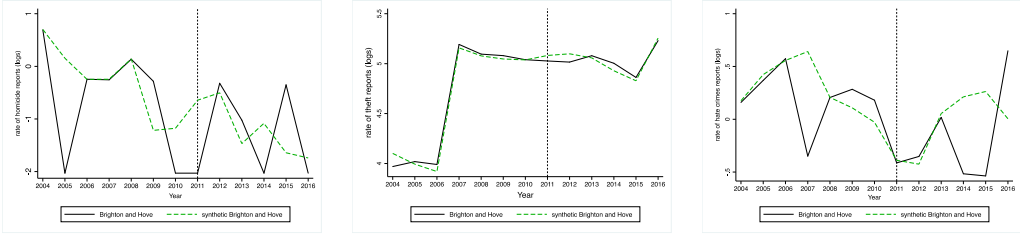


Figure S11 outlines the visual investigation for the parallel trends assumption for the DID and the GDID.

Figure S11: Parallel trends assumption of the Difference-In-Difference (DID) and the Generalized Difference-In-Difference (GDID). The propensity to report sexual crimes for Brighton and Hove (solid black line) and the one for the control group used for the DID and the GDID estimations (solid green line).

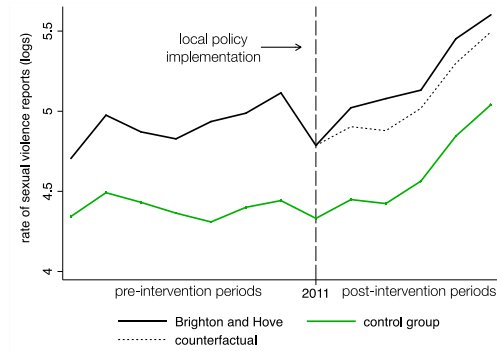


Table S12 summarizes several robustness checks for the GDID model.

Table S12. Generalized Difference-In-Difference (GDID) estimates for the local policy impact under several robustness checks: (i) without the outliers detected through the Synthetic Control Method (SCM) estimation (column 1); (ii) dropping Community Safety Partnerships (CSPs) with a low detention rate for sexual crimes (column 2); (iii) bootstrapping standard errors; (iv) adding a unit-specific linear time trends to control for unobserved heterogeneity

Variable	Dependent variable: Report of sexual crimes on women to the police (for 100,000 inhabitants in logs)			
	No SCM outliers	No low detention rate CSPs	All CSPs bootstrap se	CSP linear - time trend
	(1)	(2)	(3)	(4)
Brighton and Hove × (2011-2016) (Treatment Effect)	0.0958 *** (0.0219)	0.0776*** (0.019)	0.0590*** (0.0145)	0.068*** (0.023)
CSP FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
CSP-specific linear time trends	NO	NO	NO	YES
Control variables	YES	YES	NO	YES
No. of clusters	57	73	85	85
No. of observations	687	870	1 105	1 105
Within R-Squared	0.5123	0.4486	0.4673	0.4686

The period of observation is 2004-2016. Outcome variable is the rate of sexual violence reports on women over age 16 for 100 000 women over age 16 (logs) Control variables are unemployment, real wage of female workers (logs), female population between the age of 16 and 44, drug possession (logs) and female police force. Standard errors are clustered at CSP level and they are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Table S13 presents estimates from the baseline DID model⁹ given by

$$y_{it} = \beta_1 \text{treat}_i + \beta_2 \text{Post}_t + \beta_3 (\text{treat}_i \times \text{Post}_t) + \beta_4 X_{it} + \epsilon_{it} \quad (A1)$$

where treat_i is a dummy variable that is equal to 1 for the treated unit, Post_t is another dummy variable that equals 1 in the period after the intervention, X_{it} is a matrix of the observed characteristics that have been considered as potential confounders in the SCM. The policy impact, conveyed through an Average Treatment Effect on the Treated (ATT) is captured by the estimate of β_3 .

Table S13. Difference-In-Difference (DID) estimates for the local policy impact

Variable	Dependent variable: Report of sexual crimes on women to the police (for 100 000 inhabitants in logs)	
	DID	
	(1)	(2)
Brighton and Hove × (2011-2016) (Treatment Effect)	0.050 ***	0.257 ***
	(0.015)	(0.065)
CSP FE	NO	NO
Year FE	NO	NO
Control variables	NO	YES
No. of clusters	85	85
No. of observations	1 105	1 105
R-Squared	0.07	0.72

Outcome variable is the rate of sexual violence reports on women over age 16 for 100 000 women over age 16 (logs) Control variables are unemployment, real wage of female workers (logs), female population between the age of 16 and 44, drug possession (logs) and female police force. Standard errors are clustered at CSP level and they are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively. DID estimation considers two time periods: pre-intervention period and post-intervention period. For each CSP, a pre-intervention period predictor is given by the 2004-2010 average of the same predictor. Similarly, a post-intervention period predictor is given by the 2011-2016 average of the same predictor.

Figure S12 outlines the balance between the outcome and the control variables in the pre-treatment periods alongside the pre and post treatment trend for the outcome variable for the TJBAL approach with mean balancing and kernel balancing. The post balancing differences are given by $(\text{mean}_{\text{treated}} - \text{mean}_{\text{control}}) / |\text{mean}_{\text{treated}}|$. All the periods of the pre-treatment outcome as well as the five covariates are included because TJBAL does not require to set aside a validation period and it allows for minimizing user discretion when choosing pre-treatment variables (Hazlett and Xu, 2018). The mean balancing estimation is performed without taking out the

⁹ DID estimations are performed with STATA 14 using `diff` (Villa, 2016).

average of pre-treatment outcomes for each unit (demeaning), given the high number of units in the control groups (Hazlett and Xu, 2018). The kernel balancing estimation is done with demeaning because from the GDID estimation we can assume plausibility of parallel trends (Hazlett and Xu, 2018). The smaller value for the bias ratio in the mean balancing shows that this estimator provides a higher improvement than the kernel balancing. Table S14 outlines the TJBAL estimated impact of the local policy for each year after the policy intervention.

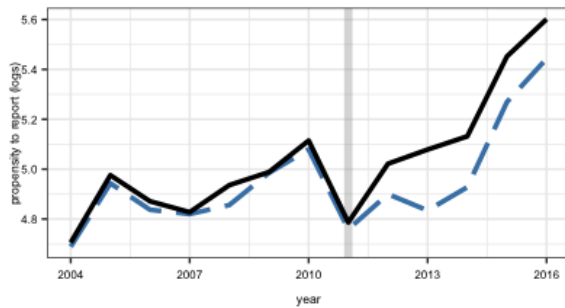
Figure S12. Trajectory Balancing (TJBAL) approach estimates for the pre-post treatment trends of the rates of sexual violence reports to the police and for the mean balance between the outcome and the covariate in the pre-treatment periods under the two considered approaches (mean balancing and kernel balancing with demeaning).

Trajectory Balancing approach estimates

mean balancing

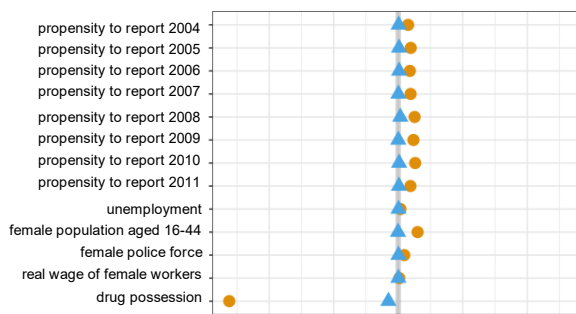
bias ratio = 0.0668

Treated and Counterfactual Trajectories



— Treated — Estimated Y(0)

Covariate Balance

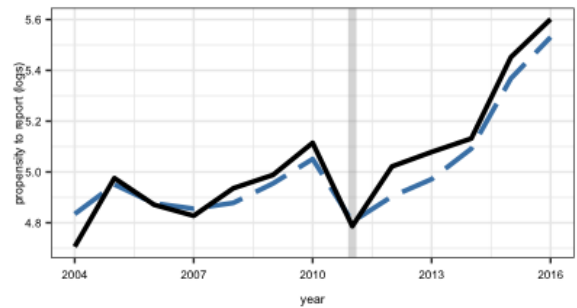


● Unweighted ▲ Weighted

kernel balancing with demeaning

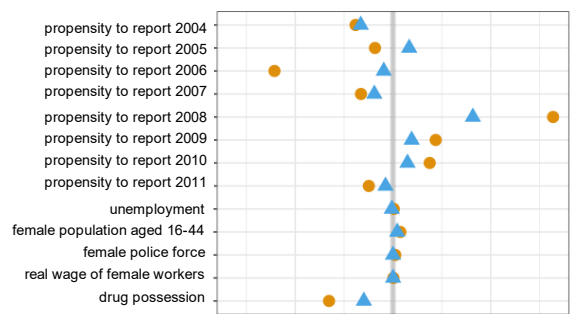
bias ratio = 0.6232

Treated and Counterfactual Trajectories



— Treated — Estimated Y(0)

Covariate Balance



● Unweighted ▲ Weighted

Table S14 Trajectory Balancing (TJBAL) approach yearly estimated effect for the local policy impact under mean balancing and under kernel balancing with demeaning

Brighton and Hove		
	Estimates of the treatment effect (mean balancing)	Estimates of the treatment effect (kernel balancing)
2011	0.0275	0.0813
2012	0.1218	0.1180
2013	0.2442	0.1070
2014	0.2038	0.0401
2015	0.1828	0.0837
2016	0.1583	0.0708

Table S15. Socioeconomic outlook of Brighton and Hove and England and Wales

Variable	Brighton and Hove	England and Wales
Unemployment	6.8	6.4
Wage	486.75	481.46
Prevalence of sexual violence	3.17	3.17
Foreign population	0.089	0.076

Unemployment, wage, foreign population and inequality are averaged for the 2004–2016 period. Unemployment is in share. Wage is measured by the weekly gross wage. Foreign population is in share.