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ORIGINAL ARTICLE

Socio-Economic Inequality and Intimate Partner Violence in Sweden: A Municipal-Level Analysis

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Abstract

Purpose Intimate partner violence (IPV) is influenced by multi-level factors. This study tests whether municipal-level socio-economic inequality – operationalized as concentrated disadvantage – predicts variation in police-reported IPV against adult women across Sweden.

Method A cross-sectional analysis of all Swedish municipalities in 2021 was conducted. IPV was measured as assault against women by intimate partners per 100,000 residents. The key predictor was an additive disadvantage index with single-parent households, social assistance recipiency, low income, unemployment, and low education as indicators for socio-economic status (SES). Ordinary least squares models estimated bivariate and multivariable associations with demographic controls, and Moran's I tested spatial autocorrelation.

Results The disadvantage index was strongly and positively associated with IPV (bivariate $B \approx 27.0$, $p < .001$; multivariable $B \approx 18.0$, $p < .001$), accounting for roughly 26–36 percent of variance across municipalities. Controls – including population density, residential mobility, and the proportion of men – were not independently significant. Spatial diagnostics showed no significant residual clustering.

Conclusions Findings align with social disorganization and macro-level strain perspectives, indicating that concentrated socioeconomic disadvantage is an indicator of IPV at the municipal level. Prevention could pair poverty reduction, education, and employment initiatives with investments in informal social control and community cohesion. Cross-sectional design and reliance on police reports warrant caution; future work should examine mediating mechanisms and longitudinal change.

Keywords Intimate partner violence · Concentrated disadvantage · Socioeconomic inequality · Municipal analysis · Social disorganization · Macro-level strain

Introduction

Intimate partner violence (IPV) is a serious public health and social issue that occurs across all societies. The World Health Organization (WHO) emphasizes that IPV is driven by factors at multiple levels – from individual (micro) up to community and societal levels (macro) – in what is known as the social-ecological model (WHO, 2010). This means that structural conditions in the broader community can influence the risk of IPV, alongside individual and relationship factors. For example, macro-level factors such as norms that reinforce gender inequality, poverty and unemployment rates, and weak sanctions against domestic abuse have been identified as contextual risk factors for IPV (WHO, 2010). In line with this perspective, effective IPV prevention requires addressing not only individual behaviors but also the wider social environment in which violence occurs.

Sweden and the EU provide relevant context for IPV prevalence and policy, as both offer high-quality survey data, comparable administrative statistics, and well-developed policy frameworks that enable situating national findings within a broader comparative perspective. The 2023 Swedish Crime Survey special module reported that 13.6 percent of the population (aged 16–84) experienced some

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form of IPV during 2022 (Brå, 2024). Although psychological violence was reported as most common, it was also the least reported to the police. According to the report, women were more often victimized than men, and residents of socio-economically disadvantaged areas were somewhat more likely to be victimized. Survey-based studies suggest that Sweden's IPV prevalence is broadly comparable to that of other Nordic countries (WHO, 2021). Despite high levels of gender equality and social protection, IPV remains a persistent problem across the region (Gracia & Merlo, 2016). Therefore, further research, such as quantitative multilevel analyses (ML), is requested to inform preventive strategies which should be research-driven. Arguably, multilevel analyses would primarily contribute insight into whether the associations observed at the municipal level also hold at the individual level, and to what extent variation in IPV victimization is attributable to individual characteristics versus contextual conditions.

At the EU level, Eurostat's EU-GBV survey supplies harmonized cross-national indicators (Eurostat, 2022); administrative data compiled by EIGE also indicate that women are disproportionately affected by severe IPV outcomes, with 86 percent of police-recorded IPV offences in 2022 (EIGE, 2024). These sources contextualize our police-based outcome measure and underscore both the burden of IPV and the known underestimation inherent in administrative data.

In Sweden, a national strategy launched in 2017 emphasizes a holistic approach to combat IPV through measures at the individual, group, and societal levels (Government Offices of Sweden, 2017). This policy recognition further highlights the importance of understanding how socio-economic and community-level conditions relate to IPV incidence. In line with this perspective, recent empirical research has demonstrated a clear association between low socio-economic status and higher levels of IPV. For example, Karimi et al. (2024) show that socio-economic disadvantage is consistently linked to elevated IPV risk, underscoring the relevance of examining structural and contextual determinants of violence. However, they demonstrate this relationship at the individual level, whereas the present study focuses on area-level associations.

Prior research from Sweden suggests that crime rates vary systematically across communities due to underlying structural characteristics. In Sweden, for instance, an early report by the National Crime Prevention Council (Brå, 2002) found notable differences in overall violent and property crime rates between municipalities, partly attributing these to factors like income levels, unemployment, and age composition. However, that study did not specifically disaggregate IPV. Spatial clustering could be expected if neighboring municipalities share similar structural conditions, social norms, or institutional practices. Clustering may also reflect spillover effects, regional labor markets, or shared access to support services, as suggested by spatial epidemiological research on IPV (Alderton et al., 2020; Gracia et al., 2015). International literature indicates that areas with concentrated disadvantage – such as high poverty, unemployment, and other signs of socio-economic stress – tend to experience higher levels of violence, including IPV (Pinchevsky & Wright, 2012). A recent Swedish study identified a relationship between socio-economic vulnerability and actual exposure to IPV (cf. Karimi et al., 2024). A meta-analysis by Pratt and Cullen (2005) showed that aggregated measures of socio-economic problems (often termed "concentrated disadvantage" or "neighborhood disadvantage") are among the strongest and most stable predictors of crime across different macro-level units. In the context of IPV, a comprehensive review by Pinchevsky and Wright (2012) concluded that a higher degree of area-level socio-economic disadvantage is clearly associated with higher IPV prevalence. Conversely, communities with more resources and higher socio-economic status tend to have lower rates of IPV (Pinchevsky & Wright, 2012). These patterns align with theoretical expectations from criminology that structural inequality and social context matter for crime. However, similar studies, on a municipal level, have not been conducted in Sweden known for its socio-economically equal society.

At the same time, not all community differences in IPV may be due to actual victimization disparities; reporting practices and policing can play a role. In a Swedish study of regional crime anomalies, higher crime rates in certain counties were partly explained by greater public trust in police and proactive policing, which increased reporting (Brå, 2010). However, such factors are less likely to explain IPV variation, since IPV typically occurs in private settings where police presence or third-party surveillance is minimal (Pinchevsky & Wright, 2012). Indeed, area differences in IPV reporting propensities appear to be modest – a recent analysis found that only a small fraction of the variance in reported violence between communities could be attributed to factors like local reporting culture or trust in authorities (Brå, 2021). This suggests that observed geographic differences may partly reflect underlying differences in occurrence, although reporting practices and disclosure barriers remain important considerations.However, rurality and reporting barriers (limited police presence, longer response times, stigma) can depress disclosure and recorded IPV in sparsely populated areas (Petersson et al., 2025). We therefore treat municipal differences in police-reported IPV as a lower bound and interpret rural municipalities with caution.

The present study focuses on socio-economic inequality at the municipal level in Sweden and its relationship to IPV

rates. We mainly draw on two complementary theoretical frameworks – social disorganization theory and strain theory – to inform our expectations. Both perspectives predict that communities characterized by socio-economic disadvantages and related social illness will experience higher levels of crime, including IPV. We aim to test the core hypothesis that municipalities with lower socio-economic status (greater concentrated disadvantage) will have higher rates of IPV. Additionally, we explore the spatial distribution of IPV across municipalities to see whether high-IPV areas are geographically clustered or if the pattern corresponds mainly to socio-economic conditions rather than location. Our analysis covers all municipalities in Sweden, providing a nationwide quantitative assessment that contributes to understanding macro-level predictors of IPV in a Nordic context. Given that Swedish municipalities are increasingly tasked with crime prevention responsibilities by law (Parliament, 2023) insights into structural risk factors at the municipal level are highly policy-relevant, which constitutes a reason for the geographical limitations adopted in this study.

Theoretical Framework

Social Disorganization Theory and Community Control

Social disorganization theory posits that structural disadvantages in a community undermine informal social control mechanisms, leading to higher crime rates (Shaw & McKay, 1969). Originating from the classic work of Shaw and McKay in the Chicago School of sociology, this perspective emphasizes how characteristics like poverty, residential instability (high mobility), and family disruption can weaken the social networks and norms that ordinarily inhibit criminal behavior. In their seminal studies of urban neighborhoods, Shaw and McKay observed that areas with low economic status, poor housing conditions, and a transient or heterogenous population tended to have elevated levels of delinquency (Shaw & McKay, 1969). For example, they found that the proportion of families receiving public welfare and the prevalence of low-rent housing were strongly correlated with higher crime rates in an area (Shaw & McKay, 1969). Such conditions were interpreted not as direct causes of crime, but as indicators of social disorganization – the breakdown of community social structures and collective efficacy. Disadvantaged neighborhoods often experience a loss of informal social control, meaning residents are less able or willing to monitor and intervene in deviant behavior (Shaw & McKay, 1969). Furthermore, limited opportunities and resources in these areas breed alternative norms and values that conflict with conventional, law-abiding behavior.

Applied to intimate partner violence, social disorganization theory suggests that communities with greater disadvantage and social instability may have higher IPV rates partly because of weaker collective supervision and support networks. When neighbors are less interconnected or less inclined to intervene, private conflicts and domestic abuse may flourish unchecked. Indeed, prior research on IPV at the community level has frequently used social disorganization as a guiding framework (Pinchevsky & Wright, 2012). For example, Browning (2002) extended this theory to IPV, finding that neighborhoods with higher collective efficacy (strong informal social control and social cohesion) had significantly lower levels of IPV. Conversely, low collective efficacy was associated with increased IPV (Browning, 2002). This underscores that in disadvantaged contexts – where unemployment, single-parent households, and residential turnover might be common – the lack of social control can exacerbate the occurrence of IPV. In summary, social disorganization theory would predict that Swedish municipalities marked by concentrated disadvantage and weakened social ties will exhibit higher IPV, due to diminished informal control and potentially normative tolerance of violence.

Macro-Level Strain Theory

Strain theories of crime focus on stressors and frustrations that arise from the inability to achieve socially valued goals through legitimate means (Merton, 1938). While classic strain theory was formulated at the individual level, Robert Agnew's general strain theory has been extended to the macro level to explain why some communities have higher crime rates (Agnew, 1999). Agnew's macro-level strain theory (sometimes abbreviated MST) proposes that communities characterized by aggregate strain – for instance, pervasive poverty, unemployment, and other adversity – will exhibit higher levels of crime, especially if there are inadequate supports or coping mechanisms in place. The underlying idea is that concentrated structural strain generates collective stress and frustration (e.g. due to financial hardship and family disruptions), which can increase the propensity for violence (Agnew, 1999). At the same time, communities under strain often have fewer institutional resources (like employment opportunities, quality schools, or effective social services) and may experience erosion of social bonds, compounding the likelihood of criminal responses.

According to Agnew (1999), factors such as chronic unemployment, low income, and economic inequality contribute to community-level frustration and despair, which in

turn can fuel crimes including interpersonal violence. These strain-inducing factors often co-occur with the social disorganization factors noted above, meaning disadvantaged areas may suffer a "double burden" of high strain and low control. Macro-level strain theory also highlights that the relationship between structural strain and violence can be influenced by conditioning factors such as social support or informal control (Agnew, 1999; Warner & Fowler, 2003). For example, Warner and Fowler (2003) tested a community strain model and found that high levels of economic strain led to more violence, but primarily in neighborhoods lacking robust informal social control or social support networks. In areas with stronger social cohesion, the impact of structural strain on violence was less pronounced (Warner & Fowler, 2003). This finding reinforces the interplay between strain and disorganization: high disadvantage raises crime risks, and those risks are exacerbated when informal social control is weak.

Empirical research provides mixed but growing support for macro-level strain effects on IPV. Several studies report that communities with greater socio-economic hardship have higher rates of IPV, consistent with strain theory (see e.g. Botchkovar et al., 2018; Pinchevsky & Wright, 2012; Wright & Benson, 2011). One challenge noted in the literature is operationalizing "aggregate strain" reliably: many studies use proxies like poverty levels or unemployment rates, which capture facets of strain but not the subjective stress level directly (Agnew, 1999; Pratt & Cullen, 2005). Despite this, the overall evidence indicates that macro-level socio-economic stressors contribute to IPV. In the present context, we expect that Swedish municipalities with lower socio-economic status (reflecting higher collective strain) will have relatively higher IPV prevalence. This expectation is bolstered by the fact that most prior macro-level IPV studies, though often U.S.-based, find socio-economic disadvantage to be an important predictor (Pinchevsky & Wright, 2012). By applying both social disorganization and strain perspectives, we acknowledge that structural disadvantages can heighten IPV risk through multiple pathways: by generating stress and frustration that may precipitate violence, and by eroding the community controls that might otherwise check violent behavior.

Theoretical Implications

Importantly, the two theories are complementary and overlapping in this study's context. Both frameworks identify low socio-economic status (SES) as a key underlying condition linked to higher crime. Social disorganization emphasizes the breakdown of community regulation and networks, while strain focuses on the buildup of pressure and negative stimuli. Given that our interest is in socio-economic inequality, we use concentrated disadvantage as a unifying construct, consistent with previous research (see e.g. Pinchevsky & Wright, 2012). We note that applying these theories to IPV in a Swedish municipal context is relatively novel – most existing comparable studies are from North America. Thus, our research also serves to test whether these predominantly macro-criminological theories hold explanatory power for IPV in a Swedish welfare state setting. However, a potential limitation is that concepts such as collective efficacy are typically theorized at smaller spatial scales, such as neighborhoods. Applying these frameworks at the municipal level therefore involves assuming that similar processes operate at higher levels of aggregation. This limitation also applies to strain theory, where proxy indicators capture structural conditions rather than subjective stress.

Ecological and social determinant perspectives complement our macro-criminological framing. Bronfenbrenner's (1977) ecological systems model conceptualizes multi-level influences across micro-, meso-, exo-, and macro-systems, and Heise's (1998) integrated ecological framework applies these insights to gender-based violence by articulating factors at individual, relational, community, and societal levels. These perspectives therefore complement social disorganization and strain theory by explicitly linking structural conditions to multilevel mechanisms influencing IPV risk.

Public health work has also synthesized these ideas within a social determinants paradigm, which emphasizes how structural conditions (e.g., socioeconomic position, institutional context) shape downstream risk factors and health outcomes (WHO, 2010).

Recent spatial IPV literature underscores that area context matters: systematic reviews and spatial epidemiology link concentrated disadvantage, immigrant concentration, and residential instability to higher IPV risk, and visualize clusters using Bayesian disease mapping (e.g., Alderton et al., 2020; Gracia et al., 2015, 2018). Our study adds municipal-scale evidence from Sweden and situates findings alongside these strands, while recognizing heterogeneity within municipalities and the need for finer-grained analyses (e.g., Gallo-Rivera et al., 2024).

Guided by the above theories and prior findings, we hypothesize that municipalities with greater socio-economic disadvantage will experience higher rates of IPV. We also anticipate that other structural factors associated with disorganization (such as residential instability or family disruption) could be related to IPV, but that their influence may be mediated by the broader SES context. Overall, the theoretical framework leads us to expect a positive association between low community SES and IPV prevalence, reflecting the combined insights of social disorganization and strain theory.

Research Questions

RQ1: Does municipal-level concentrated disadvantage predict higher police-reported IPV assault rates against adult women?
RQ2: Do IPV rates exhibit spatial clustering independent of socioeconomic structure?

Methodology

Data and Sample

This study utilizes a quantitative cross-sectional design, examining all Swedish municipalities ($n=290$) as the units of analysis. We focus on the year 2021, which was the most recent year for which complete data were available at the time of analysis. Using a full population of municipalities (a total survey of Sweden's municipalities) avoids sampling bias and allows for comprehensive coverage of urban, suburban, and rural areas. One municipality (Heby) is not included in certain analyses due to a missing data point (as noted below). Another municipality – Ydre – lacks reported cases of IPV, hence the minimum rate of IPV reported as zero (0). During the multiple regression analysis, an additional municipality (Övertorneå) was excluded, as it represented an extreme outlier within the dataset, resulting in an effective sample of 288 municipalities for the regression models and 290 for the spatial analyses.

Dependent Variable

Dependent Variable (IPV): The outcome measure is the rate of IPV against women aged 18 years or older for each municipality, operationalized as the number of police-reported IPV assaults per 100,000 inhabitants in 2021. This measure was derived from the Swedish Crime Statistics maintained by the National Council for Crime Prevention (Brå). We concentrated on this category for two reasons: (1) women are disproportionately affected by severe IPV outcomes, particularly in police-reported assault cases in Sweden and globally, focusing on female-targeted abuse provides a more uniform indicator of severe IPV (Brå, 2014); and (2) by using assault incidents, we rely on a crime type with relatively stable legal definitions over time, thus enhancing comparability.

This study focuses on police-reported physical assaults against adult women by intimate partners. Men and nonbinary persons can be victims of IPV, but the present operationalization is bound to female victimization given data availability and the policy relevance of severe female-targeted IPV in Sweden. We note that health and social consequences of IPV are disproportionately severe for women on average; this does not diminish the seriousness of male victimization.

Issues Regarding Swedish Crime Data

The Swedish National Council of Crime Prevention (2023) recently conducted a quality assessment of police-reported crime data, focusing on how relationship categories between victim and perpetrator are recorded in the police case-management system. In 2019, Sweden implemented a revision of offence codes used at the time of reporting (Brå, 2023). Accurate use of these codes is essential for the reliability of statistics on reported offences. However, the assessment identified substantial miscoding, creating risks of erroneous conclusions regarding crime levels and trends (Brå, 2023). For example, assaults against women by intimate partners were found to be underestimated, while assaults recorded as committed by a "known non-family acquaintance" were overestimated (Brå, 2023). The primary cause of these errors appears to be limited knowledge and inconsistent application of offence-code definitions among reporting personnel (Brå, 2023).

The Swedish National Council of Crime Prevention therefore recommends that analyses of police-reported IPV should merge the three relationship categories used in Swedish crime statistics – intimate partner, family/kinship, and other known relationship – into a single aggregated category, as this approach most closely reproduces the crime levels observed prior to the 2019 coding revision (Brå, 2023). In line with this recommendation, the present study applies the aggregated category when constructing the IPV outcome measure.

Independent Variables

Key Independent Variable (Socio-Economic Disadvantage Index) The primary independent variable is a composite index representing low socio-economic status (SES) or concentrated disadvantage in each municipality. Following common practice in macro-level crime research (Pinchevsky & Wright, 2012; Pratt & Cullen, 2005), we constructed an additive index to capture multiple aspects of socio-economic disadvantage while mitigating multicollinearity between highly correlated indicators (Allison, 1999). We included the following five indicators of low SES, all measured as percentages of the relevant population in 2021:

Single-parent households: Percentage of households that are single-parent with children (ages 0–24).

Social assistance recipiency: Percentage of adults (18+) receiving social welfare (income support).
Low income: Percentage of individuals (20+years) with a low economic standard (e.g., Low income component follows Statistics Sweden's at-risk-of-poverty definition: equivalised disposable income < 60 % of the national median.).
Unemployment: Percentage of working-age individuals (20–64 years) who are unemployed.
Low education level: Percentage of residents (ages 16–74) with only primary education (not beyond 9 years of schooling).

At present, there is no established definition of low socio-economic status in Sweden (see, for example, Delmos, 2021; Statistics Sweden, n.d.). However, each of these five variables reflects a dimension of socioeconomic disadvantage (family economic stress, poverty, unemployment, and low human capital). These variables are also available at the municipal level from official sources, which has been crucial for their inclusion in the SES index. To create the composite, we standardized the indicators to a common scale and then averaged them (sum divided by five) to obtain a socio-economic disadvantage index (SES index) for each municipality. A higher value on this index indicates a higher concentration of low-SES characteristics in the municipality. Notably, in adapting measures used in U.S. studies of "concentrated disadvantage" (e.g. Browning, 2002; Wright & Benson, 2011), we made a couple of adjustments to suit the Swedish context: we included education level as an indicator (believing low education is a salient disadvantage marker in Sweden), and we excluded two variables commonly used in U.S. indices – the percentage of residents under 18 and the percentage of foreign-born residents – from the index, since we do not consider those to directly reflect socio-economic status in the Swedish setting. Instead, as explained next, we treat those factors as separate controls. Note that complete data for all five index components were available for 289 municipalities; one municipality – Heby – lacked updated social welfare support figures, hence its omission from analyses involving the index.

Note that our concentrated disadvantage measure, SES index, is a theory-driven, additive composite (single-parent households, social assistance recipiency, low income, unemployment, low education). Because these indicators form – not reflect – a latent construct, internal consistency metrics such as Cronbach's alpha are not conceptually appropriate (Diamantopoulos & Winklhofer, 2001). Instead, we justify the index by theoretical coverage and assess indicator redundancy via collinearity diagnostics, consistent with best practice for formative indices.

Control Variables In the regression models, we incorporate several additional independent variables to account for other structural and demographic factors that might influence IPV rates (based on prior research, data availability and theory). These include:

Population density – the number of inhabitants per square kilometer in the municipality. This captures the urban–rural character; more densely populated (urban) areas might have different dynamics affecting crime (for example, urban anonymity versus rural isolation could affect IPV reporting or occurrence).
Residential mobility – measured as the percentage of the population that were new residents in the municipality during the year (in-migration relative to population). High mobility can indicate less stable social networks; a factor often linked to social disorganization.
Percentage of males – the percentage of the municipality's population who are men aged 20–64. Official Swedish crime statistics consistently show that men constitute the majority of suspected perpetrators of violent crime, including intimate partner violence (Brå, 2024; EIGE, 2024). A higher proportion of men might therefore theoretically increase IPV incidence. It also roughly adjusts for the pool of potential male perpetrators.
Family instability – proxied by the percentage of children (0–17) in the municipality whose parents separated or divorced during the year. This indicator reflects family disruption, which can correlate with broader social instability and has been used in prior studies as a community risk factor, often related to strain or disorganization effects (e.g. Pinchevsky & Wright, 2012; Pratt & Cullen, 2005).
Foreign-born population – the percentage of residents who are foreign-born. While not a direct socio-economic measure, it is sometimes linked to community-level crime differences and was considered in previous IPV studies (e.g. as part of "ethnic heterogeneity") (see e.g. Alderton et al., 2020; Pinchevsky & Wright, 2012). We include it here as a control to see if immigrant composition has any independent relationship with IPV rates, recognizing that it might also overlap with socio-economic disadvantage in complex ways.

All data were drawn from official Swedish statistics: Statistics Sweden (SCB), The National Council for Crime Prevention (Brå), and The National Board of Health and Welfare (Socialstyrelsen), for 2021. By including these controls, we aim to isolate the specific effect of socio-economic disadvantage on IPV while accounting for other plausible contextual influences.

Data Limitations

Police-reported IPV is an imperfect proxy for the true prevalence of intimate partner violence, as only a fraction of incidents are brought to the attention of authorities. In Sweden, national victimization data demonstrate that a substantial share of IPV is never reported (Brå, 2014), forming the "dark figure" of crime that cannot be captured through official statistics (Biderman & Reiss, 1967). Offence classifications recorded at the time of reporting may also be inaccurate (Skogan, 1974), and a police report does not guarantee that an offence will later be substantiated. Reporting propensities vary across contexts – shaped by cultural attitudes, trust in authorities, and access to support services – and although area-level differences appear relatively small (Brå, 2021), municipalities may still differ in reporting levels for reasons unrelated to actual IPV prevalence. Such variation is further complicated by the fact that Swedish police regions operate with considerable autonomy: despite national guidelines prioritizing IPV, investigative practices and resource allocation differ across regions (Olsson & Wallin, 2025). These disparities are difficult to quantify but may influence the number of recorded cases. Survey-based estimates can provide complementary information, yet municipal-level samples in Sweden are often too small for reliable small-area estimation. Consequently, while police-reported IPV must be interpreted cautiously, it remains the most consistently available and widely used source for ecological crime research, allowing for meaningful analysis of structural correlates such as socio-economic disadvantage (Biderman & Reiss, 1967; Skogan, 1974).

Analytical Approach

We employed ordinary least squares (OLS) regression to examine the relationship between the independent variables and the IPV rate outcome. Two main regression models were estimated: (1) a bivariate model with the SES index as the sole predictor (to test the basic relationship); and (2) a multiple regression model including the SES index and all the control variables discussed above. The hypothesis is supported if the SES index shows a positive, statistically significant coefficient in these models. We set the significance threshold at the conventional 5 percent level ($p<.05$) for hypothesis testing. Regression diagnostics were conducted to ensure the validity of the analysis: we checked for multicollinearity (the SES index construction itself mitigated some of this, as it combined collinear indicators), examined residual plots for heteroscedasticity and normality, and identified any outliers or influential cases. One small municipality emerged as a potential outlier due to an extremely high IPV rate relative to its SES level (an unusual case with very few residents but several IPV reports); we ran robustness checks excluding this case to verify it did not unduly distort the results.

In addition to the regression, a geographical analysis, checking for spatial autocorrelation, was performed to explore spatial patterns in IPV rates. Spatial autocorrelation means that values for a variable co-vary with the corresponding value in a nearby geographical unit (Svensson Henning, 2009). Here, this would correspond to neighboring municipalities co-varying in terms of the number of reported IPV. We mapped the municipal IPV rates and employed a spatial autocorrelation test (Moran's I) using GeoDa software to detect any clustering of high- or low-rate municipalities. Moran's I is similar to Pearson's correlation coefficient and ranges from −1 to + 1 where a value close to one (positive or negative) indicates problems with spatial autocorrelation. This step addresses the secondary research question regarding geographic variation: if IPV is strongly clustered regionally, it might indicate localized cultural or regional effects beyond socio-economic structure. Conversely, a random or dispersed spatial pattern would suggest that each municipality's structural conditions (rather than shared location) drive the IPV rate. The mapping was done by quartiles of IPV rate to visually inspect any clusters of particularly high or low IPV municipalities.

All data processing and statistical analyses were conducted using Microsoft Excel for initial data compilation and IBM SPSS Statistics (Version 27) for regression modeling. GeoDa was used for spatial analysis. The analysis is based on official aggregate data, so ethical considerations such as informed consent or confidentiality of individuals do not apply; however, we remain sensitive to the interpretation that higher reported IPV in some areas may reflect both actual victimization and complex social dynamics.

Results

Descriptive Findings

Table 1 contains descriptive statistics which shows considerable variation in both IPV rates and socio-economic conditions across Swedish municipalities. The average number of reported IPV assaults against women (per 100,000 population) was around 200, with about half of municipalities falling roughly between 100 and 300 per 100,000. A few municipalities had extremely low IPV incidence (including one with zero cases in 2021), whereas the highest observed rate was close to 500 per 100,000. Regarding the socio-economic context, the composite SES disadvantage index ranged from just under 4 percent to just over 11 percent, representing the average share of the population experiencing

Table 1 Descriptive statistics for study variables (N=289)

Variable	Average	Median	SE	Min	Max
Dependent variable					
IPV rate (per 100,000)	202,58	205,44	4,48	0	498,40
Independent variables					
SES index	7,42	7,42	0,08	3,69	11,18
Residential mobility (%)	6,07	5,74	0,11	3,19	16,06
Males (%)	27,41	27,20	0,09	23,45	34,06
Population density/ km^2	161,03	28,55	34,69	0,20	6171,0
Children with separated parents (%)	3,46	3,40	0,05	1,00	6,80
Under age 18 (%)	20,61	20,42	0,14	14,17	28,55
Foreign born (%)	15,79	14,24	0,38	6,98	43,36

Table 2 Compilation of the outcome from regression 1 and 2 (N=288)

Variables	Coefficient (B)	SE
Model 1		
Constant	1,07	20,04
SES index	27,024**	2,65
Model 2		
Constant	–75, 07	95,46
SES index	17,973**	3,95
Residential mobility (%)	3,09	2,82
Males (%)	3,02	3,08
Population density/km^2	–0,003	0,008
Children with separated parents (%)	10,711*	5,08
Under age 18 (%)	–2,08	1,93
Foreign born (%)	3,052**	0,91

* p<.05 ** p<.001

the five hardships (e.g. some municipalities had very low poverty/unemployment, while others had substantially higher levels). As expected, many of the disadvantage indicators are inter-correlated; for instance, municipalities with high unemployment often also had a high proportion of social assistance recipients and single-parent families. The bivariate correlation between the SES index and the IPV rate was positive and moderately strong (Pearson's $r \approx 0.52$, p<.001), a first indication that IPV tends to be higher in more disadvantaged areas.

Regression Analysis

Table 2 presents the OLS regression results for the relationship between municipal socio-economic disadvantage and IPV rates. The number of reported IPV is calculated per 100,000 inhabitants.

In the bivariate model (Model 1), low socio-economic status has a significant positive association with the IPV rate. Specifically, the SES index alone explains about

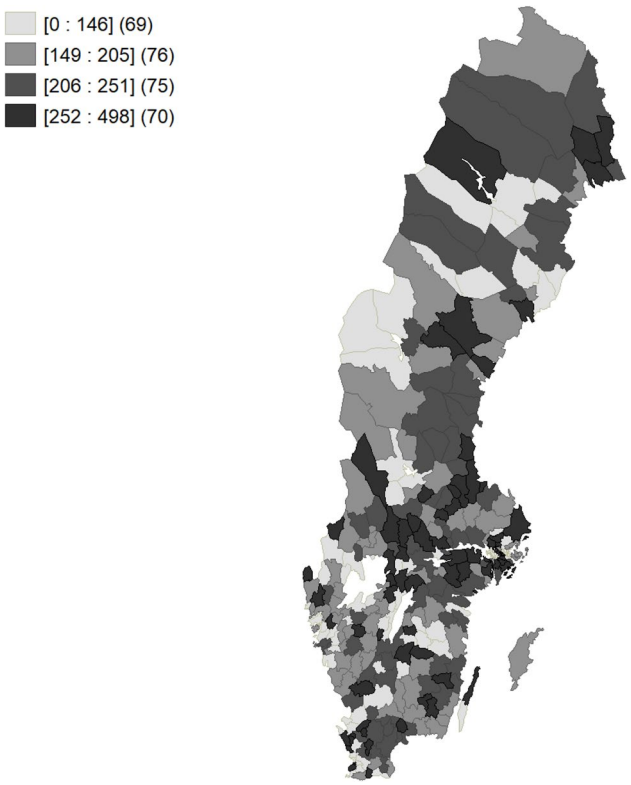


Fig. 1 Choropleth map of IPV rate per 100,000 by municipality (2021)

26.6 percent of the variance in IPV across municipalities (R^2=0.266, p<.001).

It is important to highlight that no suppressor effects or multicollinearity issues distorted the SES index's role – the tolerance and VIF diagnostics were within acceptable ranges in Model 2, in part because the index construction combined several correlated socio-economic variables into one measure. One extreme outlier case (a sparsely populated and rural municipality called Övertorneå with an unusually high IPV rate, case 290) was analyzed separately; excluding that case did not materially change the results, aside from a minor reduction in the intercept and a negligible increase in R^2 (0.364; p<.001).

In Model 2, the SES index remains a strong indicator for IPV. Certain controls (e.g., foreign-born %) exhibit positive associations in some specifications but given moderate correlation with SES and theoretical overlap, we interpret such estimates cautiously and focus inference on SES while reporting all coefficients and notes in Table 2.

Spatial Outputs

Spatially, as shown by Fig. 1, the map of IPV rates by municipality did not reveal any one contiguous region with consistently high (or low) IPV. High-IPV municipalities were somewhat scattered over Sweden, though with a slight

concentration in parts of Stockholm County and some other urbanized areas.

Some neighboring municipalities shared similar IPV levels (for example, a cluster of suburban communities south of Stockholm showed higher-than-average IPV rates, and some geographically proximal rural areas in northern Sweden showed uniformly low rates). A geographical analysis using Geoda was thus carried out to control for any spatial dependencies (spatial autocorrelation). The test for spatial autocorrelation gave a result regarding Moran's I of 0.189 (N=290 municipalities), indicating that we do not have problematic spatial autocorrelation in terms of differences in crime levels between municipalities. Figure 2 shows which municipalities contributed the most to Moran's I.

In other words, knowing the location of a municipality (north, south, etc.), or rural vs. urban was not a decisive factor in its IPV rate once a broader socio-economic context was considered. This preliminary geographic check suggests that any clustering that exists is relatively minor; the occurrence of IPV may depend more on local conditions like socio-economic disadvantage than on regional or purely spatial effects.

In sum, the regression analysis provides robust evidence that socio-economic inequality, in the form of concentrated disadvantage, is an indicator of differences in IPV prevalence across Swedish municipalities. The relationship holds even when accounting for various demographic and structural controls, most control variables were not statistically significant, although two (children with separated parents and foreign-born population) showed significant associations. Additionally, the spatial autocorrelation test on the regression residuals indicated no significant clustering of the unexplained portion of IPV rates, suggesting that our model has captured the main spatially patterned influence (socio-economic disadvantage) and that there aren't other strong regional factors left unmodeled. Essentially, communities with a higher proportion of economically and socially marginalized residents experience disproportionately higher levels of reported IPV, whereas factors like population turnover, gender composition, or urbanicity did not show measurable net effects in this study.

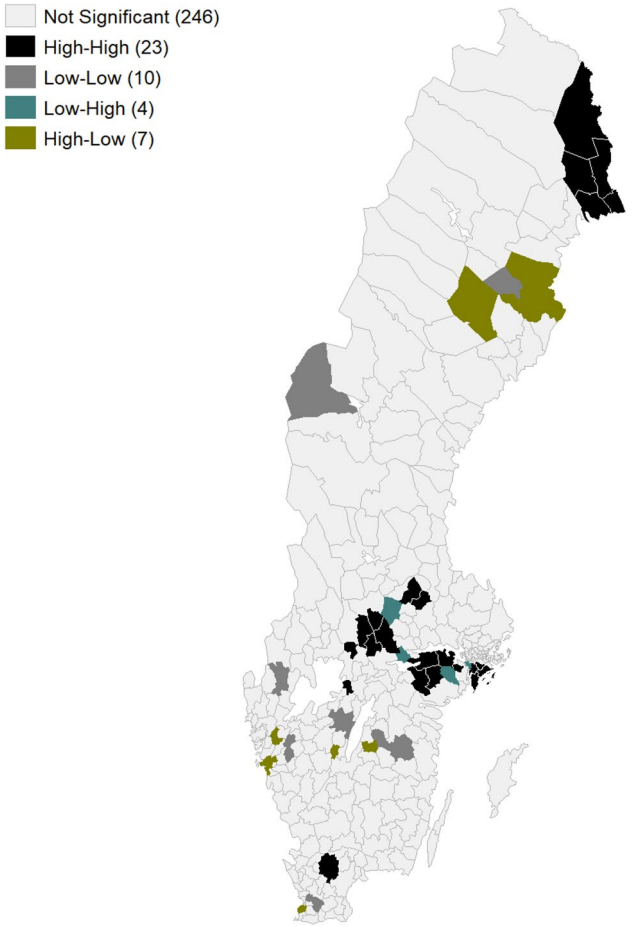


Fig. 2 Local indicators of spatial association (LISA) cluster map for IPV rate

Discussion

This study examines whether municipal-level socio-economic disadvantage is associated with variation in police-reported intimate partner violence (IPV) in Sweden. The findings show a strong, consistent, and robust positive association across municipalities. This pattern aligns with both prior empirical research and core criminological theory, indicating that structural disadvantage is a central correlate of IPV at the aggregate level. The results are consistent with spatial and epidemiological studies demonstrating that area-level disadvantage is systematically associated with IPV risk (Alderton et al., 2020; Gracia et al., 2015, 2018). Similarly, individual-level evidence from Sweden indicates that socio-economic vulnerability increases IPV exposure (Karimi et al., 2024), suggesting that structural and individual mechanisms may operate in parallel.

The magnitude of the observed association is substantial and broadly consistent with previous research linking concentrated disadvantage to IPV (Pinchevsky & Wright, 2012). Socio-economic disadvantage accounted for approximately 26–36 percent of the variance in IPV rates, supporting earlier evidence that structural conditions represent important contextual correlates of violence (Pratt & Cullen, 2005). While most control variables were not statistically significant, this further underscores that it is the broader configuration of disadvantage—rather than individual demographic characteristics—that explains variation in IPV across municipalities. From a theoretical perspective, the findings support both social disorganization theory and

macro-level strain theory. In line with social disorganization theory, municipalities characterized by socio-economic disadvantages such as high unemployment, low income, and family disruption—tend to exhibit higher IPV rates. These conditions are associated with weaker informal social control and reduced social cohesion, which may limit collective capacity to prevent or respond to violence within private settings. Our findings are consistent with prior research showing that structural disadvantage is linked to increased IPV through diminished collective efficacy (Browning, 2002; Pinchevsky & Wright, 2012). So, structural disadvantage may simultaneously generate economic strain while weakening collective efficacy and informal social control, suggesting that the two theoretical perspectives capture complementary mechanisms operating within the same community contexts.

At the same time, the results can be interpreted through the lens of macro-level strain theory. Concentrated socio-economic disadvantage reflects structural conditions associated with increased levels of community strain, including financial insecurity and relative deprivation. Such conditions may elevate the risk of conflict and violence, including IPV. Importantly, the SES index should be understood as an indicator of broader structural strain rather than a direct measure of psychological processes. The findings therefore provide contextual support for macro-level strain theory, while recognizing that key components of strain—such as stress or frustration—are not directly observed. Similarly, the present study does not directly measure collective efficacy or informal social control. Thus, interpretations grounded in social disorganization theory rest on the assumption that concentrated disadvantage functions as a proxy for conditions associated with weaker community cohesion and reduced informal control.

Taken together, these frameworks suggest that structural disadvantage may simultaneously increase strain and weaken informal social control, thereby amplifying IPV risk at the municipal level. However, it is important to emphasize that these findings indicate association rather than causation, as the cross-sectional design does not allow causal inference.

The lack of significant effects for variables such as the proportion of males and population density suggests that these factors do not independently shape IPV rates once socio-economic conditions are taken into account. This may reflect limited variation in demographic composition across municipalities or the overwhelming influence of structural disadvantage. Similarly, the absence of an independent effect of urbanicity suggests that both urban and rural areas may experience IPV risk through different but functionally similar mechanisms linked to disadvantage.

Consistent with this interpretation, the spatial analysis revealed no strong clustering of IPV beyond what could be explained by socio-economic conditions. This indicates that geographic variation in IPV is not primarily regional, but rather reflects local structural characteristics. While some localized clusters were observed, these may reflect shared contextual factors and warrant further investigation. Overall, the findings suggest that socio-economic disadvantage operates as a general mechanism across municipalities, rather than being confined to specific geographic areas.

Limitations

Police-recorded cases of IPV do not constitute a comprehensive measure of this form of violence. Nevertheless, in the absence of alternative indicators with stable and comparable measurement over time, police-recorded assault was used in the present study. It is well established in the international literature that IPV is substantially underreported, particularly in cases involving less severe physical violence or psychological abuse (Gracia, 2004; WHO, 2021). This pattern has also been documented in high-income countries such as Sweden, despite relatively high levels of institutional trust (Brå, 2024).

Additional uncertainty arises when police-recorded cases are used as a proxy for IPV prevalence at the area level, as recorded rates may reflect local reporting practices rather than actual exposure. Reporting propensities can vary due to factors such as access to police services, stigma, social visibility, or prior experiences with public authorities (Skogan, 1974). Moreover, previous research suggests that underreporting tends to be more pronounced in sparsely populated and rural areas, implying that lower recorded levels do not necessarily correspond to lower underlying prevalence (Petersson et al., 2025).

Taken together, these limitations suggest that the absolute levels of IPV are likely underestimated in this study and that the observed associations may therefore represent conservative estimates. It is also possible that some areas experience both higher actual exposure to IPV and lower reporting rates, while the opposite may apply elsewhere. Accordingly, socio-economic status should be interpreted as a contextual indicator of structural conditions associated with IPV risk, rather than as definitive evidence of differences in prevalence.

An important aspect not to overlook when analyzing geographic units such as municipalities is that these areas are administrative constructs, created for governance purposes rather than reflecting natural human activity zones. Counties, for example, consist of multiple municipalities (Brå, 2002). Consequently, these units can be considered arbitrary, as they do not necessarily align with individuals'

mobility patterns. When crime is measured at this aggregated level, the results for each municipality may be influenced by offenses that occur across municipal borders (Brå, 2002). Hypothetically, the crime scene might be located in one municipality, the victim resides in another, and the perpetrator in a third. Therefore, some of the reported incidents comprising the dependent variable may have occurred across municipal boundaries, potentially skewing the results for specific municipalities. This may partly explain the presence of smaller clusters of neighboring municipalities with elevated rates of reported IPV assaults. Importantly, this issue is closely related to the modifiable areal unit problem (MAUP), which arises when data aggregated into arbitrary spatial units produce statistical results that vary depending on how those units are defined or zoned. In our context, variations in municipality size, shape, or boundaries can affect the observed crime rates and spatial clustering patterns. More broadly, the findings are subject to the risk of ecological fallacy, meaning that associations observed at the municipal level cannot automatically be assumed to apply to individuals residing within those municipalities.

Policy Implications

The strong association between socio-economic disadvantage and IPV indicates that reducing inequality should be a central component of IPV prevention strategies. These findings suggest that IPV is not solely an individual or relational issue, but is shaped by broader structural conditions. Consequently, prevention efforts should extend beyond reactive interventions, such as policing and victim services, to include proactive social policies targeting poverty, unemployment, and educational inequality.

Municipalities in Sweden, which now have increased responsibility for crime prevention, are well positioned to integrate socio-economic interventions into violence prevention strategies. Initiatives that improve access to employment, strengthen educational opportunities, and support economically vulnerable families may contribute to reducing IPV risk by addressing underlying structural stressors. These recommendations should be interpreted at the municipal level. The present study does not demonstrate that individual unemployment or low income directly increase IPV risk, but rather that municipalities characterized by greater socio-economic disadvantage tend to exhibit higher rates of reported IPV.

At the same time, although urbanicity did not show independent effects in this study, existing research highlights important contextual differences in rural areas. These include limited access to support services, reduced police presence, and lower anonymity, all of which may affect both IPV occurrence and reporting (Edwards, 2015). These factors suggest that while socio-economic disadvantage is a common underlying driver, prevention strategies may still need to be adapted to local conditions.

In addition, the findings highlight the importance of strengthening community-level social processes. Although collective efficacy was not directly measured, theoretical perspectives indicate that stronger social cohesion and informal social control can buffer the effects of structural disadvantage. Interventions that support community engagement, local organizations, and social networks may therefore complement socio-economic policies and contribute to reducing IPV risk.

Future Research

Future research should extend this analysis in several directions. Longitudinal studies are needed to assess how changes in socio-economic conditions influence IPV over time and to better understand causal relationships. Multilevel approaches combining individual and contextual data would also be valuable in determining whether area-level associations persist at the individual level and how much variation in IPV can be attributed to place versus individual characteristics.

Further research should also examine potential mediating mechanisms, including collective efficacy, access to support services, and substance use. Although neighborhood-level data exist for some indicators, comparable nationwide IPV data at finer spatial scales are not consistently available, limiting the feasibility of such analyses. Finally, comparative research across countries or regions would help assess the generalizability of these findings and evaluate the effectiveness of different policy approaches to IPV prevention.

Conclusion

This study provides indications that socio-economic inequality at the community level is associated with IPV in Sweden. However, it should be noted that conclusions refer to police-reported assault rates only, not total IPV prevalence. Survey evidence indicates substantial underreporting – especially in rural areas – so police data are a lower bound.

Administrative indicators show most recorded IPV cases involve female victims and male suspected perpetrators in Sweden; we acknowledge debate on gender symmetry but emphasize differential harms and administrative patterns.

Municipalities with higher levels of concentrated disadvantage – marked by economic stressors such as unemployment, low income, welfare recipiency, and related factors – seem to experience significantly higher rates of reported IPV. Conversely, more advantaged municipalities tend to

have lower IPV incidence. These disparities align with established criminological theories: they illustrate how structural strain and weakened social controls in disadvantaged communities can translate into more frequent violence within households. Notably, our analysis found that when socio-economic status is accounted for, other demographic factors (like urbanization, residential mobility, or gender ratio) do not independently explain the variation in IPV between municipalities. This highlights socio-economic conditions as a macro-level correlate of IPV.

The findings carry implications for both understanding and addressing IPV. Theoretically, they extend the application of social disorganization and strain perspectives to intimate partner violence in a Swedish setting, supporting the view that what happens behind closed doors is influenced by the socio-economic context outside those doors. Practically, the results suggest that efforts to combat IPV can include structural interventions – reducing poverty, improving education and employment opportunities, and strengthening community networks – alongside more traditional criminal justice and social services approaches. In other words, improving the conditions of the neighborhoods and municipalities in which people live could reduce IPV. By tackling socio-economic inequalities and fostering cohesive communities, policymakers and practitioners can create an environment less conducive to violence and more supportive of healthy, safe relationships.

In conclusion, the municipal-level analysis presented here underscores a critical insight: IPV, often thought of as a private issue, is to some extent related to society at large. The socio-economic fabric of a municipality – its prosperity, its social stability, and the opportunities it affords residents – is intertwined with the prevalence of IPV to some degree. As Sweden and other countries continue to strive for effective IPV prevention, and given new legislation that makes municipalities responsible for crime prevention efforts, recognizing and addressing these macro-level risk factors will be essential. Our hope is that this research contributes to a more nuanced understanding of IPV indicators and encourages a holistic approach to prevention that bridges the gap between socio-economic policy and violence reduction strategies.

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Data Availability All data underlying this article consist of aggregate, non-identifiable municipal statistics from public Swedish sources. Municipal IPV rates (assaults against women aged 18+) for 2021 were retrieved from the Swedish National Council for Crime Prevention (Brå, https://statistik.bra.se/solwebb/action/index). Socio-economic indicators (low income, unemployment, social welfare support, low education, and single-parent households) were obtained from Statistics Sweden (Statistikdatabasen, https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/) and the National Board of Health and Welfare (https://www.socialstyrelsen.se/statistik-och-data/statistik/statistikdatabasen/). No individual-level or sensitive data were used; therefore, no special permissions or ethical approvals were required to access the underlying data. Additional materials necessary to reproduce the analyses are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not Applicable.

Competing interests The authors have no competing interests to declare that are relevant to the content of this article.

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