

Family size and domestic violence: An instrumental variable analysis in the Pacific

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Abstract

How does having larger family size affect the prevalence of domestic violence? This paper extends studies on children quantity-quality trade-off by examining the impact on domestic violence against female and children. We investigate the causal impact of childbearing on the prevalence of domestic violence using the data set from Kiribati, Samoa, and Tonga. Identification is based on instrumental variable strategy using three types of instruments for fertility: (1) dummy for multiple second births, (2) dummy for same-sex sibling pairs in families with two or more children, and (3) dummy for first child is female. We apply these three IVs as the exogenous variation to family size, and then examine its effect on domestic violence within the context of Pacific Island Countries. In general, the results reveal a correlation between the number of children and the prevalence of domestic violence against women and children. In a similar vein, attitudes that rationalize violent behaviour among both males and females also have a positive association with an increase in the number of children. However, the estimation results using 2SLS to determine the causal effect of family size indicate little evidence of effects. Despite the non-detectable effects, the sign of the coefficients remain consistent with the theoretically predicted outcomes.

Keywords: family size, domestic violence, instrumental variable

JEL Classifications: D19, J13, J16, O10

1 Introduction

The long-standing question of how family size affects household's socio-economic circumstances is one of the most perplexing discussions. Since the pioneering work of Becker and Lewis (1973) and Becker and Tomes (1976), numerous research have been conducted to investigate the relationship between child quality and quantity. On the one hand, earlier research (see Hanushek, 1992; Leibowitz, 1974; Parish & Willis, 1993; Rosenzweig & Wolpin, 1980) overwhelmingly supports Becker and Lewis's quality–quantity trade-off argument, which assert that an increasing marginal cost of quality (child outcome) with respect to quantity (number of children) leads to a trade-off between quantity and quality. Nonetheless, recent studies have emerged with mixed results. Using data from China, Li et al. (2008) and Rosenzweig and Zhang (2009) find that an extra child in the family significantly decreases child educational attainment. Meanwhile, according to Angrist et al. (2010), having more siblings has no negative consequences, based on data from Israel. In a similar vein, once the birth order effect is controlled for, Black et al. (2005) also find that family size has no effect on child quality, using census data of Norway.

Majority of earlier studies (e.g., Hanushek, 1992; Leibowitz, 1974), however, treat family size as an exogenous variation which makes causal inference difficult to establish. Since parental preference and household characteristics largely influence childbearing and child outcome (Browning, 1992; Haveman & Wolfe, 1995), both are in fact endogenous variables affected by many common factors. As highlighted in Angrist and Evans (1998), omitted-variable bias in estimates of childbearing's effects is a major drawback to this type research. Endogeneity can be addressed in a number of ways, one of which is to take advantage of the exogenous variations in family size that are caused by the natural occurrence of twins in order to isolate the causal effect of family size on children's quality (see Angrist et al., 2010; Black et al., 2005; Rosenzweig & Wolpin, 1980). In addition, the first child's gender (Lee, 2007) or the gender composition of the first two children (Angrist et al., 2010; Rosenzweig & Wolpin, 2000) as a measure of family size has also been proposed. These instrumental variables (IVs) are used to estimate the causal effect of family size on children's outcome. The IV estimates are found to be much smaller than the corresponding ordinary least squares (OLS) estimates.

Previous studies on children quantity-quality trade off focuses on the effect of fertility on children's health condition and educational attainment. While health and education are critical issues, this study seeks to broaden the discussion by examining the impact on female domestic violence and child violence, both of which are prevalent in developing countries, yet receive little attention and are still understudied. The literature has emphasised the significant negative impact of domestic violence on development outcomes, affecting families and communities while putting significant strain on health care, social services, policing, and justice systems. However, there are not many studies that reveal causally the factors that influence domestic violence, including how childbearing affects its prevalence. Based on the few available studies on this topic, researchers found a positive correlation between family size and domestic violence (Brinkerhoff & Lupri, 1988a; Ellsberg et al., 2001; Farrington, 1989; Straus et al., 1980). The hypothesis is that larger families are more likely to resort to violence because the pressure to provide for multiple children is greater (Hoffman et al., 1994). Family size also has a high potential for causing stress due to the low likelihood of resolution. Violence then not only becomes a possible, but also a legitimate, response to this frustration.

The case study of the Pacific is intriguing due to the considerably higher prevalence of domestic violence and total fertility rate (TFR). In Kiribati, 68% ever married women age 15-49 have experienced any form of emotional, physical, or sexual violence committed by their husband/partner; the figure is 46% in Samoa, and 40% in Tonga (United Nations Population

Fund, 2022). In the meantime, the global average of intimate partner violence against girls and women is 34%. According to the latest available data from United Nations Population Division (2022), the average TFR in the Pacific is 3.3, higher than the global average (TFR of 2.3), even to the lower middle income countries (TFR of 2.6). In Kiribati, Samoa, and Tonga, having children at a relatively young age appears to be fairly common, in which around 1 in 5 of women aged 20 had already given to at least one child (United Nations Children's Fund, 2017). The Pacific are also among the highest in the region for the occurrence of child marriage and early union (whether formal or informal, before the age of 18 years). Several factors, including the high prevalence of child marriage and low contraceptive method adoption, contribute to the high TFR rate in the Pacific. In the Pacific, 1 in 4 women age 20-24 years married by age 15 and 18, which is higher than the average rate in the Asia and Pacific of 1 in 5 women (United Nations Population Fund, 2021). Contraceptive prevalence in the Pacific stands between 20-30% of the population, significantly lower than the Asia and Pacific's average of 60%.

This paper contributes to the growing body of literature on the quantity-quality trade-off in childbearing by focusing on its effect on domestic violence against female and children. Using new datasets collected from the Pacific, including Kiribati, Samoa, and Tonga, we examine the relationship between having children and the rate of domestic violence. The identification method is based on an instrumental variable approach that makes use of three different instruments for fertility: (1) a dummy for multiple second births, (2) a dummy for same-sex sibling pairs in families with two or more children, and (3) a dummy for first child is a female. We use these three IVs to represent exogenous variation in family size and analyse its impact on domestic violence in the context of the Pacific. We investigate the causal impact using the new datasets from the Multiple Indicator Cluster Surveys (MICS) focusing on Kiribati, Samoa, and Tonga. This paper contributes to the literature in three ways. First, to the best of our knowledge, this study is the first to examine the link between childbearing and domestic violence in the Pacific region. Second, while many prior studies treated childbearing as an exogenous factor, the IV approach allows for rigorous causal analysis by treating childbearing as endogenous and exploiting the exogenous variation via three distinct types of instruments. Finally, this paper fills in the theoretical gaps in the literature by explaining how larger families are more likely to engage in domestic violence.

This paper will proceed as follows. Section 2 discusses the countries' context and theoretical framework explaining the relationship between family size and domestic violence. Section 3 and Section 4 describe the data features and econometric method utilised in this

paper. The empirical findings are presented and discussed in Section 5. It concludes with policy implications in Section 6.

2 Literature review

2.1 Context

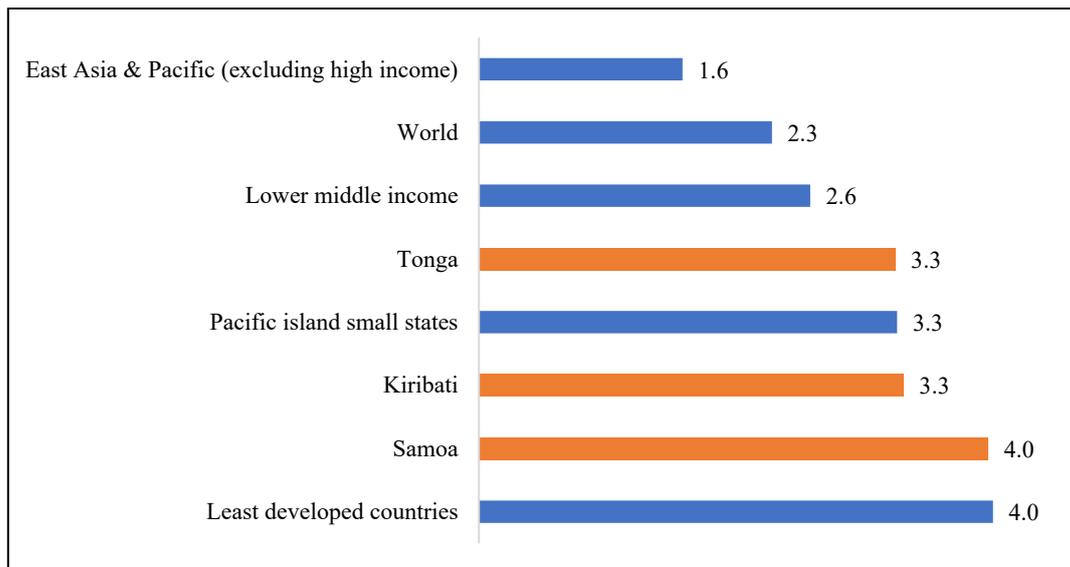


Figure 1: Total fertility rate (births per women), 2021

Note: Pacific island small states include Fiji, Kiribati, Marshall Islands, Micronesia, Fed. Sts, Nauru, Palau, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

Source: United Nations Population Division, 2022. *World Population Prospects: 2022 Revision*.

Fertility, along with mortality and migration, is a component of population growth that reflects both the causes and effects of economic and social changes. **Figure 1** shows that the average total fertility rate (TFR) for the Pacific is 3.3, higher than the rest of the world, with a global average TFR of 2.3, and the lower middle income countries having a TFR of 2.6 (United Nations Population Division, 2022). The pattern also varies across countries (see Appendix **Figure A.1** for a visualisation of changes over time). The Pacific's TFR are predominantly fell into two groups: (1) moderately high fertility (i.e., a TFR of 3.0 or higher but less than 4.0) and (2) very high fertility (i.e., a TFR of 4.0 or higher). In this case, Kiribati and Tonga are classified as having a moderately high fertility rate (both with TFR of 3.3). Meanwhile, Samoa is classified as having a very high fertility rate (with TFR of 4.0). The Pacific, on average, also has a relatively high adolescent fertility rate of 50 births per 1,000 women ages 15-19, higher than the global average of 41 births (United Nations Population Division, 2022) (see Appendix **Figure A.2**). In the Pacific, social and religious norms play an important role in suppressing

demand for contraceptive, and thus increasing fertility. Among married women aged 15–49, the most commonly cited reason for not intending to use contraception was religion, followed by fear of side effects, and the desire to have as many children as possible. Access to family planning services may be hampered by social norms that stigmatise out-of-marriage adolescents sexual behaviour. There is often little confidentiality in the health services, where everyone knows everyone in the community, and young people can risk ridicule or beatings if they ask for contraceptives.

In many developing countries, it is still quite common for members of close-knit families and communities to take turns being responsible for the care and upbringing of children. This is traditionally the case for the majority of the Pacific’s children, who were brought up in an environment where extended families lived in close proximity to one another. As a result, children usually benefit from having multiple care and protection networks. This gives them the chance to learn from other relatives and be taken care of when their parents are unable to meet their immediate needs. Across the Pacific, kinship care and informal adoption are prevalent, with extended family typically stepping in to care for a child who is orphaned or whose parents are not able to provide adequate care. Informal extended family also represents important safety nets, especially in the absence of a comprehensive social protection system. Nevertheless, the extended family network is reportedly under increased strain for countries in the Pacific, in which children living in larger households have also been found to be more vulnerable to poverty (Household Income and Expenditure Survey, 2020). For example, in Kiribati and Samoa, the poverty rate for households with three or more children is double the rate of those with only one child (Household Income and Expenditure Survey, 2020). When the role of the extended family is considered, the effect of family size on domestic violence will have two contradictory effects. The large number of children, including those who are not biologically related, will increase the pressure on adults to meet the needs of their family members. As a result, this could lead to more instances of domestic violence. On the other hand, having informal extended families living in close proximity to one another can make things easier on everyone as it allows for resource sharing between families. Consequently, decreasing stress and domestic violence incidents.

According to surveys conducted in the Pacific, the incidence of violence against women is the highest in the world, with over 60% of women and girls having experienced violence at the hands of an intimate partner or family member. Nevertheless, there is substantial variation in the nature and extent of domestic violence against female women across the Pacific. Kiribati

is the highest with 68% of women who have ever been married and are between the ages of 15 and 49 have been victims of emotional, physical, or sexual abuse by their husbands or partners. Violence against women and threats of violence are violations of the human rights of women. It restricts women's social, political, and economic participation. Furthermore, violence against women has the potential to perpetuate the cycle of violence against the next generation of women. Children of women who have experienced violence, for instance, have higher rates of infant mortality, emotional and behavioural issues, and are more likely to either become violent perpetrators or victims themselves. More than half of the women in Tonga who had experienced physical partner violence reported that their children had witnessed the violence at least once (United Nations Children's Fund, 2017). In addition to women, children are also victims of domestic violence. Throughout the Pacific, corporal punishment is still prevalent, and children are exposed to relatively high levels of domestic violence, with an overall average prevalence of 77% (United Nations Children's Fund, 2017). A major contributor to violence against children is the normalisation of violence as a form of punishment and discipline in many households and communities. All PICs have provisions that make it legal for a parent, teacher, or other caretaker to use physical punishment as a form of "reasonable" discipline or correction. The pervasive culture of silence surrounding issues of domestic and sexual violence is another factor that contributes to the vulnerable position of children, which also acts as a barrier to reporting and intervention.

2.2 Theoretical framework

One of the most enduring issues in social science is the question of how family size affects household's socio-economic outcomes. Since Becker and Lewis (1973) and Becker and Tomes (1976), economists have built a strong theoretical framework that sees both the number of children and the amount of money parents spend on each child as choices made by households that are affected by economic forces. Importantly, this framework implies that unanticipated growth in family size is expected to decrease parental investment and, therefore, child quality. However, earlier studies related to family size and household investment (e.g., Hanushek, 1992; Leibowitz, 1974) focused more on revealing a correlation between family size and children's outcome than establishing the causal effect. The biggest problem with this kind of research is that the effects of having children may be overestimated due to the likelihood of omitted variables bias. Angrist and Evans (1998) highlight this by using instrumental variables (IVs) derived from multiple births and same-sex sibling pairs to estimate the causal effect of

family size on mothers' labour supply. Their study finds that the IV estimates are significantly lower than the corresponding ordinary least squares (OLS) estimates, despite still being negative. Using the same set of IVs, Angrist et al. (2010) present evidence on the child-quantity/child-quality trade-off and find that children from large families are not significantly different in terms of human capital investment and economic well-being from those of small families.

According to the Becker-Lewis model, exogenous increases in family size decrease quality of children because the "shadow price" of quality rises as birth-rates rise. Despite the sheer development and application of the conceptual framework underlying the children quantity-quality trade off, theories and empirical evidence that explain the relationship between fertility and domestic violence are still very limited. Building on the resource theory of violence (Blood & Wolfe, 1960), Goode (1971) argues that a husband's use of physical force against his wife or other family members, such as children, can be considered a resource similar to money or personal attributes that can be used to deter unwanted actions or to induce desired behaviours. According to Goode (1971), the more resources a person has at their disposal, the more force they can employ, but the less likely it is that they will actually use violence. Since violence is used when other options are deemed insufficient or have failed to produce the desired result, it is viewed as the "last resort". Thus, when other and more subtle methods of control fail to elicit submission, husbands' resort to violence (Yllö & Bograd, 1988). To test key hypothesis of Goode's (1971) resource theory of violence, Allen and Straus (1980) used occupational prestige, educational level, income, and satisfaction with income as measures of extrinsic resources, as well as variables assessing interpersonal, intrinsic resources. They discovered that low socioeconomic status was significantly associated with the husband's use of physical force (Allen & Straus, 1980). Other studies also found that resource-poor husbands are more likely to physically abuse their wives (Browker, 1983; Pagelow, 1981).

Several factors derived from the resource theory may predict the occurrence of domestic violence. These variables include socioeconomic status, status inconsistency, and number of children (Hoffman et al., 1994). Abuse of wives can be found in every socioeconomic class; however, it appears to be more prevalent and severe in the lower socioeconomic classes (Gelles & Straus, 1988; Hotaling & Sugarman, 1986, 1990). Frustration and stress are predicted to be more prevalent among individuals with fewer resources than the rest of society. Besides, a few studies have also used the extended version of resource theory to explain significantly greater rates of violence in household with status inconsistency. Gelles (1974) and O'Brien (1971) find

that domestic violence is more common when the wife has a higher status at work than her husband. High rates of physical abuse of wives are linked to marital inequality observed across socioeconomic groups. This is especially true in marriages in patriarchal societies where the husband may feel threatened by his wife's educational or occupational advantage (Yllö & Bograd, 1988). In addition, children have a substantial impact on the family's financial resources. Children are present in 80% of the families reporting wife abuse (Fagan et al., 1983). As the number of children in a family grows, so does the amount of money and time that must be dedicated to supporting them, increasing overall level of parental stress. From the limited available studies, researchers find a positive linear relationship between family size and domestic violence (Brinkerhoff & Lupri, 1988b; Ellsberg et al., 2001; Farrington, 1989; Straus et al., 1980). Researchers generally agree that larger families are more likely to resort to violence because the pressure to provide for multiple children is greater (Hoffman et al., 1994). Because of the low likelihood of resolution, family size has a high potential for causing frustration. Not only does violence become a possible response to this frustration, but it also becomes an acceptable one.

3 Data and variables

Data from Kiribati MICS 2018-19, Samoa MICS 2019-20, and Tonga MICS 2019-20 serve as the main data set for this study. The MICS data provide detailed information on household and individual demographic characteristics. In addition to data from each individual country, data across these three countries will be used to construct a pooled cross-section dataset. Estimation will then be performed for each country individually as well as using the pooled dataset. In this paper, the effects of family size will be estimated with regard to violence against two key populations: (1) women, including girls and women; and (2) children.

Female domestic violence

This paper focuses on domestic violence against girls and women inflicted by their spouse/partner or often termed as intimate partner violence (IPV). The samples are girls and women between the ages of 15 and 49 who are, or ever were, married or even who are, or ever have been, living with a man in an intimate relationship. They were asked questions related to intimate partner violence including emotional, physical and sexual violence occurred in the last 12 months. Emotional violence refers to a pattern of degrading and humiliating conduct towards a person in a manner to intimidate or harass under threats, verbal abuse, or constant

humiliation. Meanwhile, physical violence refers to any act or conduct which causes bodily pain, harm or danger to life and impair the health of a person. The term sexual violence is used to describe any act of a sexual nature that is abusive, humiliating, degrading, or otherwise infringes upon the dignity of the victim. Each variable is a dummy variable that is assigned the value 1 if the respondent has experienced any abusive behaviour that fall into each type of violence category, and 0 otherwise.

Another relevant outcome variable of interest is the attitudes towards domestic violence. Aside from prevalence of domestic violence, MICS also assessed women and men between the ages of 15 and 49 about their views on domestic violence, specifically whether or not they believe their husbands or partners are justified in hitting or beating them in various situations (including if she goes out without telling him, if she neglects the children, if she argues with him, if she refuses sex with him, or if she burns the food). These questions are designed to elucidate the social justification of violence against women as a form of disciplinary action that is taken when a woman does not comply with certain expected gender roles. For both women and men, attitudes towards domestic violence are dummy variables coded as 1 if they justify abusive behaviour for any of the reasons listed, and 0 otherwise

Child violence

The most common form of violence experienced by children is violent discipline at home. While it is essential for parents across cultures to instruct their children in self-control and proper conduct, many resort to physical and psychological violence to correct inappropriate behaviour and reinforce desirable actions. This paper focuses on the impact of physical (or corporal) punishment, an action intended to cause physical pain or discomfort, but not injuries. Physical punishment is defined as shaking the child, hitting or slapping him/her on the hand/arm/leg, hitting him/her on the bottom or elsewhere on the body with a hard object, spanking or hitting him/her on the bottom with a bare hand, hitting or slapping him/her on the face, head or ears, and beating him/her over and over as hard as possible. For children age 1 to 14 years, child violence is a dummy variable with the value of 1 when he/she experienced any act of physical punishment, and 0 otherwise. MICS also collects information about attitudes towards physical punishment. It is a dummy variable with the value of 1 if mothers/caretakers of children age 1-14 years believe that physical punishment is needed to bring up, raise, or educate a child properly, and 0 otherwise.

Independent variable and covariates

The independent variable of interest is the number of children age 15 and below. This variable will be instrumented with (1) a dummy for multiple births (or twins) that equals 1 in the n th delivery is a multiple delivery, and 0 otherwise; (2) a dummy for same-sex sibling pairs in families with two or more children that equals 1 if the first and subsequent births are of the same sex, and 0 otherwise; and (3) a dummy for the first child is female that equals 1 if gender of the first children is female; 0 otherwise. Other factors that affect violence and are correlated with the number of children in the household are controlled in the specification. These covariates include the household location of residence (urban/rural), socioeconomic status, non-homogamous education level between spouses, presence of children under 2 years old, relationship status (married or cohabitating), child's birth order, child spacing, and whether or not other siblings are enrolled in school, as well as male adult drinking behaviour and females' fear of husbands/partners as proxies of household tensions.

4 Identification strategy

This paper will employ the quasi-experimental method akin to Angrist et al. (2010), in which two types of instrument for fertility are used: (1) dummy for multiple second births, and (2) dummy for same-sex sibling pairs in families with two or more children. In addition, this study will also consider additional instrument using gender of the first child based on Lee (2007). We apply these three IVs as the exogenous variation to family size, and then examine its effect on domestic violence within the context of the Pacific region.

The empirical analysis focuses on investigating the effect of family size on a set of measures describing the prevalence of violence towards female and children based on the following structural form specification:

$$Y_i = \alpha_0 + \mathbf{X}_i' \boldsymbol{\alpha}_1 + \beta F_i + \varepsilon_i$$

where Y_i refers to the outcome variables of female and children in the family, in terms of occurrence of female domestic violence (i.e., ever experienced emotional, physical, sexual, or any of the three violence by their husband/partner) and child violence (i.e., ever experienced physical punishment by any adult in the household). F_i is the independent variable of interest, number of children who are less than 15 years old, which is endogenous and is instrumented by the IVs. The specification also controls for a set of household and individual characteristics, including household location of residence (urban/rural), socioeconomic status, non-

homogamous education level between spouses, presence of children under 2 years old, relationship status (married or cohabitating), child's birth order, birth spacing, whether or not other siblings are enrolled in school, as well as male adult drinking behaviour and females' fear of husbands/partners as proxies of household tensions. To account for potential serial correlation, the estimation is clustered at the household level.

The IV regression is estimated using two-stage least squares (2SLS). In the first stage, number of children less than 15 years old, F_i , is regressed on the instruments, which are the exogenous variation of F_i affecting Y_i and uncorrelated with ε_i . The first stage of the IV regression is as follows:

$$\widehat{F}_i = \delta_0 + \mathbf{X}'_i \boldsymbol{\delta}_1 + \mathbf{Z}'_i \boldsymbol{\tau} + v_i$$

and the second stage as follows:

$$Y_i = \alpha_0 + \mathbf{X}'_i \boldsymbol{\alpha}_1 + \beta \widehat{F}_i + \varepsilon_i$$

\mathbf{Z}_i are the instrumental variables that predict the number of children less than 15 years old, including (1) dummy for multiple births (or twins), (2) dummy for same-sex sibling pairs in families with two or more children, and (3) a dummy for the first child is female. For the instruments to be valid, they should have no separate effect on violence towards female and children. *Multiple births* can be considered as a plausibly exogenous variation of family size since it is unlikely to depend on family background and for parents to plan or manipulate twin births. *Same-sex sibling pairs* also correlates with larger family size since parents are significantly more likely to have another child if the first two children are of the same sex. This is because of the widely observed preference of parents for a mixed sibling sex composition (Angrist & Evans, 1998; Ben-Porath & Welch, 1976). *First child's gender* is also associated with larger family size when the society has preference over sons than daughters. If the first child is not a son and the parents would prefer to have at least one son, they are more likely to attempt to have another child (Lee, 2007). A strong preference for sons is commonly seen in the Pacific due to the patriarchal societal structure where daughters are viewed as a source of financial hardship for the family, whereas sons are viewed as a source of benefit. **Figure 2** depicts a stylised correlation between the three instruments and the number of children under the age of 15.

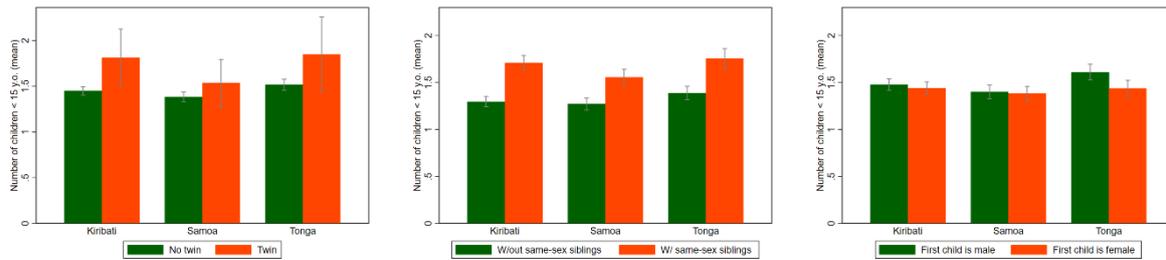


Figure 2: Correlation between instruments and endogenous treatment

Note: Author's calculation based on each country's Multiple Indicator Cluster Surveys (MICS)

It is critical that the analysis incorporates evidence from multiple sources of variation since twins, sex-composition, and first child's gender instruments could have omitted-variable biases. Among other things, the rate of twin births varies depending on maternal characteristics such as age at childbirth and race. Parents' selection of in vitro fertilisation (IVF) or other forms of assisted reproduction raises the possibility that the occurrence of twins is not completely random. Since these treatments are expensive and not generally offered by the public health service in the Pacific, it is likely that family characteristics associated with the occurrence of twins through IVF procedure are also correlated with the occurrence of domestic violence. There are also exceptions to using twin births as the instrument, especially if child spacing has an effect on violence. Due to the fact that there is no space between twins, this could be a potential issue to instrument validity. Competition between siblings for time and parental funds is likely to be higher if the age gap between two children is smaller, which can increase tension and the likelihood of violence independent of the effect via the number of children. Furthermore, sex composition may influence outcomes due to economies of scale for household resources (Rosenzweig & Wolpin, 2000). Same-sex sibling pairs may improve household efficiencies; and hence, reduce household tension and the occurrence of domestic violence. The gender of the first child has the potential to have an effect on the outcomes, particularly considering the negative stigma that surrounds having a daughter, where girls are regarded as a burden to the family. Thus, the occurrence of the first child is female is likely to increase domestic violence. To address this issue in part, the regressions also control for characteristics such as age, household wealth, birth spacing, as well as male adult drinking behaviour and females' fear of partner as proxies of household stress or tensions.

5 Main results

5.1 Female domestic violence

Table 1 displays the main results for the effects of family size on the occurrence of female domestic violence in the past 12 months perpetrated by intimate partners. There are four female domestic violence outcomes examined, including experience of emotional, physical, sexual, and any of the three domestic violence. The outcome variables are dummy variables with a value of 1 if the respondent, a girl or woman aged 15 to 49, had experienced types of domestic violence in the previous 12 months at the time of the interview. For each outcome variable, results from alternative specifications are also presented, including OLS, reduced-form, and 2SLS estimation. Additionally, the table consists of four panels based on the sample countries, namely Kiribati, Samoa, Tonga, and the pool of three countries.

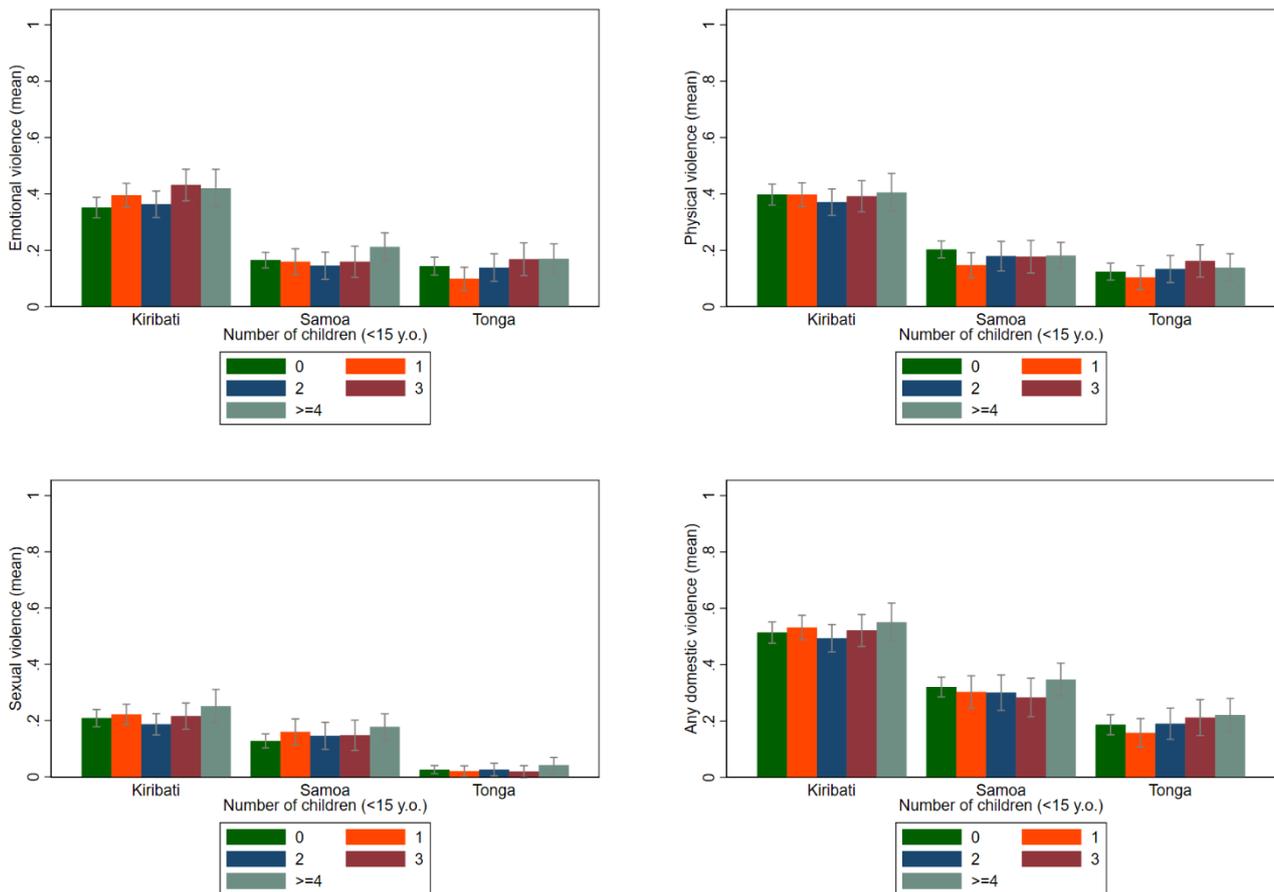


Figure 3: Correlation between number of children and domestic violence prevalence

Note: Author's calculation based on each country's Multiple Indicator Cluster Surveys (MICS)

Figure 3 depicts a stylised correlation between the number of children and the prevalence of domestic violence. Although there appears to be a positive correlation, especially for females with three children and above, the average of violence prevalence is not statistically

different across number of children. The OLS estimation results show a positive relationship between family size and female domestic violence, particularly spousal emotional violence. One additional child is associated with an increase in the prevalence of emotional violence of between 1.1 and 1.8 percentage points. Despite the fact that OLS estimation has controlled for a large number of covariates that capture certain family characteristics related to the number of children, there may be unobserved characteristics that affect the validity of the exogeneity assumption on the independent variable of interest. Therefore, estimation is performed using IV 2SLS by making use of three instrumental variables, having twins, same-sex siblings, and a female child as the first child. The 2SLS estimation still includes the set of covariates to partially account for the potential direct relationship between the instruments and the outcome variable, as explained in Section 4. However, the results from the main specification using 2SLS estimation show no evidence of significant effects of family size on the prevalence of domestic violence against girls and women perpetrated by intimate partners.

As an alternative, I also provide estimation based on reduced form, in which the outcomes are directly regressed on the exogenous instrumental variables. In general, the findings indicate that there is little evidence of a direct relationship between the instrument and the outcome. The negative, but insignificant, coefficient of the same sex sibling variable is in line with the hypothesis that same sex siblings may improve household efficiency; thus, lowering conflict and the likelihood of domestic violence. Similarly, while not statistically significant, the coefficient for having twins and a female child as the first child is positive. This is consistent with the prediction that a lack of birth space for twin cases will increase competition among children for resources, increasing tension and the likelihood of violence. On the same vein, domestic violence can also be exacerbated by negative stereotypes about having female children, especially as first child.

The estimation results from the first stage of IV 2SLS regression can be used as a form of robustness to see if the instrument is strong or not, by examining the correlation between the instrument and the endogenous treatment. In Table 1, the F-stat is greater than 10 for Kiribati and the three-country pooled dataset, but it is close to, but less than, 10 for Samoa and Tonga. These results demonstrate that the instruments are sufficient to explain the endogenous treatment; however, we must continue to be cautious about the issue of the weak instruments, particularly for Samoa and Tonga. The results of the 2SLS estimator with weak instruments will be biased, where any inconsistency caused by a small violation of the exclusion restriction will be magnified by weak instruments (Angrist & Pischke, 2009). This problem will be

especially severe in settings with a small sample size. In this particular instance, the sample is sufficiently large, including for Samoa and Tonga, and it is representative at the national level. In addition, we have more instruments than endogenous regressor, allowing for the overidentifying restrictions test. The null hypothesis that additional instruments are exogenous cannot be rejected, indicating that instruments are overall exogenous.

Table 1: Family size and female domestic violence

	No. of children	Spousal emotional violence			Spousal physical violence			Spousal sexual violence			Any spousal violence		
		First stage IV	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form
<i>Panel A: Kiribati</i>													
No. of children		0.018** (0.008) [0.008]		0.009 (0.051) [0.049]	-0.006 (0.008) [0.007]		0.028 (0.051) [0.046]	0.008 (0.007) [0.007]		-0.022 (0.043) [0.041]	0.001 (0.008) [0.008]		-0.008 (0.052) [0.046]
Twin	0.610*** (0.220)		-0.021 (0.077) [0.077]		0.005 (0.076) [0.074]				-0.025 (0.059) [0.063]				-0.036 (0.080) [0.081]
Same-sex siblings	0.410*** (0.067)		-0.000 (0.022) [0.023]		-0.008 (0.021) [0.022]				-0.001 (0.018) [0.019]				-0.008 (0.022) [0.022]
Female first child	-0.016 (0.062)		0.007 (0.023) [0.021]		0.013 (0.023) [0.020]				-0.008 (0.020) [0.019]				0.001 (0.024) [0.023]
F-stat	24.769												
Overidentification				0.929			0.949			0.987			0.882
Observations	1882	1882	1882	1882	1882	1882	1882	1882	1882	1882	1882	1882	1882
<i>Panel B: Samoa</i>													
No. of children		0.011** (0.006) [0.006]		-0.053 (0.080) [0.081]	-0.001 (0.005) [0.006]		-0.014 (0.080) [0.078]	0.009* (0.005) [0.005]		0.047 (0.075) [0.076]	0.006 (0.006) [0.006]		-0.039 (0.095) [0.097]
Twin	-0.190 (0.210)		-0.020 (0.049) [0.051]		0.014 (0.050) [0.048]				-0.049 (0.042) [0.042]				0.006 (0.059) [0.057]
Same-sex siblings	0.201** (0.094)		-0.016 (0.019) [0.020]		0.012 (0.020) [0.020]				-0.013 (0.018) [0.019]				-0.005 (0.024) [0.024]
Female first child	-0.093 (0.092)		0.007 (0.019) [0.016]		0.031* (0.019) [0.018]				-0.042** (0.018) [0.017]				0.011 (0.023) [0.022]
F-stat	8.986												
Overidentification				0.809			0.149			0.027			0.964
Observations	1451	1451	1451	1451	1451	1451	1451	1451	1451	1451	1451	1451	1451

	No. of children	Spousal emotional violence			Spousal physical violence			Spousal sexual violence			Any spousal violence		
		First stage IV	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form
<i>Panel C: Tonga</i>													
No. of children		0.014** (0.007) [0.006]		-0.002 (0.073) [0.072]	0.010 (0.006) [0.006]		-0.063 (0.071) [0.064]	0.004 (0.004) [0.004]		0.042 (0.038) [0.036]	0.016** (0.007) [0.006]		0.016 (0.079) [0.075]
Twin	0.036 (0.290)		-0.102** (0.051) [0.052]			-0.062 (0.050) [0.050]			-0.003 (0.034) [0.033]				-0.110** (0.051) [0.052]
Same-sex siblings	0.249** (0.103)		0.003 (0.021) [0.021]			-0.029 (0.020) [0.019]			0.003 (0.011) [0.011]				-0.003 (0.023) [0.024]
Female first child	-0.122 (0.098)		0.003 (0.020) [0.020]			-0.015 (0.019) [0.019]			-0.018* (0.010) [0.010]				-0.017 (0.022) [0.024]
F-stat	9.804												
Overidentification				0.162			0.213			0.375			0.085
Observations	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054
<i>Panel D: All</i>													
No. of children		0.014*** (0.004) [0.004]		-0.011 (0.040) [0.040]	-0.000 (0.004) [0.004]		0.006 (0.039) [0.038]	0.008** (0.003) [0.003]		-0.005 (0.033) [0.032]	0.006 (0.004) [0.004]		-0.002 (0.043) [0.042]
Twin	0.054 (0.132)		-0.035 (0.034) [0.035]			-0.001 (0.035) [0.034]			-0.033 (0.027) [0.028]				-0.024 (0.039) [0.038]
Same-sex siblings	0.298*** (0.049)		-0.002 (0.013) [0.013]			0.003 (0.013) [0.012]			-0.006 (0.011) [0.010]				-0.001 (0.014) [0.014]
Female first child	-0.067 (0.047)		0.003 (0.012) [0.012]			0.003 (0.012) [0.011]			-0.019* (0.010) [0.010]				-0.003 (0.013) [0.014]
F-stat	31.976												
Overidentification				0.602			0.908			0.069			0.812
Observations	4387	4387	4387	4387	4387	4387	4387	4387	4387	4387	4387	4387	4387

Note: The estimations include a set of covariates such as household location (urban/rural), socioeconomic status, non-homogamous education level between spouses, presence of children under 2 years old, relationship status (married or cohabiting), child spacing, and whether or not other siblings are enrolled in school, as well as male adult drinking behaviour and females' fear of husbands/partners as proxies of household tension. Standard errors clustered at the household level are in parentheses, and those clustered at the community level are in square brackets. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, with standard errors clustered at the household level.

Table 2: Family size and attitudes towards domestic violence

	Women's attitude			Men's attitude		
	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS
<i>Panel A: Kiribati</i>						
No. of children	0.018*** (0.006) [0.006]		0.059 (0.046) [0.048]	0.015* (0.009) [0.008]		-0.004 (0.055) [0.053]
Twin		0.117*** (0.039) [0.039]			0.042 (0.069) [0.065]	
Same-sex siblings		0.004 (0.016) [0.016]			-0.004 (0.026) [0.026]	
Female first child		0.007 (0.017) [0.017]			0.014 (0.025) [0.023]	
Observations	3734	3734	3734	1761	1761	1761
<i>Panel B: Samoa</i>						
No. of children	0.007 (0.005) [0.006]		0.223 (0.142) [0.147]	-0.005 (0.011) [0.011]		-0.026 (0.074) [0.074]
Twin		0.031 (0.042) [0.042]			0.043 (0.070) [0.073]	
Same-sex siblings		0.042** (0.019) [0.019]			0.038 (0.033) [0.034]	
Female first child		0.015 (0.018) [0.019]			0.040 (0.032) [0.032]	
Observations	3618	3618	3618	1031	1031	1031

	Women's attitude			Men's attitude		
	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS
<i>Panel C: Tonga</i>						
No. of children	-0.012* (0.007) [0.007]		0.024 (0.069) [0.067]	0.013 (0.010) [0.010]		-0.050 (0.061) [0.055]
Twin		0.038 (0.054) [0.051]			0.132 (0.096) [0.106]	
Same-sex siblings		-0.014 (0.024) [0.024]			-0.017 (0.030) [0.030]	
Female first child		-0.026 (0.022) [0.022]			0.030 (0.027) [0.025]	
Observations	2377	2377	2377	924	924	924
<i>Panel D: All</i>						
No. of children	0.005 (0.003) [0.004]		0.076* (0.043) [0.043]	0.007 (0.006) [0.006]		-0.017 (0.063) [0.063]
Twin		0.048* (0.027) [0.028]			0.060 (0.044) [0.045]	
Same-sex siblings		0.018 (0.011) [0.011]			0.005 (0.017) [0.017]	
Female first child		0.002 (0.011) [0.011]			0.025 (0.016) [0.016]	
Observations	9729	9729	9729	3716	3716	3716

Note: The estimations include a set of covariates such as household location (urban/rural), socioeconomic status, non-homogamous education level between spouses, presence of children under 2 years old, relationship status (married or cohabiting), child's birth order, child spacing, and whether or not other siblings are enrolled in school, as well as male adult drinking behaviour and females' fear of husbands/partners as proxies of household tension. Standard errors clustered at the household level are in parentheses, and those clustered at the community level are in square brackets. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, with standard errors clustered at the household level.

Table 2 displays the findings regarding the relationship between the number of children and women's and men's attitudes toward domestic violence. The outcome variable is a dummy variable, and it will have the value 1 if they accept abusive behaviour from a partner in a relationship. The OLS estimation results for Kiribati show that having one additional child has a positive correlation with women's justification for abusive behaviour, and the same holds true for men. In terms of magnitude, females are more accepting of violence when they have one more child, with 1.8 percentage points higher acceptance. As for men, the value is 1.5 percentage points higher. A similar pattern, however, was not observed for the other sample countries.

The 2SLS estimation results also provide scant support for a causal relationship between domestic violence and the number of children. Overall, I find a positive coefficient among females but a negative coefficient among males; however, the results are not statistically significant for each of the three country samples. When all pooled data is used, there is evidence of a 7.6 percentage point increase in acceptance of domestic violence among female, but this is only significant at the 10% level. Similar to the prevalence of domestic violence in **Table 1**, the results of the reduced form in **Table 2** indicate that there is no direct relationship between the instruments and the outcome variables that support the basic assumptions of the instrumental variable set up.

5.2 Child violence

Table 3 displays the results of OLS, reduced-form, and 2SLS estimations of the relationship between family size and domestic violence against children. According to the OLS estimation results, there is a positive relationship between the number of children and the use of physical punishment on those children. This positive correlation is becoming stronger, particularly for severe form of physical punishment, which includes (1) hitting or slapping on the face, head, or ears, and (2) beating up, that is hitting over and over as hard as one could. However, there is no significant evidence of mothers' and caregivers' higher justifying attitudes toward children violent discipline as the number of children increases. There are even indications that mothers and caregivers are becoming less likely to justify violent forms of discipline as the number of children increases, but the coefficients are not statistically significant.

Table 3: Family size and child violence

	Any physical violence			Severe physical violence			Any violent discipline			Attitudes towards violent discipline		
	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS
<i>Panel A: Kiribati</i>												
No. of children	0.005 (0.004) [0.004]		-0.007 (0.033) [0.032]	0.016*** (0.005) [0.006]		-0.021 (0.042) [0.044]	-0.000 (0.003) [0.003]		0.006 (0.027) [0.026]	-0.005 (0.008) [0.008]		-0.037 (0.056) [0.058]
Twin		-0.005 (0.033) [0.031]			0.020 (0.040) [0.040]			0.000 (0.029) [0.025]				-0.007 (0.069) [0.073]
Same-sex siblings		0.000 (0.013) [0.012]			-0.014 (0.016) [0.015]			0.005 (0.010) [0.009]				-0.017 (0.023) [0.023]
Female first child		0.024* (0.012) [0.014]			0.010 (0.015) [0.016]			0.020** (0.010) [0.011]				-0.017 (0.021) [0.022]
Observations	3634	3634	3634	3634	3634	3634	3634	3634	3634	2448	2448	2448
<i>Panel B: Samoa</i>												
No. of children	0.008** (0.004) [0.004]		0.197 (0.153) [0.156]	0.009** (0.004) [0.004]		0.012 (0.088) [0.083]	0.005* (0.003) [0.003]		0.167 (0.127) [0.130]	-0.004 (0.006) [0.006]		-0.043 (0.063) [0.063]
Twin		-0.042 (0.033) [0.032]			0.011 (0.033) [0.033]			-0.025 (0.025) [0.024]				-0.056 (0.044) [0.046]
Same-sex siblings		0.022 (0.015) [0.015]			0.002 (0.014) [0.013]			0.021* (0.012) [0.011]				-0.017 (0.019) [0.019]
Female first child		-0.044*** (0.015) [0.014]			-0.009 (0.014) [0.013]			-0.028** (0.012) [0.011]				0.009 (0.018) [0.018]
Observations	3993	3993	3993	3993	3993	3993	3993	3993	3993	2208	2208	2208

	Any physical violence			Severe physical violence			Any violent discipline			Attitudes towards violent discipline		
	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS	OLS	Reduced-form	2SLS
<i>Panel C: Tonga</i>												
No. of children	-0.001 (0.006) [0.005]		0.021 (0.058) [0.053]	-0.002 (0.006) [0.006]		0.031 (0.066) [0.065]	0.003 (0.004) [0.004]		-0.023 (0.050) [0.044]	0.009 (0.008) [0.008]		-0.003 (0.073) [0.076]
Twin		-0.049 (0.054) [0.054]			0.035 (0.064) [0.061]			-0.052 (0.048) [0.046]			0.036 (0.065) [0.061]	
Same-sex siblings		0.001 (0.019) [0.017]			0.007 (0.021) [0.019]			0.002 (0.016) [0.015]			-0.023 (0.026) [0.023]	
Female first child		-0.015 (0.019) [0.017]			-0.002 (0.020) [0.021]			0.004 (0.015) [0.016]			-0.025 (0.025) [0.024]	
Observations	2336	2336	2336	2336	2336	2336	2336	2336	2336	1626	1626	1626
<i>Panel D: All</i>												
No. of children	0.005* (0.003) [0.002]		0.036 (0.036) [0.034]	0.008*** (0.003) [0.003]		0.001 (0.036) [0.036]	0.003 (0.002) [0.002]		0.033 (0.028) [0.027]	-0.001 (0.004) [0.004]		-0.049 (0.040) [0.041]
Twin		-0.038 (0.023) [0.022]			0.017 (0.024) [0.024]			-0.027 (0.018) [0.017]			-0.024 (0.033) [0.034]	
Same-sex siblings		0.010 (0.009) [0.009]			-0.002 (0.009) [0.009]			0.011 (0.007) [0.007]			-0.019 (0.013) [0.013]	
Female first child		-0.012 (0.009) [0.009]			-0.000 (0.009) [0.009]			-0.003 (0.007) [0.007]			-0.010 (0.012) [0.012]	
Observations	9963	9963	9963	9963	9963	9963	9963	9963	9963	6282	6282	6282

Note: The estimations include a set of covariates such as household location (urban/rural), socioeconomic status, non-homogamous education level between spouses, presence of children under 2 years old, relationship status (married or cohabiting), child's birth order, child spacing, and whether or not other siblings are enrolled in school, as well as male adult drinking behaviour and females' fear of husbands/partners as proxies of household tension. Standard errors clustered at the household level are in parentheses, and those clustered at the community level are in square brackets. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, with standard errors clustered at the household level.

The results of the 2SLS estimation do not indicate a significant causal relationship between the number of children and violent child discipline. The same is true for the causal relationship between the number of children and justifications for violent discipline attitudes. Although not statistically significant, the coefficients explaining effects of family size on violent discipline are generally positive, with the exception of Kiribati, which has a negative coefficient. Meanwhile, despite not being statistically significant, the coefficients on attitudes towards violent discipline, is negative across sample countries. Therefore, the directions of effects are generally consistent with results obtained using the OLS approach.

6 Conclusion

Domestic violence is an issue that negatively impacts one's health, economy, education, and overall human development, but most importantly, one's rights. Domestic violence includes violence committed by an intimate partner and other family members, regardless of the location and nature of the violence. Violence against women and girls is a barrier to respecting human rights and realizing the Sustainable Development Goals, one of which is to “eradicate all forms of violence against all women and girls in public and private spheres, including trafficking and sexual and other forms of exploitation.” Violence against women is also widely acknowledged as a barrier to women's participation in development and peace. If women are not given equal opportunities to contribute to society, then countries are not able to progress. Violence against women also hinders societal and economic progress, as evidenced by the monetary and health costs associated with such violence.

All societies place equal importance on instilling in children the values of self-discipline and social acceptability through discipline, not to mention in the Pacific region. Positive parenting practices include showing children how to deal with their feelings and conflicts in ways that teach them to think for themselves and take responsibility, and that protect their self-esteem, physical and mental integrity, and dignity. However, far too frequently, children are brought up using coercive methods that rely on the application of physical force or verbal intimidation in order to obtain the behaviours that are desired. Research (see Erickson & Egeland, 1987; Schneider et al., 2005; Straus et al., 1980) shows that the negative effects of using physical punishment on children are far-reaching and can last well into adulthood. Violence impedes a child's growth, capacity for learning, and academic

performance; it prevents the development of healthy relationships; it causes low self-esteem; emotional distress; and depression; and, occasionally, it encourages risk-taking and self-harm.

This paper seeks to uncover the relationship between family size and the prevalence of domestic violence. This paper investigates two types of domestic violence: female domestic violence and child domestic violence. Female domestic violence is assessed in girls and women aged 15 to 49, whereas child violence is assessed in children aged 1 to 14. According to theoretical predictions derived from the resource theory, having children is associated with reduced resources leading to higher likelihood of domestic violence due to stress, frustration, and lower likelihood of resolution. In general, the OLS estimation results reveal a correlation between the number of children and the prevalence of domestic violence against women and children. In a similar vein, attitudes that rationalize violent behaviour among both males and females also have a positive association with an increase in the number of children. However, the estimation results using 2SLS to determine the causal effect of family size indicate little evidence of effects. Although the results are not statistically significant, the sign of the coefficient corresponds to the theoretically predicted outcomes. A lack of statistical power due to a small sample size is one of the factors that can contribute to the non-significance of 2SLS findings. This problem could be exacerbated by potentially weak instruments that may bias results, especially when using small samples. For future research, it would be of interest to determine whether the effect of family size on domestic violence varies depending on marital versus cohabitational status. Also, separating the estimation based on the number of children in the household could provide a more nuanced assessment of the marginal rise in domestic violence, especially since its occurrence is unlikely to be linear.

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Appendix

Table 4: Summary statistics

Variable	Kiribati					Samoa					Tonga					All				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
<i>Endogenous treatment</i>																				
No. of children	4,235	1.32	1.42	0	8	4,530	1.25	1.66	0	9	3,157	1.26	1.54	0	8	11,922	1.28	1.55	0	9
<i>Outcome variables</i>																				
Emotional violence	2,098	0.38	0.49	0	1	1,567	0.17	0.37	0	1	1,215	0.14	0.35	0	1	4,880	0.25	0.44	0	1
Physical violence	2,099	0.39	0.49	0	1	1,567	0.19	0.39	0	1	1,215	0.13	0.34	0	1	4,881	0.26	0.44	0	1
Sexual violence	2,099	0.21	0.41	0	1	1,567	0.15	0.35	0	1	1,214	0.03	0.16	0	1	4,880	0.14	0.35	0	1
Any violence	2,099	0.52	0.50	0	1	1,567	0.32	0.47	0	1	1,215	0.19	0.39	0	1	4,881	0.37	0.48	0	1
Women's attitude to DV	4,115	0.71	0.45	0	1	4,015	0.34	0.47	0	1	2,857	0.41	0.49	0	1	10,987	0.50	0.50	0	1
Men's attitude to DV	2,032	0.61	0.49	0	1	1,198	0.26	0.44	0	1	1,225	0.18	0.38	0	1	4,455	0.39	0.49	0	1
Violent discipline	3,635	0.91	0.29	0	1	3,994	0.87	0.33	0	1	2,336	0.87	0.33	0	1	9,965	0.89	0.32	0	1
Attitude towards violent discipline	2,449	0.42	0.49	0	1	2,209	0.79	0.41	0	1	1,626	0.36	0.48	0	1	6,284	0.53	0.50	0	1
<i>Instrumental variables</i>																				
Twin	3,836	0.03	0.18	0	1	4,070	0.07	0.25	0	1	2,607	0.04	0.19	0	1	10,513	0.05	0.21	0	1
Same sex siblings	3,836	0.40	0.49	0	1	4,070	0.42	0.49	0	1	2,607	0.38	0.49	0	1	10,513	0.40	0.49	0	1
First child is female	3,836	0.48	0.50	0	1	4,070	0.48	0.50	0	1	2,607	0.47	0.50	0	1	10,513	0.48	0.50	0	1
<i>Other covariates</i>																				
Rural	4,235	0.56	0.50	0	1	4,530	0.68	0.47	0	1	3,157	0.71	0.45	0	1	11,922	0.65	0.48	0	1
Age	4,235	30.08	9.45	15	49	4,530	30.01	10.23	15	49	3,157	29.52	10.26	15	49	11,922	29.91	9.97	15	49
With 2 y.o. child	4,235	0.37	0.48	0	1	4,530	0.39	0.49	0	1	3,157	0.25	0.43	0	1	11,922	0.35	0.48	0	1
Married	4,146	0.64	0.48	0	1	4,135	0.49	0.50	0	1	2,892	0.56	0.50	0	1	11,173	0.56	0.50	0	1
Children is closely space	3,836	0.18	0.38	0	1	4,070	0.27	0.44	0	1	2,607	0.19	0.40	0	1	10,513	0.22	0.41	0	1
Child's sibling is at school	3,836	0.90	0.30	0	1	4,070	0.87	0.34	0	1	2,607	0.86	0.34	0	1	10,513	0.88	0.33	0	1
Husband/partner is drinking	2,095	0.61	0.49	0	1	1,567	0.51	0.50	0	1	1,214	0.64	0.48	0	1	4,876	0.59	0.49	0	1
Female's fear of husband/partner	2,095	0.60	0.49	0	1	1,567	0.20	0.40	0	1	1,211	0.11	0.31	0	1	4,873	0.35	0.48	0	1

Table A.2: Outcome indicators

Outcome	Description	Unit
<i>Female domestic violence</i>		
Emotional violence	Women ages 15-49 years who have experienced specified acts of emotional violence committed by their current husband/partner in the past 12 months. Emotional violence refers to a pattern of degrading and humiliating conduct towards a person in a manner to intimidate or harass under threats, verbal abuse, or constant humiliation.	Dummy [Yes=1; 0=otherwise]
Physical violence	Women ages 15-49 years who have experienced specified acts of physical violence committed by their current husband/partner in the past 12 months. Physical violence refers to any act or conduct which causes bodily pain, harm or danger to life and impair the health of a person.	Dummy [Yes=1; 0=otherwise]
Sexual violence	Women ages 15-49 years who have experienced specified acts of sexual violence committed by their current husband/partner in the past 12 months. Sexual violence is used to describe any act of a sexual nature that is abusive, humiliating, degrading, or otherwise infringes upon the dignity of the victim.	Dummy [Yes=1; 0=otherwise]
Any form of domestic violence	Women ages 15-49 years who have experienced any specified acts of physical, sexual, or emotional violence committed by their current husband/ partner in the past 12 months	Dummy [Yes=1; 0=otherwise]
Women's and men's attitudes towards domestic violence	Women and men between the ages of 15 and 49 about their views on domestic violence, specifically whether or not they believe their husbands or partners are justified in hitting or beating them in various situations (including if she goes out without telling him, if she neglects the children, if she argues with him, if she refuses sex with him, or if she burns the food).	Dummy [Yes=1; 0=otherwise]
<i>Child violence</i>		
Violent discipline	Children ages 1-14 years who experienced physical punishment and/or psychological aggression by caregivers in the past one month.	Dummy [Yes=1; 0=otherwise]
Caregiver's attitudes towards physical punishment	Mothers/caretakers of children age 1-14 years believe that physical punishment is needed to bring up, raise, or educate a child properly.	Dummy [Yes=1; 0=otherwise]

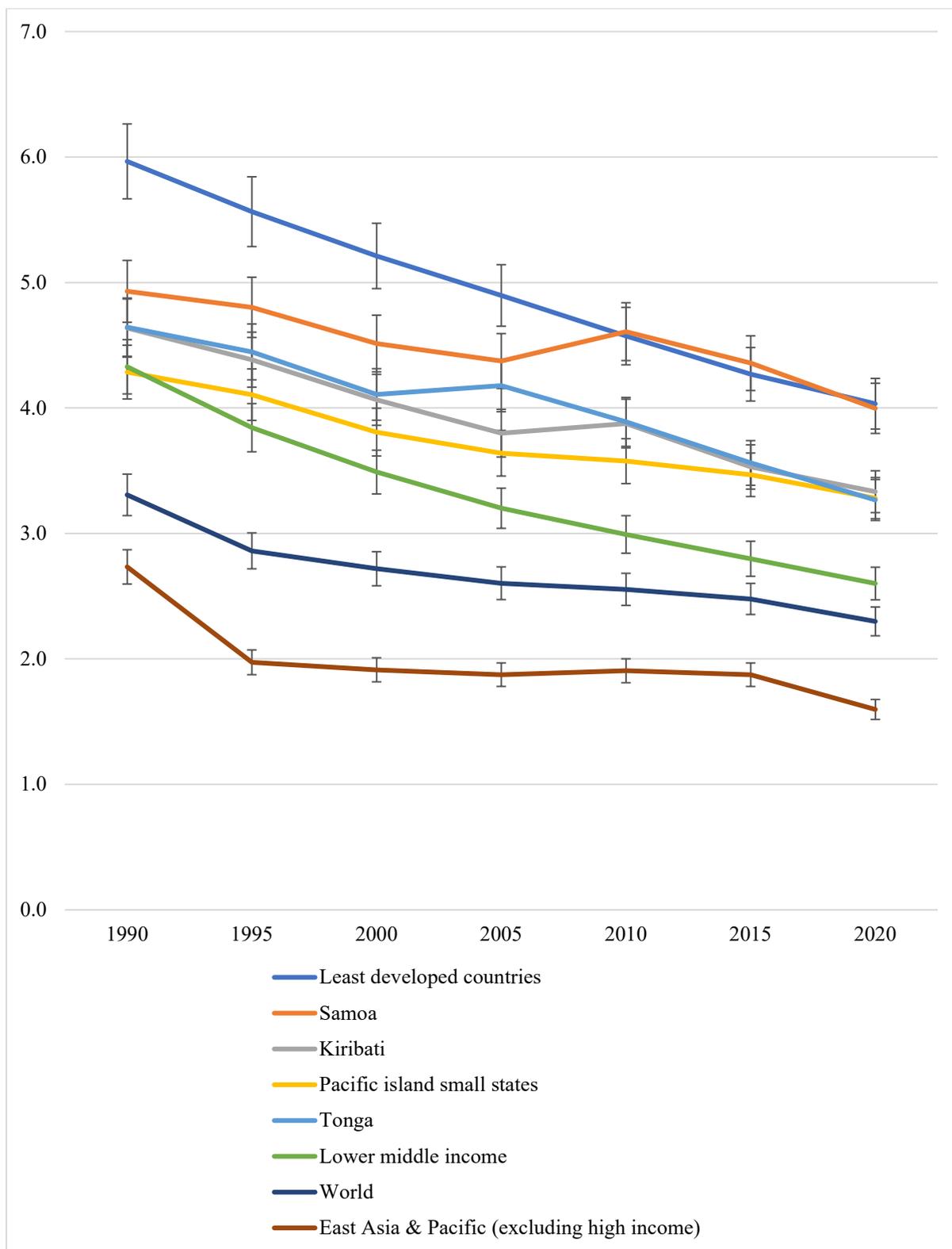


Figure A.1: Total fertility rate, births per woman

Note: Pacific island small states include Fiji, Kiribati, Marshall Islands, Micronesia, Fed. Sts, Nauru, Palau, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

Source: United Nations Population Division, 2022. *World Population Prospects: 2022 Revision*.

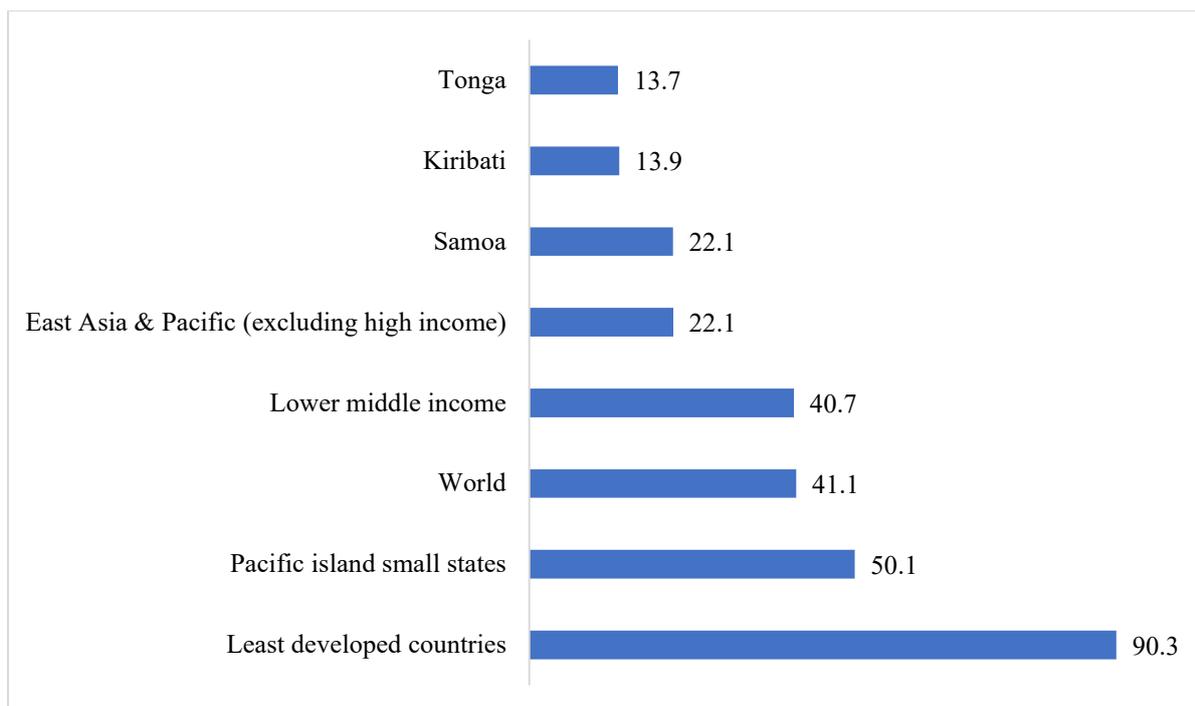
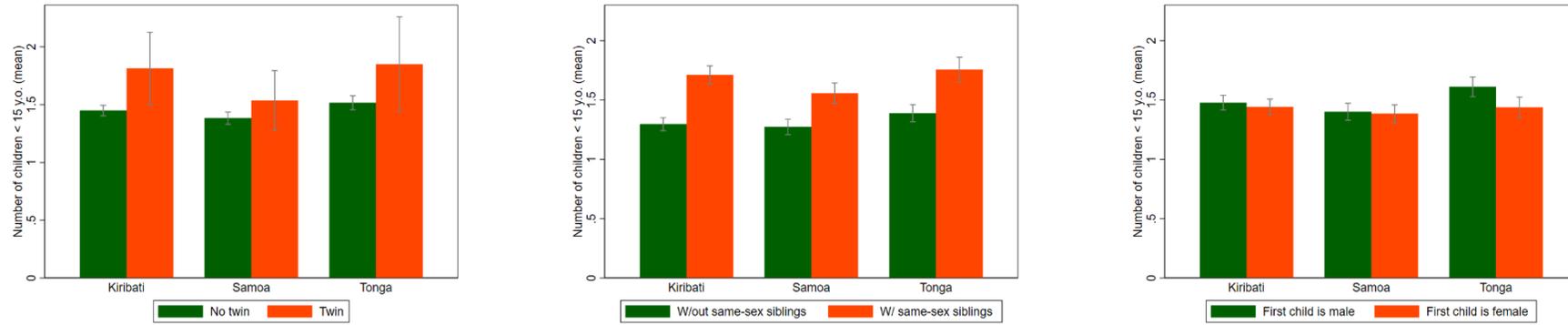


Figure A.2: Adolescent fertility rate (births per 1,000 women ages 15-19)

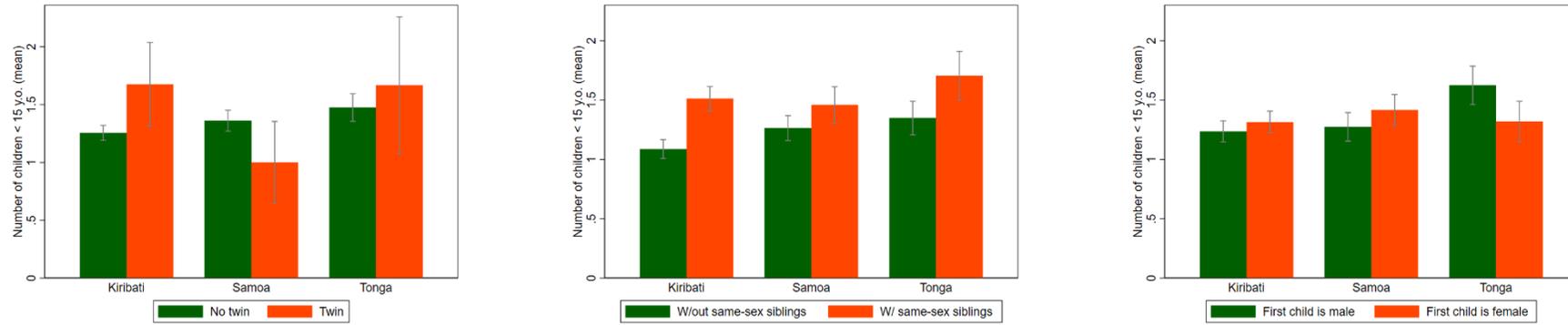
Note: Pacific island small states include Fiji, Kiribati, Marshall Islands, Micronesia, Fed. Sts, Nauru, Palau, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

Source: United Nations Population Division. 2022. *World Population Prospects: 2022 Revision*.

All (Urban + Rural)



Urban



Rural

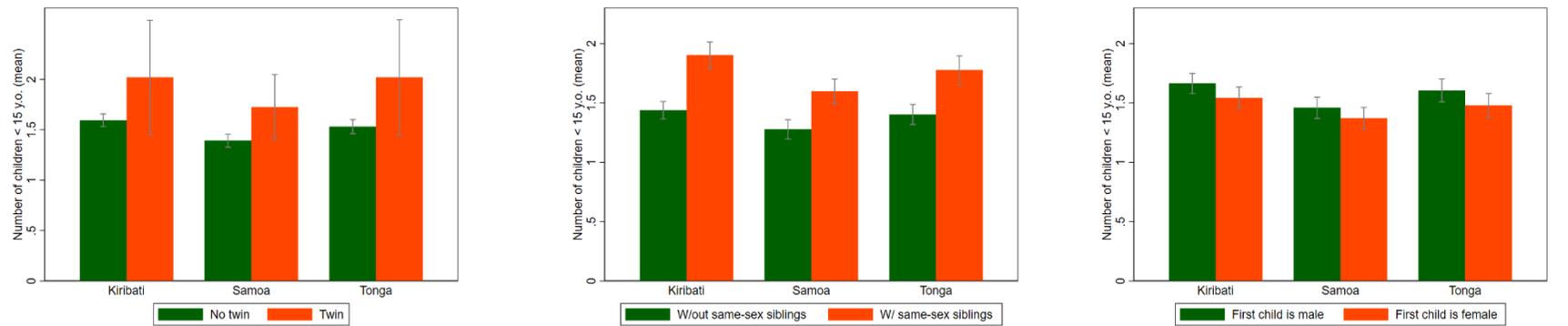


Figure 3: Correlation between instruments and endogenous treatment

Note: Author's calculation based on each country's Multiple Indicator Cluster Surveys (MICS)