Mothers at peace: International peacebuilding and post-conflict fertility*

Vincenzo Bove (University of Warwick)

Jessica Di Salvatore (University of Warwick)

Leandro Elia (Marche Polytechnic University)

Roberto Nisticò† (University of Naples Federico II)

Abstract

A considerable body of empirical evidence indicates that conflict affects reproductive behaviour, often resulting in an increased fertility rate due to higher child mortality and limited access to healthcare services. However, we know much less about the effect of peace in a post-conflict setting. This study explores how the external provision of security affects fertility by focusing on the UN intervention in Liberia. Combining DHS birth history data with information on road distance to UN military compounds, we find that women living in the proximity of peacekeepers have lower fertility rates in the deployment period. This is due to parents prioritizing quality over quantity: peacekeepers improve maternal and child health and encourage family planning by enabling donors and humanitarian actors to deliver infrastructures and services and facilitating citizens' access to such services. We also provide evidence that UN mission revitalizes local economic activities, thus increasing the opportunity cost of childbearing.

Keywords: conflict; fertility; maternal health; child health; UN operations.

JEL classification: J16; J24; D74; F50.

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† Corresponding author. Address: Department of Economics and Statistics, University of Naples Federico II, Via Cinthia, Complesso Monte Sant'Angelo, 80126 Napoli, Italy. E-mail address: roberto.nistico@unina.it

1. Introduction

States affected by war are burdened by social insecurity, inadequate access to reproductive health services and low levels of female education, leading to higher fertility rates. This is particularly evident in Sub-Saharan Africa, where over half of the countries have experienced conflict since 1989 and more than 20 states had active armed conflicts in 2020 (SIPRI 2021). The region also has the world's highest fertility rates, with women having an average of nearly five children over their reproductive lifetime, compared to a global average of 2.5 children (UN DESA 2019). Fertility plays a crucial role in debates on the effects of population growth on human development, migration patterns and global trade. It is estimated that in the 2040s, African mothers will have more than 550 million children, accounting for about 40% of all births worldwide in that decade (Paice 2022). High fertility rates pose significant health risks to both children and mothers, with 99% of all maternal and child deaths occurring in less developed regions, particularly Africa (Africa Health Organisation 2019). Additionally, high fertility rates can negatively affect educational attainment, economic growth and the environment (see, e.g., Birdsall et al. 2001; Casterline 2010).

Whereas scholars and policymakers have frequently implied that restoring security after prolonged conflict is key to reducing fertility rates, there is still limited evidence of whether and how this occurs. This article investigates the effect of external security provision through United Nations (UN) peacebuilding interventions on fertility behaviour.

The United Nations (UN) has established over 70 peacekeeping operations (PKOs) worldwide since 1960, in an effort to stabilize conflict zones and protect civilians. Currently, approximately 70,000 multinational personnel, also known as Blue Helmets, are deployed in 12 operations across the world, tasked with maintaining or enforcing peace. Despite facing a persistent shortage of resources and the failure to protect civilians in some emblematic cases, such as Rwanda, large-N studies demonstrate that peacekeeping has a positive effect on reducing violence in ongoing civil wars and the likelihood of conflict reoccurrence, even in the most challenging contexts (e.g., Beardsley 2011; Bove et al. 2020; Di Salvatore and Ruggeri 2017; Hegre et al. 2019; Hultman et al. 2013; Ruggeri et al. 2017). Peacekeepers also contribute to household well-being by revitalizing economic exchanges, promoting labour market participation, and building confidence and trust (Beber et al. 2019; Bove and Elia 2017; Bove et al. 2021; Carnahan et al. 2006; Caruso et al. 2017; Cil et al, 2019; Nomikos 2022).[1] The presence of peacekeepers has also a positive effect on maternal health outcomes, reducing maternal mortality rates and increasing access to services and education for women (Gizelis and Cao 2021).

UN peacekeeping missions are crucial in ensuring basic public services, including medical services, are available and accessible by vulnerable populations. This is due to the security they provide. In addition, they oftentimes directly provide essential healthcare equipment and products.[2] This is because contemporary UN interventions are not limited to keeping the peace – they aim at building sustainable and long-term peace (Campbell and Di Salvatore, 2023).[3] This implies that the presence of UN peacekeepers not only offers a reduction in violence, but also the security umbrella essential to the *provision of and access to* basic public services and to stimulate local economic activity. This article focuses on how peacekeeping operations, by enabling NGOs and governments to function more effectively and promoting revitalization of economic activities, are expected to affect fertility rates. Indeed, this enhanced security provided by UN interventions creates a qualitative difference from post-conflict settings where peace is present but access to services may still be lacking.

Numerous studies have investigated the extent to which exposure to violence and armed conflict shapes individuals' long-term decisions,[4] including reproductive behaviour, showing that conflict leads to higher fertility rates (see, e.g., Iqbal 2010; Islam et al. 2016; Kraehnert et al. 2019; Urdal and Che 2013). This is thought to be driven by several intertwined factors, such as reduced access to contraception, low levels of education, increased importance of child labour, and a desire to replace children lost to conflict. However, there is also empirical evidence that armed conflict reduce fertility levels in some cases (e.g., Lindstrom and Berhanu 1999 in Ethiopia; Agadjanian and Prata 2002 in Angola; De Walque 2006 in Cambodia). This is consistent with the argument that individuals may delay childbearing with the hope of improved circumstances or because they prioritize the quality of childrearing over the quantity of children (Guerra-Cujar et al. 2021; Thiede et al. 2020; Torrisi 2020). As such, fertility rates

[1] Despite its successes, UN peacekeeping missions have also faced criticism for misconduct and accused of engaging in sexual exploitation and abuse (Nordås and Rustad 2013). In some cases, they have fathered children with local women who faced discrimination from their communities (Lee and Bartels 2020).
[2] For example, in Kidal, Mali, civilians requested medical supplies in October 2015. In response, peacekeepers from the MINUSMA (United Nations Multidimensional Integrated Stabilization Mission in Mali) operation donated $32,000 worth of supplies through a local NGO as part of a UN Quick Impact Project (UN 2015).
[3] Because most contemporary peacekeeping missions involve some peacebuilding capacity, we use the two terms interchangeably in this article.
[4] See Verwimp et al. (2019) for a review of the literature.

tend to decrease during periods of conflict, but may recover once hostilities have stopped (see, e.g., Agadjanian and Prata 2002).

Against this backdrop of conflicting evidence, we explore the case of Liberia. With an history of violent conflict, and one of the world's highest fertility rates, averaging 4 children per woman compared to the global average of 2.5 (UN DESA 2019), Liberia provides a crucial case for investigating the effects of peacebuilding on fertility rates. Between 2003 and 2018, the country hosted the United Nations Mission in Liberia (UNMIL), one of the largest and most important peacekeeping missions since 1960. The main task of UNMIL was to support the implementation of a peace process in the immediate aftermath of the Second Liberian Civil War, with the arrival of peacekeepers marking the end of the conflict. However, simply reaching peace agreements and ending the conflict does not necessarily guarantee the cessation of violence or improve perceptions of security. Even if violence subsides, its psychological impact can linger on, and perceptions of insecurity may affect fertility. Focusing on the effect of peacekeeping operations in a *post-conflict setting* helps us examine the joint role of security and service provision in shaping fertility decisions.[5] Indeed, while violence halted across the country, only some locations benefitted from the enhanced peace (security and services) provided by the UN intervention.

We integrate geocoded data on the local deployment of UNMIL with the Demographic and Health Surveys (DHS) conducted in Liberia in 2007, 2013, and 2019. To identify the casual effect of peacebuilding on fertility, we exploit exogenous variation in the local presence of peacekeepers. We use the road distance of DHS cluster’s centroid to the closest UN base, providing a granular measure of individual exposure to peacebuilding activities. Since the location of the women corresponds to the centroid of the cluster, more than one woman is usually assigned to the same centroid.

Our findings suggest that peacebuilding has a significant, negative effect on fertility. We find that the likelihood of having a child decline by 5 percentage points and the total number of children per woman drops by 25% for women close to UN bases. This effect is particularly pronounced among older and married women, and those with more children at the time of the UN deployment. In exploring the mechanisms underpinning these findings, we find evidence of increased contraceptive use, increased access to healthcare and better health outcomes for

[5]Additionally, studying UNMIL specifically is motivated by the fact that other UN missions were deployed during the conflict, which could complicate the assessment of the UN's effect on fertility rates during both the conflict and peace periods.

women and children, which suggest a shift towards a "quality over quantity" approach to parenting. In addition, we observe a shift in parents' employment away from farming toward more clerical jobs as well as sales and service sectors, which have higher labour productivity and higher salaries, resulting in a higher childbearing opportunity cost.

The article proceeds as follows. Section 2 provides background information on the conflict in Liberia and on the UN Mission in Liberia. In Section 3 we describe the data used for the study and the empirical strategy employed to address issues of endogeneity, particularly selection bias. The main results are presented in Section 4, followed by the conclusions in Section 5.

2. The United Nations Mission in Liberia

In this section, we highlight some key features of both the Liberia case and the UN response to the conflict. The deployment of UN peacekeepers to Liberia was a response to two devastating civil wars that had resulted in an estimated 250,000 casualties between 1989 and 2003 (Economist, 2022). The UN Security Council (UNSC) established the United Nations Mission in Liberia (UNMIL) in September 2003, following the resignation of President Taylor and ahead of the Accra Comprehensive Peace Agreement, which marked the end of the war. UNSC Resolution 1509 authorized UNMIL as a multidimensional peacekeeping operation tasked with monitoring the 2003 ceasefire agreement, supporting the implementation of the peace process, facilitating the provision of humanitarian aid, and assisting the transitional government in restructuring the police force. In 2004, UNMIL consisted of 14,700 personnel, including approximately 13,500 soldiers and 1,200 police officers and civilians. The deployment reached its peak in 2005, with over 16,000 personnel. After 15 years of deployment, UNMIL withdrew in 2018, leaving behind a legacy of both success and criticism. The mission was successful in bringing about a transfer of power from one elected president to another and restoring the rule of law (see e.g., Blair 2019). Yet, it also faced criticism for violating international norms, such as peacekeepers engaging in transactional sex with local women (Beber et al. 2017).[6]

Over the years, the focus of UNMIL's mandate shifted to focus on peacebuilding activities, including protecting local populations from violence, supporting the government in reforming justice and security institutions, and promoting and protecting human rights (UN, 2018b). We expect that these activities will influence fertility rates through the creation of a safer and more

[6] Mvukiyehe and Samii (2021) find only modest effects of UNMIL on local security and socio-economic activities. The focus of their analysis, however, is on the short-run - 4 years post-deployment - and does not account for longer term effects as we do in our investigation.

secure environment. This security umbrella reduces the likelihood of conflict reoccurrence in post-conflict settings, hence it should lead to better access to essential services such as healthcare. These services are provided by international agencies and non-governmental organizations that are protected by the UN security umbrella. Additionally, supporting the establishment of stronger and stable institutions within the host state may result in an improved capacity to provide services to its citizens. However, even in such cases, humanitarian actors will likely continue to play a vital role especially in the immediate aftermath of peace.[7] As such, the presence of UN peacekeepers offers a safe environment that enables access to medical facilities and the delivery of humanitarian aid and vital services in areas where access is often restricted due to enduring perceptions of insecurity.

UN operations can at times also directly engage in healthcare outreach initiatives. As mentioned, contemporary peace missions' mandates have significantly expanded to include more active support to local authorities and international and national organizations in providing essential services. UNMIL provides examples of this, as the mission collaborated with local organizations on development projects to enhance the lives of the local population. These quick impact projects, which were carried out across the country, aimed to address various local needs, such as farming and urban development (UN 2018). Some of these small-scale infrastructure projects included a healthcare component. According to Davies and Rushton (2016: 424), UNMIL has a long history of engaging in healthcare-related projects, including medical outreach and other activities carried out by different national contingents. Additionally, UNMIL was equipped with its own medical services, providing healthcare to both UN peacekeepers and civilian staff. Reports of UN personnel providing medical services to civilian populations, particularly women and children, were frequently highlighted in the mission's publication, *UNMIL Today*. UN personnel also offered training to medical staff in Liberian hospitals (Davies and Rushton 2016: 426).

Civil war interrupts economic activities, destroys critical infrastructure and reduces investment. Violence itself can harm the economy by, for example, stopping people from going to work. If peacekeepers reduce conflict, they should also create conditions for economic recovery. In fact, the security umbrella provided by the UN mission, by restoring the basic conditions for local economic recovery, can revitalize economic exchanges and participation in the labour market (Bove et al. 2021; Caruso et al. 2017).

[7] In fact, the country has been heavily reliant on non-governmental organisations; by one estimate, they have provided roughly 90% of primary health care and hospital services (UN 2006).

In conclusion, the presence of a UN peace mission has the potential to bring about improvements in access to medical services and to lay the groundwork for economic recovery and thus affects fertility. Improved access to health services translates into improved health outcomes for mothers and children, and availability of family planning services, including contraceptives, particularly where women lacked access to or knowledge of these services. Likewise, better economic opportunities can result in increased opportunity cost of childbearing. As a consequence, we should expect a decrease in fertility among women exposed to UN peacebuilding activities. Our research design, outlined in the next section, aims to test this causal relationship, and provide plausible mechanisms for the effect of peacekeeping on fertility.

3. Data and methods

We use three rounds of the Demographic and Health Surveys (DHS) conducted in Liberia in 2007, 2013, and 2019. These surveys gather information on the dates of birth and death of all children for women in the reproductive age group of 15-49 years. As the first DHS survey is in 2007, we only include women that were already in childbearing age when the deployment started (four years before the survey was taken). This means that we include women that were at least 15 in 2003. Other DHS samples are used in their entirety (15-49 at the time of the survey). Using these data, we create a complete birth history for each woman included in the three surveys' samples. Although the first DHS round was conducted four years after the arrival of the UN Mission in Liberia (UNMIL), full birth histories enable us to analyse fertility trends from before the deployment of UN peacekeepers.

To examine the effect of UN peacekeeping on women's fertility, we combine the DHS data with geocoded information on UNMIL's monthly sub-national deployment based on the GeoPKO dataset (Cil et al 2020). Peacekeepers are mostly deployed along the road network (see Figure 1). We calculate the road distance between a UN base and each DHS cluster and assign the treatment (exposure to peacekeeping in a given month-year) to women who live within a 10 km radius of the UN military base.[8] Consequently, by utilizing this information, we know whether and when these women lived in proximity to peacekeepers and whether and when they gave birth to children.

[8] The shapefile with the road network is available at https://www.diva-gis.org/gdata

Figure 1: Liberia road network (orange) and peacekeeping locations

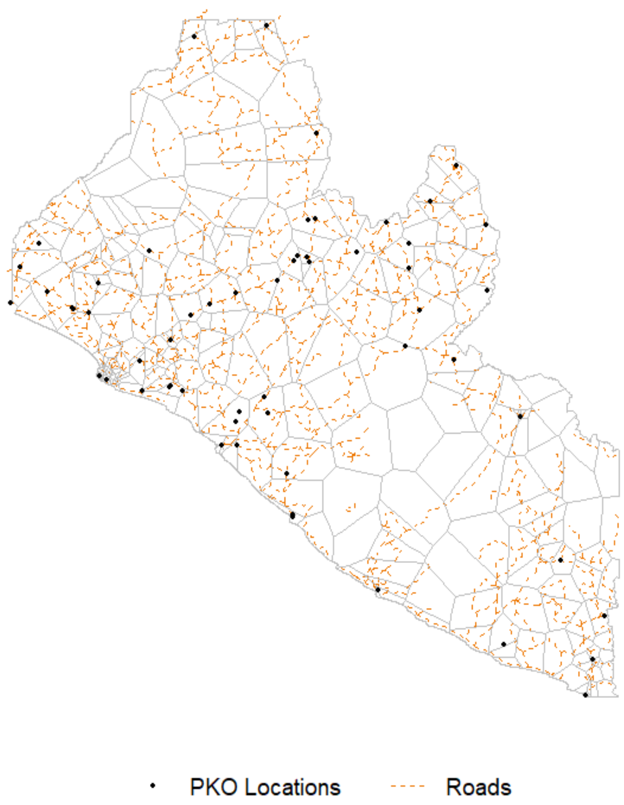
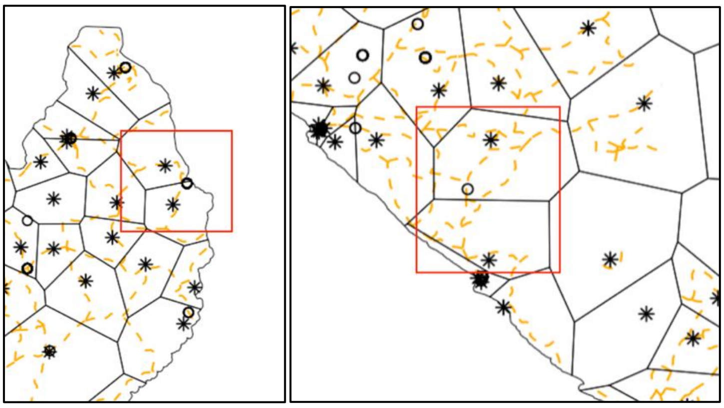


Figure 2 illustrates the granularity of our measurement approach through two examples. Individuals in clusters represented (asterisks) may be equidistant from peacekeepers (circles) based on the road network (dashed orange line). However, this information may be incorrectly overlooked by assigning the treatment only to individuals residing in the cluster that physically hosts the base (black border). In other words, two individuals residing in different clusters will both be treated if they are within 10km of a UN base, even though the base is physically located in only one of the clusters.

Figure 2: Respondents' location (asterisks) and distance from PKO base (circles)



As previously mentioned, despite not being a panel survey, the DHS birth histories can be used to track each surveyed woman's pregnancy experience before and after the arrival of the UN. The first wave of the survey was conducted in 2007 when peacekeepers were already present in the country. To distinguish between births that occurred before and after the deployment of peacekeepers, we leverage information on the movement of peacekeeping forces across the country. The deployment of UNMIL changed over time, and peacekeepers left some areas and started patrolling new ones throughout the mission. We use this variation to distinguish between births occurring before and after UNMIL deployment. The estimated specification takes the following form:

$$Y_{icjt} = \alpha_i + \beta PKO\_10km_i + \delta' X_{icjt} + \gamma' Z_c + \mu_j + \eta_t + \epsilon_{icjt} \qquad (1)$$

The outcome variable, Y_{icjt} is a dummy for any post-deployment birth or the number of post-deployment births for woman *i*, residing in DHS cluster *c*, located in district *j*, and interviewed at time *t*. If no post-deployment birth is reported, the value of Y_{icjt}, is zero. The main variable of interest, our treatment variable, is the binary indicator PKO_10km_i which measures whether a woman *i* has ever been exposed to peacekeeping within a 10km road distance from her cluster centroid, irrespective of whether peacekeepers were present in her cluster of residence. Thus, the treatment variable in the equation remains constant over time. We use the timing of deployment to compute the outcome variable, i.e., post-deployment births.[9] For treated women, we consider births occurring since the arrival of peacekeepers in their vicinity (within a 10km

[9] Note that we cannot use a standard two-way fixed effects model, i.e., including a time-varying dummy for the treatment variable, because the DHS data does not track women over time, but it only allows to track births. Our model therefore relies on the assumption of constant treatment effect.

radius), which coincides with the start date of the mission in 2004 for 85% of our treated women. For control women, we distinguish those who had peacekeepers in their cluster of residence but have never been exposed to the mission in their vicinity from those who never had peacekeeping in their cluster nor in their vicinity. Births are considered since the arrival of the mission in their clusters for the former group, and from the mission's start date for the latter group. Importantly, for all women we consider births as post-deployment if occurring at least nine months after the assigned date of deployment. This approach prevents overestimating the impact of UNMIL on fertility by excluding births from pregnancies that began before the actual deployment.

However, a purely accounting-related explanation for a negative correlation between deployment status and post-deployment fertility among treated women is also possible. This is due to the shorter time interval considered for post-deployment births among treated women compared to control women. Consequently, omitting the timing of deployment in Equation (1) could lead to a biased estimate of the impact of peacekeeping. In fact, the timing of deployment exhibits a negative correlation with post-deployment fertility and a positive correlation with the PKO_10km_i dummy variable.[10] This would generate a negative bias on the estimated impact of exposure to peacekeeping.[11]

To address this issue and mitigate potential omitted variable bias, we incorporate an indicator for the year of deployment into Equation (1). This indicator variable is set to the actual date of deployment for treated women and for control women who had peacekeeping presence in their cluster but not in their vicinity. For all remaining control women, the indicator is set to 2004. To further address this concern, we employ an alternative approach in the robustness section (Section 4.1) that eliminates temporal variation in the outcome variable. This approach involves classifying all births occurring since 2004 as post-deployment births for both treated and control groups, effectively disregarding the actual timing of deployment. This yields estimates that are biased towards zero, providing a lower bound for the impact of peacekeeping.

As for the treatment variable, we experimented with different radius lengths, ranging from 10 to 40km, and find that the size of β decreases as the distance from the residence increases. However, the only statistically significant indicator remains the one that measures presence within a 10km distance. This is consistent with the radius for UN missions' patrolling

[10] The fraction of individuals exposed to deployment increases as the mission expands over time.

[11] We thank the editor Andrew Foster for pointing this issue out.

activities, which is usually between 5-10 kilometres.[12] The width of this circle, also known as the 'golden circle', is usually based on the time it takes to get back to the base in case of an emergency (Dworschak and Cil 2022). Oftentimes, security conditions, poor roads or lack of infrastructure (especially in the aftermath of a civil war) do not allow long-range patrols and UN peacekeepers are forced to patrol in a quite limited radius from their home base and return home at sunset (Boyle, 2020). This operational constraint likely explains why the results are more robust and significant within the 10km range.[13]

To mitigate concerns about endogeneity, we control for a wide range of women's predetermined characteristics. The vector X_{icjt} includes variables such as age, education, marital status, type of residence (urban versus rural), number of children before the deployment of UNMIL, household's wealth, and the number of dead children (both in total and under the age of five) prior to the arrival of the mission. Additionally, we incorporate subnational characteristics, all available at the DHS cluster level (indicated by vector Z_c in equation 1), such as malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. The inclusion of cluster-level variables allows us to compare women who are similar in terms of their social, economic, demographic, and environmental conditions.

Furthermore, we include both district-level (second-order administrative units in Liberia) and wave-level fixed effects, represented by μ_j and η_t, respectively. In the robustness analysis, we also include the interactions between districts and wave dummies. These strategies guard against spurious correlation and ensure the identification of the effect of peacekeeping. To account for potential serial correlation and correlation within the cluster, we report standard errors that are clustered at the cluster level. Descriptive statistics of the main variables used in the empirical analysis are provided in Table A.1 in the Appendix.

Before presenting our main results, a prominent threat to identification is that deployment of peacekeepers might be influenced by past levels of violence, which in turn affect fertility rates. The subnational distribution of peacekeepers does not follow violence only, as the UN also

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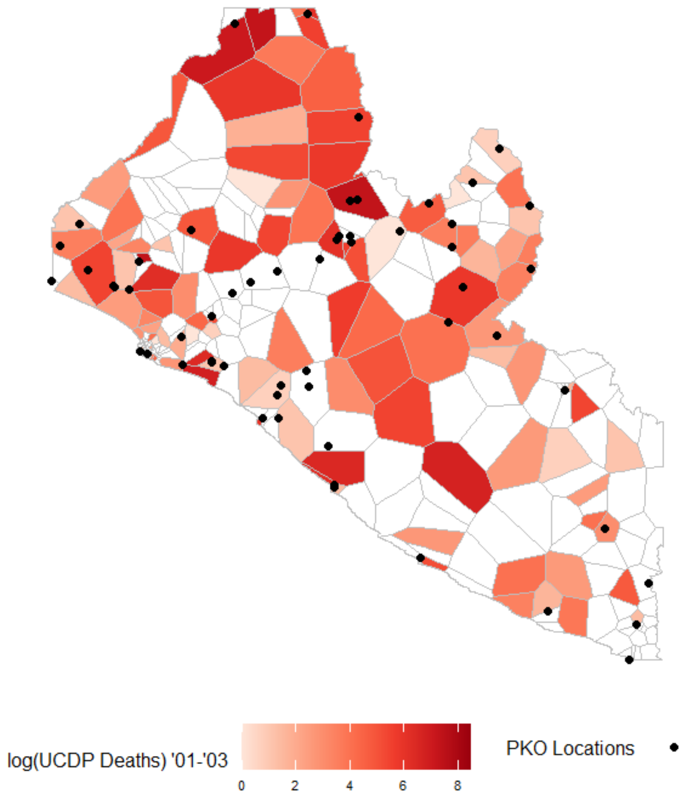
[12] https://reliefweb.int/report/democratic-republic-congo/rdc-lonu-explique-son-intervention-au-kasa-et-invite-les-autorit-s

[13] In the Appendix (Table A.8 and A.9), we also report the results of a donut-like estimator that compares women 10km and 20km from a UN base to show that our main results are robust to potential spillovers. See also the discussion in Section 4.1.

needs to consider the feasibility of setting up a base in a given location. For instance, it is often more logistically viable to set up bases in urban areas or near key road networks (Ruggeri, Dorussen, and Gizelis, 2016). Furthermore, preventive deployments are not uncommon to "prevent, deter or pre-empt" violence in areas where the UN or governments anticipate its eruption (UN DPKO and DFS, '2015 PoC Policy'; also see Bourgeois and Labuda, 2023). In essence, units subject to peacekeeping intervention exhibit varying pre-deployment levels of violence, as peacekeepers are not exclusively deployed in the most volatile regions. Consequently, the conflict-reducing effect of peacekeeping is likely to be downward bias because treated units include units that were not particularly violent (if at all) or units where violence was expected but averted.

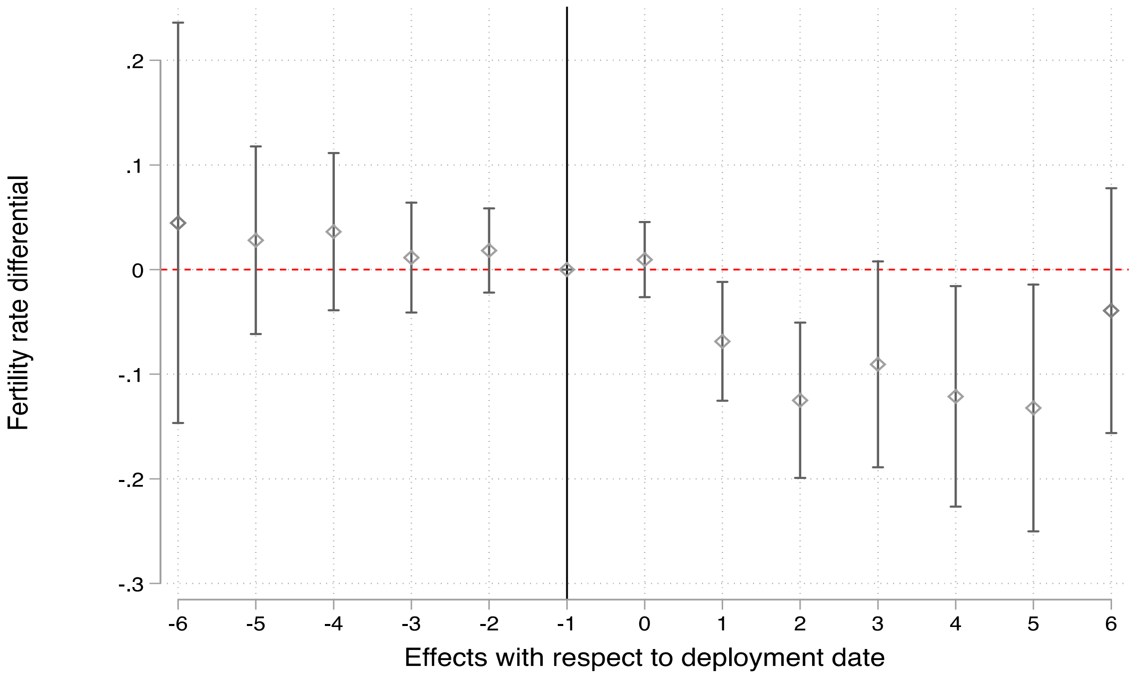
Accordingly, Figure 3 depicts the geographic distribution of UN peacekeeping locations across clusters in Liberia, along with the prior level of violence experienced in each cluster during the second civil conflict (2000-2003), measured by the log number of civilian deaths (based on UCDP GED, Sundberg and Melander 2013). The map indicates that there is not a strong correlation (0.25) between the presence of peacekeepers and prior levels of violence. This is confirmed when we estimate an event study by regressing violent events (based on Armed Conflict Location & Event Data, ACLED, Raleigh et al. 2010) on UNMIL deployment (Figures A.1 and A.2 in the Appendix). We find that peacekeepers usually deploy to areas that previously experienced more political violence but the difference between the treated and control group is never statistically significant. Moreover, after UNMIL deployment in 2003, we find that the difference in the rate of political violence is very close to zero and never statistically significant, while it turns negative and statistically significant when adopting the De Chaisemartin & D'Haultfoeuille (2020) approach (Figure A.2). If anything, this evidence indicates that violence-reducing effect of peacekeeping (one of our mechanisms) is indeed likely.

Figure 3: Pre-deployment violence (2000-2003) and peacekeeping location



To further dig into this issue and to assuage concerns over other pre-deployment factors, we examine fertility trends before and after deployment in treated and untreated clusters. To this aim, we use birth histories to estimate yearly average fertility rates at the cluster level. If fertility attitudes changed due to peacekeepers deployment in the way we postulate, we would expect it to react to current and lagged deployment rather than future deployment. We thus examine fertility differences between exposed and unexposed areas around the deployment dates compared with a baseline reference period (the year before deployment). In particular, we estimate an event study on cluster-level fertility rates in the years 1999 to 2018, which includes 6 deployment leads and 6 deployment lags. We present here only the visual output of the analysis in Figure 4, which shows lags and leads coefficients with 90% confidence intervals. Findings show that there is no evidence of pre-existing trends in fertility rates before the mission, but a noticeable difference in fertility rates between the two groups becomes evident during the deployment period. This provides further confidence in our identification strategy and mitigates concerns over conflict and other pre-deployment differences significantly contaminating our findings. Moreover, the trends in post-deployment fertility rates observed in Figure 4 are consistent with our model assumption of constant treatment effect.

Figure 4: Panel event study on fertility rates.



Note: Figure shows the coefficients of deployment lags and leads with their 90% confidence intervals. Results are from an OLS regression of cluster-level annual average fertility rates which controls for cluster and year fixed effects. The sample is comprised of 298 clusters observed in the years 1997 to 2018. Standard errors are clustered at the DHS cluster level.

4. Results

In this section we conduct a systematic analysis of the relationship between peacekeeping and fertility. The first round of results is presented in Table 1. The table demonstrates a consistent and statistically significant negative effect of peacekeeping on fertility across all specifications. The baseline specification, which only incorporates our key variable of interest, PKO_10km_i (that is, a UN base within a 10km radius from the cluster's centroid) and Year of deployment, is displayed in column 1. The estimated coefficient is negative and statistically significant at the 1% level, indicating that exposure to peacekeeping decreases the likelihood of having a child by 10-percentage points. When we account for individual-level factors in column 2, this point estimate remains significant and slightly decreases to 8 percentage points. When we include cluster-level factors in column 3 and also district fixed effects in column 4, the estimate remains consistent in magnitude.

Table 1. Main results. Dependent variable: any children post-deployment.

	(1)	(2)	(3)	(4)	(5)
PKO 10km	-0.100***	-0.081***	-0.076***	-0.079***	-0.045***
	(0.013)	(0.016)	(0.016)	(0.018)	(0.016)
Year of deployment	-0.004	-0.003	-0.005	-0.004	-0.017**
	(0.009)	(0.007)	(0.008)	(0.008)	(0.008)
Age		0.021***	0.020***	0.020***	0.001
		(0.003)	(0.003)	(0.003)	(0.003)
Age (sq)		-0.000***	-0.000***	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)	(0.000)
Married pre PKO		-0.037***	-0.033***	-0.030***	0.072***
		(0.008)	(0.007)	(0.007)	(0.007)
Primary Education		0.023***	0.019**	0.019***	0.020***
		(0.008)	(0.008)	(0.007)	(0.007)
Secondary Education		-0.049***	-0.040***	-0.039***	-0.045***
		(0.011)	(0.010)	(0.010)	(0.009)
Children pre PKO		-0.044***	-0.044***	-0.043***	-0.005*
		(0.003)	(0.003)	(0.003)	(0.003)
Children dead pre PKO		0.004	0.007	0.008	-0.007
		(0.006)	(0.006)	(0.006)	(0.005)
Wealth index		-0.002	-0.000	0.000	-0.002
		(0.003)	(0.003)	(0.002)	(0.002)
Urban		-0.025	0.017	0.021	-0.020
		(0.015)	(0.015)	(0.016)	(0.014)
U-5 mortality pre PKO		0.074***	0.072***	0.070***	0.050***
		(0.009)	(0.009)	(0.008)	(0.008)
Observations	17,226	17,226	17,226	17,226	17,226
Cluster-level controls	NO	NO	YES	YES	YES
District fixed effects	NO	NO	NO	YES	YES
Wave fixed effects	NO	NO	NO	NO	YES

Notes: Results in each column are from OLS regression. Cluster-level controls are malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

The results are robust when we finally add wave fixed effects in column 5. The findings in column 5, which represents our most stringent specification, reveal that women residing within 10km from peacekeepers have a 4.5-percentage point lower probability of giving birth, compared to women living in regions without peacekeepers.[14] Not only are these results

[14] We examine the robustness of our results against potential bias arising from omitted variables and follow the procedure outlined in Oster (2019). We run the test using specification in column 5 of Table 1 as the unrestricted model. The restricted model excludes individual and cluster-level covariates. As suggested by Oster (2019), we estimate δ according to a value of the Rmax that is 1.3 times larger than the R-squared of the unrestricted specification. The result of this test indicates that the unobservables would need to be four times as important as the observables to produce a treatment effect of zero. This implies that selection on unobservables must be significantly stronger than selection on observables to explain away our main result. As such, our results are robust to a substantial degree of selection on unobservables.

statistically significant, but the magnitude of the coefficient is also economically meaningful. Given that the average probability of having a child is 82%, the effect corresponds to a roughly 5.5% decrease in the average fertility rate.

Having analysed the effect of peacekeeping on the likelihood of giving a birth (the extensive margin), we now turn to investigate how exposure to peacekeepers affects the number of post-deployment births (the intensive margin). The results are presented in Table 2 and reveal a significant and negative effect of exposure to peacekeeping on the total number of children born after the deployment of peacekeepers. This result is robust to the gradual inclusion of the full set of control variables. In terms of magnitude, the results from our preferred and more demanding specification in column 5 indicate that exposure to peacekeeping reduces the number of children born post-deployment by 24%. This effect corresponds to a decrease in the average number of children by roughly 0.5. As such, a UN peacekeeping mission not only affects the probability of having a child but also the number of children born after its deployment.

Table 2. Intensive margin. Dependent variable: number of children post-deployment.

	(1)	(2)	(3)	(4)	(5)
PKO 10km	-0.728***	-0.398***	-0.381***	-0.395***	-0.242***
	(0.061)	(0.057)	(0.059)	(0.071)	(0.050)
Observations	17,226	17,226	17,226	17,226	17,226
Individual-level controls	NO	YES	YES	YES	YES
Cluster-level controls	NO	NO	YES	YES	YES
District fixed effects	NO	NO	NO	YES	YES
Wave fixed effects	NO	NO	NO	NO	YES

Notes: Results in each column are from Poisson regression. Displayed are marginal effects at the mean. Individual-level controls are those reported in Table 1, columns 2-5. Cluster-level controls are malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

4.1 Robustness tests

The key finding that emerges from our analysis is a negative effect of peacekeeping on fertility. To provide further support for this finding, we probe the robustness of our results through a round of robustness checks, which are reported in the Appendix.

Firstly, we examine whether the negative impact of peacekeeping on fertility is affected by our operationalization of the dependent variable. As elaborated in Section 3, our main specification's dependent variable accounts for the temporal variation in exposure to deployment, while the treatment variable considers whether a woman is ever exposed to peacekeeping, regardless of the actual year of deployment. This can negatively bias the estimated effect of peacekeeping if the year of deployment is not included in the model. As an alternative strategy, we assume no variation in the timing of deployment and consider the start year of the mission, 2004, as the reference year for post-deployment fertility for all women. By doing so, women who have not yet been exposed to peacekeeping but will be in the future are considered as treated since 2004. This approach would lead to a more conservative estimate of the fertility effect of peacekeeping as it will be biased towards zero. The results are presented in Tables A.2 and A.3 in the Appendix, for the likelihood of giving birth and the number of post-deployment births, respectively. As expected, the estimates in Table A.2 (Table A.3) are 20% (15%) smaller in magnitude than those in Table 1 (Table 2)

Second, all the event studies presented before (Figure A.1 in the Appendix, Figure 4 and Figure 5) have been re-estimated following De Chaisemartin and D'Haultfoeuille (2020) approach. The results in the Appendix (Figure A.2, A.3 and A.4) are in line with what we have reported in the main article. We also show that our result on night light emissions remain even when we exclude top 1% deployment locations from the sample (Figure A.5). This excludes the possibility that the change in night lights is caused by peacekeepers activity only.

In Table A.4 we show that the findings on the extensive margin hold when district-by-wave fixed effects are considered, i.e., when district time-varying factors are included (column 1); when excluding the top 5% of areas with the highest concentration of peacekeepers (column 2); when excluding women who have migrated since the arrival of peacekeepers (around 13% of the sample) as individuals might self-select into areas based on the distance from UN bases (column 3); and when considering only urban areas, given the relatively more frequent presence of UN compounds (column 4). We also consider the possibility that the estimated effect of peacekeeping on fertility may be contaminated by previous levels of violence. Figure 3 already showed no clear correlation between the deployment of peacekeepers and previous levels of violence. To further investigate this, we include a measure of conflict based on cumulative pre-deployment conflict deaths from the UCDP GED (column 5). Finally, we check for potential contamination from the outbreak of Ebola in 2014 by replicating the analysis with observations only up to 2013 (column 6).

We replicate the robustness analysis for results on the intensive margin of fertility in Table A.5, showing that also in this case the peacekeeping effect of fertility is not affected by the inclusion of the additional controls and when using different samples. Overall, findings in

Tables A.4-A.5 provide strong evidence that peacekeeping affects both the extensive and intensive margin of fertility.

In Table A.6, we replicate the models that account for prior exposure to violence (columns 5 in Tables A.4-A.5 in the Appendix) by replacing the UCDP measure of conflict intensity (conflict deaths) with the same measure derived from ACLED (Raleigh et al. 2010). ACLED adopts a less restrictive definition of violence and records violent political events also outside of civil wars. The results (column 1 and 2) are virtually identical and remain robust even when we include a control for post-deployment violence (column 3 and 4), which UCDP does not code as it is based on a more restrictive definition of conflict violence.

In Table A.7 we show the results of estimating equation (1) using two alternative treatments: a dummy for the presence of peacekeeping in the respondents' cluster (column 1) and a set of dummies for the presence of peacekeeping at different distances (column 2). The results indicate that the effect is most significant when the distance from the peacekeepers is within 10 km of the respondents' location. These findings reinforce the validity of the identification of the treatment effect, as it shows that estimating exposure to peacekeeping through their presence or absence in the cluster may lead to an overestimation of the treatment effect.

The evidence of a spatial decay in the impact of peacekeeping, however, might indicate that our main findings can be contaminated by spillover effects, due to considering as comparison units women residing very close to the 10km distance but who can be treated with lower intensity. To remove such a possibility, we re-estimate models of Tables 1-2 using as control group all women residing beyond 20km away from peacekeepers, that is, excluding women living between 10 and 20km away from peacekeepers. Findings presented in the Appendix Tables A.8 and A.9 indicate stronger negative impacts of peacekeeping than the one in Tables 1 and 2 and suggest that our main results are robust to possible spillover effects.

Finally, to ensure that our main results are not due to changes in sample composition over time, we present some balance testing in the Appendix. In particular, we focus on the following observable characteristics of women: age (Table A.10), number of children before deployment (Table A.11) and marital status (Table A.12). We check the composition of the full sample as well as each DHS wave separately. The latter allows us to detect in which wave, if any, a change in composition might have occurred. The results indicate that there is no change in composition over time with respect to age and the number of children. We find a lower percentage of married women in areas where peacekeepers are deployed, and this change is detected for the 2019 wave. This last finding might lead to lower fertility *per se* regardless of whether the mission is present. If so, by excluding the wave 2019, we should not detect or should detect a weak effect on fertility. This check is presented in column 6 ("Pre-ebola period") of Appendix Tables A.4 and A.5 for the extensive and intensive margin, respectively. As shown, the exclusion of women surveyed in 2019 does not affect the negative effect on fertility substantiated in our paper. Therefore, changes in the marital status seem not to undermine our main conclusion.

4.2 Heterogeneity

In this section, we examine whether the effect of peacekeeping on fertility may differ depending on five individual-level characteristics: women's age, number of pre-existing children (parity), child mortality, education, and place of residence (urban or rural). We present these results in Table 3. To facilitate the interpretation of the interaction terms, we also report the coefficients and standard errors associated with the interaction terms in the lower part of Table 3. Findings indicate that peacekeeping has a consistently negative effect on fertility across all age groups, with the strongest effect seen among women aged 30 to 45 years old at the time of deployment (column 1). The effect is negative for all parity levels and increases as the number of pre-existing children increases (column 2). The negative effect is more pronounced for women with at least one child dead in the pre-deployment period (column 3). Women who were married at the time of deployment appear to be more affected compared to unmarried women (column 4). Finally, no statistically significant difference in the effect of peacekeeping on fertility is found based on education level (column 5) or place of residence (urban versus rural, column 6). Table A.13 in the Appendix reports similar analyses but using the number of children post deployment as the dependent variable. The results show similar trends as the ones seen in Table 3 for every woman's characteristic analysed.

Table 3. Heterogeneity. Dependent variable: any children post-deployment.

	(1)	(2)	(3)	(4)	(5)	(6)
PKO 10km	-0.024	0.006	-0.036**	-0.022	-0.040**	-0.048**
	(0.018)	(0.018)	(0.016)	(0.018)	(0.017)	(0.021)
PKO 10km * Aged 20-29	-0.022*					
	(0.013)					
PKO 10km * Aged 30-45	-0.068***					
	(0.018)					
PKO 10km * Parity 1		-0.077***				
		(0.020)				
PKO 10km * Parity 2+		-0.080***				
		(0.015)				
PKO 10km * Any children dead pre PKO				-0.036***		
				(0.013)		
PKO 10km * Married pre PKO				-0.037***		
				(0.012)		
PKO 10km * Secondary Education						-0.023
						(0.015)
PKO 10km * Urban						0.006
						(0.023)
PKO 10km + PKO 10km * H1	-0.046***	-0.070***	-0.072***	-0.059***	-0.062***	-0.042***
	(0.016)	(0.021)	(0.019)	(0.016)	(0.017)	(0.017)
PKO 10km + PKO 10km * H2	-0.092***	-0.073***				
	(0.018)	(0.017)				
Observations	17,226	17,226	17,226	17,226	17,226	17,226

Notes: Results in each column are from OLS regression. Individual-level controls (as in Table 1, columns 2-5), cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * p < 0.10, ** p < 0.05, *** p < 0.01.
Source: DHS 2007, 2013, and 2019.

4.3 Mechanisms

As discussed, we argue that the key channels through which peacekeeping affects fertility are related to how their security umbrella enables health services provision and access and promotes local economic development. To explain the strong negative effect of peacekeeping on fertility decisions, we propose three potential mechanisms that may be contributing to this relationship (none of which are mutually exclusive).

First, peacekeepers create a supportive environment that enables development and humanitarian projects, including the provision of key services and the construction of vital infrastructures for the local community by other international actors.[15] We use night lights data to measure levels of infrastructural development, levels of local development more broadly (Bruederle and Hodler, 2018) and – to some extent – the availability of health services. In

[15] To illustrate, the 13th progress report of the Secretary-General on UNMIL suggests that the most visible indicators of progress in meeting key benchmarks in this area is the restoration of street lighting and piped water in parts of Monrovia. The World Bank/UNMIL joint infrastructure and employment programme provided additional help with the development of critical infrastructure across the country (UN 2016).

Figure 5 we show the results from an event study on grid-level (50 x 50 km cells) night lights intensity in the years 1999 to 2012 (9 years after peacekeepers first deployment in 2003). The night lights data are taken from PRIO (Tollefsen et al 2012). The model includes 6 deployment leads and 8 deployment lags. The figure shows the coefficients of deployment leads and lags, along with their 90% confidence intervals. The results indicate that there is no statistically significant difference in night lights intensity before deployment. However, there is a relevant positive difference between exposed and unexposed areas during the deployment period.

In addition to night lights, Table A.14 in the Appendix shows the results of a two-way fixed effects model estimating the correlation between World Bank aid projects (based on AidData, Tierney et al., 2011) and peacekeeping presence at the grid-cell level. We do not perform an event study on aid projects because projects in Liberia are reported from 2006 onward. The results provide suggestive evidence that cells hosting UN peacekeepers are also more likely to host aid projects (measured as a dummy for any project and as a count of total projects). Taken together, these findings suggest that the peacekeeping mission may have had a positive long-term effect on the economic and social development of these areas and create a safe environment for international actors (donors or NGOs) to carry out their critical activities.

Second, the security provided by peacekeepers not only makes it possible for external actors to deliver critical infrastructures and services, but also improves local citizens to access such services. In some cases, as seen in Liberia, peacekeepers also engage in community outreach programs aimed at raising awareness about health issues,[16] including family planning.[17] To evaluate the effect of peacekeeping on maternal and child health, we analyse the number of prenatal visits, iron intake during pregnancy, birthweight of the child, number of postnatal visits, number of child deaths under the age of five, and contraceptive use. Our results, presented in Table 4, show that exposure to peacekeeping is linked to improved health outcomes for both mothers and children, as indicated by improved indicators and increased contraceptive use.

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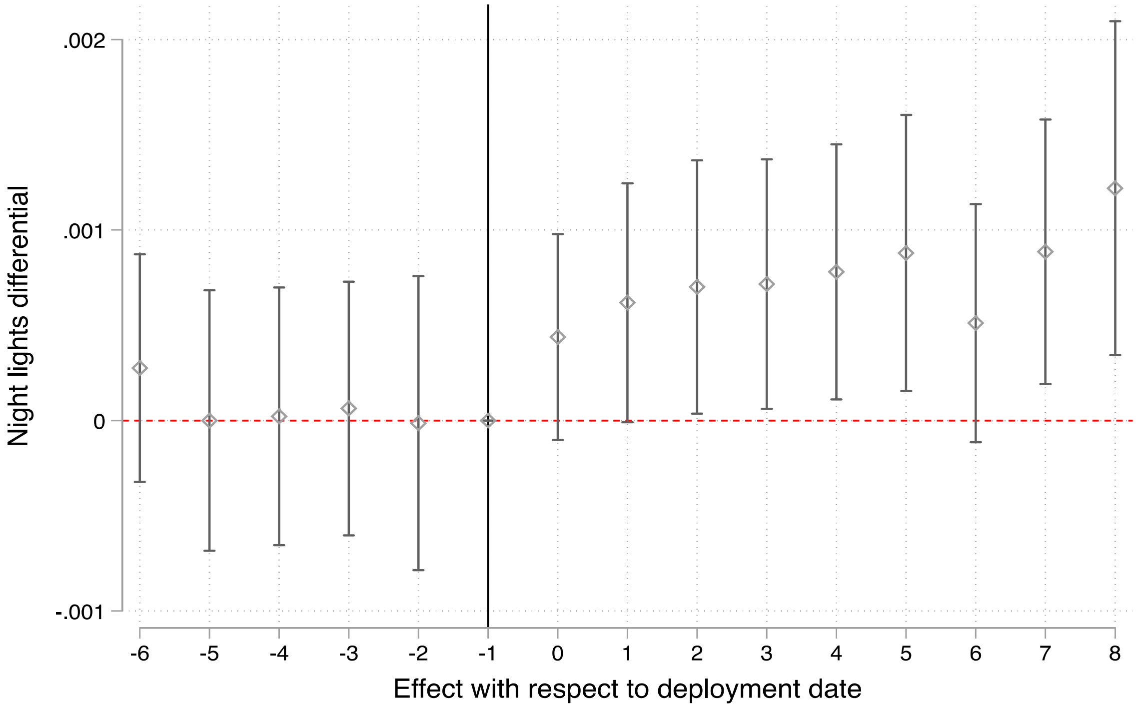
[16] For example, the mission helped "disseminating lifesaving information on Ebola prevention via UNMIL radio and community outreach" (https://theglobalobservatory.org/2014/09/role-un-peacekeepers-unmil-tackling-ebola/). UNMIL radio's phone-in programme was also a key tool in raising awareness on HIV/AIDS (S/2006/958, para53). See also: "UNMIL Sensitizes hazard prone communities on good hygiene practices" (https://peacekeeping.un.org/en/unmil-sensitizes-hazard-prone-communities-good-hygiene-practices)

[17] See for example "Rural women embrace family planning" (https://unmil.unmissions.org/rural-women-embrace-family-planning)

Figure 5: Panel event study of night lights.



Note: Figure shows the coefficients of deployment lags and leads with their 90% confidence interval. Results are from an OLS regression of grid-level (50 x 50 km cells) night lights intensity which controls for grid and year fixed effects. The sample is comprised of 45 grids observed in the years 1999 to 2012. Standard errors are robust to heteroskedasticity.

Access to family planning services enable women to make more informed decisions about their reproductive health and have greater control over the timing and number of children, for example by reducing unintended pregnancies. At the same time, access to quality prenatal and maternal healthcare can improve health outcomes for mothers and their children, reducing the pressure to have more children to compensate for high infant mortality rates. As such, because peacekeeping presence improves maternal and child health, it might induce a quantity-quality trade-off, leading to a reduction in fertility (Becker, 1960). Note that the plausibility of this mechanism is corroborated by the results in Table 2, which show a significant effect of peacekeeping on the number of children. Overall, the results in Table 4 also align with previous research demonstrating negative effects of conflict on maternal health (Ghobarah et al., 2003; Kotsadam and Østby, 2019), institutional child delivery (Østby et al., 2018), child health (Bundervoet et al., 2009; Akresh et al., 2011, 2012; Mansour and Rees, 2012; Minoiu and Shemyakina, 2014; Valente, 2015; Quintana-Domeque and Ródenas-Serrano, 2017; Brown, 2018; Dagnelie et al., 2018; Le and Nguyen, 2020; Tapsoba, 2023), and contraceptive use (Svallfors and Billingsley, 2019).

Table 4. Effects of PKO on maternal and child health.

	(1) Antenatal visits	(2) Antenatal iron intake	(3) Deliver at home	(4) Postnatal visits	(5) Birth weight	(6) Under-5 mortality	(7) Contrace ption use
PKO 10km	0.349**	0.024**	-0.039*	0.057**	0.221***	-0.026**	0.047***
	(0.152)	(0.012)	(0.023)	(0.024)	(0.078)	(0.011)	(0.013)
Observations	10,501	11,128	11,419	9,538	2,752	17,226	14,225

Notes: Results in each column are from OLS regression. Individual-level controls (as in Table 1, columns 2-5), cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * p < 0.10, ** p < 0.05, *** p < 0.01.
Source: DHS 2007, 2013, and 2019.

Third, there could be an opportunity-cost dynamic at play, due to the peacekeeping impact on local economic development. We check whether better economic and labour market conditions may be potential factors explaining the decrease in fertility. We estimate the effect of peacekeeping on both respondents' and partners' occupation. In particular, we consider the following categories: agriculture, white-collar, sales, services and blue-collar. Due to the limited information on the labour market conditions in the DHS, we cannot consider a finer classification of the type of occupation. The results of this analysis are presented in columns 1-6 in Table 5. The upper part of Table 5 refers to the women's occupation while the lower part of Table 5 reports the results for partners' occupation. While we find no effect of peacekeeping on employability for women but only foor men, we do detect an effect on jobs re-allocation away from agriculture and towards more clerical positions and occupations in the services and sales sector. Typically, these jobs have higher labour productivity, are better paid and have potential better career prospects. Recent literature shows that in developing countries women employed in manufacturing tend to marry later and delay childbearing (Heath and Mobarak, 2015; Amin 2006) and that decline in fertility is partly due to the industrialization policies which stimulate employment growth in the industry and services sectors (White et al. 2001). These factors are consistent with the rising opportunity cost hypothesis leading to reduced fertility.

Taken together, these findings suggest that peacekeeping may affect fertility by increasing availability of and access to key services, such as healthcare, and by affecting the investment parents make in their children, leading to a shift from quantity to quality. This last round of findings provides new insights into the ways in which the external provision of security may affect reproductive behaviour.

Table 5. Effects of PKO on the opportunity cost of childbearing.

	(1) Employed	(2) Agriculture	(3) White-collar	(4) Sales	(5) Services	(6) Blue-collar
Women Occupation						
PKO 10km	-0.004	-0.125***	0.011**	0.085***	0.019*	0.011**
	(0.017)	(0.022)	(0.005)	(0.021)	(0.009)	(0.005)
Mean of DV	0.827	0.548	0.035	0.318	0.079	0.020
Observations	13622	11945	11945	11945	11945	11945
Partner Occupation						
PKO 10km	-0.015**	-0.099***	0.023**	0.016*	0.034***	0.024
	(0.007)	(0.021)	(0.010)	(0.009)	(0.010)	(0.015)
Mean of DV	0.191	0.526	0.134	0.078	0.076	0.174
Observations	13686	11180	11180	11180	11180	11180

Notes: Results in each column are from OLS regression. Individual-level controls (as in Table 1, columns 2-5), cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

5. Final Remarks

Civil wars have a detrimental effect on countries' economic prospects and crucially shape individuals' long-term decisions, some of which linger in the post-conflict phase. Extant research has focused on behavioural changes in the public sphere (e.g., community participation) and on the psychological sphere of conflict legacies (e.g., trauma). In between these two areas, the legacy effect of conflict on reproductive behaviour belongs to the personal sphere but at the same time has significant long-term implications for development in post-conflict settings.

UN peace operations have been shown to be effective in reducing the level of violence in ongoing conflict and the probability of conflict relapse. However, we know relatively little about whether and to what extent external provision of security can shape the socio-economic conditions of local communities. The present paper aims to fill this gap. We study the case of Liberia, which hosted one of the largest UN peacebuilding operations, deployed between 2003 and 2018, to support the implementation of a peace process in the immediate aftermath of the Second Liberian Civil War. We leverage geocoded information on the subnational deployment of peacekeepers and data on maternal and child health and on fertility using the childbirth histories of women from three rounds of the DHS. The granularity of the data –particularly the distance between the presence of peacekeepers and the location of respondents – allows us to probe whether this link is causal and which mechanisms are likely at play.

We find that the UN has a significant and socially meaningful effect on the likelihood of having a child. Women exposed to the local presence of peacekeepers experience a lower likelihood of having a child and a reduction in the number of children they have in the post-deployment period. The estimated effect is larger for older and married women, and it increases with the number of existing children at the time of the deployment. We provide evidence that the estimated negative effect of peacekeeping on fertility is explained by improved maternal health and childbirth outcomes, as well as a greater probability of contraceptive use and increased opportunity cost of childbearing. This suggests that the presence of peacekeepers, in addition to improving local security, enables provision of and access to services and stimulates local economic conditions, which result in improved health and economic outcomes and better opportunities for family planning. These findings highlight the important role that external peacebuilding interventions can play in shaping the socio-economic conditions of post-conflict communities.

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Appendix

Table A.1. Summary statistics

	(1) count	(2) mean	(3) std. dev.	(4) min	(5) max
Any children post PKO	17,226	0.816	0.387	0	1
No. children post PKO	17,226	1.875	1.529	0	11
PKO 10km	17,226	0.389	0.488	0	1
Age	17,226	32.728	8.303	15	49
Married pre PKO	17,226	0.629	0.483	0	1
Primary education	17,226	0.282	0.450	0	1
Secondary education	17,226	0.228	0.420	0	1
No. children pre PKO	17,226	2.141	2.452	0	15
No. children dead pre PKO	17,226	0.453	1.002	0	10
Wealth	17,226	0.001	1.582	-1.258462	57.30864
Urban	17,226	0.381	0.486	0	1
Under-5 mortality pre PKO	17,226	0.142	0.439	0	5

Source: DHS 2007, 2013, and 2019.

Table A.2. Robustness checks considering 2004 as year of deployment for all women. Dependent variable: any children post-deployment.

	(1)	(2)	(3)	(4)	(5)
PKO 10km	-0.088***	-0.072***	-0.062***	-0.069***	-0.036**
	(0.013)	(0.014)	(0.015)	(0.017)	(0.014)
Observations	17,226	17,226	17,226	17,226	17,226
Individual-level controls	NO	YES	YES	YES	YES
Cluster-level controls	NO	NO	YES	YES	YES
District fixed effects	NO	NO	NO	YES	YES
Wave fixed effects	NO	NO	NO	NO	YES

Notes: Results in each column are from OLS regression. Cluster-level controls are malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

Table A.3. Robustness checks considering 2004 as year of deployment for all women. Dependent variable: number of children post-deployment.

	(1)	(2)	(3)	(4)	(5)
PKO 10km	-0.670***	-0.373***	-0.331***	-0.358***	-0.206***
	(0.062)	(0.058)	(0.060)	(0.073)	(0.051)
Observations	17,226	17,226	17,226	17,226	17,226
Individual-level controls	NO	YES	YES	YES	YES
Cluster-level controls	NO	NO	YES	YES	YES
District fixed effects	NO	NO	NO	YES	YES
Wave fixed effects	NO	NO	NO	NO	YES

Notes: Results in each column are from OLS regression. Cluster-level controls are malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

Table A.4. Robustness checks. Dependent variable: any children post-deployment.

	(1) District-wave FE	(2) Trimming top 5% troops	(3) Excluded Migrants	(4) Urban cluster only	(5) Conflict (#deaths UCDP)	(6) Pre-Ebola period
PKO 10km	-0.039***	-0.042***	-0.049***	-0.043*	-0.045***	-0.040**
	(0.013)	(0.016)	(0.017)	(0.024)	(0.016)	(0.018)
Observations	17,226	16,308	14,959	6,566	17,226	12,603

Notes: Results in each column are from OLS regression. Individual-level controls (as in Table 1, columns 2-5), cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

Table A.5. Robustness checks. Dependent variable: number of children post-deployment.

	(1) District-wave FE	(2) Trimming top 5% troops	(3) Excluded Migrants	(4) Urban cluster only	(5) Conflict (#deaths UCDP)	(6) Pre-Ebola period
PKO 10km	-0.230***	-0.233***	-0.248***	-0.252***	-0.242***	-0.144***
	(0.046)	(0.051)	(0.054)	(0.073)	(0.050)	(0.049)
Observations	17,226	16,308	14,959	6,566	17,226	12,603

Notes: Results in each column are from Poisson regression. Displayed are marginal effects at the mean. Individual-level controls (as in Table 1, columns 2-5), cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

Table A.6. Robustness checks replacing UCDP conflict data with ACLED data.

	(1) Any children post-deployment	(2) No. children post-deployment	(3) Any children post-deployment	(4) No. children post-deployment
PKO 10km	-0.045***	-0.243***	-0.046***	-0.243***
	(0.016)	(0.050)	(0.016)	(0.050)
Observations	17226	17226	17226	17226
ACLED before	YES	YES	YES	YES
ACLED after	NO	NO	YES	YES

Notes: Results in each column are from OLS regression. Individual-level controls, cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

Table A.7. Robustness checks on treatment variable. Dependent variable: any children post-deployment.

	(1)	(2)
PKO in cluster	-0.161***	
	(0.017)	
PKO 10km		-0.059***
		(0.020)
PKO 10-20km		-0.015
		(0.016)
PKO 20-30km		-0.014
		(0.014)
PKO 30-40km		-0.014
		(0.015)
Observations	17,226	17,226

Notes: Results in each column are from OLS regression. Individual-level controls (as in Table 1, columns 2-5), cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: DHS 2007, 2013, and 2019.

Table A.8 Dependent variable: any children post-deployment. Treatment group is within 10km; Control group is beyond 20km.

	(1)	(2)	(3)	(4)	(5)
PKO 10km	-0.110***	-0.097***	-0.081***	-0.083***	-0.045**
	(0.014)	(0.018)	(0.019)	(0.024)	(0.021)
Observations	14142	14142	14142	14142	14142
Individual-level controls	NO	YES	YES	YES	YES
Cluster-level controls	NO	NO	YES	YES	YES
District fixed effects	NO	NO	NO	YES	YES
Wave fixed effects	NO	NO	NO	NO	YES

Notes: Results in each column are from OLS regression. The control group consists of women living 20km away from peacekeepers. Cluster-level controls are malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: DHS 2007, 2013, and 2019.

Table A.9. Dependent variable: number of children post-deployment. Treatment group is within 10 km; Control group is beyond 20 km.

	(1)	(2)	(3)	(4)	(5)
PKO 10km	-0.817***	-0.489***	-0.436***	-0.434***	-0.271***
	(0.064)	(0.067)	(0.068)	(0.088)	(0.063)
Observations	14142	14142	14142	14142	14142
Individual-level controls	NO	YES	YES	YES	YES
Cluster-level controls	NO	NO	YES	YES	YES
District fixed effects	NO	NO	NO	YES	YES
Wave fixed effects	NO	NO	NO	NO	YES

Notes: Results in each column are from OLS regression. The control group consists of women living 20km away from peacekeepers. Cluster-level controls are malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: DHS 2007, 2013, and 2019.

Table A.10. Balance test on age.

	(1) All waves	(2) Wave 2007	(3) Wave 2013	(4) Wave 2019
PKO 10km	-0.021	-0.313	0.388	-0.358
	(0.187)	(0.322)	(0.324)	(0.342)
Observations	17226	5277	7326	4623
Cluster-level controls	YES	YES	YES	YES
District fixed effects	YES	YES	YES	YES
Wave fixed effects	YES	NO	NO	NO

Notes: Results in each column are from OLS regression. Dependent variable is Age. All specifications include the following cluster-level controls: malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * p < 0.10, ** p < 0.05, *** p < 0.01.
Source: DHS 2007, 2013, and 2019.

Table A.11. Balance test on number of children before deployment

	(1) All	(2) Wave 2007	(3) Wave 2013	(4) Wave 2019
PKO 10km	0.020	-0.036	0.120	-0.023
	(0.060)	(0.111)	(0.105)	(0.090)
Observations	17226	5277	7326	4623
Cluster-level controls	YES	YES	YES	YES
District fixed effects	YES	YES	YES	YES
Wave fixed effects	YES	NO	NO	NO

Notes: Results in each column are from OLS regression. Dependent variable is No. of children pre PKO. All specifications include the following cluster-level controls: malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * p < 0.10, ** p < 0.05, *** p < 0.01.
Source: DHS 2007, 2013, and 2019.

Table A.12. Balance test on marital status before deployment

	(1) All	(2) Wave 2007	(3) Wave 2013	(4) Wave 2019
PKO 10km	-0.039***	-0.023	-0.015	-0.069***
	(0.011)	(0.017)	(0.020)	(0.024)
Observations	17226	5277	7326	4623
Cluster-level controls	YES	YES	YES	YES
District fixed effects	YES	YES	YES	YES
Wave fixed effects	YES	NO	NO	NO

Notes: Results in each column are from OLS regression. Dependent variable is Married pre PKO. All specifications include the following cluster-level controls: malaria prevalence, population size, the number of individuals under five years old, rainfall patterns, proximity to water, proximity to national borders, land aridity, frequency of drought episodes, economic activity, irrigation practices, livestock ownership, and the average time required to reach a major settlement. Standard errors clustered by DHS cluster. * p < 0.10, ** p < 0.05, *** p < 0.01.
Source: DHS 2007, 2013, and 2019.

Table A.13 Heterogeneity. Dependent variable: number of children post-deployment.

	(1)	(2)	(3)	(4)	(5)	(6)
PKO 10km	-0.162***	-0.085***	-0.135***	-0.118***	-0.144***	-0.133***
	(0.034)	(0.033)	(0.031)	(0.033)	(0.033)	(0.039)
PKO 10km * Aged 20-29	-0.016					
	(0.022)					
PKO 10km * Aged 30-45	-0.091***					
	(0.035)					
PKO 10km * Parity 1		-0.081**				
		(0.032)				
PKO 10km * Parity 2+		-0.130***				
		(0.029)				
PKO 10km * Any children dead pre PKO				-0.083***		
				(0.027)		
PKO 10km * Married pre PKO					-0.056***	
					(0.022)	
PKO 10km * Secondary Education						-0.037
						(0.029)
PKO 10km * Urban						-0.045
						(0.048)
Observations	17,226	17,226	17,226	17,226	17,226	17,226

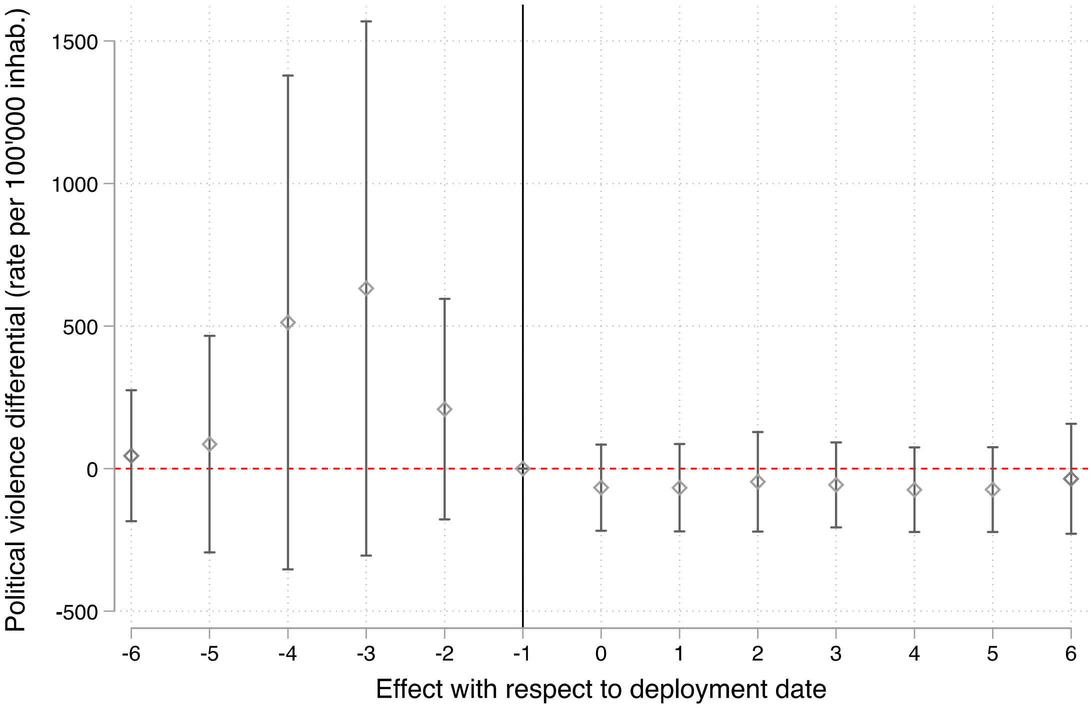
Notes: Results in each column are from Poisson regression. Displayed are marginal effects at the mean. Individual-level controls (as in Table 1, columns 2-5), cluster-level controls, district fixed effects and wave fixed effects are included in all specifications. Standard errors clustered by DHS cluster. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: DHS 2007, 2013, and 2019.

Table A.14. Development Mechanism: Dependent variable: aid projects.

	(1) Any projects in cell	(2) No. projects in cell
PKO in cell	0.279 ***	0.608***
	(0.065)	(0.177)
Observations	522	522
Cell-level controls	YES	YES
Cell fixed effects	YES	YES
Year fixed effects	YES	YES

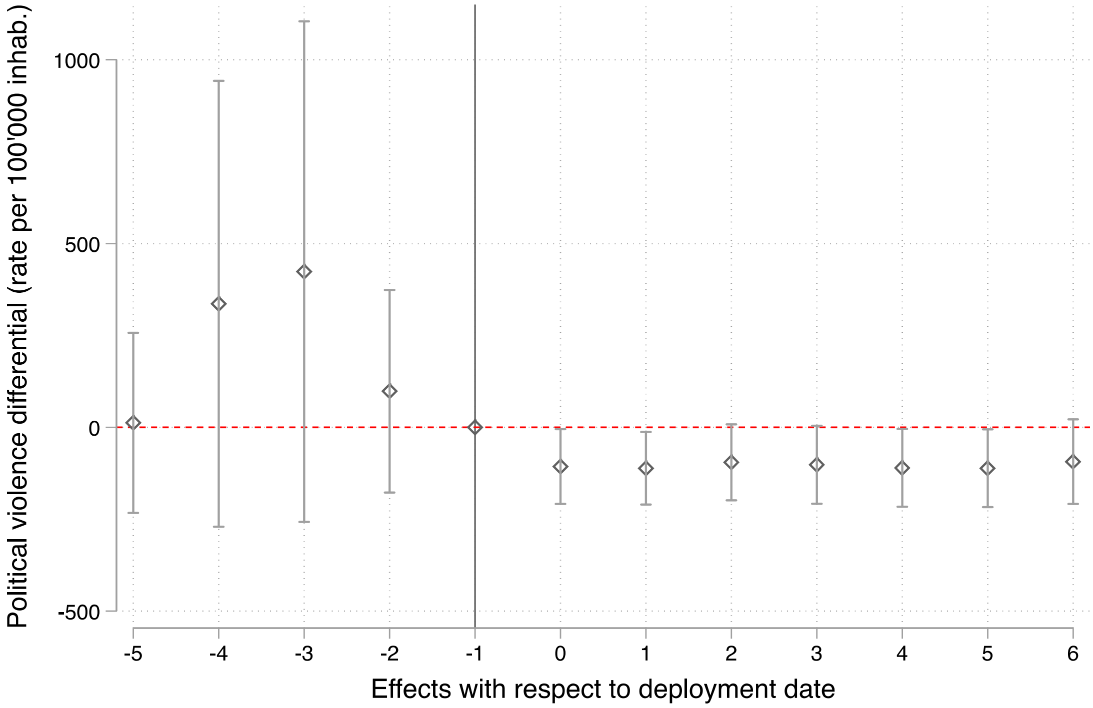
Notes: Results are from OLS regression in column 1 and from Poisson regression (displayed are marginal effects at the mean) in column 2. Cell-level controls included in all specifications: agricultural area, forest area, gross-cell product, population, precipitation, grass areal, excluded ethnic group(s). Standard errors clustered by Grid-Cell. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: AidData, Tierney et al. (2011).

Figure A.1. Panel event study on political violence events.



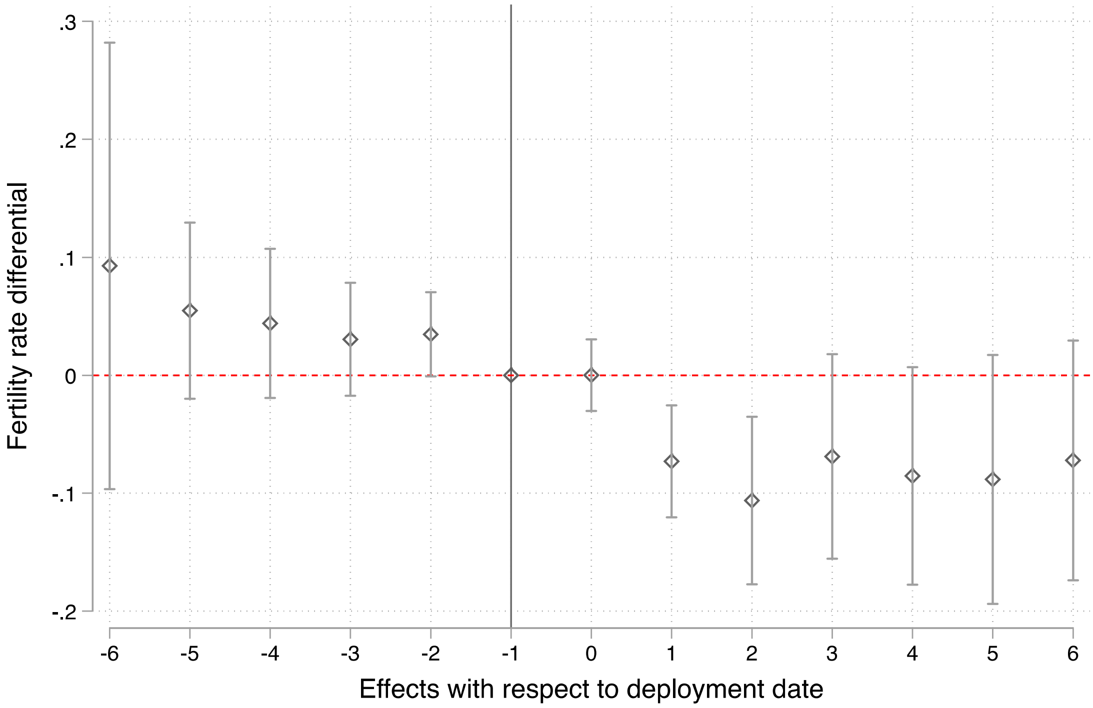
Note: Figure shows the coefficients of deployment lags and leads with their 90% confidence intervals. Results are from an OLS regression of cluster-level annual political violence rates which controls for cluster and year fixed effects. The sample is comprised of 287 clusters observed in the years 1997 to 2018. Standard errors are clustered at the DHS cluster level.

Figure A.2. Panel event study on political violence events following De Chaisemartin & D'Haultfoeuille (2020) approach.



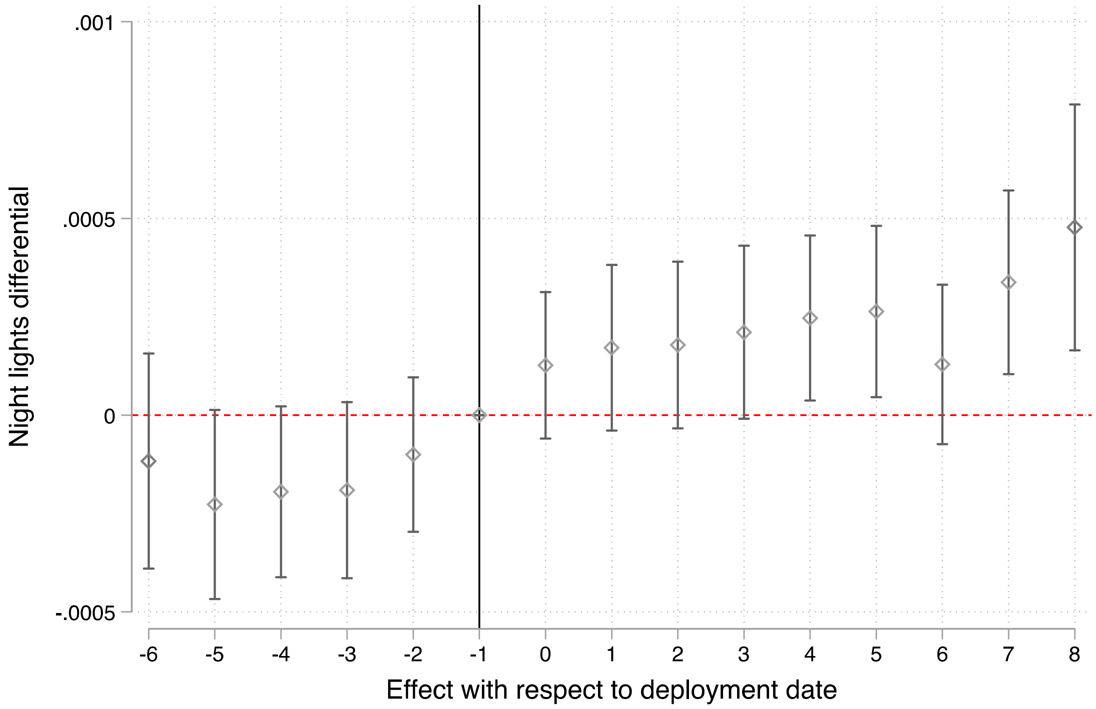
Note: Figure shows the coefficients of deployment lags and leads with their 90% confidence intervals. Results are from an OLS regression of cluster-level annual political violence rates which controls for cluster and year fixed effects. Regression follows the approach of De Chaisemartin & D'Haultfoeuille (2020) to address heterogeneous impacts among clusters and over years. The sample is comprised of 287 clusters observed in the years 1998 to 2018. Standard errors are clustered at the DHS cluster level.

Figure A.3. Panel event study on fertility rates following De Chaisemartin & D'Haultfoeuille (2020) approach.



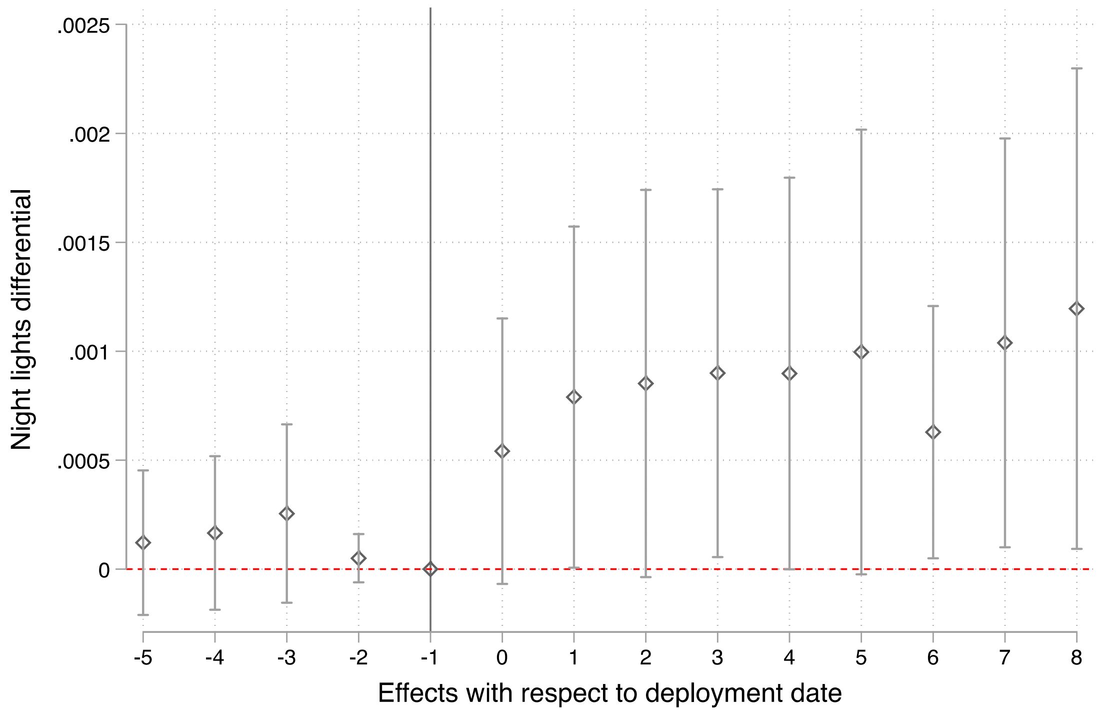
Note: Figure shows the coefficients of deployment lags and leads with their 90% confidence intervals. Results are from an OLS regression of cluster-level annual average fertility rates which controls for cluster and year fixed effects. Regression follows the approach of De Chaisemartin & D'Haultfoeuille (2020) to address heterogeneous impacts among clusters and over years. The sample is comprised of 298 clusters observed in the years 1997 to 2018. Standard errors are clustered at the DHS cluster level.

Figure A.4. Panel event study on night lights following De Chaisemartin & D'Haultfoeuille (2020) approach.



Note: Figure shows the coefficients of deployment lags and leads with their 90% confidence interval. Results are from an OLS regression of grid-level (50 x 50 km cells) night lights intensity which controls for grid and year fixed effects. Regression follows the approach of De Chaisemartin & D'Haultfoeuille (2020) to address heterogeneous impacts among clusters and over years. The sample is comprised of 44 grids observed in the years 1999 to 2012. Standard errors are robust to heteroskedasticity.

Figure A.5. Panel event study on night lights excluding areas with top 1% UN personnel



Note: Figure shows the coefficients of deployment lags and leads with their 90% confidence intervals. Results are from an OLS regression of cluster-level annual political violence rates which controls for cluster and year fixed effects. The sample excludes peacekeeping bases where top 1% personnel is deployed. Regression follows the approach of De Chaisemartin & D'Haultfoeuille (2020) to address heterogeneous impacts among clusters and over years. The sample is comprised of 287 clusters observed in the years 1998 to 2018. Standard errors are clustered at the DHS cluster level.