

## **Working title: Shifting Norms, Shifting Desires? The Role of Context in the Association between Gender Attitudes and Fertility Ideals among Young Women in Sub-Saharan Africa**

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### **Extended abstract**

#### **Describing topic and theoretical focus**

While fertility rates have been declining globally, the fertility transition in sub-Saharan Africa (SSA) has proceeded more slowly than in other low- and middle-income regions [1], and stalls in fertility decline have been documented in several countries [2–4]. This lag has been linked to high fertility preferences in the region [1,5,6], which are shaped by pronatalist social and cultural norms. Women's status and empowerment, defined as the capability to make strategic life choices [7], influence reproductive choices. However, the expression of empowerment is conditioned by normative contexts that may enable or constrain it [8,9]. Family systems (kinship norms, beliefs and practices) and gender systems (beliefs and norms defining male and female rights and obligations) shape empowerment and, in turn, reproductive preferences. In patriarchal systems, where male authority and women's subordinate position are institutionalised (through practices such as bridewealth), women's reproductive autonomy is limited [10,11]. In many contexts, motherhood is regarded as a key part of womanhood [12], and having many children can provide social standing and economic security, especially for women with lower levels of empowerment [13–16].

While more egalitarian gender attitudes are generally associated with lower fertility desires, the strength and even the direction of this association is not uniform across the region [17–19]. This heterogeneity has been understudied, as existing work tends to focus either on micro- or macro-level determinants of desired fertility without examining how these levels interact. Studies using multilevel models that capture individual, community and national variation simultaneously remain limited. This study addresses that gap by testing whether the association between gender attitudes and fertility preferences is moderated at the community level by local gender norms and community-level empowerment, and at the national level by national development and gender inequality, among girls and young women aged 15–24. A widely used indicator of gender attitudes is the justification of wife beating, which reflects the extent to which individuals view violence against women as justified [20]. This measure captures the endorsement of norms that grant men authority to discipline women through force and, more broadly, that reinforce unequal gender roles and women's subordinate status [21]. Using individual- and community-level data in 37 SSA countries, we estimate pooled multilevel Poisson models relating attitudes towards wife beating to the ideal number of children, including cross-level interactions to assess moderation.

#### **Data**

This study draws on the most recent Demographic and Health Surveys (DHS) conducted in 37 countries. The DHS is a nationally representative survey that uses a two-stage cluster sampling design and provides comparable data on population and health across countries. The pooled dataset includes 195,463 adolescent girls and young women aged 15–24, regardless of their marital status, who were selected from 20,734 clusters containing at least five women aged 15–49.

We include married and unmarried women to address the frequent omission of the latter in the literature [18]. In contexts of early childbearing and shifting gender norms, this broader coverage captures preferences across diverse life courses, including those of never-married women. Limiting the sample to ages 15–24 reduces bias from post hoc rationalisation, the tendency to align reported ideal family size with realised births [22], which is more prevalent among older women [23].

#### **Variables**

##### *Dependent variable*

The outcome variable is the ideal number of children the respondent would like to have in her lifetime, which is a commonly used measure for fertility preferences [18,24]. The DHS measures ideal number of children with two variants depending on parental status. All respondents are essentially asked: "If

*you could choose exactly the number of children to have in your whole life, how many would that be?"* For those who already have living children, the question is framed counterfactually, asking them to think back to before they had any children. Non-numeric responses (NNRs) were excluded from the main analyses after robustness checks (results not shown) confirmed that their exclusion did not affect conclusions substantively.

### *Independent variables*

#### *Individual level variables*

We use attitudes towards wife beating as an indicator for gender attitudes, which has been extensively used in prior studies [18,24]. Respondents were presented with five scenarios to assess whether they believed a husband is justified in hitting or beating his wife: *"if she goes out without informing him, neglects the children, argues with him, refuses sex, or burns the food"*. Following established approaches [25–28], a binary indicator of tolerance of wife beating was created. Women who endorsed at least one of these justifications were coded as "1", while those who did not justify wife beating in any scenario or responded "don't know" were coded as "0". This dummy variable indicates whether respondents justify norms that grant men the right to discipline women with force and by extension, norms that perpetuate unequal gender roles and the subordinate position of women relative to men [21]. Respondents with partial missing data were retained, whereas those missing all five items were excluded from the analysis.

#### *Contextual level variables*

Community-level variables were constructed for each cluster using data on women aged 15–49. We include three indicators reflecting local educational attainment (proportion of women with at least secondary education), prevailing gender norms (proportion of women who consider wife beating to be justified) and women's economic participation (proportion of women engaged in paid employment).

At the national level, we draw on data from the United Nations Development Programme (UNDP) Human Development Reports [29]. We include the Human Development Index (HDI), which captures overall human development based on three dimensions: health (life expectancy at birth), education (mean and expected years of schooling) and standard of living (gross national income per capita). Higher HDI values reflect greater human development. To complement this broad measure, we also include the Gender Inequality Index (GII), which specifically reflects gender-based disparities. The GII is a measure of gender inequality comprising three dimensions: reproductive health (maternal mortality ratio and adolescent fertility rate), empowerment (women's representation in parliament and educational attainment) and economic status (women's labour force participation). Lower GII values indicate less inequality between women and men, whereas higher values indicate more.

For each country, HDI and GII values correspond to the survey year; where surveys spanned multiple years, the average across those years was used. If data for the relevant year(s) were unavailable, the value from the closest available year was taken. Because GII data were not available for Guinea, Comoros, Eswatini, and Chad, this indicator was included only in a supplementary model to illustrate its potential contribution and not included in the main model sequence.

Both cluster- and national-level variables were centred around the mean to facilitate interpretations.

#### *Control variables*

The analyses controlled for a set of socio-economic and demographic variables, including age group (15–19 as reference; 20–24), place of residence (urban as reference; rural), educational attainment (no education as reference; primary; secondary; higher), household wealth quintile based on the DHS wealth index (poorest as reference; poorer; middle; richer; richest) [30], total number of children ever born, and marital status (never in union as reference; currently in union; formerly in union). Subregional fixed effects were included (Western Africa as reference; Middle Africa; Eastern Africa; Southern Africa) to account for regional-level variation in fertility preferences.

### **Statistical analyses**

To examine contextual moderation in the relationship between individual gender attitudes and fertility preferences, we used multilevel Poisson regression models with three hierarchical levels: individual women (Level 1) nested within clusters (Level 2), which were nested within countries (Level 3). The

outcome variable, ideal number of children, was treated as a count outcome suitable for Poisson regression.

We estimated a series of nested models to assess the effects of individual- and contextual-level factors. The null model included random intercepts for clusters and countries to capture baseline variability. Subsequent models sequentially added predictors: M1 estimated the bivariate association between attitudes towards wife beating and fertility preferences; M2 added individual-level controls; M3 added cluster-level controls; and M4 added country-level controls, with both M3 and M4 reflecting normative and socioeconomic contexts. M4 also included a control for African subregion. Finally, we introduced cross-level interactions in stages (first two-way terms and then a three-way term) to test whether the effect of individual gender attitudes on fertility preferences was moderated by cluster-level factors (M5), by country-level factors (M6), and by both simultaneously (M7–M9).

Incidence Rate Ratios (IRRs) with two-sided p-values ( $\alpha = 0.05$ ) are reported; IRRs above 1 indicate a higher expected number of ideal children associated with the predictor, while IRRs below 1 indicate fewer. All analyses were conducted in R, using appropriate survey weights.

### **Preliminary findings**

*Note: These are preliminary findings as this paper is a work in progress.*

Multilevel Poisson models (Table 1) show that women who justified wife beating consistently reported higher fertility ideals. In the bivariate model (M1), they desired about 7% (IRR=1.07,  $p<0.001$ ) more children, an effect that remained significant at 5% (IRR=1.05,  $p<0.001$ ) after adjusting for individual- (M2), cluster- (M3), and country-level (M4) factors. Education and wealth were negatively associated with ideal family size, while age, parity, and being in union were positively associated. At the cluster-level, higher female education and employment was associated with lower fertility ideals, whereas normative acceptance of wife beating with higher ideals. At the country level, HDI was not associated with ideal number of children after controlling for subregion (intermediate model without subregion not shown). Regional differences were evident, with lower fertility ideals in Eastern and especially Southern Africa. The intraclass correlation fell from 37% to 17% across models (M1–M4), indicating that contextual factors explained much of the between-cluster and between-country variation.

#### *Cross-level interactions*

Models M5 to M8 tested whether contextual factors moderate the association between women's tolerance of wife beating and their fertility ideals. Across these four models, the main effect of wife beating justification remained positive and significant (IRR=1.05,  $p<0.001$ ). Among community-level moderators (M5), only the share of women with secondary or higher education significantly amplified this effect (IRR=1.03,  $p<0.01$ ), indicating that the gap in fertility preferences between women who do and don't justify wife beating gets more pronounced in better-educated clusters. Interactions with the community share of tolerance of wife beating and women in paid employment were not significant.

At the country level, the interaction between tolerance of wife beating and HDI (M6) was significant and positive (IRR=1.25,  $p<0.001$ ), indicating that the gap in fertility ideals between both groups of women widens as the health, education and standard of living increases in the country.

When cluster- and country-level moderators were estimated jointly (M7), the interaction with community education lost significance, while the interaction with the community share of tolerance towards wife beating became significant (IRR=1.03,  $p<0.01$ ). Which means that when controlling for the moderation of HDI on tolerance towards wife beating, the local adherence to patriarchal norms does moderate the relationship between individual gender attitudes and fertility desires. In communities with higher tolerance towards wife beating, the gap in fertility desires between women with traditional and progressive views widens.

Including a three-way interaction between individual tolerance of wife beating, the local share tolerating such violence, and HDI (M8) improved model fit and clarifies the cross-level interplay in explaining variation in the ideal number of children. To simplify the specification, we excluded the cluster-level interactions with community education and women's employment, which remained non-significant. With the three-way interaction added, the IRRs of the main effects (tolerance, share of tolerance and HDI) and the two two-way interactions carried over from M7 remained substantively similar in

magnitude and significance. The three-way interaction is positive and statistically significant (IRR=1.55,  $p<0.05$ ).

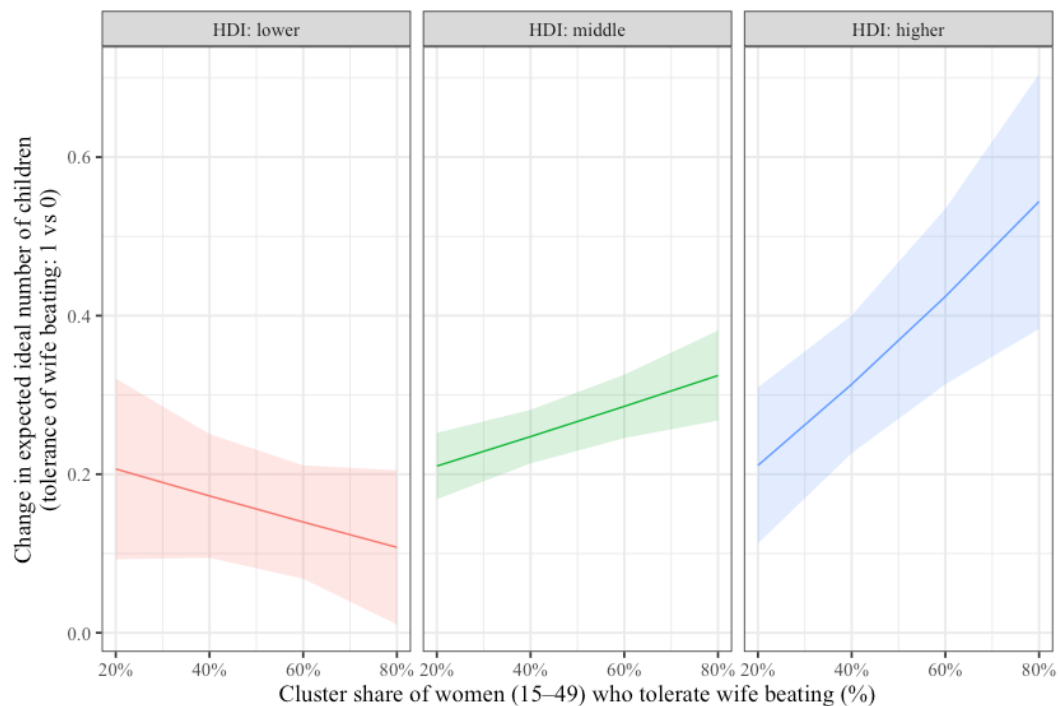
Figure 1 presents the absolute gap in expected ideal number of children between women who tolerate wife beating and those who do not, by cluster share of wife beating tolerance and HDI. In lower-HDI countries, the gap slightly narrows as cluster tolerance rises. However, in middle- and especially higher-HDI countries the gap widens with higher cluster tolerance: women who tolerate wife beating maintain more pronatalist preferences while women who reject it report lower ideals, widening the difference. In communities with more gender-equal attitudes (i.e. lower tolerance of wife beating), those who still hold traditional views may nevertheless conform to prevailing norms of lower fertility, consistent with diffusion mechanisms, which in turn narrows the gap. Confidence intervals indicate that the pattern at low HDI is modest, whereas the gradient at high HDI is pronounced.

### Gender Inequality Index

To assess the role of gender inequality, we re-estimated M8 on the 33 countries with GII data available and added a three-way interaction between individual tolerance of wife beating, the cluster share tolerating wife beating and the country's GII (higher values = more inequality), while retaining the HDI terms. The main effect of GII is not significant, but the interactions with GII are, including a positive three-way term (IRR=1.73,  $p<0.01$ ), indicating that gender inequality moderates how local norms amplify the association between individual tolerance and fertility ideals.

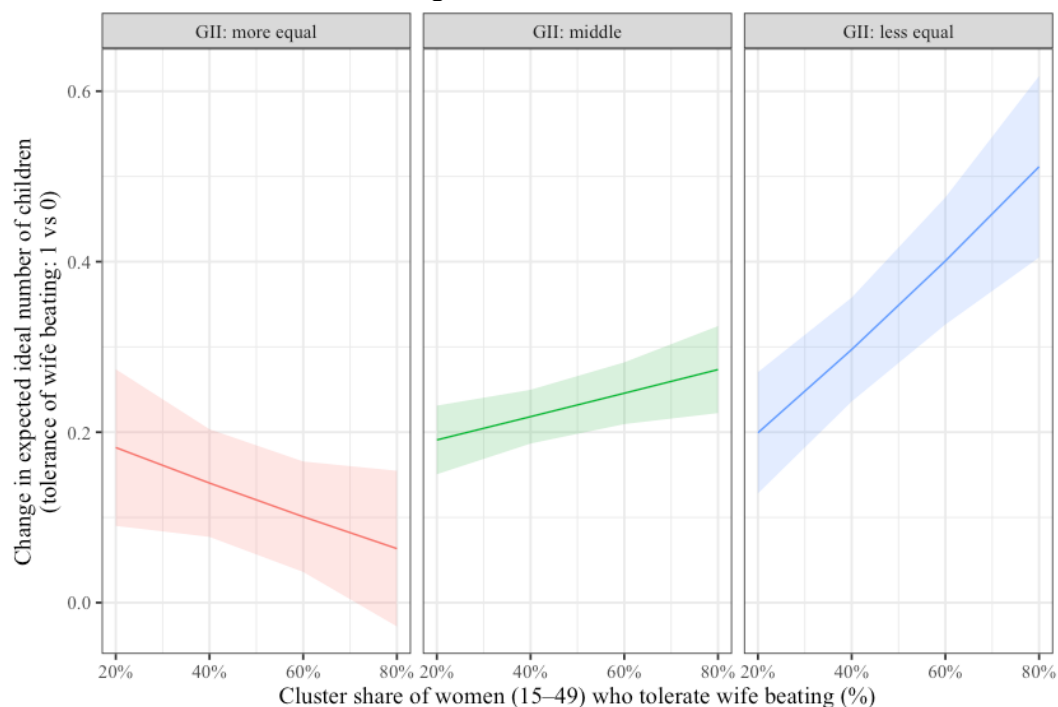
Figure 2 presents the absolute gap in expected ideal number of children between women who tolerate wife beating and those who do not, by cluster-level share tolerating wife beating and GII. In countries with higher gender inequality, the gap widens as cluster-level tolerance increases: women who justify wife beating retain more pronatalist preferences, whereas those who reject it report lower ideals, enlarging the difference. In more gender-equal countries (lower GII), the gap is small at both low and high levels of cluster tolerance, and it even narrows as cluster tolerance rises. Fertility preferences for both groups of women converge towards prevailing norms of lower fertility ideals. Confidence intervals indicate that the pattern in more gender-unequal settings is strong, while the gradient in more gender-equal settings is modest.

**Figure 1.** Marginal effect of individual level tolerance of wife beating on ideal number of children, by cluster level tolerance of wife beating and national HDI



Note: HDI = Human Development Index. HDI groups were defined as the mean HDI of countries in the lowest 10%, middle 10% and highest 10% of the sample ( $n=37$  countries): 0.392, 0.538 and 0.692, respectively. These values were used to compute the predicted marginal effects. Shaded ribbons show 95% confidence intervals.

**Figure 2.** Marginal effect of individual level tolerance of wife beating on ideal number of children, by cluster level tolerance of wife beating and national GII



Note: GII = Gender Inequality Index. GII groups were defined as the mean GII of countries in the lowest 10%, middle 10% and highest 10% of the sample ( $n=33$  countries): 0.431, 0.565 and 0.686, respectively. These values were used to compute the predicted marginal effects. Shaded ribbons show 95% confidence intervals.

## References

- 1 Bongaarts J. Africa's Unique Fertility Transition. *Popul Dev Rev.* 2017;43:39–58. doi: 10.1111/j.1728-4457.2016.00164.x
- 2 Bongaarts J. The Causes of Stalling Fertility Transitions. *Stud Fam Plann.* 2006;37:1–16. doi: 10.1111/j.1728-4465.2006.00079.x
- 3 Schoumaker B. Stalls in Fertility Transitions in sub-Saharan Africa: Revisiting the Evidence. *Stud Fam Plann.* 2019;50:257–78. doi: 10.1111/sifp.12098
- 4 Shapiro D, Gebreselassie T. Fertility Transition in Sub-Saharan Africa: Falling and Stalling. *African Popul Stud.* 2008;23. doi: 10.11564/23-1-310
- 5 Casterline JB, Agyei-Mensah S. Fertility Desires and the Course of Fertility Decline in sub-Saharan Africa. *Popul Dev Rev.* 2017;43:84–111. doi: 10.1111/padr.12030
- 6 Odimegwu CO, Akinyemi JO, Banjo OO, *et al.* Fertility, Family Size Preference and Contraceptive Use in Sub-Saharan Africa: 1990-2014. *Afr J Reprod Health.* 2018;22:44–53. doi: 10.29063/ajrh2018/v22i4.5
- 7 Kabeer N. Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment. *Dev Change.* 1999;30:435–64. doi: 10.1111/1467-7660.00125
- 8 Jejeebhoy SJ. Women's Autonomy in Rural India: Its Dimensions, Determinants, and the Influence of Context. In: Presser HB, Sen G, eds. *Women's Empowerment and Demographic Processes: Moving Beyond Cairo.* Oxford: Oxford University Press 2000:204–38.
- 9 Malhotra A, Schuler SR. Women's Empowerment as a Variable in International Development. In: Narayan D, ed. *Measuring Empowerment: Cross-Disciplinary Perspectives.* Washington, DC: World Bank 2005:71–88.
- 10 Mbaye LM, Wagner N. Bride Price and Fertility Decisions: Evidence from Rural Senegal. *J Dev Stud.* 2017;53:891–910. doi: 10.1080/00220388.2016.1208178

- 11 Horne C, Dodoo FNA, Dodoo ND. The Shadow of Indebtedness: Bridewealth and Norms Constraining Female Reproductive Autonomy. *Am Sociol Rev.* 2013;78:503–20. doi: 10.1177/0003122413484923
- 12 Hollos M, Larsen U. Motherhood in Sub-Saharan Africa: The Social Consequences of Infertility in an Urban Population in Northern Tanzania. *Cult Health Sex.* 2008;10:159–73. doi: 10.1080/13691050701656789
- 13 Dhont N, Van De Wijgert J, Coene G, *et al.* ‘Mama and papa nothing’: Living with infertility among an urban population in Kigali, Rwanda. *Hum Reprod.* 2011;26:623–9. doi: 10.1093/humrep/deq373
- 14 Dierickx S, Rahbari L, Longman C, *et al.* ‘I am always crying on the inside’: A qualitative study on the implications of infertility on women’s lives in urban Gambia. *Reprod Health.* 2018;15:151. doi: 10.1186/s12978-018-0596-2
- 15 Karp C, Wood SN, Galadanci H, *et al.* ‘I am the master key that opens and locks’: Presentation and application of a conceptual framework for women’s and girls’ empowerment in reproductive health. *Soc Sci Med.* 2020;258:113086. doi: 10.1016/j.socscimed.2020.113086
- 16 Odimegwu C, Adedini S. Gender Equality and Fertility Transitions in Africa. *Gend Behav.* 2014;12:5843–62.
- 17 Upadhyay UD, Karasek D. Women’s Empowerment and Ideal Family Size: An Examination of DHS Empowerment Measures In Sub-Saharan Africa. *Int Perspect Sex Reprod Health.* 2012;38:78–89. doi: 10.1363/3807812
- 18 Upadhyay UD, Gipson JD, Withers M, *et al.* Women’s empowerment and fertility: A review of the literature. *Soc Sci Med.* 2014;115:111–20. doi: 10.1016/j.socscimed.2014.06.014
- 19 Robilliard A-S. Empowerment and Desired Fertility in Sub Saharan Africa. In: Ochman M, Ortega-Díaz A, eds. *Advances in Women’s Empowerment: Critical Insight from Asia, Africa and Latin America.* Bradford: Emerald Publishing Limited 2020:39–64.
- 20 Hindin MJ. Understanding women’s attitudes towards wife beating in Zimbabwe. *Bull World Health Organ.* 2003;81:501–8.
- 21 Kishor S, Subaiya L. Understanding Women’s Empowerment: A Comparative Analysis of Demographic and Health Surveys (DHS) Data. DHS Comp. Reports No. 20. 2008.
- 22 Bongaarts J. The Measurement of Wanted Fertility. *Popul Dev Rev.* 1990;16:487–506. doi: 10.2307/1972833
- 23 Bongaarts J. Can family planning programs reduce high desired family size in sub-Saharan Africa? *Int Perspect Sex Reprod Health.* 2011;37:209–16. doi: 10.1363/3720911
- 24 Westoff CF. Desired Number of Children 2000-2008. DHS Comp. Reports No. 25. 2010.
- 25 Snow RC, Winter RA, Harlow SD. Gender Attitudes and Fertility Aspirations among Young Men in Five High Fertility East African Countries. *Stud Fam Plann.* 2013;44:1–24. doi: 10.1111/j.1728-4465.2013.00341.x
- 26 Chauhan BG, Prasad JB. Contraception use and fertility aspiration among currently married young men in India: Do gender attitudes matter? *Child Youth Serv Rev.* 2021;122:105920. doi: 10.1016/j.chilyouth.2020.105920
- 27 Oyediran KA. Explaining trends and patterns in attitudes towards wife-beating among women in Nigeria: Analysis of 2003, 2008, and 2013 Demographic and Health Survey data. *Genus.* 2016;72:11. doi: 10.1186/s41118-016-0016-9
- 28 Dickson KS, Ameyaw EK, Darteh EKM. Understanding the endorsement of wife beating in Ghana: Evidence of the 2014 Ghana demographic and health survey. *BMC Womens Health.* 2020;20:25. doi: 10.1186/s12905-020-00897-8
- 29 United Nations Development Programme Human Development Reports. Human Development Data. <https://hdr.undp.org/data-center> (accessed 18 July 2025)
- 30 Rutstein SO, Johnson K. The DHS Wealth Index. DHS Comp. Reports No. 6. 2004.



**Table 1.** Multilevel Poisson models of ideal number of children, women aged 15–24: main effects (M1–M4) and cross-level interactions (M5–M9) (continued)

	M1	M2	M3	M4	M5	M6	M7	M8	M9: +GII (33 countries)
<i>Predictors</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>
<i>Cross-level interactions</i>									
<i>- Two-way: individual and cluster level</i>									
Tolerance of wife beating * Share of women (15–49) secondary or higher education	–	–	–	–	1.03**	–	1.02	–	–
Tolerance of wife beating * Share of women (15–49) who tolerate wife beating	–	–	–	–	1.02	–	1.03**	1.03**	1.03*
Tolerance of wife beating * Share of women (15–49) in paid employment	–	–	–	–	1.02	–	1.01	–	–
<i>- Two-way: individual and country level</i>									
Tolerance of wife beating * HDI	–	–	–	–	–	1.25***	1.25***	1.13*	1.15**
Tolerance of wife beating * GII	–	–	–	–	–	–	–	–	1.12**
<i>- Two-way: cluster and country level</i>									
Share of women (15–49) who tolerate wife beating * HDI	–	–	–	–	–	–	–	2.15***	4.32***
Share of women (15–49) who tolerate wife beating * GII	–	–	–	–	–	–	–	–	2.50***
<i>- Three-way: individual, cluster and country level</i>									
Tolerance of wife beating * Share of women (15–49) who tolerate wife beating * HDI	–	–	–	–	–	–	–	1.55*	1.68**
Tolerance of wife beating * Share of women (15–49) who tolerate wife beating * GII	–	–	–	–	–	–	–	–	1.73**
<i>Subregion (ref. Western Africa)</i>									
Middle Africa	–	–	–	1.06	1.06	1.06	1.06	1.06	1.00
Eastern Africa	–	–	–	0.81***	0.81***	0.81***	0.81***	0.81***	0.82**
Southern Africa	–	–	–	0.60***	0.60***	0.60***	0.60***	0.61***	0.63***
<b>Random Effects</b>	MRR	MRR	MRR	MRR	MRR	MRR	MRR	MRR	MRR
<i>Level 3 (Country)</i>	1.31	1.28	1.25	1.14	1.14	1.14	1.14	1.15	1.13
<i>Level 2 (Cluster)</i>	1.21	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16
ICC	0.36	0.31	0.27	0.17	0.17	0.17	0.17	0.18	0.16
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>	0.004 / 0.365	0.052 / 0.346	0.086 / 0.336	0.198 / 0.336	0.198 / 0.335	0.198 / 0.336	0.198 / 0.336	0.198 / 0.338	0.182 / 0.316
Number of countries	37	37	37	37	37	37	37	37	33
Number of clusters	20900	20900	20900	20900	20900	20900	20900	20900	19363
Number of women	200050	200050	200050	200050	200050	200050	200050	200050	186412

Source: selected DHS-datasets. Significant at \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . IRR = Incidence Rate Ratio; MRR = Median Rate Ratio; ICC = Intraclass Correlation Coefficient; ref. = reference category. Cluster- and country-level variables are centred around the mean to facilitate interpretations. M9 re-estimates M8 on the subset of 33 countries with GII available and adds GII and its two- and three-way interactions. Sample sizes differ from M1–M8 accordingly.