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Does country-level gender equality explain individual risk of intimate partner violence against women? A multilevel analysis of individual heterogeneity and discriminatory accuracy (MAIHDA) in the European Union

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Background: Gender equality is widely accepted as an important explanatory factor for the occurrence of intimate partner violence (IPV) against women. However, the relationship is not straightforward, as high country-level gender equality is not always associated with lower IPV prevalence. We apply 'multilevel analysis of individual heterogeneity and discriminatory accuracy' (MAIHDA) to (i) quantify the extent to which the country of residence determines individual risk of IPV and (ii) investigate the association between country-level gender equality and individual experience of IPV, and to which extent this association explains the observed between-country differences. **Methods:** Using data from the 2012 European Union Agency for Fundamental Rights survey on violence against women we applied MAIHDA to analyse experiences of physical and sexual IPV among 42 000 women living in the EU. We fitted three consecutive models, and calculated specific individual contextual effects (measures of association) as well as the general contextual effects (measures of variance) and the discriminatory accuracy (DA). **Results:** Our findings show that the relationship between experiences of IPV and country-level gender equality is weak and heterogeneous. The general contextual effect is small and the DA is low, indicating that country boundaries are rather irrelevant for understanding the individual risk of IPV. **Conclusions:** Findings from the present study do not imply that that gender equality is unimportant in relation to IPV, but rather that information on country of residence or country-level gender equality does not discriminate very well with regards to individual experiences of IPV in cross-national comparisons.

Introduction

Gender equality is widely accepted as an important explanatory factor for the occurrence of intimate partner violence (IPV) against women and, accordingly, its prevalence is expected to be higher in countries with low levels of estimated gender equality.[1–3] However, the relationship between country-level gender equality and IPV does not appear to be straightforward, as high country-level gender equality is not always associated with lower IPV prevalence.[4–6] For example, a survey conducted by the European Union Agency for Fundamental Rights (FRA)[7] showed the lifetime prevalence of IPV in the three EU Nordic countries (Denmark: 32%; Finland; 30%; Sweden: 28%) to be higher than the EU average (22%; 13% being the lowest prevalence), despite these countries ranking the highest in gender equality. This puzzling finding, labelled as the 'Nordic paradox',[4,8] illustrates the need to further investigate the link between macro or societal levels of gender equality, and individual experiences of IPV.

Three possible types of relationships between country-level gender equality and violence against women have been proposed:[5,6] 'amelioration' (increasing gender equality decreases violence against women), 'backlash' (increasing gender equality increases violence against women) and 'convergence' (increasing gender equality makes men and women more similar both in experiencing and perpetrating violence). However, literature reviews show that neither the relationship between macro-level gender equality and violence against women nor the direction of this relationship could be assumed,[6] and that the association appears to be complicated.[5] This apparent confusion could in part be due to the limited attention paid in research, so far, to macro-level explanatory factors, as compared to individual-level factors.[9,10] While multilevel modelling investigating both macro- and individual-level IPV predictors appears as an ideal analytical approach, only a small number of such studies have been performed.[11–13] Existing multilevel analyses have mainly focused on 'specific contextual effects' based on differences between country-average risks (i.e. measures of association), without specifically attending to the 'general contextual effects' based on measures of variance and heterogeneity around the averages [i.e. measures of variance partition and of discriminatory accuracy (DA)].[14,15]

To increase our knowledge on how the country context influences the individual risk of IPV, we need to apply a suitable methodology, like 'multilevel analysis of individual heterogeneity and discriminatory accuracy' (MAIHDA).[14,16,17] MAIHDA simultaneously considers both specific and general contextual effects. That is, through MAIHDA we not only investigate the association between

country characteristics and individual IPV but also the ability of the information on country of residence to accurately discriminate between women with and without experiences of IPV.[14,16,17]

Disregarding the general contextual effects might give misleading information to decision-makers planning interventions to prevent IPV (cf.[14,17]). From a European Union perspective, the question is to what extent specific countries should be pointed out for targeted interventions or to what extent such intervention should be universal and cover the whole of the EU. Today, the idea of 'proportionate universalism' appears as a suitable approach for resource allocation in public health.[18] As Marmot advocated,[19] health actions must be universal, not targeted, but with a scale and intensity that is proportionate to the level of disadvantage. The MAIHDA approach provides a suitable instrument within 'proportionate universalism', enabling the making of informed decisions about to which degree public health interventions should be universal of targeted.

Therefore, in this study we apply MAIHDA with two main objectives. First, we aim to quantify the extent to which the country of residence—as a whole—determines the individual risk of IPV over and above individual characteristics (i.e. the general contextual effect). Second, we aim to investigate the association between country-level gender equality and individual IPV (i.e. specific contextual effect) and to which extent this association explains the observed between-country differences.

Methods

Population

Our data were drawn from the 2012 FRA survey on violence against women.[7] The FRA survey comprises data from structured interviews with 42 002 women aged 18 years or older across the 28 EU member states. An average of 1500 women were interviewed in each country, ranging from 908 (Luxembourg) to 1620 (Czech Republic). Data were primarily collected through structured face-to-face interviews, but also through self-report. The self-report section was intended to offer the respondents a more anonymous way of disclosing experiences of violence. Details of the survey can be found elsewhere.[7,20] The FRA approved our use of the survey, and provided a special license for the analyses (reference number 120715).

Assessments of variables

Outcomes

We analysed two related IPV outcomes: experiences of 'physical violence' and of 'sexual violence' over the life-course. Both measures were self-reported and based on the participant's answer to the statements 'My partner or an ex-partner has been physically violent against me' and 'My partner or an ex-partner has been sexually violent against me', by 'Yes' (=1) or 'No' (=0). Women who answered 'I have not had a partner or an ex-partner' were excluded from the analysis, as were women with missing information on the IPV outcomes, leaving 39 429 women eligible for analysis of experience of physical IPV and 39 436 for experience of sexual IPV.

Individual-level variables

A number of individual-level variables, found to be associated with IPVAW in previous studies,[9,11–13] were included in the analysis.

'Age' was divided into seven groups with the youngest, aged 18–24, used as reference.

'Marital status' was categorized as being married or in civil partnership (reference category) or not.

'Educational level achievement' was divided into three groups: primary (reference category), secondary and university education.

Parental country of birth was used as a proxy for 'immigrant background' and divided into three groups, (i) both parents born in the country of residence (reference category), (ii) one parent born in the country of residence or (iii) both parents born in another country.

'Type of residential area' was categorized as big city or suburb (reference category), town or small city and rural area or country village.

We also included measures of self-reported 'childhood experiences of physical abuse' and 'childhood experiences of sexual abuse' before age 15 ('yes' versus 'no'). These measures were based on questions about childhood experiences (six regarding physical and five regarding sexual abuse). We considered childhood experience of physical/sexual abuse to be present if the participant answered affirmative to any of these questions.

Missing values for the covariates ranged from 0.3% (age) to 1.2% (immigrant background).

Further information on the variables is available in the FRA survey technical report.[20]

Country-level variables

To assess the level of gender equality, we used the Gender Equality Index (GEI) from 2012.[21] The GEI is built from country-level, gender-specific aggregated variables covering six core domains (work, money, knowledge, time, power and health). The index relies on gender gaps, i.e. differences between women and men in each domain, without distinguishing the direction of the gap. The index ranges from 1, indicating total gender inequality, to 100, indicating full gender equality, the minimum is 50.1 (Greece) and the maximum 79.7 (Sweden). We categorized the countries into three groups according their GEI; low ($\leq$59), medium (60–69) and high ($\geq$70) (see table 1).

Analytical strategy

Multilevel analysis of individual heterogeneity and discriminatory accuracy

Following a previously described MAIHDA design,[16] we performed three consecutive models for each outcome. For an elaborated description of the analytical strategy, see the Supplementary Material.

In the first model, or the 'single-level individual effects model', we fitted a conventional single-level logistic regression for IPV experience, including only the individual-level covariates. Here, the countries are ignored. This model informs on associations between the individual-level variables and the outcome [expressed as odds ratios (ORs) and 95% confidence intervals]. In addition, we calculated the predicted probabilities from this model and used them to compute the receiver operating characteristic (ROC) curve, and the corresponding area under the ROC curve (AU-ROC), as a measure of DA[16,22,23] of the model (see Supplementary Material for further information). Thus, the AU-ROC of the first model quantifies the accuracy of the included individual-level covariates alone for identifying individuals with or without IPV experience.

The second or 'general contextual effects model' is a multilevel logistic regression model constructed by adding a random country-level intercept to the first model. This second model decomposes the total individual variance into between- and within-country variance. From this model we can estimate the general contextual effect using two different measures, the variance partition coefficient (VPC) and the AU-ROC.

The VPC quantifies the share of the total individual variance in the propensity of having experienced IPV that is located at the country-level. Interpreting the VPC as a measure of DA implies that the higher the variance, the better the country context is for classifying women with or without experiences of IPV.[24–26] The VPC was calculated using the latent variable method[25,26] and is expressed as a percentage

Table 1 Gender equality index (GEI) and prevalence of physical and sexual IPV in the countries of the EU according to the FRA 2012 survey on violence against women

GEI group	Country	GEI (units)	Physical IPVAW (%)	Sexual IPVAW (%)
Low	Greece	50.1	13.5	4.4
	Cyprus	50.6	13.1	3.7
	Romania	51.2	21.0	5.1
	Hungary	51.8	17.6	6.3
	Slovakia	52.4	19.3	7.3
	Croatia	52.6	12.4	3.6
	Estonia	53.5	18.8	5.9
	Lithuania	54.2	24.1	6.3
	Portugal	54.4	15.9	3.7
	Latvia	56.2	24.9	7.7
	Italy	56.5	12.6	5.5
	Czech Republic	56.7	17.2	7.6
	Bulgaria	56.9	19.7	8.0
	Poland	56.9	11.7	4.3
	Malta	57.8	10.8	5.0
Medium	Austria	61.3	12.0	5.6
	Germany	64.9	17.3	6.3
	Luxembourg	65.9	16.3	5.8
	Slovenia	66.1	9.5	2.2
	Spain	67.4	9.6	3.4
	Ireland	67.7	11.8	4.5
	France	68.9	16.0	6.8
	UK	68.9	22.0	7.3
High	Belgium	70.2	18.5	7.1
	Netherlands	74.0	17.4	8.2
	Finland	74.4	23.4	8.1
	Denmark	75.6	19.3	6.0
	Sweden	79.7	19.5	7.3

$$\mathrm{VPC} = 100\mathrm{x}\frac{\sigma_u^2}{\sigma_u^2 + 3.29}$$

where 3.29 denotes the variance of a standard logistic distribution of latent continuous response and σ_u^2 is the between-country variance.

In the second model, the predicted probabilities are based on both the individual-level covariates and the country intercepts (i.e. random effects). Consequently, the AU-ROC of model 2 can be compared with that of model 1, to quantify the added value of having information on the women's country of residence for classifying them according to IPV experience. The increase in the AU-ROC can be calculated as

$$\mathrm{AU-ROC_{change}} = \mathrm{AU-ROC_{[Model2]}} - \mathrm{AU-ROC_{[Model1]}}.$$

The larger the $\mathrm{AU\text{-}ROC_{change}}$, the bigger is the general contextual effect and the better the accuracy of the country information for classifying women according to the presence or absence of IPV.

In the third 'specific contextual effects model', we add the country-level variable on gender equality (GEI) to estimate the specific contextual effect (i.e. OR) of this variable. We also calculated the proportion of opposed odds ratios (POOR),[25,27] i.e. the proportion of ORs with the opposite direction to the overall OR.[25] The values of the POOR range from 0% to 50%. A POOR of 0% means that all ORs have the same sign, while a POOR of 50% means that half of the ORs are of the opposite sign, showing that the association is very heterogeneous.

Finally, we calculated the adjusted VPC and the proportional change in variance (PCV), i.e. country-level variance explained by the GEI, as

$$\mathrm{PCV} = \frac{\sigma^2_{u[\mathrm{Model2}]} - \sigma^2_{u[\mathrm{Model3}]}}{\sigma^2_{u[\mathrm{Model2}]}}.$$

We calculated the AU-ROC, which is, however, not expected to change as the model 2 provides the ceiling or maximum AU-ROC obtained by combining the available individual information and the country of residence (see Merlo et al.[16] for an elaborated explanation).

The models were estimated using Markov chain Monte Carlo methods as implemented in the MLwiN multilevel modelling software.[28] The Bayesian deviance information criterion (DIC) was used as a measure of goodness of fit of our models.[29] The DIC considers both the model deviance and its complexity. Models with smaller DIC are preferred to models with larger DIC, with differences of five or more considered as substantial.[30] We used the statistical programmes MLwiN 3.01 and SPSS 25 to perform the analyses.

Results

Table 1 shows the country-specific GEI values as well as the prevalence of physical and sexual IPV. The figures presented in this table indicate that there is a clear association between GEI and IPV prevalence at the country-level.

Table 2 shows the characteristics of the study sample stratified by country GEI categories and by IPV experience. The highest prevalence of IPV is found among women living in countries in the high-GEI group, and the lowest levels among women living in countries in the middle-GEI group, indicating a J-shaped association between gender equality and IPV.

The age distribution was roughly similar across GEI categories, as was the type of residential area. Single and highly educated women were more frequent in high-GEI countries. Women with both parents born in another country were more frequent in middle-GEI countries. Experience of physical or sexual abuse in childhood increased by increasing GEI.

Multilevel analysis of individual heterogeneity and discriminatory accuracy

Single-level individual effects

Table 3 informs on the associations between the individual-level variables and physical and sexual IPV, respectively. The patterns of association are similar for both outcomes and in both the single-level (model 1) and the multilevel (model 2 and 3) models. The probability of suffering from IPV is lowest among the youngest and the oldest women and higher among unmarried women and those with low educational achievement. While women with both parents born abroad have similar odds of experiencing IPV as women with both parents born in the country of residence, those with only one parent born in the country of residence have higher odds of IPV. Women with experience of physical or sexual abuse in childhood have higher odds of suffering from IPV as adults. As a whole, the DA of information on the individual characteristics of the woman was moderate, since the AU-ROC were 0.671 and 0.680 for physical and sexual IPV, respectively.

Specific contextual effects

We observed a weak and inconclusive J-shaped association between GEI categories and both physical (OR = 0.70 and 1.08 for the middle- and high-GEI categories, respectively, compared with the low-GEI category) and sexual IPV (OR = 0.78 and 1.08) (table 4). Besides, the POOR indicated that between 20% and 43% of the ORs were in the opposite direction. That is, the association is not clearly supported by the multilevel analysis.

General contextual effects

The size of the VPC was small; 3.26% for physical and 2.26% for sexual IPV, in model 2 (table 4). This indicates a very small general contextual effect. Thus, differences in country prevalence comprise only a small part of the total individual differences in the latent propensity of experiencing IPV. This conclusion was confirmed by

Table 2 Characteristics of the study sample ($N = 42\,002$) from the European Union Agency for Fundamental Rights 2012 survey on violence against women by categories of Gender Equality Index (GEI) and life time experience of physical and sexual violence

	Column %			Row %	
	Low GEI[a]	Middle GEI[b]	High GEI[c]	Physical violence	Sexual violence
Number of countries (individuals)	15 (22.865)	8 (11.552)	5 (7.585)		
Life time experience of IPVAW					
Physical	16.8	14.2	19.6	–	29.6
Sexual	5.6	5.2	7.2	84.6	–
Age					
18–24 years	9.5	8.5	8.3	11.8	4.0
25–29 years	7.5	7.0	7.0	13.8	5.0
30–34 years	8.6	8.9	7.1	16.5	5.9
35–39 years	9.7	9.8	7.9	18.0	6.3
40–49 years	18.4	21.6	20.8	19.5	6.5
50–59 years	19.7	18.9	21.5	18.3	6.7
60 years or above	26.5	25.3	27.3	14.9	5.1
Marital status					
Married/partnership	61.8	61.5	54.7	12.6	4.2
Not married/partnership	38.2	38.5	45.3	23.1	8.4
Educational achievement					
Primary education	29.1	34.8	15.6	17.9	6.5
Secondary education	51.9	44.8	51.7	17.0	6.0
University education	18.9	20.1	32.5	13.9	4.4
Immigrant background					
Both parents born in the country	89.1	80.3	84.8	16.1	5.6
One parent born in the country	4.2	4.8	5.2	20.6	7.4
Both parents born in another country	6.2	14.0	8.0	18.5	6.6
Type of residential area					
Big city or suburb	35.9	30.6	36.7	17.3	6.1
Town or small city	34.0	37.1	36.9	17.0	5.8
Rural area or country village	29.8	31.8	26.4	15.5	5.5
Physical abuse in childhood					
Yes	24.6	26.2	30.4	25.1	9.5
No	75.4	73.8	69.6	13.5	4.5
Sexual abuse in childhood					
Yes	5.2	12.2	15.3	29.1	12.8
No	94.8	87.8	84.7	15.4	5.1

Note: Values are percentages.
[a]Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia.
[b]Austria, France, Germany, Ireland, Luxemburg, Slovenia, Spain, UK.
[c]Belgium, Denmark, Finland, Netherlands, Sweden.

the small change in AU-ROC from model 1 to model 2. That is, the moderate DA of the individual-level variables (model 1) only scarcely increased when the country of residence was added as a random effect in the multilevel regression analysis (model 2). This small general contextual effect needs to be considered when interpreting the country differences presented in table 1. Also, even if the GEI explained 21% of the country variance in physical IPV and about 13% of the variance in sexual IPV, these relatively large percentages were based on small initial country-level variances.

Discussion

Gender equality if often presented as an important explanatory factor of IPV prevalence,[1–3] but previous research on the link between country-level gender equality and individual experiences of IPV is inconclusive, as a high level of gender equality is not always associated with low prevalence of IPV.[4–6] Previous research investigating this issue through multilevel analysis have focused on the 'specific contextual effects' while disregarding the 'general contextual effects'.[11–13]

In previous research, three hypotheses regarding the association between gender equality and IPV have been presented: amelioration, backlash and convergence.[5,6] Our findings do not support any of these hypotheses, since we find weak and heterogeneous associations between country-level gender equality and individual IPV experiences. In addition, and perhaps more importantly, the results of our multilevel analysis show that the general contextual effect and DA of country of residence is small. The low VPC (i.e. 2.3–3.3%) and small change in the AU-ROC (i.e. 0.014–0.020 units) indicate that country boundaries are rather irrelevant for understanding the individual risk of IPV. This does not imply that gender equality is unimportant in relation to IPV, but rather that information on country of residence or country-level gender equality does not discriminate very well in relation to individual experiences of IPV in cross-national comparisons.

The small general contextual effect found in the present study is in line with previous studies by Sanz-Barbero et al.[12,13] However, these previous studies focus on measures of association without considering that the DA of the country context is small. Even if the individual and contextual variables explained almost all of the between-country variance, the between-country variance was rather small to begin with and a significant part of individual differences in experiences of IPV remained unexplained. The small general contextual effects found in our study, and by Sanz-Barbero et al., underscore the need to identify other contexts and categorizations that are more relevant for understanding individual, self-reported experiences of IPV.

Methodological considerations

In the present study, we used the self-reported binary questions on lifetime experiences of physical and/or sexual violence. However, the FRA survey also contains acts-based questions on IPV experiences,

Table 3 Single (model 1) and multilevel (models 2 and 3) logistic regression analyses modelling experiences of physical and sexual IPVAW in relation to individual-level variables

	Physical intimate partner violence			Sexual intimate partner violence		
	Single-level model	Multilevel models		Single-level model	Multilevel models	
	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Individual-level effects						
Age						
18–24 years	Reference	Reference	Reference	Reference	Reference	Reference
25–29 years	1.55 (1.33–1.81)	1.58 (1.35–1.84)	1.57 (1.33–1.86)	1.60 (1.27–2.02)	1.63 (1.29–2.08)	1.63 (1.29–2.08)
30–34 years	2.18 (1.90–2.50	2.22 (1.90–2.61)	2.22 (1.90–2.59)	2.08 (1.67–2.59)	2.10 (1.67–2.68)	2.11 (1.67–2.68)
35–39 years	2.59 (2.27–2.96)	2.62 (2.26–3.03)	2.62 (2.24–3.06)	2.46 (1.98–3.05)	2.45 (1.94–3.11)	2.46 (1.96–3.08)
40–49 years	2.73 (2.69–2.76)	2.77 (2.43–3.16)	2.77 (2.41–3.17)	2.36 (1.96–2.85)	2.39 (1.95–2.94)	2.39 (1.95–2.94)
50–59 years	2.43 (2.16–2.74)	2.41 (2.11–2.75)	2.40 (2.09–2.75)	2.36 (1.96–2.84)	2.34 (1.90–2.89)	2.34 (1.91–2.87)
60 years or above	1.68 (1.49–1.89)	1.60 (1.40–1.82)	1.59 (1.39–1.83)	1.57 (1.31–1.88)	1.54 (1.25–1.89)	1.54 (1.25–1.88)
Married/civil partnership (no vs. yes)	2.49 (2.35–2.63)	2.47 (2.32–2.62)	2.46 (2.32–2.62)	2.39 (2.18–2.61)	2.37 (2.17–2.58)	2.36 (2.16–2.57)
Education achievement						
Primary	Reference	Reference	Reference	Reference	Reference	Reference
Secondary	0.90 (0.85–0.96)	0.81 (0.75–0.87)	0.81 (0.75–0.87)	0.89 (0.81–0.98)	0.81 (0.73–0.90)	0.80 (0.72–0.89)
University	0.64 (0.59–0.70)	0.56 (0.52–0.61)	0.56 (0.51–0.62)	0.58 (0.51–0.66)	0.53 (0.46–0.62)	0.53 (0.46–0.61)
Immigrant background						
Both parents born in the country	Reference	Reference	Reference	Reference	Reference	Reference
One parent born in the country	1.21 (1.07–1.37)	1.20 (1.06–1.36)	1.20 (1.07–1.36)	1.20 (0.99–1.45)	1.20 (0.99–1.45)	1.19 (0.98–1.46)
Both parents born in another country	1.09 (0.99–1.20)	1.17 (1.06–1.30)	1.18 (1.06–1.30)	1.11 (0.96–1.30)	1.18 (1.01–1.39)	1.20 (1.03–1.40)
Type of residential area						
Big city/suburb	Reference	Reference	Reference	Reference	Reference	Reference
Town/small city	1.01 (0.94–1.08)	1.02 (0.95–1.09)	1.02 (0.95–1.09)	0.99 (0.89–1.09)	0.98 (0.89–1.09)	0.99 (0.89–1.09)
Rural area/village	0.96 (0.89–1.03)	0.96 (0.89–1.03)	0.96 (0.89–1.03)	0.99 (0.88–1.11)	0.97 (0.88–1.08)	0.98 (0.88–1.09)
Abuse in childhood (yes vs. no)						
Physical	1.96 (1.84–2.07)	1.95 (1.84–2.07)	1.96 (1.84–2.08)	1.98 (1.81–2.16)	1.97 (1.79–2.16)	1.96 (1.78–2.15)
Sexual	1.92 (1.77–2.08)	2.02 (1.85–2.21)	2.02 (1.85–2.21)	2.31 (2.06–2.59)	2.29 (2.03–2.58)	2.31 (2.06–2.59)

Table 4 Single (model 1) and multilevel (models 2 and 3) logistic regression analyses modelling experiences of physical and sexual IPVAW

	Physical intimate partner violence			Sexual intimate partner violence		
	Single-level model	Multilevel models		Single-level model	Multilevel models	
	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Specific contextual effects						
Gender Equality Index						
Low			Reference			Reference
Middle			0.70 (0.54–0.91)			0.78 (0.60–0.99)
POOR			20%			24%
High			1.08 (0.81–1.44)			1.08 (0.81–1.45)
POOR			43%			41%
General contextual effects						
σ^2		0.111 (0.034)	0.088 (0.028)		0.076 (0.028)	0.066 (0.025)
VPC (%)		3.26	2.61		2.26	1.97
PCV (%)	–	–	20.72	–	–	16.16
AU-ROC	0.671	0.691	0.691	0.680	0.694	0.694
Change in AU-ROC	–	0.020	0.000	–	0.014	0.000
Goodness of fit						
DIC	32 360.93	31 916.95	31 916.93	16 003.99	15 907.61	15 906.51
Change in DIC compared with previous model	–	−443.98	−0.02	–	−96.38	−1.10

Note: The table informs on both specific and general contextual effects.
POOR: proportion of opposed odds ratios; σ^2: variance; VPC: variance partition coefficient; PCV: proportional change in variance; AU-ROC: area under the receiver operator characteristics curve; DIC: Bayesian deviance information criterion.

over the life-course and over the past year (e.g. being slapped, burned or threatened with violence). These questions have been used in previous studies.[12,13] We fitted models identical to the ones presented above but using the acts-based questions on lifetime experience of physical and sexual IPV (if the respondent answered yes to any of the questions, she was considered to have experienced physical or sexual IPV) with almost identical results with regard to between-country variance and DA.

It is important to acknowledge, when conducting comparative research, that survey questions may be interpreted differently within different contexts and that this might influence observed between-country differences. This needs to be addressed in forthcoming studies.

It should also be noted that the GEI perhaps does not cover all aspects of gender in/equality relevant to IPV, such as private-sphere norms of masculinity, femininity and heterosexual interaction.[31–33]

Conclusion

Within the framework of 'proportionate universalism', as an approach for public health resource allocation,[18,19] our results suggest that IPV interventions in the EU need to be universal, not targeted to specific countries, but with a scale and intensity that is proportionate to the IPV prevalence.

Since the EU countries yield a very small general contextual effect, we need to identify other, more relevant contexts for identifying women who risk suffering from IPV. Rather than geopolitical evaluation based on country boundaries, an 'intersectional' perspective based on demographic and socioeconomic contexts[17,34,35] might provide a better understanding of the heterogeneous distribution of IPV in the population and thereby allow for more effective structural interventions towards those societal context that are most exposed to IPV.

Supplementary data

Supplementary data are available at *EURPUB* online.

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Key points

- We address the issue of the complex association between country level of gender equality and the occurrence of intimate partner violence (IPV) against women in the European Union by applying multilevel analysis of individual heterogeneity and discriminatory accuracy (MAIHDA).
- Our findings show that that the relationship between experiences of IPV and country-level gender equality is weak and heterogeneous.
- The MAIHDA shows that only about 2–3% of the individual variance in experience of IPV can be found at the country level, and that the discriminatory accuracy of knowing the country of residence of a woman is low.
- Our results suggest that IPV interventions in the EU need to be universal not targeted to specific countries, but with a scale and intensity that is proportionate to the IPV prevalence.

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Gender differences in treatment with antidepressants during first weeks of a sick-leave spell due to depressive episode

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Background: The incidence of depression is higher in women; women are more often on sick leave due to depression, and more women than men use antidepressants. The objective of this study was to explore possible gender differences in buying prescribed antidepressants during the first 21 days of a new sick-leave spell due to depressive episode. **Methods:** Included were all individuals living in Sweden in working age (18–64 years old) who in 2010 or 2011 began a new sick-leave spell due to depressive episode (ICD-10 F32) lasting at least 21 days ($n = 44\,863$). Register data on sociodemographics, morbidity and dispensed prescription medication were used to investigate associations between gender and buying prescribed antidepressants in the total group and in subgroups, using multiple logistic regression models. **Results:** The study population consisted of 69.5% women. Within the first 21 days of the sick-leave spell, 48.0% of the men and 42.1% of the women had dispensed prescribed antidepressants. In the adjusted multiple logistic regression model, men had an odds ratio of 1.28 (95% confidence interval 1.23–1.33) as compared with women, for buying prescribed antidepressants. **Conclusions:** In this nationwide register study, nearly half of the women and men on sick leave with depressive episode bought prescribed antidepressants during the first three weeks of the sick-leave spell. In the adjusted models, men were more likely to do this. Further studies are needed to elucidate the reasons for this gender difference.

Introduction

Depressive disorders are among the leading causes of disability, believed to affect more than 300 million people of all ages worldwide.[1] The lifetime risk of developing depression has been estimated to be between 10 and 18%[2–4] with a gender risk ratio of about 2:1 for women as compared with men. The gender gap in depression seems to exist across populations and cultures[5] and is also apparent in Sweden, where the present study was conducted.[6] The reasons why depression is more common in women than men are debated. The proposed possible explanations include potential differences in biological and psychological susceptibility between women and men as well as differences in environmental exposures at both micro and macro levels.[7] At young ages, depression is somewhat more common in boys than in girls, but in the early teens that pattern shifts[8] providing the largest gender difference for some years.[5]

There are different factors that directly and indirectly might contribute to the gender gap in depression. Such factors may work on different structural levels and may be more or less distal or proximal to the individual. Among the individual-level factor that could contribute to differences in incidence and in treatments are women's and men's different healthcare seeking behaviours. It is known that men are less prone to seek help for their mental disorders, which subsequently might delay diagnosis and treatment.[9–12]

According to a Swedish study examining self-reported depression, men were at least as likely to report having depressive symptoms as women, implying that men's lower prevalence of diagnosed depression may be due to under-detection.[13] The European Commission's report on the state of men's health in Europe (2011)