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Women's empowerment and violent death among women and men in Europe: An  
ecological study

Debbi Stanistreet, Viren Swami, Dan Pope

Division of Public Health, University of Liverpool, Liverpool, UK

Clare Bamba

Centre of Health and Public Policy, University of Durham, Durham, UK

Alex Scott-Samuel

Division of Public Health, University of Liverpool, Liverpool, UK

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Address correspondence to: Dr. Debbi Stanistreet, Division of Public Health,  
University of Liverpool, Whelan Building, Quadrangle, Brownlow Hill, Liverpool  
L69 3GB. Email: [debbi@liv.ac.uk](mailto:debbi@liv.ac.uk); Phone: +44 151 794 5583; Fax: +44 151 795  
5588.

## ABSTRACT

### Background

This study examined the association between mortality due to injury and poisoning among men and women in Europe, and **nine** indicators of women's empowerment (that is, women's challenging of existing power structures that subordinate women).

### Methods

A cross-sectional ecological design was used, with 24 countries from the European Union plus two countries within the European Economic Area and Switzerland.

### Results

**Most of the nine indicators of women's empowerment were unrelated to men's, as well as women's, death rates from injury and poisoning. However,** multiple linear regression models showed that **few** indicators of women's empowerment were significantly associated with mortality due to injury and poisoning for both women and men. When three Baltic states with considerably higher mortality rates (Latvia, Lithuania and Estonia) were excluded from the analysis, **however, only one indicator (female economic activity as a percentage of male economic activity) remained a significant predictor of men's death rates.**

### Conclusion

These data suggest that **some indicators of women's empowerment may be** associated with mortality due to injury and poisoning for men, **although the association was dependent on which countries were included in the analysis.** This highlights the importance of examining in greater detail the influence of changing gender roles on the health behaviours of women and men.

**Keywords** Gender; empowerment; inequality; public health

Sex differences in mortality rates are found on a global scale. Numerous studies have shown that men can expect shorter life expectancies than women, particularly in socio-economically developed nations [1-4]. In Western Europe, for instance, this sex difference is stable across the life course [5-6] and is most prominent for violent causes of death [1, 7-8]. Traditionally, this sex difference in mortality was explained as a function of biological differences between women and men [9]. More recent work, however, has shifted the focus onto gender differences in health-related or risk behaviors, such as alcohol and cigarette consumption [10-11], high risk sports [12], dangerous driving and denial of vulnerability [13-15]. In most settings, men's greater risk behaviours are thought to contribute to their higher rates of mortality compared with women [12-16].

In addition, there is evidence that the structure of gender relations, or gender order, is an important determinant of sex differences in health [13, 17] and that some countries may be less structured by gender than others [18-19]. Thus, research on gender inequality, whether measured by political participation, economic autonomy or reproductive rights [20-22], suggests that women's relative lack of power adversely affects their well-being [23]. Moreover, gender inequality is detrimental to the dominant or hegemonic male group. Recent studies have shown that patriarchy – the 'systematic domination of women by men and domination of men by other men' [24] – is detrimental for men's health and leads to their higher mortality [5, 15, 22, 25-26].

Given the lower status accorded to women by comparison with men in most societies, it seems intuitive that as societies become more gender equal, there will be a corresponding improvement in women's and men's health. From this perspective, a consistent public policy aimed at reducing inequalities between men and women is a

key element in improving public health. However, when studies have examined this possibility, they have tended to report conflicting results.

On the one hand are studies that report beneficial effects of gender equality on the health of women [27-29] and men [13, 30]. For women, socioeconomic changes that integrate women into the public sphere – the worlds of labour, politics and social life – offer beneficial health effects accrued as a result of greater economic independence, better familial negotiating power, increased opportunity for social interaction, skill enhancement and personal growth [29, 31]. For men, on the other hand, improved gender equality may lead to a reduction in risky behaviours, as they no longer need to demonstrate their ‘masculine’ identities through cultural signifiers [14].

By contrast, a number of studies have suggested that, although gender equality is an important and valuable goal in itself, the association between women’s empowerment and improved health may not be so straightforward. Given that behavioural factors play a large role in explaining men’s disadvantage for many health outcomes [26, 30-31], it is possible that some men may feel threatened by female competition and their relative loss of power. In such a scenario, some men may engage in compensatory masculinities that endanger the self and others [29, 32]. Moreover, given that men are overwhelmingly the main perpetrators of violence against women [32], male violence may also result in increased female death rates from violence.

Additionally, as some women move into the public sphere, it is possible that they may engage in risky masculine behaviour as a means of integration and attenuating threats to their identity [34], or as a result of increased life opportunities [35-36] or narrowing gender differences in patriarchal family patterns [37]. Thus, any

change towards gender equality may be detrimental for women's and men's health, unless it is accompanied by significant alterations in the way women and men relate to their changing roles. More generally, until such a time when societal institutions adapt to pressures for change, health benefits expected as a result of improvements in gender equality may be held in check [38].

In the present study, we examined the association between indicators of women's empowerment and mortality due to injury and poisoning (accidents, homicide, suicide and deaths due to undetermined causes) in Europe. Empowerment is a complex and evolving term, but its most common current usage is as a reference to the extent of women's involvement in three related societal domains (see Box 1): political participation and decision-making, economic participation and decision-making power, and power over economic resources [39]. It is, therefore, possible to examine country-level associations between measures of women's empowerment, and men's and women's health-related behaviours.

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Insert Box 1 about here  
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We further operationalised health-related behaviours using rates of death by injury and poisoning (violent death), which provides a useful indicator of risk-taking and self-destructive behaviour leading to higher mortality. **Moreover**, violent death can also be considered as an indicator of male behaviour on the basis that men are the main perpetrators of violence, particularly domestic and sexual violence [33]. In short, then, we sought to examine the association of a number of indicators of women's empowerment with violent death among women and men in 27 European countries.

## METHODS

Data on age standardised male and female rates of death by injury and poisoning per 100,000 were obtained for 24 European Union countries, plus Norway, Iceland and Switzerland. The ICD codes used for injury and poisoning were V01-Y98, taken from Chapter 20 of ICD-10. The ages of injury covered all ages and were directly standardised using the European population as the standard population. Mortality rates were taken from the World Health Organisation *European Health for All* [40] database for the most recent available year (see Table 1). Nine indicators of women's empowerment were available for all the 24 countries and were, therefore, used in the present study. These were: (i) female unemployment in the female labour force as a ratio of male unemployment in the male labour force [41]; (ii) ratio of male to female earned income [42]; (iii) female economic activity rate as a percentage of male economic activity rate [42]; (iv) maternity leave benefits (percentage of wages paid in the first six weeks) [43]; (v) weeks of maternity leave [42]; (vi) female legislators, senior officials and managers as a percentage of the total [42]; (vii) the female to male ratio for average years of schooling [41]; (viii) women in government at a ministerial level, as a percentage of the total, and [42]; (ix) seats in parliament (single or lower house) held by women as a percentage of the total [42]. Data used for all indicators was for the latest available year (see Table 1). Gross domestic product (GDP) was obtained from the 2003 *Human Development Report* [39].

To investigate the relationship between age-standardised mortality rates and indicators of female empowerment, multiple linear regression models were used. Indicators of empowerment that were found to be correlated with death rates using correlation analysis were selected as independent variables to be included in separate regression models. Indicators of empowerment were not included in the same regression model due to the correlation between the variables and to investigate each

empowerment indicator separately, given potential differential effects on health behaviours. GDP was included in each model to adjust for any differences in socioeconomic circumstances between the countries. Age-standardised death rate was assessed for normality using the Kolmogorov Smirnov statistic prior to conducting the regression analyses.

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Insert Table 1 about here  
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## RESULTS

The distribution of data for male and female rates of death by injury and poisoning did not differ significantly from normality (Kolmogorov Smirnov statistic for normality, age standardised female rate of violent death,  $p=.269$ ; age standardised male rate of violent death,  $p=.111$ ). Each variable was, therefore, correlated univariately using parametric methods with indicators of women's empowerment, and the results are presented in Table 2. However, it was also noticeable that three Baltic states (Latvia, Lithuania and Estonia) had mortality rates that were considerably higher than the other European countries. We, therefore, conducted a sensitivity analysis of the data by running separate regression models excluding these Baltic states, to assess the influence on estimates of effect (see below).

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Insert Table 2 about here  
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### *Male mortality from injury and poisoning*

Age standardised death rates from injury and poisoning for men were found to be strongly correlated with two indicators of female empowerment; female legislators,

senior officials and managers as a percentage of the total ( $r=0.664$ ,  $p=0.001$ ) and female economic activity as a percentage of male economic activity ( $r=0.375$ ,  $p=0.054$ ). GDP was also found to be significantly correlated with death rates ( $r=-0.565$ ,  $p=0.002$ ). Two regression models were, therefore, created out to quantify the effect of each indicator of female empowerment on age standardised death rates from injury and poisoning in men, adjusting for GDP (Table 3).

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The first regression model (including all countries) identified a significant relationship between the proportion of female legislators, senior officials and managers as a percentage of the total and age standardised mortality rates for injury and poisoning in men, after adjusting for GDP ( $\beta=5.954$ ,  $t=3.439$ ,  $p=0.002$ ). However, after excluding the Baltic States, this relationship achieved borderline significance ( $\beta=2.079$ ,  $t=-2.055$ ,  $p=0.054$ ).

The second regression model (including all countries) found female economic activity to only have borderline significance in relation to age standardised mortality rates for injury and poisoning in men ( $\beta=1.487$ ,  $t=2.020$ ,  $p=0.055$ ). After excluding the Baltic States, this relationship was found to be statistically significant ( $\beta=0.821$ ,  $t=-2.547$ ,  $p=0.019$ ).

#### *Female mortality from injury and poisoning*

Age standardised rates of death from injury and poisoning for women were **found to be correlated** with (i) the ratio of female to male unemployment ( $r=-0.382$ ,  $p=0.049$ ); (ii) the ratio of male to female earned income ( $r=0.340$ ,  $p=0.082$ ); (iii) female economic activity as a percentage of male economic activity ( $r=0.393$ ,



$p=0.043$ ), and (iv) female legislators, senior officials and managers as a percentage of the total ( $r=0.542$ ,  $p=0.005$ ). These four indicators of female empowerment were incorporated in separate regression models adjusting for GDP (Table 4).

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 Insert Table 4 about here  
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Only two of the four indicators of female empowerment (including all countries) were found to be significantly associated with age standardised death rates by injury and poisoning in women: (i) the proportion of female legislators, senior officials and managers ( $\beta=0.995$ ,  $t=2.358$ ,  $p=.028$ ), and; (ii) female unemployment as a ratio of male unemployment ( $\beta=-10.843$ ,  $t=2.228$ ,  $p=.035$ ). After exclusion of the three Baltic States none of the indicators of female empowerment were found to significantly predict age standardised death rates by injury and poisoning in women.

## **DISCUSSION**

The results of this study showed a significant association between **some** indicators of women's empowerment and violent death in 27 European countries. Specifically, for all 27 countries, two indicators of women's empowerment (female legislators, senior officials and managers as a percentage of the total, and; female economic activity as a percentage of male economic activity) were significantly associated (or had borderline significance) with male mortality from injury and poisoning. Of these indicators, female legislators, senior officials and managers was the stronger predictor. When three Baltic states were excluded from the analysis, female economic activity remained strongly associated with male mortality. Thus, even after excluding the Baltic outliers, female economic activity was significantly associated with male injury and poisoning mortality.

It would appear, therefore, that as the proportion of women who are economically active compared to men increases, this has a detrimental effect on the health-related behaviours of men, particularly risk behaviours. These results are consistent with the proposal that some men respond to improved gender equality by engaging in risky or self-destructive behaviours [14, 32, 34]. It may be that, as women increasingly occupy traditionally masculine roles, thus challenging stereotypes of hegemonic masculinities, some men engage in compensatory risky behaviours [13]. This may include such behaviours as drink driving and violence towards others, which endanger not only men as a whole but also women [14, 30, 32]. Furthermore, it is likely that it is the most disadvantaged, powerless men who experience the greatest increase in violent death as women begin to gain some power. Such men may be reluctant to change their behaviour, and engage in risky behaviour as a means of asserting what appears to be a diminishing masculine identity.

For women, on the other hand, when all 27 countries were included in the analysis, four indicators of empowerment (the ratio of female to male unemployment; the ratio of male to female earned income; female economic activity as a percentage of male economic activity, and; female legislators, senior officials and managers as a percentage of the total) had a significant (or borderline significant) association with violent death among women. The strongest association was with the proportion of women in high-ranking positions. However, when the three Baltic outliers were removed from the analysis, none of these relationships remained significant. **This suggests that, in Europe, women's empowerment may not be associated with violent death.**

In general, these findings do not support the suggestion that women's empowerment results in greater risk-taking or self-destructive behaviour **among**

women. That is, the opportunities accrued as a result of improved gender equality do not appear to adversely affect women in terms of their health-related behaviour. This is in contrast to previous single-nation [34, 36, 44-45] and cross-national studies [35], which have suggested that improved gender equality is associated with more masculine behaviour among women, which in turn is associated with poorer life outcomes (although it is difficult to generalise findings from earlier studies, as they may be dependent on cultural factors unique to a specific period of time or locality).

However, the present results also suggest that cultural factors may underscore cross-national differences in mortality rates due to injury and poisoning, particularly in relation to the difference between Baltic states and the rest of Europe for women's violent death. That is, specific factors associated with violent death (e.g., rates of alcohol consumption) may differ between countries, which in turn influences the risk of injury and poisoning deaths. Furthermore, the nature of women's empowerment and what it means for women 'on the ground' will vary by country and will need to be understood within the wider historical, cultural and welfare contexts specific to each country. In the present study, such cultural differences were not controlled for in view of the proposed mediating role of risk behaviours between empowerment and health. Nevertheless, it would be useful for future research to measure independent associations between different types of risk behaviour and women's empowerment.

These results have implications for strategies aimed at reducing sex differences in mortality, which we believe is associated with gender equality. Specifically, the effects of women's empowerment on women's and men's health behaviours are unlikely to be straightforward or immediate. Rather, changes in the socioeconomic and political roles of women may adversely affect men's health behaviours, unless there is a corresponding change in the behaviour of men as they

adapt to their changing roles [34, 46]. The available evidence suggests that, when men do alter their behaviour, it has a beneficial effect on their health [13]. In short, the beneficial effects of improved gender equality will likely only accrue when men no longer feel a need to demonstrate their masculinity through cultural signifiers and when a more supportive environment emerges for the new roles of women in public spheres.

In the present study, we attempted to identify all aspects of empowerment that were available as routine data across countries. Other factors could have been included such as women's participation in local government, measures of occupational composition, and the division of labour in public and private spheres [47]. Nevertheless, the selection of multiple factors used in this study was consistent with the definition of gender empowerment set out by the United Nations *Human Development Report* [39] and covered the main dimensions of political participation, economic decision-making power, and power over economic resources. In this way, we increased the probability that these factors meaningfully captured dimensions of gender empowerment.

A more serious limitation concerns the cross-section ecological nature of the study, and the fact that we were not able to control for potential confounding variables such as income inequality, the proportion living in poverty and so on. Nevertheless, it is important to note that our results are, in outline, consistent with studies conducted with individual-level data [34]. A further related difficulty concerns the generalisability of these findings. With population-level data it is not possible to make predictions at the level of the individual. In this sense, the definition of gender empowerment that we have relied upon may not be adequate, as it does not take into account other diverse forms of oppression, such as class or race. Multi-dimensional

data and analyses would provide a better understanding of whether gender empowerment is associated with negative health effects at both individual and national levels. In particular, it may be useful to examine the association between women's empowerment and sex differences in health across time, using time-series analyses for example.

These limitations notwithstanding, the findings of the present study suggest that **some indicators of** women's empowerment **are** significantly associated with mortality from violence for men in 27 European countries. At a practical level, this study raises important questions about the partial nature of any move towards gender equality that does not also involve a change in individual, societal and institutional attitudes toward traditional gender roles. Alongside efforts at improving gender equality, which is a worthwhile end in itself, public policies are needed that challenge attitudes towards traditional gender roles, which, if left unchecked, adversely affect the health of men.

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**BOX 1: WOMEN'S EMPOWERMENT**

Women's empowerment is a multi-dimensional term. It is most usually associated with two different literatures: the feminist literature and the international development literature.

The contemporary conceptualisation of empowerment derives from the radical political movements of the 1960s, including the women's movement [48]. Women's empowerment has been used to 'describe a struggle for social justice and women's equality that involves transforming economic, social and political structures' [49]. In this definition, it is stressed that women's empowerment 'should lead to the liberation of men from false value systems and ideologies of oppression. It should lead to a situation where each one can become a whole being regardless of gender, and use their fullest potential to construct a more humane society for all' [49].

In the international development literature, women's empowerment is used in many different contexts (e.g., as an indicator of level of development) and by many different organisations including the World Bank, United Nations, the UK Department for International Development, Oxfam and various other international development agencies [50]. Here, women's empowerment is variously associated with challenging oppression and inequality (Oxfam) or increasing women's participation, autonomy and decision making (UN).

Empowerment is about opening up access to decision making, and also about the ability to make choices, and be involved in shaping what choices are on offer. Essentially then, empowerment corresponds to women challenging existing power structures which subordinate women [50].

Table 1. Data on age standardised male and female rates of death by injury and poisoning, nine indicators of women's empowerment and GDP

Country	Female rate <sup>a</sup>	Male rate <sup>a</sup>	A	B	C	D	E	F	G	H	I	GDP <sup>a</sup>
Austria	23.60	66.21	.95	.35	66	100	16	27	1.07	35.3	33.9	31289
Belgium	32.85	77.84	1.26	.54	67	77	15	31	1.11	21.4	34.7	29096
Czech Republic	34.03	96.25	1.53	.64	83	69	28	26	1.00	11.1	17.0	8794
Denmark	29.49	63.46	1.02	.73	85	90	18	26	1.13	33.3	36.9	39332
Estonia	45.83	228.65	.90	.64	82	100	20	35	1.21	15.4	18.8	6713
Finland	38.28	105.76	1.01	.72	87	70	30	28	1.12	47.1	37.5	31058
France	33.56	78.86	1.28	.59	78	100	16	*	1.07	17.6	12.2	29410
Germany	18.50	50.07	1.02	.54	71	100	14	36	1.00	46.2	32.8	29115
Greece	14.40	51.76	2.35	.45	60	100	17	26	1.00	5.6	14.0	15608
Hungary	44.42	121.44	.89	.62	72	70	24	34	1.07	11.8	9.1	8169
Iceland	22.45	50.99	.81	.69	83	80	13	29	1.12	27.3	30.2	36377
Ireland	20.90	58.04	.80	.41	54	70	18	29	1.13	21.4	13.3	38487
Italy	19.94	49.91	1.77	.46	60	80	22	21	1.07	8.3	11.5	25471
Latvia	58.30	225.75	.85	.62	80	100	16	40	1.14	23.5	21.0	4771
Lithuania	54.31	255.57	.88	.68	80	100	18	39	1.07	15.4	22.0	5274
Luxembourg	26.63	74.25	1.89	.39	58	100	16	*	1.08	14.3	23.3	59143
Malta	21.92	41.84	1.32	.39	38	100	13	18	1.07	15.4	9.2	12157
Netherlands	18.65	38.13	1.29	.53	68	100	16	26	1.06	36.0	36.7	31532
Norway	25.87	62.63	.90	.75	86	100	42	30	1.19	44.4	38.2	48412
Poland	25.62	101.71	1.09	.62	81	100	16	34	1.07	5.9	20.2	5487
Portugal	22.03	77.70	1.45	.54	72	100	17	32	1.13	16.7	19.1	14161
Slovakia	20.42	95.05	1.01	.65	84	55	28	35	1.00	.00	16.7	6033
Slovenia	33.77	108.90	1.11	.62	81	100	15	33	1.13	6.3	12.2	13909
Spain	16.83	51.03	2.05	.44	58	100	16	30	1.06	50.0	36.0	20404
Sweden	22.76	58.77	.84	.69	90	80	14	30	1.24	52.4	45.3	33676

Switzerland	25.04	56.37	1.11	.90	67	80	14	28	1.00	14.3	25.0	43553
United Kingdom	17.41	38.61	.79	.62	76	90	26	33	*	28.6	18.1	30253

Notes: \*Figures unavailable in original; <sup>a</sup>Age standardised rate of death from injury and poisoning per 100,000; <sup>b</sup>Per capita US dollars; A= Female unemployment in the female labour force as a ratio of male unemployment in the male labour force; B= Ratio of male to female earned income; C= Female economic activity rate as a percentage of male economic activity rate; D= Maternity leave benefits (percentage of wages paid in the first six weeks); E=Weeks of maternity leave; F= Female legislators, senior officials and managers as a percentage of the total; G= Female to male ratio for average years of schooling; H= Women in government at a ministerial level, as a percentage of the total; I= Seats in parliament (single or lower house) held by women as a percentage of the total

Table 2. The correlations between age standardised male and female violent death and indicators of female empowerment.

	Age standardised death rate by injury and poisoning for men		Age standardised death rate by injury and poisoning for women	
	Pearson's <i>r</i>	<i>p</i>	Pearson's <i>r</i>	<i>p</i>
Female unemployment in the female labour force as a ratio of male unemployment in the male labour force	-0.312	0.114	-0.382	0.049
Ratio of male to female earned income	0.255	0.199	0.340	0.082
Female economic activity as a percentage of male economic activity	0.375	0.054	0.393	0.043
Maternity leave benefits	0.124	0.537	0.027	0.895
Weeks of maternity leave	0.046	0.818	0.083	0.682
Female legislators, senior officials and managers, as a percentage of the total	0.664	0.001	0.542	0.005
Ratio of female to male average years of schooling	0.247	0.233	0.286	0.157
Women in government at a ministerial level, as a percentage of the total	-0.256	0.198	-0.162	0.418
Seats in parliament held by women, as a percentage of the total	-0.195	0.330	-0.141	0.482
Gross domestic product	-0.565	0.002	-0.406	0.035

Table 3. Linear regression models for the relationship of age standardised mortality rates from injury and poisoning in males with significant indicators of empowerment as independent variables. Results presented with and without Baltic States (Latvia, Lithuania and Estonia).

	Age standardised death rate by injury and poisoning for men*		
	R <sup>2</sup>	B	<i>p</i> -value
Model 1: (all countries)			
Female legislators, senior officials and managers, as a percentage of the total	0.594	5.954	0.002
Model 1: (- Baltic states)			
Female legislators, senior officials and managers, as a percentage of the total	0.404	2.079	0.054
Model 2: (all countries)			
Female economic activity as a percentage of male economic activity	0.418	1.487	0.055
Model 2: (- Baltic states)			
Female economic activity as a percentage of male economic activity	0.376	0.821	0.019

\* All models adjusted for GDP

Table 4. Linear regression models for the relationship of age standardised mortality rates from injury and poisoning in females with significant indicators of empowerment as independent variables. Results presented with and without Baltic States (Latvia, Lithuania and Estonia).

	Age standardised death rate by injury and poisoning for women*		
	R <sup>2</sup>	B	p-value
Model 1: (all countries)			
Female legislators, senior officials and managers, as a percentage of the total	0.367	0.995	0.028
Model 1: (- Baltic states)			
Female legislators, senior officials and managers, as a percentage of the total	0.039	0.219	0.581
Model 2: (all countries)			
Female economic activity as a percentage of male economic activity	0.288	0.324	0.053
Model 2: (- Baltic states)			
Female economic activity as a percentage of male economic activity	0.145	0.214	0.083
Model 3: (all countries)			
Female unemployment as a ratio of male unemployment	0.308	-10.843	0.035
Model 3: (- Baltic states)			
Female unemployment as a ratio of male unemployment	0.098	-5.332	0.167
Model 4: (all countries)			
Ratio of male to female earned income	0.288	30.682	0.053
Model 4: (- Baltic states)			
Ratio of male to female earned income	0.141	20.043	0.088

\* All models adjusted for GDP