Gender empowerment and female-to-male smoking prevalence ratios

Sara C Hitchman[a] & Geoffrey T Fong[a]

Objective To determine whether in countries with high gender empowerment the female-to-male smoking prevalence ratio is also higher.
Methods Bivariate and multiple regression analyses were performed to explore the relation between the United Nations Development Programme's gender empowerment measure (GEM) and the female-to-male smoking prevalence ratio (calculated from the 2008 *WHO global tobacco control report*). Because a country's progression through the various stages of the tobacco epidemic and its gender smoking ratio (GSR) are thought to be influenced by its level of development, we explored this correlation as well, with economic development defined in terms of gross national income (GNI) per capita and income inequality (Gini coefficient).
Findings The GSR was significantly and positively correlated with the GEM ($r = 0.680$; $P < 0.001$). In addition, the GEM was the strongest predictor of the GSR (β, adjusted: 0.47; $P < 0.0001$) after controlling for GNI per capita and for Gini coefficient.
Conclusion Whether progress towards gender empowerment can take place without a corresponding increase in smoking among women remains to be seen. Strong tobacco control measures are needed in countries where women are being increasingly empowered.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Tobacco smoking currently kills five million people a year worldwide and, according to estimates, will probably kill eight million people a year between now and 2030 and one billion over the course of the 21st century.[1,2] In 2010, the World Health Organization (WHO) chose as the theme of World No Tobacco Day the relation between gender and tobacco, with an emphasis on marketing cigarettes to women. This theme was chosen "to draw particular attention to the harmful effects of tobacco marketing towards women and girls".[3]

Worldwide it is estimated that men smoke nearly five times as much as women,[4] but the ratios of female-to-male smoking prevalence rates vary dramatically across countries. In high-income countries, including Australia, Canada, the United States of America and most countries of western Europe, women smoke at nearly the same rate as men.[5] However, in many low- and middle-income countries women smoke much less than men. In China, for example, 61% of men are reported to be current smokers, compared with only 4.2% of women. Similarly, in Argentina 34% of men are reported to be current smokers, compared with 23% of women.[5]

While women's smoking prevalence rates are currently lower than men's, they are projected to rise in many low- and-middle-income countries. Data from the Global Youth Tobacco Survey show that worldwide smoking rates among boys and girls resemble each other more than smoking rates among adult women and men, with boys between the ages of 13 and 15 years smoking only 2 to 3 times more than girls.[6] Additionally, Lopez et al.'s 1994 descriptive model of the tobacco epidemic predicts that the female-to-male ratio in smoking prevalence will rise in many low- and- middle-income countries where females currently smoke at much lower rates than males.[7]

According to Lopez et al.'s descriptive model of the tobacco epidemic, countries fall into one of four stages.[7] In stage 1, men's smoking prevalence rates rise first, followed 10 to 20 years later by a more modest rise in women's rates. In stage 2, men's and women's prevalence rates continue to rise, with the increase in prevalence among men slightly outpacing the increase in prevalence among women. In stage 3, men's prevalence rates level off and then drop sharply to resemble women's rates; during the same stage, women's rates increase moderately and then decrease, although not as sharply as men's. In stage 4, women's and men's smoking rates continue to fall until they are nearly equal.

The relatively slower rise of smoking among women in comparison with men has been attributed to social disapproval of women who smoke and to women's lower social and economic status.[8–10] For example, before the 1920s in the United States, smoking among women was much less common than among men because women who smoked were not viewed as respectable. However, as society became increasingly tolerant of women who smoked, women's smoking rates began to climb towards levels nearly as high as those seen among men.[8] Cigarette smoking among women in northern Europe followed a similar pattern.[11]

The rise of smoking among women has been attributed not just to social factors and to women's increasing economic resources, but also to the tobacco industry's marketing of cigarettes to women as a symbol of emancipation.[12–14] This theme inspired a variety of marketing campaign slogans, including Phillip Morris' well known 1968 advertisement for the Virginia Slims cigarettes campaign, "*You've come a long way baby*", which underlined the achievements of the women's movement in the United States.[15] A 1991 internal industry document describes the creative strategy behind this brand, targeted specifically to women:

"To convince fashionable, modern, independent and self-confident women aged 20–34 that by smoking VSLM, they are making better/more complete expression of their independence."[16]

[a] University of Waterloo, Department of Psychology, 200 University Ave West, Waterloo, Ontario, N2L 3G1, Canada.
Correspondence to Sara C Hitchman (e-mail: schitchm@uwaterloo.ca).
(*Submitted: 29 May 2010 – Revised version received: 11 November 2010 – Accepted: 16 November 2010 – Published online: 5 January 2011*)

Advertising for Virginia Slims followed similar patterns elsewhere. Here is a 1994 advertisement in Japan:

"I'm going the right way – keeping the rule of society, but at the same time I am honest with my own feelings. So I don't care if I go against the so-called 'rules' so long as I really want to."[12]

Today we can takes steps to prevent women's smoking rates from increasing, but only if we understand the factors leading to their rise. To examine if women's empowerment is related to current differences in male and female smoking prevalence rates within countries worldwide, we looked for a potential association between the ratio of female-to-male current cigarette smoking prevalence rates and the gender empowerment measure (GEM) developed by the United Nations Development Programme (UNDP), as manifested across 74 countries at different stages of the tobacco epidemic.[17] While it is imperative that women's empowerment continue, attention must be paid to its potential link to increased smoking among women and to the ways in which the tobacco industry is capitalizing on societal changes to target women.

In this study we focused on cigarette smoking rather than on tobacco use in general because the use of "traditional" forms of tobacco (smoked or smokeless) shows widely varying patterns between men and women.[10] Furthermore, current cigarette smoking rates probably best reflect the burden of current smoking within a country and are more likely to be associated with the current GEM.

The GEM is described as "a composite index measuring gender inequality in three basic dimensions of empowerment – economic participation and decision-making, political participation and decision-making and power over economic resources".[17] In a 2007 review of gender-related indicators of well-being, Klasen described the GEM as providing some useful cross-country comparisons on components of female empowerment, less problematic than UNDP's gender-related development index, and a measure not of well-being, but of the "relative empowerment of males and females in the political, economic and household sphere".[18]

Much has been written on the relation between women's and men's smoking rates, but few authors have attempted to investigate it empirically across countries.[8,10] In a study conducted in 2009, Schaap et al. examined the relation between the GEM, gross domestic product (GDP) and ever-smoking rates among high- and low-income women aged 25 to 39 years in 19 European countries.[19] They found non-significant associations between GEM and ever-smoking rates when controlling for GDP; the association was negative for high-income women and positive for low-income women. In 2006 Pampel[20] studied female-to-male smoking prevalence ratios in 106 nations as a function of various proposed measures of gender equality (fertility rates, literacy rates, female representation in parliament, tertiary education levels, etc.). The author found inconsistent associations between these variables and arrived at the conclusion that the general level of cigarette diffusion in a country seemed to more consistently explain the gender difference in smoking rates than did the level of gender equality.

The present study assesses the relation between the GEM and the female-to-male current smoking prevalence ratio across countries, with adjustment for established measures of economic development and general inequality.

Methods

Measures

Gender smoking ratio

To calculate the GSR, current female and male cigarette smoking prevalence rates for each country were taken from the *WHO report on the global tobacco epidemic, 2008*.[5] These rates are adjusted by WHO to best reflect the prevalence of current smoking among people over 15 years of age in each country, current smoking being defined by WHO as "smoking at the time of the survey, including daily and non-daily smoking".[5] These rates were available for 130 countries. We chose not to impute smoking rates for countries with missing data from other sources because the prevalence rates thus obtained would not have been similarly adjusted. We divided women's smoking rates by men's smoking rates to yield a female-to-male gender smoking ratio (GSR).

Gender empowerment measure

We used the GEM given in statistical tables in the UNDP's *Human development report 2009*.[17] The measure is derived from several components, including: (i) seats in parliament held by women, (ii) female legislators, senior officials, and managers, (iii) female professional and technical workers, (iv) year women received the right to vote and year they were allowed to stand for election, (v) year when a woman became Presiding Officer of parliament or of one of its houses for the first time, (vi) percentage of ministerial positions held by women, and (vii) ratio of estimated female-to-male earned income. The GEM ranges from 0 to 1, with values closer to 1 signifying higher empowerment. The GEM was available for 109 countries.

Gini coefficient

The Gini coefficient, a well known measure of income inequality and wealth within a population, was controlled for in an attempt to examine the unique impact of the GEM (female inequality), independent of the general level of income inequality within a country. A value of 0 signifies maximal equality, whereas a value of 1 signifies maximal inequality.[21] The Gini coefficient was taken from statistical tables in the UNDP's *Human development report 2009*.[17] It was available for 142 countries.

Gross national income per capita

It was important to control for level of economic development because much of the research literature on the stages of the tobacco epidemic links progression through the epidemic to a country's level of development.[7] We used GNI per capita for 2008, as given by the World Bank and expressed in international or purchasing power parity dollars,[22] which account for relative prices across countries and provide a suitable measure for international comparisons.[23] GNI per capita is used by the World Bank to classify countries into income categories (i.e. low, lower-middle, upper-middle and high).[23] In our analyses we used the logarithm of the GNI per capita [ln(GNI per capita)], because GNI per capita data are highly skewed in a positive direction. GNI per capita was available for 166 countries.

Statistical analyses

SPSS 17.0 (SPSS Inc., Chicago, USA) was used to conduct all statistical analyses. We first performed Pearson correlations between all measures. Subsequently we tested whether the relation between GEM and GSR persisted when partialling on GNI per capita and Gini coefficient

Table 1. **Descriptive statistics for gender smoking ratio (GSR), gender empowerment measure (GEM) and economic development in 74 countries[a]**

Variable	Mean	SD
GSR[b]	0.44	0.30
GEM[c]	0.61	0.16
ln(GNI per capita)[d]	9.30	1.08
Gini coefficient[e]	37.75	9.09

GNI, gross national income; ln, logarithm; SD, standard deviation.

[a] These were the countries for which data were available on all four measures.

[b] Male-to-female current cigarette smoking prevalence ratio. Current smoking rates obtained from reference.[5]

[c] Obtained from reference.[17] Value range: 0 to 1. Values closer to 1 signify higher empowerment.

[d] GNI per capita in purchasing power parity dollars.

[e] Obtained from reference.[17] Value range: 0 to 1. 0 signifies maximal equality and 1, maximal inequality.

in two separate correlational analyses. Finally, we tested whether the relation between GEM and GSR persisted when controlling for GNI per capita and Gini coefficient in a multiple regression analysis. Sample size was reduced in some of the analyses because data were not available on all indices for all countries.

Results

Descriptive statistics

Table 1 displays the descriptive statistics for the four measures. Before choosing to use current smoking rates to calculate the GSR, we ran all analyses using current smoking and daily smoking rates. Because we obtained nearly identical results, we chose to use the adjusted current smoking rates. The correlation between the ratio of women's to men's current smoking rates and the ratio of women's to men's daily smoking rates was 0.99 ($P < 0.0001$).

Correlations between measures

Table 2 displays the bivariate correlation matrix. The positive and statistically significant correlation found between GSR and the GEM suggests that in countries with higher female empowerment, female and male smoking rates are closer to being equal (Fig. 1). GSR and GNI per capita were also found to be significantly and positively correlated. Thus, the higher a country's GNI per capita, the closer the female and male smoking rates come to being equal. The GSR and the Gini coefficient were negatively correlated, which shows that in countries with low income inequality, female and male smoking rates are also closer to being equal.

Table 2. **Gender smoking ratio (GSR), correlation matrix**

Measure	Correlation coefficient/ *P*-value/no. of countries	GSR[a]	GEM[b]	Gini[c]	ln(GNI per capita)[d]
GSR[a]	*r*	1			
	P	–			
	n	130			
GEM[b]	*r*	0.680	1		
	P	<0.001	–		
	n	88	109		
Gini[c]	*r*	–0.241	–0.22	1	
	P	0.014	0.034	–	
	n	104	92	142	
ln(GNI per capita)[d]	*r*	0.659	0.708	–0.325	1
	P	<0.001	<0.001	<0.001	–
	n	115	102	138	166

GEM, gender empowerment measure; Gini, Gini coefficient; GNI, gross national income; GSR, gender smoking ratio; ln, logarithm.

[a] Female-to-male current cigarette smoking prevalence ratio. Current smoking rates obtained from reference.[5]

[b] Obtained from reference.[17] Value range: 0 to 1. Values closer to 1 signify higher empowerment.

[c] Obtained from reference.[17] Value range: 0 to 1. 0 signifies maximal equality and 1, maximal inequality.

[d] GNI per capita in purchasing power parity dollars.

Partial correlations

The correlation between GSR and GEM remained significant after adjusting for ln(GNI per capita) ($r = 0.480$; $P < 0.0001$; $n = 82$). Some countries could not be included in the analyses due to missing data on GNI per capita. The correlation between GSR and GEM, adjusted for the Gini coefficient, increased slightly ($r = 0.703$; $P < 0.0001$, $n = 75$), most likely because some countries were excluded from the analysis due to missing data on their Gini coefficient.

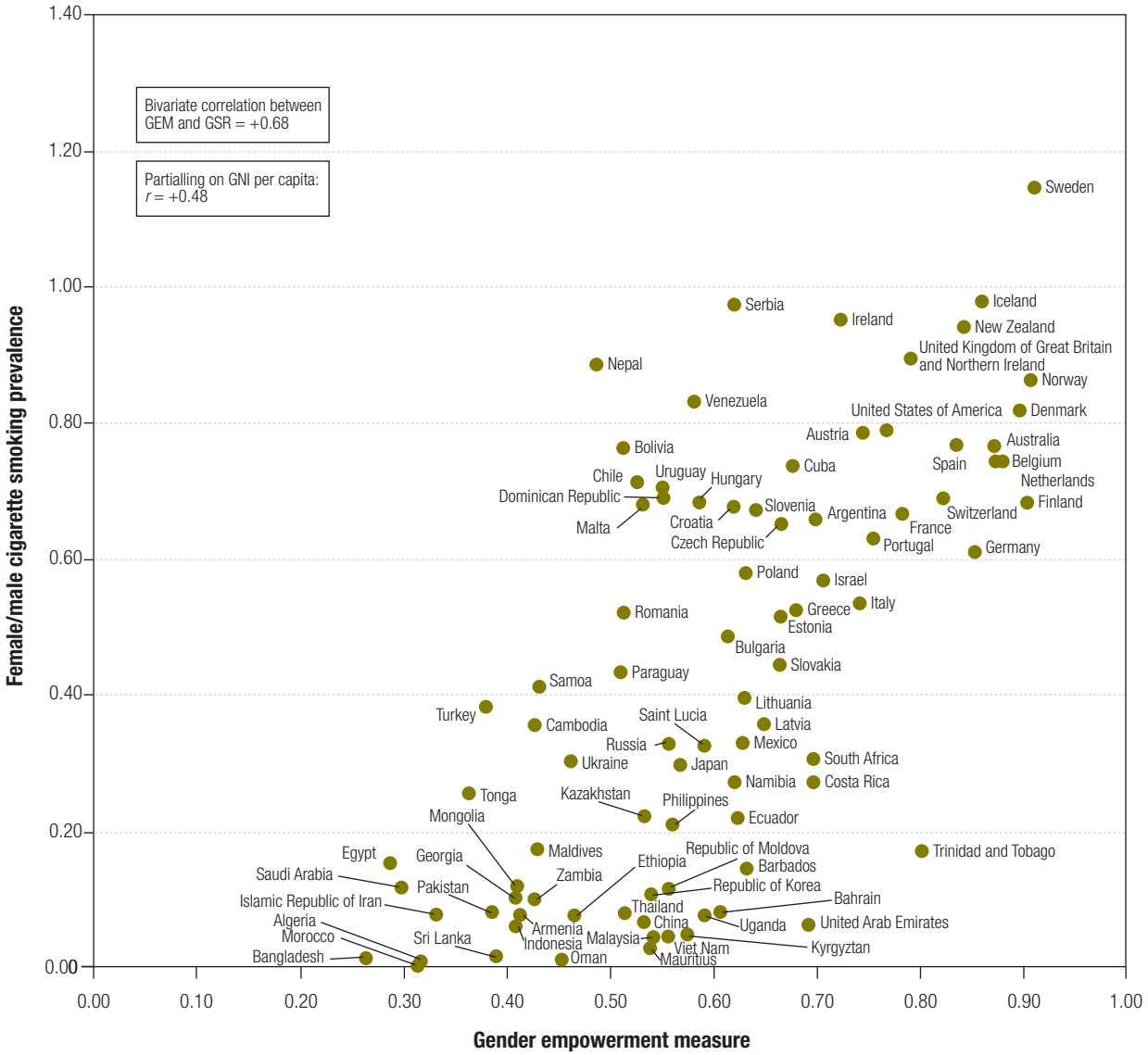
Multiple regression analysis

With GSR as the dependent variable, we tested whether GEM predicted the GSR while controlling for GNI per capita and for Gini coefficient (model results, $F_{3,70} = 27.21$; $P < 0.0001$; adjusted $R^2 = 0.519$). The analysis showed that GEM remained a very strong and highly significant predictor of GSR after controlling for GNI per capita and Gini coefficient. Table 3 displays the model coefficients.

Discussion

In a June 1998 editorial for the newsletter of the International Network of Women Against Tobacco, former Director General of the WHO, Dr Gro Harlem Brundtland, wrote that "there can be no complacency about the current lower level of tobacco use among women in the world; it does not reflect health awareness, but rather social traditions and women's low economic resources".[24] The findings presented in this study lend empirical support to Dr Brundtland's warning. We found that in countries where women have higher empowerment, women's smoking rates are higher than men's, independent of the level of economic development and of the level of income inequality. In fact, GEM was by far the strongest predictor of the gender smoking ratio, even after including the other two competing predictors in the model. That is, women's empowerment as measured by economic participation and decision-making, political participation and decision-making, and power over economic resources, was found to be associated with the ratio of female-to-male cigarette smoking prevalence.

Fig. 1. **Gender smoking ratio (GSR),[a] by gender empowerment measure (GEM)[b]**



[a] Female-to-male current cigarette smoking prevalence ratio. Current rates obtained from reference.[5]
[b] Obtained from reference.[17] Value range: 0 to 1. Values closer to 1 signify higher empowerment.

The findings of this study are supported by historical trends of the tobacco epidemic in developed countries and by previous discussions of the associations between social changes, women's rising economic resources and the rise in women's smoking rates relative to men's.[8–11] The one study that explored the reasons for the difference between women's and men's smoking rates across multiple nations did not find strong support for a relation between such rates and its proposed measure of gender inequality; however, this measure captured gender equality rather than women's empowerment and included constructs that are not components of the GEM (fertility rates, tertiary education rates, literacy rates, etc.).[20] Another study that examined the relation between the GEM and ever-smoking rates among women in Europe yielded findings consistent with those of this study, although not statistically significant.[9,11]

Implications

Evidence-based tobacco control policies should be implemented to stop the rise in women's smoking rates worldwide, particularly in countries where rates are low at present but where women are being

Table 3. **Multiple regression analyses predicting the gender smoking ratio[a] (*n* = 74)**

Predictor	β (standardized)	*P*
ln(GNI per capita)[b]	0.33	0.01
Gini coefficient[c]	0.07	0.41
Gender empowerment measure[d]	0.47	<0.0001

ln, logarithm.
[a] Female-to-male current cigarette smoking prevalence ratio.
[b] GNI per capita in purchasing power parity dollars.
[c] Obtained from reference.[17] Value range: 0 to 1. 0 signifies maximal equality and 1, maximal inequality.
[d] Obtained from reference.[17] Value range: 0 to 1. Values closer to 1 signify higher empowerment.

increasingly empowered. A greater emphasis should be placed on policies aimed to prevent the tobacco industry from targeting women, including bans on all forms of tobacco advertising and promotion, in accordance with the guidelines in Article 13 of the WHO Framework Convention on Tobacco Control (FCTC).[25–27] Furthermore, because this study found an association between women's smoking rates relative to men's and the GEM, which includes components measuring women's economic participation and decision-making and power over economic resources, policies to reduce the demand for tobacco through increasing the price of cigarettes and levying taxes on tobacco products should also be implemented, in accordance with Article 6 of the WHO FCTC.[26] Future research should monitor and evaluate how price and tax measures affect the uptake of smoking among girls and women in countries where the tobacco epidemic is currently in its early stage.

The articles and guidelines of the WHO FCTC have not yet outlined specific strategies to keep smoking prevalence rates among women from rising, although the preamble emphasizes the need for gender-specific tobacco strategies.[26] However, there is clearly a need to specifically outline policies to prevent women's smoking prevalence rates from rising, as shown by the currently wide gap in men's and women's smoking rates coupled with evidence that women's smoking rates are rising in some countries.[6,7]

Emphasizing that bans on advertising, promotion and sponsorship are key to preventing women from taking up smoking, as indicated in the WHO FCTC guidelines, may be helpful in alerting countries to the importance of taking action and the opportunity to do so. As stated in WHO's 2008 and 2009 reports on tobacco control, the tobacco industry targets women and "advertising, promotion, and sponsorship can make smoking more socially acceptable", with a resulting breakdown of traditional norms that discourage women from using tobacco.[5,28] A recent report on the WHO Operational Planning Meeting for Gender and Tobacco Projects recommended, among other things, educating people about gender-specific tobacco marketing, monitoring advertising by the tobacco industry, using gender arguments to advocate for enactment of Article 13, and involving women's civil society groups when appropriate.[29]

Future research

Future research should investigate what strategies may be most effective in preventing uptake among groups of women who tend to be the first to take up smoking, as shown by historical investigations of the tobacco epidemic, namely, those who are younger and more highly educated.[8,11,30] However, as the course of the tobacco epidemic may not evolve in exactly the same way across countries, the tobacco epidemic among women should be carefully monitored. As the epidemic continues to unfold, the impact of WHO FCTC policies and other tobacco control efforts to prevent women from taking up smoking should be evaluated, particularly in those countries where women are gaining in empowerment.[31]

Study limitations

This paper was not intended as an in-depth discussion of the relation between GEM and GSR within each country and region, but rather, as an attempt to demonstrate the basic empirical relation between GEM and GSR across countries by using ecological methods. There are limitations to the conclusions we can draw from this study. First, because the relation between the GSR and GEM was examined cross-sectionally, we cannot conclude that increases in women's empowerment will lead to an increase in the female-to-male smoking prevalence ratio. This hypothesis should be tested by examining the correlation between women's empowerment and the GSR over time, provided suitable and comparable country-level indicators of both variables have been generated. Second, because this study was ecological in nature (i.e. focused on the relation between GEM and GSR among groups of countries), no inferences can be drawn about a specific woman's level of empowerment and the chances that she will take up smoking.

We did not control for several potential confounders. Educational level, for instance, is a potential confounder, but adjusting for the many ways in which it can relate to the GEM is not possible. The United Nations Educational, Scientific and Cultural Organization (UNESCO) lists lower priority for girls' education, early marriages and pregnancies, and high opportunity costs/lower rate of return as just some of the factors affecting gender equality in education.[32] The female employment rate is another possible confounder that would have entailed a similar problem. The extent to which public health regulation and government support for tobacco control exist in a given country can also influence smoking behaviour, along with women's empowerment. However, differences in men's and women's smoking rates cannot be explained by regulation alone.

Finally, the GEM measure has been criticized for several reasons. Although it captures certain aspects of women's empowerment, it fails to account for informal economic and political empowerment (i.e. informal work, political involvement at the community level).[33–36] Klasen has also identified and discussed at length several shortcomings in the implementation of the components of the GEM and its calculations, including some that may make it difficult for poor countries to achieve high scores on the income component of the GEM.[35]

Conclusion

Women's empowerment must continue, but does the bad necessarily have to follow from the good? Will increases in women's empowerment inevitably be accompanied by increases in women's smoking prevalence rates? The findings of this study provide an empirical basis for further exploring the nature of the relation between women's empowerment and women's smoking rates worldwide. More importantly, they highlight the need to act quickly to curb smoking among women by implementing tobacco control policies as outlined in the WHO FCTC and its guidelines. ■

Acknowledgements

Geoffrey T Fong is also affiliated with the Ontario Institute for Cancer Research, Toronto, Canada.

Competing interests: None declared.

الملخص

تمكين المرأة والتدخين

التمكين حسب النوع الاجتماعي ونسب انتشار التدخين بين الرجل والمرأة.

التمكين حسب النوع الاجتماعي ونسب انتشار التدخين بين الرجل والمرأة.

الهدف تحديد ما إذا كانت نسبة انتشار التدخين بين الإناث نسبة إلى الذكور أعلى البلدان التي بها نسبة مرتفعة من التمكين العالي بحسب النوع الاجتماعي.

الأساليب تم استخدام تحاليل الانحدار ذو المتغيرين لاكتشاف العلاقة بين مقياس التمكين حسب النوع الاجتماعي التابع لبرنامج الأمم المتحدة الإنمائي (GEM) ونسبة انتشار التدخين في الإناث إلى الذكور)محسوبة وفقاً للتقرير العالمي لمنظمة الصحة العالمية لمكافحة التبغ لعام 2008)، حيث يعتقد أن تقدم المراحل المختلفة لوباء التبغ ونسبة المدخنين بين الجنسين يتأثران بمستوى التنمية في البلد. وقد قمنا أيضاً بدراسة هذه العلاقة مع التنمية الاقتصادية من حيث إجمالي الدخل القومي للفرد، وعدم المساواة في الدخل)معامل دجيني).

النتائج كانت نسبة انتشار التدخين بين الجنسين لها علاقة يعتد بها إحصائياً وإيجابية مع مقياس التمكين حسب النوع (بلغ معامل الارتباط= (0.680 وقوة الاحتمال< 0.001). وإضافة إلى ذلك فقد كان مقياس التمكين حسب النوع هو المؤشر الأقوى لنسبة انتشار التدخين بين الجنسين (β منقح : 0.47 و وقوة الاحتمال< 0.0001) بعد المراقبة من حيث حيث إجمالي الدخل القومي للفرد، وعدم المساواة في الدخل)معامل دجيني)

الخاتمة لاتزال هناك حاجة إلى دراسة ما إذا كان التقدم نحو التمكين حسب النوع الاجتماعي يمكن إحرازه بدون ارتفاع مماثل في نسبة المدخنات، وهناك ضرورة لاتخاذ التدابير القوية لمكافحة التبغ في البلدان التي يجري فيها تمكين المرأة على نحو متزايد.

摘要

性别权利及女性对男性吸烟比率

目的 旨在确定女性性别权利高的国家里，女性对男性吸烟比率是否接近1。

方法 我们运用二元回归分析探讨了女性对男性吸烟比率（根据2008年世界卫生组织的全球烟草控制报告进行计算）与联合国开发计划署性别权利测度（GEM）的关联。因为一个国家通过烟草流行的各个阶段和其性别吸烟比率（GSR）所体现出的进步受其发展水平的影响，我们探讨这种关联以及以人均国民总收入（GNI）和收入不平等（基尼系数）所界定的经济发展。

结果 性别吸烟比率与性别权利测度呈显著正相关（r=0.680；P<0.001）。此外，在控制人均国民总收入（GNI）和基尼系数的情况下，性别权利测度是性别吸烟比率的最强预测因子（β，调整：0.47；P<0.0001）。

结论 处于经济发展中的国家正目睹妇女权利和性别平等的增加。经济的进步是否伴随相应的女性吸烟比率的增加仍有待观察。在妇女权利越来越强的国家有必要采取强有力的烟草控制措施。

Résumé

Participation sexospécifique et rapports de prévalence du tabagisme femmes/hommes

Objectif Déterminer si dans les pays présentant une forte autonomisation des femmes, le rapport de prévalence du tabagisme féminin/masculin est aussi plus élevé.

Méthodes Des analyses de régression multiples et bivariées ont été effectuées afin d'étudier la corrélation entre l'indice de participation des femmes (IPF) du Programme des Nations Unies pour le développement et le rapport de prévalence du tabagisme femmes/hommes (calculé à partir du *rapport de l'OMS sur la lutte antitabac dans le monde* de 2008). Comme la progression d'un pays au travers des différentes étapes de la propagation du tabagisme et son rapport sexospécifique pour le tabagisme sont considérés comme étant influencés par son niveau de développement, nous avons également étudié cette corrélation, avec le développement économique défini en termes de revenu national brut (RNB) par habitant et d'inégalité de revenu (coefficient de Gini).

Résultats Le rapport femmes/hommes pour le tabagisme était corrélé de façon significative et positive à l'IPF (r=0,680; P<0,001). De plus, l'IPF était l'indice le plus fort du rapport femmes/hommes pour le tabagisme (β, ajusté: 0,47; P<0,0001) après contrôle du RNB par habitant et du coefficient de Gini.

Conclusion Il reste à observer si des progrès économiques peuvent se produire sans aucune augmentation correspondante des taux de tabagisme chez les femmes. Il est nécessaire de mettre en place des mesures de lutte antitabac fortes dans les pays où l'autonomisation des femmes est de plus en plus élevée.

РЕЗЮМЕ

Расширение гендерных прав и возможностей и коэффициент распространенности курения «женщины/мужчины»

Цель Определить, правда ли, что в странах с высоким уровнем осуществления гендерных прав и возможностей значение коэффициента распространенности курения «женщины/мужчины» также является более высоким.

Методы Для исследования соотношения между показателем расширения возможностей женщин (ПРВЖ), разработанным Программой развития Организации Объединенных Наций, и коэффициентом распространенности курения «женщины/мужчины» (рассчитанным на основе «Доклада ВОЗ о глобальной борьбе против табака» 2008 года) были проведены бивариантный регрессионный анализ и множественный регрессионный анализ. Поскольку мы предполагали, что продвижение страны по этапам табачной эпидемии и гендерный коэффициент курения (ГКК) в стране зависят от ее уровня развития, мы исследовали также и эту корреляцию, определив экономическое развитие

в категориях валового национального дохода на душу населения (ВНД) и неравенства дохода (коэффициент Джини).

Результаты Отмечена статистически значимая и позитивная корреляция ГКК с ПРВЖ ($r = 0.680$; $P < 0.001$). Кроме того, ПРВЖ был сильнейшим предиктором ГКК (скорректированная β: 0.47; $P < 0.0001$) с поправкой на ВНД на душу населения и коэффициент Джини.

Вывод Остается наблюдать, может ли прогресс в области расширения гендерных прав и возможностей происходить без сопутствующего роста распространенности курения среди женщин. В странах, где права и возможности женщин расширяются, необходимо применять жесткие меры по борьбе с табаком.

Resumen

Emancipación de género y cocientes de la prevalencia del tabaquismo entre mujeres y hombres

Objetivo Determinar si la relación de la prevalencia del tabaquismo entre mujeres y hombres también es más elevada en los países con un empoderamiento de género alto.

Métodos Se realizaron análisis de regresión bifactorial y regresión múltiple para estudiar la relación existente entre la medida del empoderamiento de género mediante el Programa de desarrollo de las Naciones Unidas (GEM, *gender empowerment measure*) y el cociente de la prevalencia del tabaquismo entre mujeres y hombres (calculado a partir del *Informe de la OMS del 2008 sobre la lucha mundial contra el tabaco*). Puesto que se considera que la progresión de un país a través de las diferentes etapas de la epidemia del tabaquismo y su proporción de tabaquismo por géneros (GSR, *gender smoking ratio*) se ven influenciadas por su nivel de desarrollo, analizamos dicha correlación junto con el desarrollo económico, definido en términos del producto nacional bruto (PNB) *per capita* y la desigualdad de ingresos (coeficiente de Gini).

Resultados El GSR se correlacionó significativa y positivamente con el GEM ($c = 0{,}680$; $p < 0{,}001$). Además, el GEM fue el factor pronóstico más potente de la GSR (β, ajustado: 0,47; $p < 0{,}0001$) después de controlar el PNB *per capita* y el coeficiente de Gini.

Conclusión Aún queda por ver si la emancipación de género se puede producir sin un aumento asociado del tabaquismo entre las mujeres. Se deben tomar medidas fuertes para luchar contra el tabaquismo en los países en los que las mujeres están adquiriendo cada vez una mayor independencia.

References

1. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med* 2006;3:e442. doi:10.1371/journal.pmed.0030442 PMID:17132052
2. Peto R, Lopez AD. Future worldwide health effects of current smoking patterns. In: Koop CE, Pearson CE, Schwarz MR, editors. *Critical issues in global health*. San Francisco: Wiley (Jossey-Bass); 2001. pp. 154–61.
3. Tobacco Free Initiative: World No Tobacco Day 2010. Theme: gender and tobacco with an emphasis on marketing to women [Internet]. Geneva: World Health Organization; 2010. Available from: http://www.who.int/tobacco/wntd/2010/announcement/en/index.html [accessed 17 November 2010].
4. Guindon GE, Boisclair D. *Past, current and future trends in tobacco use: HNP discussion paper*. Washington: The World Bank; 2003. Available from: http://escholarship.org/uc/item/4q57d5vp [accessed 17 November 2010].
5. *WHO report on the global tobacco epidemic, 2008: the MPOWER package*. Geneva: World Health Organization; 2008.
6. Warren CW, Jones NR, Eriksen MP, Asma S; Global Tobacco Surveillance System (GTSS) collaborative group. Patterns of global tobacco use in young people and implications for future chronic disease burden in adults. *Lancet* 2006;367:749–53. doi:10.1016/S0140-6736(06)68192-0 PMID:16517275
7. Lopez AD, Collishaw NE, Piha T. A descriptive model of the cigarette epidemic in developed countries. *Tob Control* 1994;3:242–7. doi:10.1136/tc.3.3.242
8. Waldron I. Patterns and causes of gender differences in smoking. *Soc Sci Med* 1991;32:989–1005. doi:10.1016/0277-9536(91)90157-8 PMID:2047903
9. Mackay J, Amos A. Women and tobacco. *Respirology* 2003;8:123–30. doi:10.1046/j.1440-1843.2003.00464.x PMID:12753525
10. Waldron I, Bratelli G, Carriker L, Sung W-C, Vogeli C, Waldman E. Gender differences in tobacco use in Africa, Asia, the Pacific, and Latin America. *Soc Sci Med* 1988;27:1269–75. doi:10.1016/0277-9536(88)90357-7 PMID:3206258
11. Graham H. Smoking prevalence among women in the European community 1950–1990. *Soc Sci Med* 1996;43:243–54. doi:10.1016/0277-9536(95)00369-X PMID:8844928
12. Amos A, Haglund M. From social taboo to "torch of freedom": the marketing of cigarettes to women. *Tob Control* 2000;9:3–8. doi:10.1136/tc.9.1.3 PMID:10691743
13. O'Keefe AM, Pollay RW. Deadly targeting of women in promoting cigarettes. *J Am Med Womens Assoc* 1996;51:67–9. PMID:8868553
14. Nerín I. [Women and smoking: fatal attraction]. *Arch Bronconeumol* 2005;41:360–2. [Spanish] doi:10.1016/S1579-2129(06)60241-3 PMID:16029727
15. Richmond R. You've come a long way baby: Women and the tobacco epidemic. *Addiction* 2003;98:553–7. doi:10.1046/j.1360-0443.2003.00342.x PMID:12751968
16. TOBACCODOCUMENTS.org [Internet]. Vslm print advertising test, April 5 1991. Tokyo: Philip Morris Kabushiki Kaisha; 1991. Available from: http://tobaccodocuments.org/pm/2504059015-9081.html [accessed 17 November 2010].
17. *Human development report 2009: overcoming barriers: human mobility and development*. New York: United Nations Development Programme; 2009. Available from: http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf. [accessed 17 November 2010].
18. Klasen S. Gender-related indicators of well-being. In: McGillivray M, editor. *Studies in development economics and policy, human well-being: concept and measurement*. New York: Palgrave MacMillan; 2007. pp. 167-92.
19. Schaap MM, Kunst AE, Leinsalu M, Regidor E, Espelt A, Ekholm O et al. Female ever-smoking, education, emancipation and economic development in 19 European countries. *Soc Sci Med* 2009;68:1271–8. doi:10.1016/j.socscimed.2009.01.007 PMID:19195749
20. Pampel FC. Global patterns and determinants of sex differences in smoking. *Int J Comp Sociol* 2006;47:466–87. doi:10.1177/0020715206070267
21. Gini C. Measurement of inequality and incomes. *Econ J* 1921;31:124–6. doi:10.2307/2223319
22. The World Bank. *Data and statistics* [accessed 5 May 2010]. Available from: http://data.worldbank.org/about/faq/specific-data-series.
23. The World Bank [Internet]. GNI per capita: PPP (current international $). Available from: http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD [accessed 17 November 2010].
24. *Women and the tobacco epidemic: challenges for the 21st century*. World Health Organization & Institute for Global Tobacco Control, John Hopkins School of Hygiene and Public Health. Available from: http://www.who.int/tobacco/media/en/WomenMonograph.pdf [accessed 17 November 2010].
25. Amos A. How women are targeted by the tobacco industry. *World Health Forum* 1990;11:416–22. PMID:2092689
26. *WHO Framework Convention on Tobacco Control*. Geneva: World Health Organization; 2003. Available from: http://whqlibdoc.who.int/publications/2003/9241591013.pdf [accessed 17 November 2010].

27. *Guidelines for implementation of Article 13 of the WHO Framework Convention on Tobacco Control (Tobacco advertising, promotion and sponsorship)*. Geneva: World Health Organization; 2008. Available from: http://www.who.int/fctc/guidelines/article_13.pdf [accessed 17 November 2010].
28. *WHO report on the global tobacco epidemic, 2009: implementing smoke-free environments*. Geneva: World Health Organization; 2010.
29. *WHO operational planning meeting for gender and tobacco projects: meeting report*. World Health Organization Tobacco Free Initiative; 2009. Available from: http://www.who.int/tobacco/wntd/2010/en_tfi_who_meeting_gender_and_tobacco_projects.pdf [accessed 17 November 2010].
30. Cavelaars AEJM, Kunst AE, Geurts JJM, Crialesi R, Grötvedt L, Helmert U et al. Educational differences in smoking: international comparison. *BMJ* 2000;320:1102–7. doi:10.1136/bmj.320.7242.1102 PMID:10775217
31. Fong GT, Cummings KM, Borland R, Hastings G, Hyland A, Giovino GA et al. The conceptual framework of the International Tobacco Control (ITC) Policy Evaluation Project. *Tob Control* 2006;15(suppl_3):iii83–94. doi:10.1136/tc.2005.015438 PMID:16754952
32. *Gender-sensitive education statistics and indicators: a practical guide*. Paris: United Nations Educational, Scientific and Cultural Organization, Division of Statistics; 1997. Available from: http://www.uis.unesco.org/ev.php?ID=5017_201&ID2=DO_TOPIC [accessed 17 November 2010].
33. Bardhan K, Klasen S. UNDP's gender-related indices: a critical review. *World Dev* 1999;27:985–1010. doi:10.1016/S0305-750X(99)00035-2
34. Cueva Beteta H. What is missing in measures of women's empowerment? *J Hum Dev* 2006;7:221–41. doi:10.1080/14649880600768553
35. Klasen S. UNDP's gender-related measures: some conceptual problems and possible solutions. *J Hum Dev* 2006;7:243–74. doi:10.1080/14649880600768595
36. Klasen S. Schüler D. *Reforming the gender-related development index (GDI) and the gender empowerment measure (GEM): some specific proposals*. Göttingen: Ibero-America Institute for Economic Research; 2009. Available from: http://ideas.repec.org/p/got/iaidps/186.html [accessed 17 November 2010].