CHAPTER 14.

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GENDER DIFFERENCES IN THE EFFECTS OF LONG-TERM ILLNESS ON INCOME ATTAINMENT

Illness is usually defined in terms of a limitation or lack of ability to perform an activity in a normal manner due to a person's physical or mental condition (Bury 2000; Finkelstein 2001; Thomas 2004). In this chapter, illness is considered from the labor market participation perspective. Individuals are "classified" as experiencing illness if they report a removal from the labor market due to their own sickness or disability for three or more months. Using this operational definition, I provide an empirical analysis of the effects of illness on income attainment, with a focus on gender differences.

The usual method for explaining income attainment, especially job earnings, involves the use of human capital characteristics—in particular, education and job experience (Hodson 1985). However, a broad understanding of human capital involves health; even Becker's (1964) classic work incorporates health as part of the human capital model.

In accordance with human capital theory, past economic literature has found that removal from the labor force due to ill health has significant wage penalties (Mincer and Ofek 1982). The exact extent of penalty for an illness varies drastically depending on occupation, health conditions, and demographic characteristics (Chirikos 1993). However, little is known about gender differences with respect to the possible effects of illness on income attainment. This is an important topic of inquiry because while theory predicts a lack of differences between women and men, everyday observations cast some doubt on this prediction.

Theoretical Background

Human capital theory is cited most often to explain why removals from the labor force impact income attainment. Removal from the labor force might indicate that the worker has some problems potentially affecting his or her productivity. Poor health belongs to these factors. Moreover, this theory posits that workers build "capital" in the form of education, job experience, and on-the-job training. Good health, high education, longer job experience, and obtaining on-the-job training positively influence income. Workers who experience an illness receive less pay than workers without an illness because their human capital diminishes due to their physical or mental condition and loss of skills (Ben-Porath 1967; Corcoran, Duncan, and Ponza 1983; Duncan and Hoffman 1979; Mincer and Ofek 1982; Mincer and Polachek 1974). In the same manner, it has been argued that individuals with poor health reduce the number of hours worked and/or modify their occupational tasks to better accommodate their health condition (Chirikos 1993; Pelkowski and Berger 2003).

However, human capital theory incompletely explains changes in income attainment caused by removal from the labor force, especially when comparing women and men. Gronau (1988) established that even after controlling for relevant variables, women suffer additional penalties for certain types of removals from the labor force. This finding calls for further investigation. In particular, what kind of gender difference in wage penalty for illness can be expected? What is the rationale for such an expectation?

Previous literature has proposed the basic hypothesis that women experience a significant decrease in income attainment, while men experience no significant effect of illness on income (Lovell 2006). Theoretically, this hypothesis, advanced for Sweden, seems to fit Poland as well. The general argument is that in Poland, as in other Central and East European countries, women experience discrimination in various forms. They earn on average 70–80 percent of what men earn; they are segregated into low-status, "light" manufacturing and service-sector jobs; they are overrepresented at the bottom rungs of employment hierarchies; and they have very high unemployment rates (Główny Urząd Statystyczny 2000; Łobodińska 2000; Pollert 2003; Reszke 1995). It is well documented that after the fall of communism poverty rates rose in Central and East European countries, which disproportionately affected women (Domański 1999).

Policies Regarding Illness

In Poland, prior to the fall of communism, all health care protection was provided by the state. Since 1989, protection for illnesses/disabilities has been provided by the state *and* employers. In 1997, legislation was passed transferring the financial responsibility from the government to compulsory employer contributions to a national network of health insurance companies (Filinson, Chmielewski, and Niklas 2003). Currently, four types of "illness situations" are distinguished: (1) long-term invalidism or disability, (2) sickness, (3) employment injury and occupational disease, and (4) illness/disability that qualifies for social assistance. Each of these situations involves different social policies.

For invalidism and disability pensions, eligibility and level of support depends upon incapacity to work, amount of contribution to the system, and age. Sickness-related absences are paid for by the Social Insurance Institution (ZUS) and by the employer. The ZUS provides coverage for lost earnings for long-term inabilities to work because of illness, beginning with the thirty-sixth day of incapacity. Prior to that time, workers receive earnings of no less than 80 percent of their salary from employers.

Workers are given protection for employment injuries and occupational diseases due to an accident at work, on the way to and from work, or as a result of an occupational disease. The benefit provides a maximum of 100 percent of an individual's wage-calculation base for those who are fully disabled and 75 percent for those who are partially disabled.

Finally, some ill/disabled workers qualify for social assistance. This protection is a based on low family income and "dysfunctional" family. This type of benefit covers physical and mental impairments as well as chronic diseases (Golinowska et al. 2003).

With the exception of policies regarding short-term sickness, all others apply to temporary removal from the labor force due to illness. Readers should be aware that these policies apply to women and men equally, although the extent to which the benefits are appropriated may differ.

Measurement and Method of Data Analysis

The sample consists of those respondents who (1) responded to all four waves of the POLPAN survey, 1988, 1993, 1998, and 2003, (2) either never had an illness or had an illness from 1988 to 2003, and (3) had income from a job in 1988 and 2003 (n = 463). Table 14.1 presents the coding procedures

for each variable in the analyses. An illness is defined as any removal from the labor force for three or more months for an illness or disability; hence, illness represents an extended period of removal from the labor force. Illness is presented as a dummy variable indicating whether one experienced the event or not; there is no differentiation for the type of illness. For the purpose of this analysis, only the first illness is taken into account.

Table 14.1. Variable Codings

Variable name	Coding procedure
Dependent variable	
Change in job income in percentiles from 1988 to 2003	Reported job income in percentiles in 1988 minus reported job income in percentiles in 2003 in Polish zlotys
Human capital variables	
Female	Female respondent = 1, otherwise = 0
Age in 1988 (years)	Respondent's age in 1988
Educational degree	Educational degree (polychotomous; more than high school degree, high school degree, and less than high school degree); high school degree is the reference category
Main independent variables	
Income in percentiles in 1988	Percentile of reported job income in 1988 in Polish zlotys
Illness/disability	Had an illness or disability = 1, otherwise = 0
Illness*female	Interaction of female (female = 1) with whether one had an illness or disability (yes = 1)
Proportion of female unemployment by voivodship in 2000	Of the total number of unemployed by voivodship in 2000, the proportion of females who were unemployed
Job complexity, 2003	Scale of job complexity in 2003

Income in 1988 and 2003 is converted to percentiles to account for skewness and for differences in the value of Polish zlotys over time. For the regression analysis, the dependent variable is change in reported job income from 1988 to 2003; therefore, the coefficients can be interpreted as changes in wages. Job income in 1988 is included as an independent variable to account for a ceiling and floor effect. Hence, the incomes of those with high incomes in 1988 have a limited potential to increase—the ceiling effect. Conversely, for those with low incomes in 1988, there is a floor effect—limited potential for a decrease in wages.

The regression equation for this simplest model (Table 14.2, Model 1) is the following:

$$W_t - W_{t-k} = a + b_1 W_{t-k} + b_2 X_{\text{female}} + b_3 X_{\text{illness}} + b_4 X_{\text{illness*female}}$$

$W_t - W_{t-k}$ is the change in wages from 1988 to 2003 and W_{t-k} is job income in percentiles in 1988. This model specifies that the change in earnings for 1988–2003, controlling for earnings in 1988, is a function of illness and gender. Since the equation contains the interaction term (illness*female) it allows us to answer whether the effect of illness on income change is different for women and men.

Results

To determine whether women and men differ with regard to when in their life cycle they experience an illness, women's and men's ages when illness occurred are compared. The age at first illness was constructed through the use of a question that asked respondents the year they experienced their illness. The results support the predicted hypothesis that women and men do not differ significantly regarding when they experience illness. The average age of illness for women is 40.77 years (standard error = 1.045) and for men is 43.15 years (standard error = 1.024). *T*-tests were conducted, and the results indicate that women's and men's mean ages at illness do not differ significantly (at $p < 0.05$).

Table 14.2 presents two change-score regression models to assess the long-term effect that illness has on income attainment. Model 1 suggests that there is a significant, negative impact of illness from 1988 to 2003 for men but not for women. In the presence of the negative coefficient for illness ($b = -17.997$), the coefficient for females is negative but small ($b = -1.295$) while the interaction term (female*illness) is positive and large ($b = 20.963$). Thus, on the basis of this model, we can expect a decrease in income associated with illness for men but not women. This result contradicts my initial hypothesis. The question is: to what extent is this result robust?

Model 2 includes human capital variables. Human capital characteristics consist of factors that alter one's potential for wages: education and age. Both new variables are important for explaining changes in wages over time. For education, high school education is the reference category. Hence, those with less than a high school degree have a statistically significant decrease in wages as compared to those with a high school degree, while having more than a high school degree is associated with a significant positive increase in

wages in relation to those with a high school education. Similarly, we observe that with increased age one can expect decreased income differential. However, illness retains its impact, as in the previous model.[1] The interaction coefficient for illness and female is significant and positive.

Table 14.2. Regression of Change in Job Income (in Percentiles) from 1988 to 2003 on Illness and Sex, Controlling for Job Income in Percentiles in 1988, Human Capital Characteristics, and Interactions

Covariates	Regression coefficients	SE	Beta	Regression coefficients	SE	Beta
Main independent variables						
Job income in percentiles, 1988	–0.743***	0.052	–0.589	–0.795***	0.045	–0.629
Illness, 1988 to 2003 (yes = 1)	–17.997**	6.070	–0.151	–16.257**	5.096	–0.136
Female	–1.295	2.963	–0.019	–7.810**	2.535	–0.112
Illness, 1988 to 2003* Female	20.963**	8.920	0.123	18.715**	7.464	0.109
Human capital characteristics						
Less than high school education, 1988 (yes = 1)[a]				–16.279***	2.737	–0.233
More than high school education, 1988 (yes = 1)[a]				20.721***	2.958	0.273
Age, 1988				–0.405**	0.160	–0.082
R^2	0.365			0.365		
Root mean square error	27.771			23.196		
Constant	37.113	3.931		57.658	6.788	
N	463			463		

[a]Reference category is high school education.
***$p < 0.001$; **$p < 0.01$ one-tailed; *$p < 0.05$ one-tailed.

To uncover gender differences in the impact of illness on job income, Model 1 in Table 14.3 includes interactions of gender with illness during specific periods of time. Overall, the coefficient for female is negative ($b = –7.775$), but it is much smaller than the size of the positive coefficients for interactions

($b_{\text{female*illness1988–1992}} = 19.165$;
$b_{\text{female*illness1993–1997}} = 20.836$;
$b_{\text{female*illness1998–2003}} = 0.693$).

[1] Age squared was also added to the model to test the nonlinear impact of age on income. However, this variable was removed since it was insignificant.

Thus, the results again demonstrate that it is men, and not women, who are significantly, negatively impacted by illness. While the interaction coefficient term is statistically significant only in the case of the period 1993–1997, its value is also sizable for other periods.

Table 14.3. Regression of Change in Job Income (in Percentiles) from 1988 to 2003 on Illness in Specific Time Periods and Sex, Controlling for Job Income in Percentiles in 1988, Human Capital Characteristics, Interactions, Female Unemployment and Job Complexity

	Model 1			Model 2		
Covariates	Regression coefficients	SE	Beta	Regression coefficients	SE	Beta
Main independent variables						
Job income in percentiles, 1988	–0.798***	0.045	–0.632	–0.863***	0.049	–0.722
Female	–7.775**	2.532	–0.112	–6.105**	2.568	–0.098
Human capital characteristics						
Less than high school education, 1988 (yes = 1)[a]	–16.498***	2.744	–0.237	–6.328*	2.87	–0.100
More than high school education, 1988 (yes = 1)[a]	20.899***	2.977	0.275	11.024***	3.117	0.168
Age, 1988	–0.401**	0.160	–0.081	–0.510**	0.163	–0.010
Time periods for illness						
Illness in 1988–1992 (yes = 1)	–28.863**	10.599	–0.127	–17.092*	9.778	–0.094
Illness in 1993–1997 (yes = 1)	–10.461	7.942	–0.058	–20.413*	8.752	–0.117
Illness in 1998–2003 (yes = 1)	–11.982	7.504	–0.063	–5.706	6.444	–0.038
Interactions						
Illness in 1988–1992 (yes = 1)*Female	19.165	14.358	0.063	5.267	12.600	0.023
Illness in 1993–1997 (yes = 1)*Female	20.836*	11.272	0.083	30.351**	11.830	0.130
Illness in 1998–2003 (yes = 1)*Female	10.693	12.282	0.035	4.683	10.303	0.020
Additional variables						
Proportion of female unemployment[b]				–18.858	41.672	–0.015
Job complexity				0.050***	0.008	0.312
R^2	0.365			0.633		
Root mean square error	27.771			18.761		
Constant	37.113	3.931		48.834	23.761	
N	463			337		

[a]Reference category is high school education
[b]This a contextual variable measured on the level of voivodships.
***$p < 0.001$; **$p < 0.01$ one-tailed; *$p < 0.05$ one-tailed.

This finding is opposite to the expected hypothesis. Why do women, in comparison with men, experience an increase in earnings after illness? What are the sources of the penalty for illness in the case of males? Several analyses were conducted in order to answer these questions. First, I included additional variables in Model 1 of Table 14.3. The proportion of females who were unemployed in 2000 by voivodship was obtained from the Główny Urząd Statystyczny (2003). The rationale for including this variable is that it could influence the impact of gender on wages because in regions with female unemployment, the earnings are much lower than in other regions. However, the lagged effect for female unemployment appears to be insignificant.

I also included a variable for job complexity, a proxy measure for type of job. Job complexity is an interval variable derived from a series of questions regarding specific tasks on the job, with a higher score indicating more complexity (Slomczynski and Kacprowicz 1979). The coefficient for job complexity is significant and positive, which indicates that those with higher levels of job complexity have significant increases in wages over time, although the male illness penalty remains.[2] The illness penalty for males is larger in Model 2, and there appears to be a lagged effect, so that those illnesses that occurred earlier have a larger impact on changes in wages than those that occurred later.

I also considered selection bias. It seems plausible that the male illness penalty could be due to the fact that women are more likely to drop out of the labor force and that those who retired had higher income than those who stayed. However, the opposite seems to be true. Here, statistics for the variable "dropped out of the panel" are a good proxy for the variable "dropped out of the labor force in the period 1988–2003." The average adjusted value of income for women who dropped out of the panel (n = 370) is 879 zlotys, the average income for women in 1998 (n = 574) is 1,097 zlotys, and the average income for women in 2003 (n = 224) is 1,401 zlotys.

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[2] To further flesh out the human capital argument, sector of the economy was included in the model but was removed for nonsignificance. As Poland has moved to a more capitalist, unregulated state, the labor market has become increasingly segmented. Variables were created to capture this segmentation based upon the amount of regulation in the sector for main job in 2003: state regulated, private regulated, private unregulated. The direction of the coefficient for state suggests that the state sector is associated with increased change in wages, and the coefficient for the interaction of female and state indicates that women in the state sector have decreased wages. However, neither of these coefficients was significant.

Hence, women who dropped out of the panel did not have higher incomes than those who stayed in the panel, and lack of retention in the panel/labor market does not create a male illness penalty.

Discussion

Although women and men have illness at the same stages in the life cycle, removal from the labor force due to illness significantly decreases men's income attainment but not women's. Women have decreases in wages over time compared with men; however, the interactions for gender and illness show that men, and not women, experience an illness wage-penalty. This result is surprising considering previous literature that describes women's disadvantage in the labor market. Lovell (2006) established a female illness penalty in Sweden, which is arguably the most gender equitable country in the world.

Although not directly measured in this analysis, micro-level variables might explain why this gendered penalty exists. Workers' wages are tied to certain preconceived expectations about their productivity, which do not have a factual basis. Thus, workers who experience illness might be perceived as having lower levels of job commitment, and thus, are more likely to experience greater wage penalties. This may be especially true in a developing market economy with high unemployment, where employers are usually less willing to accommodate ill workers when a limited number of jobs are available. Previous literature attests to a generalized stigma against men with physical/mental disabilities because these conditions are contrary to the assumptions of hegemonic masculinity (Gerschick and Miller 2004). Since Poland is witnessing growing conservative attitudes toward gender (Pollert 2003), it is plausible that employers discriminate against men who remove themselves from the labor force for extended periods of time. In the minds of conservative employers, men's illness could mean much less productivity than is the case for women. To empirically test this supposition, further research must be conducted.

New research is needed in other areas to explain wage penalties with respect to gendered illness and wage penalty. I do not measure the type of illness. Women and men potentially have different types of illness, and those types of illness can have varying effects on changes in wages.

In addition, to further examine gender differences with respect to the impact of illness on wages, more cross-national/comparative studies should be conducted to answer the questions: Does the institutional setting matter? Do other post-communist countries follow a pattern similar to Poland's? To what extent does the changing "generosity" of the welfare state matter?