Productivity Losses of Chronic Diseases Among Canadian Labour Force in 1994 & 2005: Estimates from a Nationally Representative Sample

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OBJECTIVE

To Estimate the Productivity Labour-Related Losses from 22 Chronic Disorders including: Diabetes Mellitus (DM), DM-Related Comorbidities (DRCOM), 16 Other non-Diabetic Chronic Disorders (e.g., arthritis, cancer), and some Risk Factors: BMI, smoking, # of regular drinkers (> 3 drinks/week), and physical exercise.

HYPOTHESIS

DM, DRCOM increase the probability of having disability days, the number of disability days, and earnings, ceteris paribus.

The multivariate labor supply model: D = f(X, DM, DRCOM, other chronic)disorders ξi)

 $\partial D / \partial DM$ related disorders ≥ 0 H_0 :

DATA

National Population Health Survey (NPHS) 1994 & Canadian Community Health Survey (CCHS) 2005

Ages between 20-65, excluding students & retired NPHS: 5,627 women and 4,867 men & CCHS: 32,637 women and 30,119 men If Disability days > 0 = 1, else = 1(0,1), #Disability days/year, annual earnings Socio-demographics (age, sex, education, marital status, kids under 11 years in household, regional economic conditions), DM, DRCOM, 16 Other nondiabetic chronic disorders, #drinking, smoking.

RESEARCH DESIGN AND METHODS & ECONOMETRICAL MODEL

A two-part model is used to estimate the impact of DM on labour market outcomes:

Part I: logistic regression for probability of having disability day part II: log-transformed OLS regression to estimate # of disability days and proxy annual earnings, for workers

Part I x Part II: to estimate #disability days & earnings losses for all samples Reference Categories are single, divorced, less than high school education, and healthy me ^a Represents P-Value < 0.01, ^b represents P-value < 0.05, ^c represents P-value < 0.10 (workers and non-workers). Paper presented at Conference on Health over the Life Course, University of Western Ontario, London, Ontario, 14-16 October 2009."

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RESULTS

Data / Variable	NPHS 1994	Υ.		CCHS 2005	,	
	W & M	Women	Men	W & M	Women	Men
	(1094)*	(5627)	(4867)	(62756)*	(32637)	(30119)
Dependent Variables						
Disability days status	.15	.17ª	.12	.19ª	.22	.15
# Disability days	.85	.96ª	.73	.97ª	1.12	.80
Annual income	44,206	42,302ª	46,410	54,099ª	50,944	57,518
Income(C\$93& C\$04)	27,432	21,674ª	34,088	46,575ª	40,988	5,230
Independent Variables	•	•				
DM	.02	.022	.019	.04ª	.04	.04
DRCOM	.09	.096	.08	.15 ^b	.15	.15
16 Non-DM Chronic	.40	.451	.33	.60 a	.67	.52
BMI	25.45	24.83	26.16	26 ª	25.73	26.88
Age	39	40	39	38 ^a	39	38
Married	.64	.63 a	0.64	.62 a	.64	.60
Less than Secondary	.22	.21	.23	.07 b	.07	.08
Secondary Grad	.17	.17	.16	.12 ^b	.12	.12
Post-Secondary	.38	.37	.39	.80 a	.81	.80
Kids < 11 years	.19	.22	.17	.29 a	.31	.26
Regular Smokers	.37	.35	.39	.30 a	.28	.32
Regular Drinkers	.31	.39	.21	.11 ^a	.07	.16
Physical Exercise	.40ª	.41	.38	.51	.51	.50
Unemployment Rate	12	11	12	8 a	7	8

Table 3. Impact of Diabetes on Labour Market Outcomes in Canada in 1994 & 2005, Men (SE)							
	NPHS 1994			CCHS 2005			
	DISABILITY STATUS : LOGISTIC ANALYSIS, ODDS RATIO	LN DISABILITY DAY AMONG THOSE WITH DISABILITY DAYS > 0	LN ANNUAL INCOME AMONG THOSE WITH DISABILITY DAYS > 0	DISABILITY STATUS : LOGISTIC ANALYSIS, ODDS RATIO	LN DISABILITY DAY AMONG THOSE WITH DISABILITY DAYS > 0	LN ANNUAL INCOME AMONG THOSE WITH DISABILITY DAYS > 0	
DM	0.68 (0.27)	. 0.03 (0.31)	0.10 (0.23)	1.15 (0.14)	0.13 (0.10)	32 (0.27)	
DRCOM	2.0 *** (0.38)	0.22 (0.17)	0.07 (0.10)	1.55*** (0.11)	0.15 ***(0.06)	0.02 (0.11)	
Greater than 2 weeks	2.10 *** (0.43)	0.57 ***(0.17)	05 (0.10)	2.77 ***(0.26)	0.36 (0.07)	.56 *** (0.21)	
Other Chronics	2.47*** (0.74)	0.18 (0.20)	02 (0.12)	2.38*** (0.13)	.17 (0.04)	-0.13 (0.10)	
Smoking Daily/occasio	1.22 (0.16)	.01 (0.11)	05 (0.08)	1.23 ***(0.07)	.12*** (0.04)	-0.25 ***(0.10)	
Regular Drinker > 3 /	1.11 (0.15)	0.06 (0.11)	16* (0.08)	0.97 (0.07)	06 (0.06)	.14 (0.12)	
Sample size	4867	600	340	30116	4525	3244	
***Represents P-Value < 0.01,	** represents P-value < 0.05,	* represents P-value < 0.10					



CONCLUSIONS & FUTURE RESEARCH

The average # of disability days increased from 0.85 to 0.96 (during the past 2 weeks of the survey) for both men and women (M&W). While the average prevalence of all chronic disorders increased in both men & women, depression decreased in them. Among risk factors, # of smokers dropped, # of regular drinkers and those who had physical exercise increased, however, BMI increased for both M&W. The productivity losses (probability of having disability days, number of disability days, and earnings) due to DM & DRCOM are significant in both 1994 and 2005 for men. While the productivity losses associated with DM, DRCOM, depression, and sixteen other non-DM related disorders decreased in 1994 & 2005 for women, they increased for men during these years only for DM, but decreased for other chronic disorders. Few studies suggest that people are behaving healthier. The # of deaths due to heart disease decreased during the past decade due to better risk factors, such as, decreased #of smokers, increased # of regular drinkers & those who exercised regularly. Our study results suggest that prevention through risk factors may decrease disability days beside rate of mortality and morbidity. This study especially could be replicated by longitudinal version of NPHS 1994 & 2009.



NPHS 1994			CCHS 2005				
BILITY			DISABILITY				
TUS	LN DISABILITY	LN ANNUAL	STATUS	LN DISABILITY	LN ANNUAL		
ISTIC	DAY AMONG	INCOME	: Logistic	DAY AMONG	INCOME		
YSIS,	THOSE WITH	AMONG	ANALYSIS,	THOSE WITH	AMONG		
Ratio	DISABILITY	THOSE WITH	ODDS RATIO	DISABILITY	THOSE WITH		
	DAYS > 0	DISABILITY		DAYS > 0	DISABILITY		
0.848)	0.23 (0.18)	0.03 (0.09)	1.5 *** (0.15)	0.11 (0.069)	002 (0.19)		
(0.281)	0.35*** (0.11)	0.04 (0.09)	1.37 ***(0.088)	0.17 ***(0.05)	0.02 (0.12)		
(0.29)	0.226** (0.10)	-0.03 (0.08)	2.17 *** (0.15)	0.29 *** (0.05)	-0.22 (0.17)		
0.73)	0.202 (0.13)	0.055 (0.07)	2.85 *** (0.15)	0.12 *** (0.04)	0.07 (0.17)		
0.12)	0.16* (0.08)	-0.03 (0.07)	1.35 *** (0.064)	0.06 * (0.03)	0.03 (0.1)		
0.11)	-0.09 (0.08)	-0.11 (0.08)	0.79 *** (0.07)	-0.01 (0.07)	0.34 ***(0.13)		
27	931	358	32634	7065	7065		