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On Portfolios of Preventive Decisions for Multiple Health Risks - Evidence from U.S. Data*

Christophe Courbage
Associate Professor
Geneva School of Business Administration
University of Applied Sciences Western Switzerland (HES-SO)
Switzerland

Veronika Kalouguina
PhD student in Actuarial Science
Department of Actuarial Science
Faculty of Business and Economics (HEC)
University of Lausanne – Switzerland

Abstract: Individuals face multiple health risks and therefore can undertake many preventive activities simultaneously creating a portfolio of preventive activities. In this article, we firstly investigate the determinants likely to influence the composition of preventive activities portfolios. Secondly, we look at the interactions between preventive activities. We use the U.S. Behavioral Risk Factor Surveillance System survey dataset conducted in 2016, comprising 22'510 observations from 50 states and U.S. territories. Our results show that information-related variables, in particular awareness of illness, access to information, and having a personal doctor, increase the portfolio size of preventive activities. We also show that vaccinations tend to be performed together with screening activities and to a lower extent with exercising.

Keywords: Multiple Preventive Activities; Health Information; Preventive Health Behavior; Health Risks

Short annotation: This article, using the 2016 U.S. Behavioral Risk Factor Surveillance System survey, shows that awareness of illness, access to information, and having a personal doctor increase the portfolio size of preventive activities. It also shows that vaccinations tend to be performed together with screening activities and to a lower extent with exercising.

* Corresponding author : Christophe Courbage, Geneva School of Business Administration, University of Applied Sciences Western Switzerland (HES-SO), Geneva 1127, Switzerland, Email: christophe.courbage@hesge.ch

1. Introduction

Given that individuals face multiple risks, e.g. risks of cancers, influenza, flu and heart attacks, they are most likely to undertake different preventive activities simultaneously, e.g. cancer screenings, vaccination, health check-up and regular physical activity (Spring et al., 2012). They hence create a portfolio of preventive activities. Understanding the drivers of such portfolios of preventive activities is crucial to design efficient health policies. Indeed, public authorities must be able to foresee the potential outcome of a policy and to predict the spillover effects of a prevention-oriented policy before implementing it, especially when another program is already targeting a different prevention type.

The importance of information in driving specific preventive activities has already been highlighted in the literature, including awareness of health issues (Slark and Sharma, 2014), health literacy (DeWalt et al., 2004; Fernandez et al., 2016), health knowledge (Vanslyke et al., 2008) and the role of the general practitioner as a mean and source of health information (Qi et al., 2006; McIlfatrick et al., 2013). Along with information, other determinants of specific preventive activities include socio-economic factors such as age, marital status, the level of income and self-reported health (Welch et al., 2008; Dorner et al., 2013), as well as risk attitudes (Hoebel et al., 2014) and health insurance (Simon et al., 2013). However, most of this literature addresses the determinants of one specific preventive activity instead of a whole portfolio of individual preventive decisions. We thus aim to fill this gap in the literature by specifically considering in this paper the drivers of the number of preventive activities, i.e. of the size of portfolios of preventive activities. We especially focus on health-related information drivers including experience with health risks as related to being a caregiver, easy access to health information and having a general practitioner.

The determinants of one preventive activity can also affect the realisation of another, giving rise to the issue of complementarity between preventive activities (see e.g. Beydoun and Beydoun, 2007). For instance, Carlos et al. (2005) show that Prostate-Specific Antigen (PSA) screenings are more likely to be performed with a colorectal cancer screening. Welch et al. (2008) document that regular physical exercise and being a non-smoker are determinants of feminine cancer screening. However, considering

statin use and health behaviours as preventive activities, Kaestner et al. (2014) find conflicting evidence for the hypothesis that investments in disease prevention are complementary. The question of complementarity hence remains open. We hypothesize that the relationship between preventive activities might depend on their nature, e.g. being behavioural or medicalized.

In this article, using the U.S. Behavioral Risk Factor Surveillance System survey dataset which encompasses many types of preventive activities, we aim at: (1) investigating the determinants likely to alter the composition of preventive activities portfolios, with a focus on the role played by health-related information and (2) identifying preventive activities that are complementary to each other and encourage each other's uptake.

2. Methodology

2.1 Data

For the purpose of our study, we used the Behavioral Risk Factor Surveillance System (BRFSS) survey dataset. BRFSS is a health-related phone survey carried in all the 50 states of the U.S. with the District of Columbia and three U.S. territories. The BRFSS collects state data about U.S. residents regarding their health-related risk behaviours, chronic health conditions, and use of preventive services. The BRFSS data set was particularly well suited for our analysis as it contains information on several types of preventive activities, including both medical and non-medical preventive activities amongst which mammography, Papanicolaou (Pap) test, Human Papilloma Virus (HPV) test, blood stool test for colorectal cancer, colonoscopy, Prostate-Specific Antigen (PSA) test, check-up, tetanus and flu vaccinations and exercising. We used the 33rd wave conducted in 2016 which is composed of 22'510 complete observations.

2.2 Variables

Dependent variables

We used two types of dependent variables for preventive activities classified by gender. We subdivided the population into two groups, individuals below and above 50 years old following the U.S. Preventive Services Task Force recommendations regarding cancer screenings (US Preventive Services Task Force, 2008). This allows for a better tailored portfolio as several cancer screenings are not available or are very rarely administered below the age of 50.

The first dependent variable was the sum of preventive activities per individual performed during the past 12 months. These preventive activities are presented in Table 1. The number of performed preventive activities summed up to a maximum of 6 for women aged below 50 and up to a maximum of 9 for women aged above 50. As for men, this number went up to 4 for men below 50 and 7 for those above 50 years of age.

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Insert Table 1 about here

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The second type of dependent variable was a selection of preventive activities, which were segregated in three types according to their nature, i.e. being behavioural preventive activity, screening and vaccinations as presented in Table 1. The classification of preventive activities by types allowed us to investigate the interactions between preventive activities of different nature. The underlying hypothesis was that relationships between preventive activities may depend on the type of prevention and the former may change depending on individual's age.

Information-related variables

We defined three variables to account for the role of health-related information on preventive activities. The first variable was a caregiver dummy variable. The underlying assumption justifying the use of this variable was that caregivers have a greater experience with health risks and their consequences, which may in turn incentivise them to pay more attention to their own health (Banford

et al., 2001; Broughton et al., 2011). This variable hence proxied the effect of awareness about potential health issues and their consequences.

The second variable was a dummy variable assessing the easiness of the respondent to get advice or information about health or medical topics if needed. This variable allowed to control for the accessibility of information to the individual, which in turn may influence preventive decisions.

The third variable was a personal doctor (PD) dummy depending on whether the individual reported having one person he/she thinks of as a PD or health care provider or not. Having a personal doctor is a well-recognised source of health information and individuals reporting having a personal doctor should be more likely to have a better and more personalised information about the benefits of preventive activities (see e.g. Noar et al. (2007)).

Other variables

Following the literature, we included a set of control variables which have been shown to affect preventive decisions. We first included a series of socio-economic factors, namely age, marital status, number of children below 18 years, education higher than high school, preferred race, employment and income. Concerning health-related control variables, we included health coverage, which is a dummy variable assessing whether the respondent has any kind of health coverage including health insurance, prepaid plans such as HMOs or government plans such as Medicare or Indian Health Service. We also included the subjective health, which was a count variable ranging from 1 (poor) to 5 (excellent). Finally, we added a health-risk tolerance variable to capture the idiosyncratic relationship of the respondent to health risks. This variable was a dummy controlling for whether the respondent smoked in his/her entire life at least 100 cigarettes, has driven drunk at least once in the past 30 days or if the respondent has had a red or painful sunburn that lasted a day or more during the past 12 months.

Descriptive statistics

Table 2 provides a concise description of the set of variables used in the next section's econometric

specifications.

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Insert Table 2 about here

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2.3 Econometric methodology

Following Carlos et al. (2005) and Welch et al. (2008) who used the same BRFSS dataset, our first regression was a linear model with White standard errors to correct for heteroskedasticity. The dependent variable was the number of individual preventive activities. The explanatory variables were the set of informational factors and all the individual control variables. This first model aimed at investigating the determinants of the size of preventive activities' portfolios. We also considered a sub-model for which the sum of preventive activities corresponded only to either screening activities or vaccination activities in order to address the determinants of more specific portfolios of preventive activities, i.e. portfolio of screening activities and portfolio of vaccination activities.

The second linear regression, also corrected for heteroskedasticity with White standard errors, was ran on the three groups of preventive activities described in Table 1. In addition to the information-related variables and our control variables, we included in the set of explanatory variables the other preventive activities groups. This second model aimed at investigating the interactions between different types of preventive activities.

3. Results

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Insert Table 3, Table 4, Table 5 and Table 6 about here

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3.1 Information-related determinants

Starting with the caregiver variable, its effect on the size of the total portfolios of preventive activities is overall positive for individuals aged below 50 years old. For these individuals, having provided regular

care or assistance to a person with health problems or disability during the last 30 days increases the size of the portfolio by 0.3 units for women and 0.24 for men.

As for the role of ease of access to medical information, it correlates positively and significantly with the size of the overall portfolio of preventive activities indifferent of age and gender. However, the ease of access to health information seems to be much higher for respondents aged 50 and above. When it comes to portfolio of screening activities, only women aged 50 and above are sensitive to the easiness of access to information.

Regarding the variable PD, it impacts positively and very significantly the size of the overall portfolio of preventive activities disregarding age and gender. This variable is the most important driver of the size of the overall portfolio (β between 0.50 and 0.78). The presence of a PD is more valued by individuals aged 50 and above as it represents for both men and women one-third to one-half of the standard deviation of the size of the portfolio. The same results apply for portfolios of screenings and of vaccinations.

3.2 Socioeconomic determinants

Looking at the effect of some of our control variables, as shown in Table 4, being married has a positive impact on men's overall portfolio above 50 years old. This is especially the case when it comes to the portfolio of screening activities. Looking at education, a level higher than a high school diploma leads to a larger overall portfolio in younger women and men of all ages. Healthcare coverage is also significant, mostly for portfolios of cancer screenings and of vaccinations.

It is also worth noting that an increase in subjective health is positively correlated with the number of overall preventive activities performed both for men and women above the age of 50. However, when it comes to portfolios of specific preventive behaviours, a decrease in subjective health leads to an increase in the number of vaccinations.

3.3 Interaction between preventive activities

For women, health screenings and vaccinations are complementary. A woman aged 50 year and over,

who underwent during the last 12 months at least one preventive activity in the "vaccination" portfolio, has a "screenings" portfolio larger on average by 0.36 units than a woman who did not, ceteris paribus. Similarly, a woman who is exercising has a larger portfolio of screening activities. This relationship applies the other way round, e.g. a woman above 50 years old, who underwent a screening is more likely to undergo a vaccination or to exercise. The complementary relationship between health screenings and vaccinations holds for men as well, while the complementary relation between exercising and health screenings holds only for men below 50. Exercising and vaccinations, however, present statistically weak results and no pattern is decipherable.

4. Discussion

Our results can be related to previous studies. When it comes to the positive association between being a caregiver and the size of portfolio of preventive activities, our results go along with Brown and Brown (2014) showing that care giving may yield beneficial health and well-being outcomes. One explanation could be that care giving is associated with more preventive activities. Indeed, caring after dependent individuals seems to raise awareness about potential health problems and the benefit of preventive activities for individuals below 50 years old. Interestingly, this variable stops being relevant for those aged older than 50. This could occur as individuals aged 50 and above may have already experienced themselves health problems or have relatives with health problems hence rendering this feature meaningless. Therefore, raising awareness about health problems among young men tends to increase the number of screenings they perform. Our results also highlight the dominant role of the PD in driving the number of performed preventive activities. These results confirm earlier works on the topic, for instance those of Qi et al. (2006) showing that in Canada the presence of a regular medical doctor was associated with increased rates of a specific preventive screening.

When it comes to socio-demographics drivers, being married increases the portfolio size of preventive activities for men above 50 years old. These results are in line with the observation of Jaffe (2007) and Manzoli (2007) who found that mortality rates were lower for married men. Married women

seem to have a positive influence on their spouse in terms of taking care of themselves and hence perform more preventive activities. Our findings present a channel through which we observe more longevity for married men as they perform a higher number of preventive activities. Health coverage increases the number of cancer screenings and of vaccinations, which could be explained by the fact that these preventive activities are medicalized and hence can potentially be reimbursed by insurance. As for the role of subjective health, it seems that younger individuals are less driven by their health when deciding to perform preventive activities. However, subjective health is shown to be negatively associated with the number of vaccinations. This is in accordance with Wu (2003) who showed that respondents with poorer health are more likely to be vaccinated.

Finally, vaccinations is shown to be positively associated with screening activities and to a lower extent with exercising. These results confirm that the complementary relationship between preventive activities depend on the nature of the preventive activities considered.

While we believe that our results provide the right correlations between the variables of interest, one important limitation of our study comes from the cross-sectional nature of our data. Therefore, causation has to be inferred with caution. Additionally, our data are based on a survey that contains only self-reported answers which can entail biases attributed to social desirability and could distort the results (van de Mortel, 2008; Bauhoff, 2011). Finally, the measurement or non-response biases cannot be entirely excluded from any survey (Schneider et al., 2012).

5. Conclusion

Our results offer some valuable insights in terms of prevention-oriented policies. In particular, they highlight the role and quality of health information in driving the overall portfolio of preventive activities. Not only awareness of health issues plays an important role in influencing the number of preventive activities but more importantly, the role of health professionals, and in particular the PD, is paramount in that respect. Hence, in the aim of developing preventive activities, PD and other health professionals should communicate further to their patients on the benefits of such behaviours.

Furthermore, communication should target single and young individuals in priority as they are less likely to perform multiple preventive activities than married and older individuals, especially when it comes to screening activities.

Another insight from our results is related to the complementarity between some preventive activities. This complementarity suggests that having performed one specific preventive activity is a cue to action to perform another. Hence, policies promoting vaccinations should also influence the uptake of screenings activities (and vice versa).

While our results apply to the U.S., a comparison between countries is necessary to understand whether our observations are related to a country's healthcare system or deeply rooted in human behaviour. In that respect, generalizing our study to Canada, for example, which has a universal single payer health care system very different from the U.S. system but a rather similar culture, would offer a relevant test of our results.

	Prevention before 50 years old			Prevention after 50 years old		
	Behavioural	Screenings	Vaccination	Behavioural	Screenings	Vaccination
Men	Exercise	Check up	Flu Tetanus	Exercise	Check up Blood stool Colonoscopy PSA test	Flu Tetanus
Women	Exercise	Check up Pap. Test HPV test	Flu Tetanus	Exercise	Check up Blood stool Colonoscopy HPV test Pap. Test Mammography	Flu Tetanus

Table 1: Portfolios of preventive activities

Variable	Mean	Std. Dev.	Min.	Max.	N	Variable	Mean	Std. Dev.	Min.	Max.	N
Dependent variables						Preferred race category					
Nb. prev. woman < 50	2.424	1.941	0	6	4577	White	0.623	0.485	0	1	22510
Nb. prev. woman > 50	2.561	2.362	0	9	8044	Hispanic	0.219	0.414	0	1	22510
Nb. prev. man < 50	2.165	1.198	0	4	3861	Black	0.116	0.320	0	1	22510
Nb. prev. man > 50	2.367	1.939	0	7	6028	Asian	0.014	0.116	0	1	22510
Exercising woman < 50	0.781	0.414	0	1	4577	Married	0.524	0.499	0	1	22510
Exercising woman > 50	0.711	0.453	0	1	8044	Children	0.525	1.004	0	9	22510
Exercising man < 50	0.841	0.366	0	1	3861	Education	0.697	0.460	0	1	22510
Exercising man > 50	0.767	0.423	0	1	6028	Employment status					
Screenings woman < 50	1.288	1.156	0	3	4577	Employed	0.450	0.498	0	1	22510
Screenings woman > 50	1.575	1.509	0	6	8044	Self-employed	0.088	0.284	0	1	22510
Screenings man < 50	0.595	0.491	0	1	3681	Student	0.023	0.150	0	1	22510
Screenings man > 50	1.140	1.056	0	4	6028	Retired	0.273	0.446	0	1	22510
Vaccinations woman < 50	0.876	0.781	0	2	4577	Out of work	0.135	0.342	0	1	22510
Vaccinations woman > 50	0.956	0.787	0	2	8044	Income level					
Vaccinations man < 50	0.875	0.717	0	2	3861	< $25 000	0.315	0.464	0	1	22510
Vaccinations man > 50	1.023	0.776	0	2	6028	from $25 000 to $50 000	0.227	0.419	0	1	22510
Independent variables						> $50 000	0.458	0.498	0	1	22510
Caregiver	0.213	0.410	0	1	22510	Healthcare coverage	0.948	0.222	0	1	22510
Info. Access	0.752	0.432	0	1	22510	Subjective health	3.451	1.072	1	5	22510
PD	0.820	0.384	0	1	22510	Health risks tolerance	0.146	0.353	0	1	22510
Male	0.439	0.496	0	1	22510						
Age											
18 to 34	0.161	0.368	0	1	22510						
35 to 49	0.214	0.410	0	1	22510						
50 to 64	0.316	0.465	0	1	22510						
65 to 74	0.190	0.392	0	1	22510						
75+	0.119	0.324	0	1	22510						

Table 2: Descriptive statistics

	Prevention portfolio woman		Prevention portfolio man	
	< 50 y.o.	> 50 y.o.	< 50 y.o.	> 50 y.o.
Info.-related				
Caregiver	0.300*** (0.104)	-0.090 (0.099)	0.235*** (0.089)	0.058 (0.106)
Info. access	0.199* (0.106)	0.399*** (0.110)	0.176** (0.069)	0.299** (0.090)
Personal doctor	0.547*** (0.109)	0.727*** (0.144)	0.502*** (0.068)	0.779*** (0.105)
Control variables				
Age (baseline: 18 to 34)				
35 to 49	-0.157 (0.101)		0.004 (0.067)	
65 to 74		-0.294** (0.119)		0.110 (0.112)
75+		-0.667*** (0.136)		-0.294** (0.139)
Preferred race (baseline: None)				
White	-0.101 (0.295)	0.433 (0.312)	0.045 (0.179)	0.097 (0.240)
Hispanic	0.380 (0.356)	1.690*** (0.407)	0.166 (0.211)	0.308 (0.364)
Black	0.066 (0.315)	0.883** (0.343)	0.207 (0.197)	0.001 (0.275)
Asian	-0.161 (0.355)	0.432 (0.528)	-0.418 (0.284)	-1.093*** (0.381)
Married	0.014 (0.109)	-0.005 (0.099)	0.098 (0.070)	0.173* (0.096)
Children	-0.065* (0.035)	-0.104 (0.087)	-0.003 (0.027)	0.001 (0.065)
Education	0.182* (0.101)	-0.010 (0.100)	0.184** (0.073)	0.165* (0.094)
Employment status (baseline: Employed)				
Self-employed	-0.168 (0.186)	-0.351** (0.176)	-0.107 (0.088)	-0.204 (0.125)
Student	-0.096 (0.188)	-1.064** (0.470)	0.340** (0.135)	-0.628 (0.950)
Retired	-1.308** (0.657)	0.026 (0.136)	-0.633 (0.488)	-0.044 (0.121)
Out of work	-0.128 (0.121)	-0.274* (0.154)	0.182 (0.122)	-0.010 (0.164)
Income level (baseline: < $ 25 000)				
from $25 000 to $50 000	-0.107 (0.136)	0.096 (0.135)	0.027 (0.096)	-0.116 (0.128)
> $50 000	-0.023 (0.149)	0.084 (0.142)	0.216** (0.097)	0.067 (0.135)
Healthcare coverage	0.480*** (0.169)	0.326 (0.228)	0.119 (0.103)	0.336** (0.171)
Subjective health	-0.030 (0.045)	0.098** (0.046)	0.051 (0.032)	0.125*** (0.041)
Health risks tolerance	-0.090 (0.123)	-0.255* (0.133)	-0.040 (0.079)	-0.089 (0.119)
Constant	1.795*** (0.391)	0.522 (0.455)	0.930** (0.246)	0.562 (0.346)
N R^2	4373 0.059	7868 0.046	3719 0.141	5877 0.056

Standard errors in parenthesis.
Significance levels at 10% (*), 5% (**), 1% (***).

Table 3: Regression results for prevention portfolios

	Screenings woman		Screenings man		Vaccinations
	< 50 y.o.	> 50 y.o.	< 50 y.o.	> 50 y.o.	
Info.-related					
Caregiver	-0.006 (0.028)	-0.020 (0.020)	0.065* (0.034)	0.001 (0.027)	0.064*** (0.021)
Info. access	0.035 (0.029)	0.057*** (0.022)	0.044 (0.028)	0.038 (0.025)	0.075*** (0.020)
Personal doctor	0.163*** (0.029)	0.167*** (0.034)	0.325*** (0.027)	0.229*** (0.033)	0.185*** (0.023)
Control variables					
Age (baseline: 18 to 34)					
35 to 49	-0.036 (0.026)		0.020 (0.027)		-0.063** (0.028)
50 to 64					0.002 (0.028)
65 to 74		-0.029 (0.023)		0.043 (0.027)	0.081** (0.036)
75+		-0.071** (0.028)		-0.060* (0.034)	0.047 (0.040)
Preferred race (baseline: None)					
White	-0.113* (0.067)	-0.007 (0.075)	-0.148** (0.075)	-0.028 (0.064)	0.101* (0.054)
Hispanic	-0.037 (0.082)	0.255*** (0.085)	-0.079 (0.086)	0.015 (0.092)	0.221*** (0.073)
Black	0.045 (0.072)	0.072 (0.079)	0.053 (0.081)	-0.017 (0.073)	-0.030 (0.060)
Asian	-0.218** (0.103)	0.072 (0.156)	-0.044 (0.105)	-0.089 (0.118)	-0.060 (0.081)
Married	0.031 (0.027)	0.004 (0.020)	0.015 (0.029)	0.046* (0.025)	0.002 (0.020)
Children	-0.013 (0.010)	-0.022 (0.017)	-0.011 (0.027)	0.001 (0.017)	0.002 (0.010)
Education	0.050* (0.029)	-0.033* (0.020)	0.017 (0.027)	0.020 (0.024)	0.098* (0.020)
Employment status (baseline: Employed)					
Self-employed	-0.104** (0.047)	-0.051 (0.041)	-0.027 (0.038)	-0.044 (0.034)	-0.066** (0.028)
Student	0.005 (0.047)	-0.058 (0.134)	0.156*** (0.046)	-0.329*** (0.156)	0.112* (0.060)
Retired	-0.148 (0.175)	0.017 (0.025)	0.030 (0.183)	-0.026 (0.030)	0.041 (0.030)
Out of work	-0.028 (0.033)	-0.056* (0.029)	0.234*** (0.046)	0.053 (0.041)	-0.008 (0.028)
Income level (baseline: < $ 25 000)					
from $25 000 to $50 000	-0.043 (0.035)	-0.003 (0.026)	0.018 (0.038)	-0.023 (0.033)	-0.022 (0.027)
> $50 000	-0.054 (0.038)	0.002 (0.028)	0.018 (0.037)	-0.001 (0.035)	0.060** (0.029)
Healthcare coverage	0.152*** (0.046)	0.092* (0.056)	0.155*** (0.041)	0.158*** (0.056)	0.142*** (0.034)
Subjective health	-0.020* (0.012)	0.000 (0.009)	-0.011 (0.012)	0.010 (0.010)	-0.016* (0.009)
Health risks tolerance	-0.016 (0.033)	-0.022 (0.029)	-0.072** (0.030)	-0.024 (0.032)	-0.066*** (0.024)
Male					0.047*** (0.018)
Constant	0.0596*** (0.098)	0.348*** (0.101)	0.0331*** (0.097)	0.235** (0.097)	0.547*** (0.075)
N R^2	4373 (0.073)	7868 0.036	3719 0.205	5877 0.060	19738 0.161

Standard errors in parenthesis.
Significance levels at 10% (*), 5% (**), 1% (***).

Table 4: Regression results for prevention portfolios by type-groups

	Exercising (odds ratio - logit)		Screenings		Vaccinations	
	< 50 y.o.	> 50 y.o.	< 50 y.o.	> 50 y.o.	< 50 y.o.	> 50 y.o.
Interactions						
Exercising			-0.044 (0.066)	0.049 (0.067)	0.048 (0.043)	0.078** (0.031)
Screenings	0.848 (0.119)	0.948 (0.089)			0.103*** (0.037)	0.128*** (0.028)
Vaccination	1.140 (0.164)	1.254** (0.126)	0.111* (0.061)	0.359*** (0.063)		
Info.-related						
Caregiver	1.238 (0.199)	1.272** (0.135)	0.012 (0.066)	-0.048 (0.064)	0.142*** (0.043)	0.005 (0.031)
Info. access	1.064 (0.162)	1.012 (0.105)	0.050 (0.068)	0.193** (0.075)	0.087** (0.043)	0.110*** (0.032)
Personal doctor	1.375*** (0.220)	1.114 (0.198)	0.357*** (0.067)	0.455*** (0.099)	0.080* (0.043)	0.208*** (0.044)
Control variables						
Age (baseline: 18 to 34)						
35 to 49	0.797 (0.116)		-1.115* (0.062)		-0.024 (0.039)	
65 to 74		0.910 (0.108)		-0.284*** (0.077)		0.000 (0.035)
75+		0.779* (0.108)		-0.573*** (0.091)		-0.008 (0.041)
Preferred race (baseline: None)						
White	1.104 (0.424)	1.443 (0.467)	-0.386 (0.183)	-0.058 (0.227)	0.084 (0.078)	0.127 (0.127)
Hispanic	0.639 (0.287)	1.863 (0.909)	-0.053 (0.224)	0.607** (0.285)	0.289** (0.113)	0.258* (0.149)
Black	0.731 (0.299)	1.396 (0.492)	0.128 (0.199)	0.395 (0.246)	-0.149* (0.088)	0.006 (0.133)
Asian	1.366 (0.709)	4.161* (3.071)	-0.568** (0.249)	-0.076 (0.361)	0.069 (0.108)	-0.160 (0.196)
Married	0.817 (0.123)	0.084 (0.070)	0.084 (0.070)	0.032 (0.065)	-0.056 (0.043)	-0.026 (0.031)
Children	0.898** (0.047)	0.907 (0.077)	-0.030 (0.021)	-0.043 (0.058)	0.009 (0.016)	-0.034 (0.025)
Education	1.51 (0.171)	1.044 (0.101)	0.199*** (0.063)	-0.093 (0.066)	0.070 (0.043)	0.072** (0.031)
Employment status (baseline: Employed)						
Self-employed	2.031*** (0.480)	1.693** (0.351)	-0.071 (0.122)	-0.286** (0.115)	-0.133** (0.062)	-0.118** (0.054)
Student	1.475 (0.395)	0.287* (0.212)	-0.266** (0.111)	-0.579* (0.312)	0.059 (0.081)	0.084 (0.221)
Retired	0.990 (1.247)	0.891 (0.127)	-0.175 (0.484)	0.062 (0.087)	-0.263 (0.172)	0.002 (0.040)
Out of work	0.914 (0.149)	0.762* (0.110)	-0.112 (0.075)	-0.211** (0.103)	-0.013 (0.047)	0.003 (0.042)
Income level (baseline: < $ 25 000)						
from $25 000 to $50 000	1.410* (0.250)	1.114 (0.140)	-0.073 (0.083)	-0.029 (0.091)	-0.040 (0.056)	0.064* (0.039)
> $50 000	2.713*** (0.580)	1.709*** (0.255)	-0.105 (0.092)	-0.021 (0.093)	0.098 (0.060)	0.077* (0.047)
Healthcare coverage	0.954 (0.213)	0.904 (0.212)	0.320*** (0.105)	0.372** (0.157)	0.122* (0.065)	0.164** (0.066)
Subjective health	1.314*** (0.088)	1.660*** (0.082)	-0.029 (0.029)	0.044 (0.032)	-0.026 (0.018)	-0.036*** (0.013)
Health risks tolerance	0.607*** (0.107)	0.796 (0.119)	0.007 (0.075)	-0.167* (0.086)	-0.083 (0.052)	-0.127*** (0.040)
Constant	1.109 (0.594)	0.379** (0.173)	1.150*** (0.249)	0.415 (0.320)	0.551*** (0.136)	0.337** (0.149)
N R^2	4373 0.131	7868 0.137	4373 0.082	7868 0.077	4373 0.169	7868 0.141

Standard errors in parenthesis.
Significance levels at 10% (*), 5% (**), 1% (***).

Table 5: Regression results for prevention types for women

	Exercising (odds ratio - logit)		Screenings		Vaccinations	
	< 50 y.o.	> 50 y.o.	< 50 y.o.	> 50 y.o.	< 50 y.o.	> 50 y.o.
Interactions						
Exercising			0.069**	0.067	0.064	0.025
			(0.033)	(0.062)	(0.049)	(0.039)
Screenings	1.422**	1.055			0.230***	0.149***
	(0.250)	(0.131)			(0.038)	(0.034)
Vaccination	1.387*	1.027	0.122***	0.220***		
	(0.235)	(0.129)	(0.026)	(0.052)		
Info.-related						
Caregiver	1.556*	1.151	0.050	0.048	0.060	0.053
	(0.367)	(0.179)	(0.033)	(0.062)	(0.046)	(0.041)
Info. access	1.530**	1.340**	0.042	0.193***	0.006	0.038
	(0.256)	(0.168)	(0.028)	(0.054)	(0.039)	(0.036)
Personal doctor	0.896	1.306	0.311***	0.436***	0.133***	0.191***
	(0.167)	(0.221)	(0.027)	(0.065)	(0.039)	(0.050)
Control variables						
Age (baseline: 18 to 34)						
35 to 49	0.783		0.025		-0.031	
	(0.148)		(0.026)		(0.039)	
65 to 74		1.005		0.132**		0.064
		(0.150)		(0.062)		(0.043)
75+		0.730*		-0.075		-0.010
		(0.126)		(0.075)		(0.053)
Preferred race (baseline: None)						
White	1.199	0.601	-0.161**	-0.024	0.119	0.1701
	(0.551)	(0.240)	(0.074)	(0.142)	(0.111)	(0.119)
Hispanic	0.910	0.360**	-0.091	0.113	0.176	0.207
	(0.497)	(0.175)	(0.085)	(0.209)	(0.130)	(0.157)
Black	0.866	0.557	0.049	-0.042	0.003	0.093
	(0.431)	(0.213)	(0.080)	(0.161)	(0.119)	(0.132)
Asian	0.530	1.525	-0.018	-0.426**	-0.182	-0.394**
	(0.297)	(1.037)	(0.102)	(0.177)	(0.154)	(0.186)
Married	0.847	1.057	0.014	0.120**	0.074*	-0.008
	(0.161)	(0.137)	(0.028)	(0.054)	(0.040)	(0.038)
Children	1.038	0.856	-0.012	-0.015	0.003	0.037
	(0.073)	(0.085)	(0.010)	(0.044)	(0.015)	(0.023)
Education	1.925***	2.026***	0.005	-0.027	0.079**	0.097***
	(0.339)	(0.252)	(0.026)	(0.054)	(0.037)	(0.036)
Employment status (baseline: Employed)						
Self-employed	0.810	0.789	-0.028	-0.072	-0.027	-0.052
	(0.188)	(0.153)	(0.038)	(0.071)	(0.046)	(0.051)
Student	2.951***	15.428*	0.137***	-0.374	0.088	-0.418*
	(1.167)	(23.216)	(0.046)	(0.317)	(0.071)	(0.250)
Retired	0.495	0.998	0.069	-0.007	-0.121	0.078*
	(0.409)	(0.173)	(0.166)	(0.066)	(0.244)	(0.047)
Out of work	0.652	0.729	0.243***	0.127	-0.072	-0.009
	(0.185)	(0.155)	(0.046)	(0.097)	(0.071)	(0.066)
Income level (baseline: < $ 25 000)						
from $25 000 to $50 000	1.117	0.908	0.017	-0.069	-0.040	-0.074
	(0.261)	(0.150)	(0.038)	(0.072)	(0.054)	(0.050)
> $50 000	2.149***	1.198	0.001	0.031	0.062	-0.041
	(0.574)	(0.224)	(0.036)	(0.078)	(0.056)	(0.054)
Healthcare coverage	0.570**	0.696	0.156***	0.346***	0.027	0.202***
	(0.145)	(0.196)	(0.040)	(0.103)	(0.052)	(0.072)
Subjective health	1.250***	1.461***	-0.014	0.021	0.026	-0.007
	(0.108)	(0.085)	(0.012)	(0.023)	()0.019	(0.017)
Health risks tolerance	0.912	0.779	-0.079***	-0.071	0.042	-0.088**
	(0.180)	(0.122)	(0.030)	(0.069)	(0.041)	(0.045)
Constant	1.571	1.846	0.249**	0.015	0.187	0.274*
	(1.028)	(0.944)	(0.097)	(0.202)	(0.148)	(0.157)
N	3719	5877	3719	5877	3719	5877
R^2	0.133	0.139	0.221	0.097	0.143	0.120

Standard errors in parenthesis.
Significance levels at 10% (*), 5% (**), 1% (***).

Table 6: Regression results for prevention types for men

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