ISSN 2348-3156 (Print)
International Journal of Social Science and Humanities Research ISSN 2348-3164 (online)
Vol. 3, Issue 4, pp: (157-166), Month: October - December 2015, Available at: www.researchpublish.com

Do Maternity Leave Variables Influence Happiness or Life-Satisfaction?

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***Abstract*: This analysis examined differences in maternity leave policy in relation to well-being outcomes for birth-cohorts in United States, Germany, Spain, Finland, and Great Britain. This study focused on the influence of maternity leave policies on the self-reported dependent variables of happiness and life-satisfaction as instruments for societal wellbeing. The independent variables included number of weeks of paid leave for the mother before birth, number of weeks of paid leave for parenting after birth, as well as percentage of pay received. Control variables included scale of income, health, education, birth year, survey year, country, and gender. The study used birth-cohorts for individuals born between 1960 and 1989 that participated in the World Values Survey. The study found no correlation between weeks of maternity leave and happiness or life-satisfaction. There was also no significant correlation between weeks of paid maternity leave after birth and happiness or life-satisfaction. There was a significant finding that weeks of full pay before birth are negatively correlated with life-satisfaction outcomes.**

Keywords: **maternity leave policy, happiness, life-satisfaction, fixed effect analysis.**

I. INTRODUCTION

Since the Maternity Protection Convention in Washington DC in 1919, the International Labor Organization has extended the recommended leave to a minimum of 14 weeks. More than 120 countries around the world provide paid maternity leave and health benefits by law [1, 2]. Features of various policies include: free medical care before, during, and after birth; paid job protected leave before and after birth or in cases of adoption; and a lump sum of money at the time of the birth of the child [1, 3]. The only industrialized nation without paid maternity leave for all women is the United States [1].

There is currently an international effort underway to change the economic paradigm of measuring product to one of measuring well-being or happiness [4]. No one has examined how maternity policies influence birth-cohort self-reported well-being outcomes. Previous research on maternity leave policies focused on health, economics, and academic outcomes. This paper contributes to the growing literature on happiness studies as well as maternity leave studies in three respects. First, I expand the range of outcomes considered by examining the influence of maternity leave on longterm happiness and life-satisfaction. Second, I used data from the World Value Survey to better understand how policy influenced values and outcomes. Finally, I examined the influence of weeks leave and weeks after leave rather than only looking at total weeks of leave.

This policy evaluation focused on the hypothesis that maternity policies influence outcomes for birth year cohorts in each country. Data used in the study came from the World Value Survey (WVS) and the Comparative Family Policy Database (CFPD). Using deductive analysis, I combined two existing datasets to answer the following research questions: Does maternity leave influence happiness and life-satisfaction outcomes? Which maternity variables (weeks before birth, weeks after birth, or weeks of full-pay) are more significant? Is any aspect of maternity leave policy correlated to life-satisfaction or feelings of happiness?

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II. LITERATURE REVIEW

A. Maternity Leave:

The iron chancellor Otto Von Bismarck enacted the first paid maternity leave policy in 1893 [2, 5]. In 1919 the International Labor Organization organized the Maternity Protection Convention in Washington D.C. to establish basic guidelines concerning maternity benefits. These included six weeks off before and after birth, paid job-protected leave, and time and space to nurse the child once returning to work [6]. At that time, most European countries began to adopt and create their own maternity policies.

The various stated goals of the policy have included- increasing the health of mother and child, increasing birth rate, promoting gender equality, maximizing the labor-market by being flexible, reducing emigration, and decreasing child poverty [1, 3, 6-10]. In some countries the policy of paid maternity leave is a century old, and yet the policy is still changing and evolving [11]. Current values and issues surrounding maternity leave policy include- aging, gender equality, fertility, child-poverty, value of care, labor market, and social insurance [3, 12-14].

There are a variety of different ways that maternity leave benefits have been funded. Haas (2003) identified four different types of care systems in the original 15 European Union welfare states. Greece, Italy, Portugal, and *Spain*[1] use the privatized care model where care is a private responsibility. Austria, *Germany*, Belgium, France, and Luxembourg use the family-centered care model where family values are at the center of the policy. Ireland, *Great Britain*, and Netherlands use the market-oriented care model that expects employers to be more flexible with employees, and includes many market incentives such as paid childcare. The valued care model of Denmark, Sweden, and *Finland* recognizes care as a joint responsibility of the nation and the parent. Each of these different models of care establishes different incentives and deterrents for citizens, employers, and government as to who pays for the benefits and what the benefits include.

Research demonstrated that effects of the policy fall into two categories; these include health related benefits and socio-economic benefits [3].There have been significant findings of increased infant and mother health [1, 7, 15, 16], increased time breastfeeding [17], maternal health gender equality [5], and cognitive and social development of children [15, 18, 19]. There is still debate over the economic benefits [16, 20], and academic benefits [18, 21-23]. There is a general agreement that maternity leave is generally positive, there is little consensus as to how long the leave should be, how much mothers should be paid, and what the impact of the policy is.

B. Wellbeing:

In the past few decades researchers in education, social science, economics, health, and political science have begun to research measurements associated with happiness. This includes research on general well-being as well as subjective well-being. Barrow (1980) wrote an extensive literature review on the history of the study of happiness. Barrow illustrated that many great and respected minds have contributed to literature on the elusive construct of happiness. Frey argued that there are three main reasons why economists should consider happiness research- to guide economic policy, to understand the effect of institutional conditions on individual well-being, and to understand the formation of subjective well-being [24, 25].

Outside observers cannot decide if another person is happy [26]. Happiness is not a list of conditions nor is happiness connected with objects [27]. Happiness and well-being are indicators of many aspects of existence that are difficult to measure. Veenhoven (2004) advocated for the greatest happiness principle; he asserted that happiness is a signal of thriving. The numerous skills required to maintain happiness can be taught and learned [26-30]. There are many variables that contribute to happiness including- health, relationships with friends and family, life-satisfaction, job satisfaction, and a multitude of small factors [31].

Economists, sociologists, and psychologists alike have conducted research on happiness and well-being. The Stiglitz report, commissioned by Sarkozy, was an effort to examine the possibility of adding gross national happiness to measures of gross domestic product [32]. Similar to the creation and definition of measures such as employment rates, or the stock market, there are many proposals to create a happiness test [33], or to have a national index of happiness [34]. Some use the human development index to measure well-being [35].

[1] This study used one country from each of the types of care models; italicized countries were used in the study.

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Currently the largest dataset that includes subjective well-being variables of life-satisfaction and happiness is the World Value Survey [32, 36, 37]. Previous research has used the World Value Survey to: determine how life events influence happiness [38], find the type of governance structure that creates the most happiness [31], and to determine the impact of television on happiness [39]. Research has found that above a certain threshold maximizing wealth does not maximize happiness [37].

C. Program Theory:

This analysis used a simplified program theory based on Bowlby's theory of attachment. This theory is used because the maternity policies of the 1960's were influenced by the research and theories of Bowlby who concluded that crucial development occurs very early in a child's life. Bowlby asserted that healthy parental attachment precedes normal child development, and a lack of a healthy attachment precedes violence, psychopathic behavior and poor health [7, 40]. Research has found that brain development is dependent upon bonding time with parent/s [7, 12]. The parental leave policies report wrote it best,

All members of society have a profound interest in the health and well being of young children and parents who take care of them. All of us benefit from the existence of happy and healthy children who can go on to become productive members of society. [5]

The theory is that by investing in mothers, there is an investment into the development of the child, the stability of the family, and health of the mother, and these early investments lead to long-term societal returns- see Figure 1.

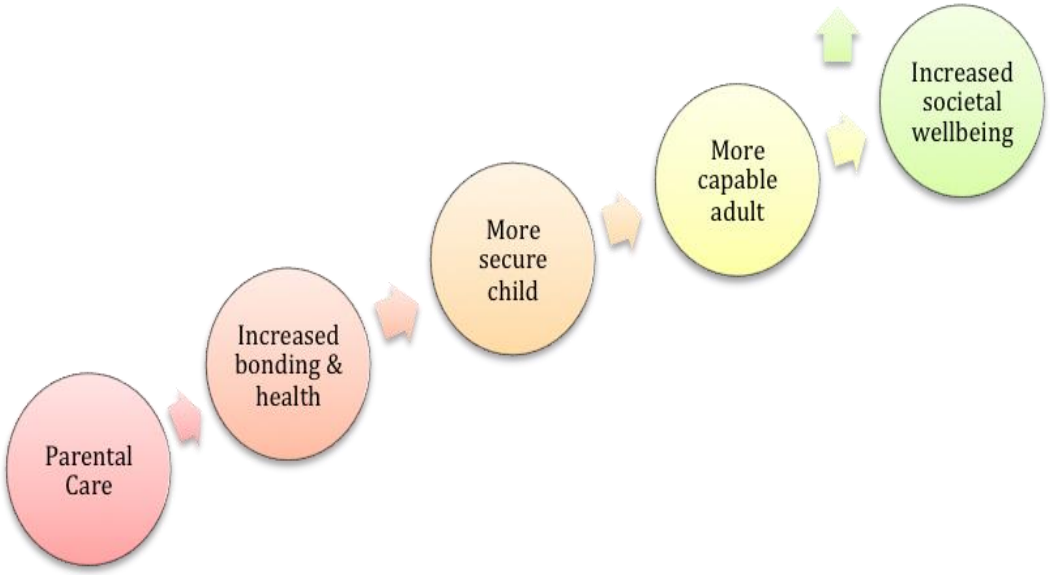

Figure: 1

Figure 1. Helping parents with the financial costs of parenting allows for the parent to be with the child, and that increases time for bonding. Healthy attachment promotes the security and social as well as cognitive development of the child, which leads to a more confident and capable adults, which would increase societal well-being.

Educational research has also shown that earlier interventions have a larger return on investment [16, 41, 42]. By providing women time and money before and after birth, as well as covering medical expenses and care, mothers will have less stress, and be able to devote themselves to their child thereby creating more of an attachment.

Economists have demonstrated that soft skills such as self-control, determination, patience, and interpersonal skills are essential for success [43]. Early family experiences have a large influence over the social and cognitive development of the child [43, 44]. Additional research has demonstrated that early experiences of affection, love, and connection have a profoundly positive influence on life outcomes [45]. Many researchers have claimed that maternity leave does contribute to well-being, and this study will test that hypothesis.

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III. METHODS

A. Sample:

For this study, the target population included people born between 1960 and 1989. I began by selecting the outcome variables (happiness and life-satisfaction), and control variables (education, income, health). This influenced country selection, as not all countries had responded to some of my chosen outcome variables. From the remaining cases I chose a western country to represent each of the models of care. The United States did not have any paid maternity leave between 1960 and 1989. Great Britain used the market-oriented care model. Germany used the family-centered care model, Spain used the privatized care model, and Finland used the valued care model.

Happiness, life-satisfaction, education, income and health variables came from the World Value Survey [46]. The WVS is an extensive voluntary survey that includes nominal, scalar, as well as continuous variables surrounding values, demographics, and life situations. A network of researchers has driven the WVS via a non-profit association. The database is downloadable on the internet. All responses were at the individual level and included demographics such as year of birth, country, survey year, and gender. Some variables were recoded to keep parallelism among the variables. For all scalar questions, a lower number represents less and a larger number represents more, see Table 1. The surveys included many questions that were not used in this analysis.

Table 1: Quantitative Coding of Nominal Variables

Variable	Coding
Life-satisfaction	1=completely dissatisfied - 10=completely satisfied
Happiness	1= Not at all happy, 2= Not very happy 3=Quite happy, 4=Very happy
Education Level	1=No formal education, 2=Incomplete primary school, 3=Complete primary school, 4=Incomplete secondary school- technical/ vocational type, 5=Complete secondary school-technical/ vocational type, 6=Complete secondary school; university-preparatory type, 7=Some university-level education, without degree, 8=University -level education, with degree
Scale of Income	1=lowest income decile - 10=highest income decile
Health	1=Very poor, 2=Poor, 3=Fair, 4=Good, 5=Very good

Note: 0 = no response * See Appendix A for interview questions

Each country has different maternity policies. Maternity policies were compared by examining aspects of the policy including, total weeks of job-protected unpaid leave, percentage of pay received, and how many weeks may be taken before and after birth. These variables were found in the Max Planck Institute of Demographic Research [47]. This data is available for each country and each year between 1960 and 2005.

Maternity variables change so that children born one year have a different experience than children born in a different year. For example children born in 1969 in Germany had a total of 12 weeks with their mother, while children born in the same country the next year were able to spend 14 weeks with their mothers. Or, for example a mother who receives 8 weeks of leave after birth at 100% pay would have the have amount of paid time as a mother who had 16 weeks of leave at 50% pay.

I used three of the variables to create four different measures. Two of the variables measure only weeks of job protected unpaid or partially paid leave; number of weeks of maternity leave prior to childbirth, and number of weeks of maternity leave after childbirth. The weeks of full-pay variables were created by, multiplying the amount of Weeks Before Birth or Weeks After Birth by the Percentage of Pay Received. This variable was created to capture the influence of paid leave as compared to job-protected unpaid or partially-paid leave. Previous research has looked at total weeks of maternity leave. This study examined the before and after birth leave as well as the percentage of pay received.

B: Design:

The quantitative analysis used a fixed effect OLS regression to determine if maternity policies influence well-being outcomes for birth-cohorts. Using panel data from the 1981-2008 WVS, a fixed effect OLS regression was run using life-satisfaction and feelings of happiness as the dependent variables, and maternity leave policies at the time of birth as the independent variables while controlling for education, income, and health see Table 2. The analysis was run using birth

year cohorts for each country rather than individuals because there was no identification number to verify if participants were continuous year after year.

Table 2: Descriptive Statistics of Sample

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Feelings of happiness	7393	0	4	3.170	0.669
Satisfaction with your life	7372	1	10	7.350	1.760
Total # weeks after birth	7393	0	44.9	6.172	6.371
Total # of weeks before birth	7393	0	11	5.015	3.421
Weeks of full-pay before birth	7393	0	9.35	3.490	2.430
Weeks of full-pay after birth	7393	0	35.92	4.251	4.257
Highest Education Level	6858	1	8	4.770	2.115
Scales of Income	6239	1	10	5.150	2.359
State of health	7393	0	5	3.900	1.242
Year of birth	7393	1960	1989	1970	7.432
Gender	7393	1	2	1.520	0.499
Valid N (listwise)	5845				

Note: Both the health and happiness variables were coded so that 1 indicated a low response rather than a high response.

C. Data Analysis:

To determine the significance of maternity leave policies influence over well-being outcomes, a fixed effect ordinary least squares (OLS) regression was run [48] using well-being outcomes [39] as the dependent variable, and maternity variables [1] as the independent variables. The covariates included income [11], education [16], and health [17]. After screening the data, I dummy coded for birth year, year of survey, gender and country.

The models then take the form:

Model 1:

Model 2

Model 3:

Model 4

The two outcomes are denoted by , for life-satisfaction (1-10), and for happiness (1-4). Each outcome was run twice, with z including time variables, and g including pay variables. First with the variables, that included maternity variables of weeks of leave before birth, and weeks of leave after birth. Then with the variables , that included the calculated variables of weeks of full-pay before leave, and weeks of full-pay after leave. This was done to capture the interaction of variance in percentage pay as well as weeks of job-protected leave. The control variables, included variables that influence well-being- scale of income (1-10), education (0-8), and health (1-5). Where is the error term. For each (i) individual, in each (c) country, each (t) year- the data was collected. Fixed effect variables included birth year, year of survey, gender, and country variables.

There were a small number of cases where respondents did not provide their year of birth. These cases were excluded from the analysis. Survey responses to level of education as well as income were not missing at random, and missing data was imputated using SPSS. There was very little missing data from the outcome variables of happiness and life-satisfaction.

The datasets were combined twice; this was done to ensure that no mistakes were made while combining the data. The large sample size increases validity. While the multiple fixed effect variables decrease precision, they dramatically increase the ability to solve the omitted variable problem. The fixed effect variables account for all time invariant characteristics that are related to the dependent variable. Fellow researchers reviewed the methods and results of this study to ensure accurate analysis.

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Although there is statistical significance, due to the large sample size, some findings may not be that practically significant. Limitations include the limited number of countries in the sample as well as the homogeneity of their economies. Limitations also included the questions themselves. Some questions were a ranking of one through ten, while other questions had only four options. The research is also limited to the subjective answers given by participants. The data analysis is limited in that it does not account for time variant omitted variables.

IV. RESULTS

Each of the four models were run independently and summaries demonstrate the similarity in the happiness and life-satisfaction construct. Life-satisfaction had a wider scale and a slightly larger adjusted R square (R2=.136) than that of the happiness models (R2=.133), see Table 3. The summary did not indicate that there is a significant difference between weeks of leave and weeks of leave at full-pay in connection with happiness and life-satisfaction.

Table 3: Model Summary of Fixed Effect OLS Regression

Model #	R	R Square	Adjusted R Square	Std. Error	Valid N
1	.374a	0.14	0.133	0.61	5857
2	.373a	0.139	0.133	0.61	5857
3	.378a	0.143	0.136	1.627	5845
4	.378a	0.143	0.136	1.626	5845

Note: a. Predictors: (Constant), highest education level, scales of income, state of health male, Spain, USA, Great Britain, 1978, 1985, 1982, 1989, 1984, 1983, 1986, 1987, 1988, 1980, 1981, 1979, 1976, 1974, 1973, 1977, 1975, 1972, 1971, 1968, 1969,1967, 1964, 1962, 1970, 1963, 1960, 1966, 1965, sy1995, sy1996, sy1998, sy1999, sy2000, sy2005, sy2006, sy2007

b. Dependent Variables: Model 1 happiness, Model 2 happiness, Model 3 life-satisfaction, and Model 4 life-satisfaction.

c. Independent Variables: Model 1 weeks of maternity leave, Model 2 weeks of maternity leave with at full-pay, Model 3 weeks of maternity leave, and Model 4 weeks of maternity leave with at full-pay.

In model 1 there was no connection between weeks of maternity leave variables and self-reported happiness see Table 4. A 1 standard deviation increase in income equals .115 standard deviations increase in happiness, and a 1 standard deviation increase in health equals .436 standard deviations increase in happiness. Health is almost four times as significant when compared to income in contributing to happiness. There was no significant correlation between education and happiness. Model 2 is almost identical to model 1; There was no connection between weeks of full-pay maternity leave and self reported happiness. Income and health were again significantly correlated with happiness, and health was much more significant than income in contributing to happiness and life-satisfaction. There was no correlation between education and happiness.

Table 4: Happiness - fixed effect OLS regression Model 1 & 2

	Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.727	0.125		13.870	0.000
	Total # of weeks before birth	0.023	0.020	0.122	1.134	0.257
	Total # weeks after birth	0.001	0.002	0.007	0.292	0.771
	State of health	0.243	0.011	0.436	21.213	0.000
	Scales of Income	0.032	0.004	0.115	8.388	0.000
	Highest Education Level	-0.005	0.004	-0.016	-1.246	0.213
2	(Constant)	1.872	0.089		21.027	0.000
	Weeks of full-pay before birth	-0.004	0.012	-0.017	-0.361	0.718
	Weeks of full-pay after birth	0.002	0.003	0.014	0.672	0.502
	State of health	0.244	0.011	0.437	21.281	0.000
	Scales of Income	0.032	0.004	0.115	8.329	0.000
	Highest Education Level	-0.005	0.004	-0.017	-1.29	0.197

Note: a. Excluded variables included- females, birth year 1960, survey year 1990, Finland, and Germany

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In model 3 there was no significance in the number of weeks of maternity leave and the outcome of life-satisfaction, see Table 5. Income and health were correlated with life-satisfaction, and health was again much more significant than income in contributing to life-satisfaction. On average a 1 standard deviation increase in income equals a .161 standard deviation increase in life-satisfaction, and a 1 standard deviation increase in health equals a .406 standard deviation increase in life-satisfaction. The correlation between education and life-satisfaction was significant (p=.004). In model 4 there was slight significance in the negative correlation between number of paid weeks before birth and life-satisfaction, see Table 5. Income and health were again significantly positively correlated with life-satisfaction, and health was again much more significant than income in contributing to life-satisfaction. The correlation between education and life-satisfaction was significant.

Table 5. Life-Satisfaction - fixed effect OLS regression Model 3 & 4

	Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3	(Constant)	4.122	0.332		12.412	0.000
	Total # of weeks before birth	-0.046	0.054	-0.091	-0.846	0.398
	Total # weeks after birth	0.005	0.006	0.019	0.795	0.427
	State of health	0.605	0.031	0.406	19.739	0.000
	Scales of Income	0.119	0.010	0.161	11.717	0.000
	Highest Education Level	0.032	0.011	0.038	2.868	0.004
4	(Constant)	4.189	0.237		17.648	0.000
	Weeks of full-pay before birth	-0.062	0.033	-0.090	-1.906	0.057
	Weeks of full-pay after birth	0.008	0.008	0.020	0.955	0.339
	State of health	0.604	0.031	0.406	19.751	0.000
	Scales of Income	0.12	0.01	0.162	11.782	0.000
	Highest Education Level	0.032	0.011	0.038	2.911	0.004

Note: a. Excluded variables included- females, birth year 1960, survey year 1990, Finland, and Germany

V. ANALYSIS

This analysis found no statistical correlation between weeks of unpaid leave and happiness or life-satisfaction. The findings do confirm what some happiness researchers have claimed- there is no formula to create happy people. Happiness was not connected to maternity variables. The life-satisfaction results were almost identical to the happiness results, however one maternity variable was significant. The negative correlation between weeks of full-pay before birth and life-satisfaction may be capturing some other endogenous interaction that is not captured in the model. These findings challenge the argument that maternity leave increases the happiness of children and society.

These findings support research that happiness and life-satisfaction are valid outcome variables. This research confirms earlier studies that health and income are both correlated with happiness and life-satisfaction. Health is a larger factor in happiness and life-satisfaction than either income or education. While there were no practically significant correlations between maternity leave variables and happiness there still may be many unmeasured impacts of the policy.

VI. CONCLUSION

This study found no correlation between maternity leave policy and happiness. This supports previous research that happiness is based on the individual [27]. There was a statistically significant, but practically insignificant finding that paid weeks before birth may actually negatively influence life-satisfaction. This aligns with previous research that over a certain threshold, money does not increase wellbeing [4]. Many policies and research describing maternity leave refer to the wellbeing and happiness of children [3, 5]. This study pointed out the need for more research into the actual impacts of the policy.

While this study found no connection between the overall average happiness of a birth-cohort and the maternity policies in time at their birth, the significance of paid weeks before birth in relation to life-satisfaction underscores the need for

more research into maternity policy and the many facets of the policy. There are countless additional outcomes that maternity leave policy may influence however this study found no significant correlation between maternity policy and happiness or life-satisfaction of children.

APPENDIX - A

INTERVIEW QUESTIONS:

Satisfaction with your life: "All things considered, how satisfied are you with your life as a whole these days? 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied" where would you put your satisfaction with your life as a whole?"

Feelings of happiness: "Taking all things together, would you say you are…" The choices are 1 Very happy, 2 Quite happy, 3 Not very happy, 4 Not at all happy. This variable was then coded so that 1 indicated not happy at all, and 4 indicated very happy.

Highest education level: "What is the highest educational level that you have attained? [NOTE; if respondent indicates to be a student, code highest level s/he expects to complete]." The choices are 1 'No formal education', 2 'Incomplete primary school', 3 'Complete primary school', 4 'Incomplete secondary school- technical/ vocational type', 5 'Complete secondary school- technical/ vocational type', 6 'Complete secondary school; university-preparatory type', 7 'Some university-level education, without degree', 8 'University - level education, with degree'.

Scales of income: "On a scale of incomes in which 1 indicates the "lowest income decile" and 10 the "highest income decile" in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in."

State of health: "All in all, how would you describe your state of health these days? Would you say it is; 1 Very good, 2 Good, 3 Fair, 4 Poor, 5 Very poor." This variable was then coded so that 1 indicated very poor, and 5 indicated very good.

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