Center for Population Dynamics
School of Social and Family Dynamics
Arizona State University
Tempe, Arizona, 85287-3701, USA www.asu.edu/cepod

CePoD Working Paper # 09-115

What Do Retrospective Subjective Reports of Childhood Health Capture? Evidence from the Wisconsin Longitudinal Study

Steven A. Haas

Nicholas J. Bishop

2009

What Do Retrospective Subjective Reports of Childhood Health Capture? Evidence from the Wisconsin Longitudinal Study[1]

Steven A. Haas

Nicholas J. Bishop

School of Social and Family Dynamics

Arizona State University

[1] Paper presented at the 2009 Annual Meeting of the Population Association of America. Please do not cite or quote without permission from the author. Address correspondence to Steven Haas, Center for Population Dynamics, Arizona State University, PO Box 873701, Tempe, AZ, 85287-3701; steven.haas@asu.edu.

Abstract

Numerous large cohort studies have begun collecting retrospective childhood health information. However, few studies have investigated the content and quality of such data. This study fills this gap by investigating the content of subjective retrospective childhood health measures using the Wisconsin Longitudinal Study. We find that a wide array of common childhood conditions and activity limitations were significant predictors of overall assessments of childhood health status. Those conditions that were persistent/recurring such as asthma, chronic bronchitis, and frequent ear infections were the strongest predictors of overall health reports. The results lend support to the judicious use of retrospective childhood health data.

Introduction

Investigators interested in understanding the determinants of health at older ages have increasingly turned their attention towards the life course. There is a growing acknowledgement that understanding health outcomes in later life, including their socioeconomic and racial/ethnic heterogeneity, requires a comprehensive understanding of how health unfolds over the life course (Kuh & Ben-Shlomo, 1997). An important aspect of such inquiry is the greater attention paid to childhood health and socioeconomic conditions. Numerous studies demonstrate that childhood health insults and disadvantaged socioeconomic environment can have strong and lasting impacts on health at mid-life and beyond (Haas, 2008; Davey Smith, Hart, Blane, Gillis, & Hawthorne, 1997).

An important constraint on this work, especially in the US context, is the dearth of large nationally representative cohort studies connecting the earliest years of life to later portions of the life course. The 1979 National Longitudinal Survey of Youth (NLSY) cohort contain almost no information on childhood health and are still relatively young to study the health of aging populations. In the UK, comprehensive large scale cohort studies—the 1946 and 1958 National British birth cohorts—cover populations that are only now beginning to age into the period of life when major health conditions become most prominent. This lack of data makes answering some of the most pressing questions about early life influences on adult health very difficult.

One approach that several major surveys have taken is to use retrospective questionnaires about childhood health and social conditions. Among the large scale longitudinal studies that have begun to collect such information are the Health and

Retirement Study (HRS), the Wisconsin Longitudinal Study (WLS), the Panel Study of Income Dynamics (PSID), the English Longitudinal Survey of Aging (ELSA), and the Survey of Health and Retirement in Europe (SHARE). In the US, the WLS and PSID represent long-standing and ongoing investments. Over the past four decades these studies have paid off handsomely, contributing greatly to our understanding of socioeconomic attainment, poverty, and family dynamics. As their samples have grown older their content focus has likewise shifted. If retrospective assessments of childhood health and social conditions prove to be valid and reliable, then these studies will continue to yield returns long into the future and population health researchers would add rich sources of data to their toolbox. However, few studies have systematically investigated the content and quality of these retrospective reports. This study attempts to fill this gap by investigating the content of retrospective childhood health reports in the WLS.

Background

Despite their growing presence in large scale health surveys and their use in empirical analyses, few studies have systematically examined the quality of retrospective reports of childhood health. A pair of studies has examined differential reporting of childhood health symptoms among hypochondriacal and non-hypochondriacal patients (Barsky, Wool, Barnett, & Cleary, 1994; Noyes, Stuart, Lanbehn, Happel, Longley, & Yagla, 2002). However, drawing conclusions about the general population from these studies is problematic at best.

Krall and colleagues (1988) validated retrospective self reports of childhood communicable diseases, accidents, hospitalizations, and surgeries. In the first year of life

subjects were examined by a pediatrician every 3 months. Examinations and parental interviews were then performed twice a year between age 1 and age 10 and once a year until age 18. Retrospective childhood health questionnaires were administered at age 30, 40, and 50. With the exception of German measles, illnesses were recalled with a very high level of accuracy averaging 85% at age 50. Accidents and surgeries were recalled correctly 75% and 89% of the time at age 50, respectively. Reliability did not change much between age 30, 40, and 50, nor was recall accuracy correlated with education (Krall, Valadin, Dwyer, & Gardner, 1988).

Few studies have attempted analyze the quality of retrospective reports of overall subjective childhood health in large nationally representative samples. This measure typically asks respondents to "*consider your health while you were growing up, from birth to age 16. Would you say that your health during that time was excellent, very good, good, fair, or poor?*" Haas (2007) presents the first comprehensive treatment of this measure. Using data from the PSID and the HRS he shows that the retrospective measure of overall childhood health is reliably reported over time (polychoric correlation =0.6; Goodman-Kruskal gamma=0.6), especially when the measure was dichotomized into a good/very good/excellent vs. fair/poor comparison (tetrachoric correlation=0.7; Goodman-Kruskal gamma=0.9) (Haas 2007). Quality of measurement did not vary substantially by gender or age. However, those with higher levels of education were somewhat more consistent reporters of childhood health (Haas, 2007). There is also no evidence that retrospective reports are subject to anchoring, by which current health status contaminates reports of health in childhood. Retrospective reports are also correlated with birth weight in the PSID (Haas 2007). More recently Smith (2009)

compared prevalence estimates of various childhood conditions to estimates drawn from external contemporaneous sources and found strong correspondence between the two. Additionally, cohort trends in retrospective reports of measles and mumps corresponded favorably to declines in prevalence rates following the introduction of vaccines for these diseases (Smith, 2009).

While previous studies have investigated many of the important measurement properties of retrospective subjective reports of childhood health, such as their reliability, much less is known about what this measure is actually capturing. In other words what specific childhood health conditions are captured by this measure? Data from the 1996 Experimental Module of the HRS provide a glimpse. In addition to the overall measure of childhood health, respondents were also asked whether or not they had, because of a health condition, either 1) missed one month of school or more, 2) were restricted from participating in sports for three or more weeks, or 3) had to remain in bed at home for one month or more. Those answering affirmatively were asked to report the specific health condition responsible.

Elo (1998) has demonstrated a high level of internal consistency between the overall subjective measure and reports of specific long-term health limitations in childhood, finding that while only 8% of those in excellent childhood health reported a long-term health condition in childhood, 20%, 23%, 61%, and 82% reported at least one for very good, good, fair, and poor, respectively. In terms of specific childhood conditions reported, the most prevalent were infectious diseases, representing half of all conditions reported (Blackwell, Hayward, & Crimmins, 2001). Similarly, those who did not experience a limiting childhood health condition, those who experienced a non-

infectious, infectious, or autoimmune condition were 4.0 ($p<.0001$), 5.0 ($p<.0001$), and 13.2 ($p<.0002$) times more likely to report having poor health in childhood (good, fair, or poor), respectively (see Haas, 2008). Unfortunately, the experimental HRS module is only available for 733 respondents and does not permit a full analysis of the content subjective measures of childhood health. The current study takes advantage of recently collected data from the WLS to estimate the relationship between specific childhood health conditions and the overall subjective measure of childhood health.

Research Questions

We are interested in two related questions. First, to what extent do specific childhood health conditions and physical/activity impairments predict overall subjective assessments of childhood health? Second, to what extent does the presence of impairment mediate the predictive effect of specific conditions?

Methods

Data

The current analysis utilizes data from the Wisconsin Longitudinal Study. The Wisconsin Longitudinal Study (WLS) has followed a random sample of 10,317 persons who graduated from a public, private or parochial high school in Wisconsin in 1957 (Sewell, Hauser, Springer, & Hauser, 2004). In this initial wave, the WLS collected information on academic ability, socioeconomic background, attitudes toward higher education, educational and occupational aspirations, and a handful of contextual factors. Subsequent waves in 1964, 1975, 1992-93 and 2003-05 collected data from WLS respondents (or their parents) on a wide range of issues that are essential to studies of the life course, including educational and occupational histories, indicators of socioeconomic

status, military service, marital status, family characteristics, social participation, psychological well-being, health behaviors and health outcomes (Sewell et al., 2004). Although the WLS is not nationally representative, its respondents resemble over two-thirds of Americans who are now entering retirement age in terms of academic achievement and ethnic background. The WLS has long been a central source of data on the processes of socioeconomic attainment. In the most recent follow up in 2003/2004 a battery of retrospective questions asked respondents about their health in childhood. The analytic sample consists of 6,700 men and women responding to the most recent follow-up. Respondents were approximately 64-65 years of age at this interview.

Measures

Overall subjective measures of childhood health are based on the question *"how would you rate your health as a child?"* Response categories include excellent, very good, good, fair, and poor. We analyze this measure in both its original ordinal metric as well as dichotomized in the comparison between excellent/very good/good vs fair/poor. To examine specific childhood health conditions WLS respondents were asked whether they had ever experienced a series of common childhood conditions including *asthma, chronic bronchitis, frequent ear infections, removal of tonsils or adenoids, whooping cough/pertussia, polio, diphtheria, hepatitis, pneumonia, meningitis, or mononucleosis* during childhood. We look at whether the respondent had each or any of the above conditions. Respondents were also asked if through age 16, they had ever *missed school for 1 month or more*, been *confined to bed or home for 1 month or more*, or had their *sports or physical activities restricted for 3 months or more* as a result of a health condition? We create a dichotomous indicator of whether the respondent experienced each of these and a fourth for whether they experienced any of the above. Finally, those answering affirmatively were asked to list the specific

condition most responsible. From this we create a series of dummy variables for the most numerous conditions based on ICD-9 codes including *infectious, circulatory, respiratory, genitourinary, digestive, skeletal/muscular, symptoms/ill-defined conditions, injuries*, and *other* for remaining conditions.

Analysis

The analysis occurs in three steps. First we present basic descriptive distributions of childhood health conditions and subjective childhood health status as well as the bivariate distribution of specific childhood health condition and activity restrictions by retrospective child health status. We then use proportional odds regression models to determine the predictive capacity of the specific childhood health condition, physical/activity restriction variables when using the subjective childhood health outcome in the original ordinal metric. We estimate then logistic regression models to determine the relationship between specific childhood health conditions and physical activity restriction and the dichotomized subjective childhood health measure. For each outcome we estimate two regression models. First we estimate the effect of specific health conditions on subject childhood health assessments. We then add controls for the experience of various physical/activity limitations which provide insight into the severity of childhood conditions. Finally, for those with childhood activity limitations we examine the relative impact of specific condition on overall childhood health.

Results

Table 1 presents descriptive statistics of retrospective childhood health and physical activity limitations. It is important to note that in general, WLS respondents reported experiencing healthy childhoods. The average self-rated childhood health falls between very good and excellent and only 3.6% of the sample reported experiencing poor childhood health. At the same time the experience of serious conditions in childhood was

quite common. Approximately 70% of individuals reported having at least one childhood health condition and the average number of health conditions was just above one. In terms of specific conditions, the most prevalent was having had the tonsils/adenoids removed. Just over 50% of respondents reported having had their tonsils removed. Respiratory conditions such as whooping cough/pertussia (18.9%), pneumonia (13.6%), chronic bronchitis (5.1%), and asthma (4.8%) were reported by a relatively high proportion of the sample. Nearly 14% experienced frequent ear infections. Other infectious conditions such as mononucleosis (3.6%), polio (1.9%), hepatitis (1.6%), meningitis (.5%), and diphtheria (.3%) were present but much less common. Regarding activity impairment, 12.3% of the sample had at least one restriction on physical activity with 8.2% of the sample reporting having been restricted to bed for one month or more, 8% missing school for one month or more and 6.9% having their physical activities restricted for 3 months or more due to a health condition. Among those with any limitation, 528 (5.1% of total sample) provided a specific responsible condition. Of these conditions the most frequent were infectious conditions (1.5%) followed by circulatory (1%), injuries (.6%), respiratory (.6%), and digestive (.35%) conditions.

[Table 1 here]

Figure 1 presents the distributions of specific childhood health conditions by subjective measure of overall childhood health status. The top pane corresponds to the ordinal metric while the bottom pane represents the dichotomized childhood health measure. There are clear and statistically significant differences in the proportion of respondents having reported experiencing the specific condition by the overall assessment of their childhood health. In general, the lower the assessment of their overall

health that respondents provided the more likely they were to have reported experiencing each specific condition. For example, approximately 2% and 4% of respondents reporting excellent or very good childhood health reported having child hood asthma. However, 23% and 32% of those who reported fair or poor health, had asthma, respectively. Compared to their peers reporting excellent childhood health, those who reported poor childhood health were three times more likely to report frequent ear infections and pneumonia, twice as likely to report whooping cough or mononucleosis, and were 18 times more likely to report chronic bronchitis. For all conditions there is a monotonic increase in the proportion reporting the condition as respondents report worse overall childhood health. All association were statistically significant at the $p<.01$ level and all but hepatitis and mononucleosis were significant at the $p<.0001$ level.

[Figure 1 here]

Similar differences are found in the distribution of functional/activity limitations presented in figure 2. Again the top pane refers to the ordinal measure of childhood health. Compared to those reporting excellent childhood health, respondents reporting poor childhood health were more than 10 times more likely to have either missed school for a month or more, confined to bed or home for a month or more, or to have had there sports or physical activities limited for 3 months or more due to a health condition before age 17. As with the specific health conditions, there is a monotonic increase in the proportion reporting each of these limitations as respondents report worse overall childhood health. While only 6.2% of those reporting excellent childhood health reported having had any limitation, 69% of those reporting poor health experienced at least one limitation. All associations are statistically significant at the $p<.0001$ level.

[Figure 2 here]

Similar patterns are observed when the subjective measure of overall childhood health is dichotomized into a comparison between excellent/very good/good and fair/poor presented in the bottom pane figure 2. For all type of limitations, those reporting fair/poor childhood health were substantially more likely to report experiencing the condition than those reporting excellent, very good, or good health. All associations are significant at the p<.0001 level.

Table 2 presents the results for the proportional odds logit models of subjective childhood health status (ordinal metric). Asthma had the largest impact on overall assessments of childhood health (odds-ratio = $e^{1.41}$ = 4.1) followed by chronic bronchitis (OR=2.8), polio (OR= 2.5), chronic ear infections (OR=2.0), pneumonia (OR=1.7), whooping cough (OR=1.3), and tonsillectomy (OR=1.2). Inclusion of the retrospective functional limitation variables produced a better fitting model than the model including only childhood health conditions (Model 1 d.f.=11, -2L.L.=13252.434; Model 2 d.f.=14, -2 L.L.=12832.062; χ^2 difference=420.372, p<.001). After adjusting for the severity of conditions via controls activity limitation, diphtheria becomes a statistically significant predictor of overall health status while tonsils/adenoids removed and polio are no longer statistically significant. In regards to physical/activity limitations, adults who reported any of these restrictions as children had greater odds of reporting poorer health as a child (activity restrictions odds ratio= 2.8; confined to bed/home odds ratio=1.8; missed school odds ratio=1.8).

[Table 2 here]

Table 3 presents the results from the binary logistic regression of overall child health (dichotomous measure). Model 1 includes only childhood health conditions and model two includes both childhood health conditions and functional impairment. Model comparison reveals that inclusion of physical impairment in the full model leads to better model fit (Model 1 d.f.=11, -2L.L.=1569.83; Model 2 d.f.=14, -2 L.L.=1346.318; χ^2 difference=223.512, $p<.001$). When the physical restriction variables are included in the model, only polio becomes non-significant, indicating the physical limitations related to polio are mediating the relationship between polio and retrospective health status.

[Table 3 here]

The odds ratios in model 2 of table 3 allow identification of the strongest predictors of dichotomized retrospective childhood health status. The single most influential predictor in the complete model was activity restrictions, indicating the odds of reporting fair to poor childhood health status increased by more than 4 times when the respondent reported activity restrictions in childhood. The remaining two functional impairment variables also significantly increased the probability of being in fair to poor health as a child. Respondents reporting having missed school for one month or more (odds ratio=2.63) or having been restricted to bed or home for one month or more (odds ratio=2.00) were also significantly more likely to rate their childhood health as fair or poor.

Regarding childhood health conditions, again asthma had the greatest effect on outcome of the childhood health conditions. Those with asthma were more than three and a half times more likely to rate their childhood health as fair or poor. Chronic bronchitis

(odds ratio=3.08), frequent ear infections (odds ratio=2.81), pneumonia (odds ratio=1.48), and having reported that their tonsils/adenoids were removed as a child (odds ratio =1.58) also were significant predictors of fair/poor health. Having experienced whooping cough/pertussia, polio, diphtheria, hepatitis, meningitis, or mononucleosis did not significantly increase the odds of retrospectively reporting fair to poor health as a child.

Table 4 presents the results of regression models estimating the impact of the specific conditions responsible for the respondent's childhood activity limitation. The most common were infectious conditions. However, other conditions such as genitourinary (OR=20.4), circulatory (OR=13.9), respiratory (OR=13.3), and Musculoskeletal (OR=7.9) had much larger impacts on reporting fair/poor overall health than did infections (OR=5.0). Given that these conditions were all severe enough to have resulted in substantial and lengthy restrictions on physical-school activities, it is not surprising that their estimated impacts are much larger than that of the common childhood conditions.

[Table 4. here]

DISCUSSION

The above analysis was designed to investigate the content of retrospective subjective measures of overall childhood health by examining the extent to which those reports map onto to corresponding reports of specific childhood health conditions and various physical/activity limitations. To the extent to which the overall childhood health assessment are strongly correlated with childhood conditions and limitations then we can be both more confident in their quality as well as more informed of what aspects of childhood health they are capturing. A wide array of common childhood conditions and limitations were significant predictors of overall assessments of childhood health status.

In general, those conditions that were persistent/recurring such as asthma, chronic bronchitis, and frequent ear infections were the strongest predictors of overall health reports. This is not surprising given that their constant presence or frequent recurrence likely increases their salience in memory. Even with the advent of modern pharmacological therapies, asthma remains ever present in the lives of those affected by it, requiring frequent management and monitoring of activity. Similarly, having ones tonsils out, while a common procedure for member of the WLS cohort, represents a significant surgical intervention that is not likely to be forgotten.

We also find that physical/activity limitation was a strong predictor of childhood health assessments. In both the binary and ordinal regression those who had ever missed school for 1 month or more, were confined to bed or home for 1 month or more, or had their sports or physical activities restricted for 3 months or more reported substantially worse childhood health than their peers who did not experience such restrictions. Regarding the specific conditions responsible for their limitation, the most common were infectious conditions. However, genitourinary, circulatory, respiratory, and musculoskeletal conditions had much larger impacts on the probability of reporting fair/poor overall health.

Despite the fact that the conditions investigated above were almost all strong predictors of overall childhood health assessments, in general, they do not do a particularly good job of explaining variation in assessments. The conditions investigated above explain less than 10% of the variation in the ordinal measure and approximately 25% in the binary measure-based on McFadden's pseudo R^2. As Haas (2007) has pointed out, there is a certain amount noise in these measures, especially the ordinal metric in which there is a fair amount of movement between adjacent marginal categories. This is much less common in the dichotomous measure. It is therefore not surprising that the

predictors do a better job of explaining variability in the binary measure. At the same time, the list of conditions examined here is by no means exhaustive. Nor does it represent the full spectrum of childhood health experiences. It is heavily skewed toward substantial illness and health shocks. Relatively minor episodic illness and injuries are not well represented, neither is information on hospitalizations or congenital sensory/physical disabilities.

Overall, the results presented above lend additional support to the validity of retrospective subjective assessments of overall childhood health. This work has begun to flesh out what exactly such measures are capturing. However, more research, especially comparisons across different data sets representing different populations and cohorts, is needed. Combined with those of Haas (2007) and most recently Smith (2009), the results suggest that health researchers need not be overly pessimistic about the use of such measures. While caution is clearly warranted, the continued judicious use of retrospective childhood health measures in population-based research is supported.

References

Barsky, A. J., Wool, C., Barnett, M. C., & Cleary, P. D. (1994). "Histories of Childhood Trauma in Adult Hypochondriacal Patients." *American Journal of Psychiatry*

151(3):397-401.

Blackwell, D. L., Hayward, M. D., & Crimmins, E. M. (2001). Does Childhood Health Affect Chronic Morbidity in Later Life? *Social Science and Medicine* 52(8):1269-84.

Davey Smith, G., Hart, C., Blane, D., Gillis, C., & Hawthorne, V. (1997). Lifetime Socioeconomic Position and Mortality: Prospective Observational Study. *British Medical Journal* 314:547-552.

Elo, I. T. (1998). Childhood Conditions and Adult Health: Evidence From the Health and Retirement Study. *Population Aging Research Center WPS* 98-03. University of Pennsylvania.

Haas, S. A. (2007). "The Long-Term Effects of Poor Childhood Health: An Assessment and Application of Retrospective Reports." *Demography* 44(1): 113-135.

Haas, S. A. **(**2008). "Trajectories of Functional Health: The 'Long Arm' of Childhood Health and Socioeconomic Factors." *Social Science & Medicine* 66(4): 849-861.

Krall, E. A., Valadin, I., Dwyer, J. T., & Gardner, J. (1988). Recall of Childhood Illnesses. *Journal of Clinical Epidemiology* 41(11):1059-1064.

Kuh, D., & Ben-Shlomo, Y. (1997). *A Life Course Approach to Chronic Disease Epidemiology*. Oxford. Oxford University Press.

Noyes, R., Stuart, S., Lanbehn, D. R., Happel, R. L., Longley, S. L., & Yagla, S. J. (2002). "Childhood Antecedents of Hypochondiasis." *Psychosomatics* 43(4):282-289.

Sewell, W. H., Hauser, R. M., Springer, K. W., & Hauser, T. S. (2004). "As We Age: A Review of the Wisconsin Longitudinal Study, 1957-2001." Pp. 3-114 in *Research in Social Stratification and Mobility*, vol. 20, edited by Kevin T. Leicht. New York:

Elsevier.

Table 1. Descriptive Statistics of Retrospective Health and Activity Restrictions, Wisconsin Longitudinal Survey

Variable	Obs	Mean	SD	Min	Max	%
Retrospective Health						
Self-rated child health	6820	4.27	0.84	1	5	
Poor childhood health	6820	0.04	0.19	0	1	3.6
Asthma	6432	0.05	0.21	0	1	4.8
Frequent Ear infections	6435	0.13	0.34	0	1	13.5
Tonsils/Adenoids removed	6622	0.51	0.50	0	1	50.7
Bronchitis	6409	0.05	0.22	0	1	5.1
Whooping Cough/Pertussia	6466	0.19	0.39	0	1	18.9
Polio	6406	0.02	0.14	0	1	1.9
Diphtheria	6403	0.00	0.05	0	1	0.3
Hepatitis	6404	0.02	0.12	0	1	1.6
Pneumonia	6463	0.14	0.34	0	1	13.6
Meningitis	6404	0.00	0.07	0	1	0.5
Mono/Infectious Mononucleosis	6415	0.04	0.19	0	1	3.6
Childhood health conditions	6725	1.11	1.02	0	8	
Any childhood health conditions	6725	0.69	0.46	0	1	69.5
Activity Restrictions						
Miss school for 1 month or more	6752	0.08	0.27	0	1	8.0
Confined to bed for 1 month or more	6743	0.08	0.27	0	1	8.2
Physical activities restricted for 3 months or more	6705	0.07	0.25	0	1	6.9
Summary of activity restrictions	6755	0.23	0.68	0	3	
Any activity restrictions	6755	0.12	0.33	0	1	12.3
Most Serious Health Condition Resulting in Functional Impairment						
Infectious and Parasitic Diseases	6787	0.02	0.15	0	1	2.3
Nervous System and Sense Organs	6845	0.00	0.05	0	1	0.3
Circulatory System	6845	0.01	0.12	0	1	1.5
Respiratory System	6845	0.01	0.09	0	1	0.9
Digestive System	6845	0.01	0.07	0	1	0.5
Genitourinary system	6845	0.00	0.06	0	1	0.3
Musculoskeletal System and Connective Tissue	6845	0.00	0.07	0	1	0.5
Symptoms, Signs, and Ill-Defined Conditions	6845	0.00	0.06	0	1	0.3
Injury and Poisoning, ICD-9 E	6845	0.01	0.09	0	1	0.9
Other	6845	0.01	0.07	0	1	0.5

Table 2. M.L. Estimates and Odds Ratios for Retrospective Child Health Proportional Odds Logit Model

	Model 1			Model 2		
1=Poor, 2=Fair, 3=Good, 4=Very Good, 5=Excellent	Estimate	(SE)	O.R.	Estimate	(SE)	O.R.
Intercept 1	0.3572***	(.04)		0.4228***	(.04)	
Intercept 2	2.1586***	(.05)		2.2938***	(.05)	
Intercept 3	4.0448***	(.07)		4.2918***	(.09)	
Intercept 4	6.2484***	(.21)		6.572***	(.20)	
Asthma	-1.412***	(.12)	.24	-1.258***	(.12)	.27
Frequent Ear Infections	-0.718***	(.07)	.29	-0.716***	(.07)	.49
Tonsils/Adenoids Removed	-0.145**	(.05)	.87	-0.096	(.05)	.91
Bronchitis	-1.035***	(.12)	.36	-1.010***	(.12)	.35
Whooping Cough/ Pertussia	-0.247***	(.06)	.78	-0.205**	(.06)	.82
Polio	-0.930***	(.18)	.4	-0.318	(.19)	.73
Diphtheria	-0.880	(.45)	.42	-0.912*	(.45)	.40
Hepatitis	-0.360	(.2)	.7	-0.073	(.2)	.93
Pneumonia	-0.521***	(.07)	.59	-0.490***	(.07)	.60
Meningitis	-0.206	(.36)	.81	-0.115	(.37)	.88
Mononucleosis	-0.216	(.13)	.81	-0.102	(.14)	.90
Missed School				-0.562***	(.14)	.06
Confined to Bed/Home				-0.578***	(.14)	.55
Activity Restrictions				-1.035***	(.11)	.36
DF	11			14		
-2 Log L	13252.434			12832.062		
χ^2 Diff.				420.372 ***		

Table 3. M.L. Estimates and Odds Ratios for Retrospective Child Health Logistic Regression

	Model 1			Model 2		
Excellent/Very Good/Good=0, Fair/Poor=1	Estimate	(SE)	O.R.	Estimate	(SE)	O.R.
Intercept	-4.444***	(.15)		-4.865***	(.17)	
Asthma	1.518***	(.21)	4.56	1.303***	(.23)	3.68
Frequent Ear Infections	0.999***	(.17)	2.72	1.033***	(.18)	2.81
Tonsils/Adenoids Removed	0.610**	(.16)	1.84	0.455**	(.17)	1.58
Bronchitis	1.063***	(.21)	2.89	1.123***	(.23)	3.08
Whooping Cough/ Pertussia	0.339	(.17)	1.40	0.196	(.19)	1.22
Polio	0.832*	(.38)	2.30	-0.105	(.38)	0.90
Diphtheria	1.184	(.76)	3.27	1.266	(.75)	3.55
Hepatitis	0.142	(.51)	1.15	-0.581	(.55)	0.56
Pneumonia	0.484**	(.18)	1.62	0.390*	(.20)	1.48
Meningitis	-0.485	(.88)	0.62	-1.100	(.98)	0.33
Mononucleosis	0.309	(.32)	1.36	0.190	(.34)	1.21
Missed School				0.969**	(.29)	2.63
Confined to Bed/Home				0.695*	(.30)	2.00
Activity Restrictions				1.440***	(.21)	4.22
D.F.	11			14		
-2 Log L	1569.83			1346.318		
χ^2 Diff.				223.512 ***		

Table 4. M.L. Estimates and Odds Ratios for Retrospective Child Health Logistic Regression and Proportional Odds Logit Models Including Most Serious Health Condition Resulting in Physical Limitation

Excellent/Very Good/Good=0, Fair/Poor=1	Logistic Regression		
	Estimate	(SE)	O.R.
Intercept	-3.7096***	(.07)	
Infectious Diseases	1.6012***	(.27)	4.96
Circulatory System	2.6370***	(.24)	13.97
Respiratory System	2.5890***	(.31)	13.32
Genitourinary system	3.0165***	(.47)	20.42
Digestive System	0.8764	(.73)	2.40
Musculoskeletal System	2.0610***	(.50)	7.85
Ill-Defined Conditions	2.2056***	(.56)	9.08
Injury and Poisoning, ICD-9 E	1.0529*	(.52)	2.87
Other	2.0674***	(.45)	7.90
1=Poor, 2=Fair, 3=Good, 4=Very Good, 5=Excellent	Proportional Odds		
	Estimate	(SE)	O.R.
Intercept 5	0.0313	(.03)	
Intercept 4	1.7514***	(.03)	
Intercept 3	3.5576***	(.07)	
Intercept 2	5.7968***	(.19)	
Infectious Diseases	-1.0671***	(.15)	.34
Circulatory System	-2.1517***	(.18)	.12
Respiratory System	-2.2491***	(.24)	.11
Genitourinary system	-2.6949***	(.40)	.07
Digestive System	-1.0005**	(.31)	.37
Musculoskeletal System	-0.9182**	(.33)	.40
Ill-Defined Conditions	-2.1845***	(.39)	.11
Injury and Poisoning, ICD-9 E	-0.2724	(.24)	.76
Other	-0.7620*	(.30)	.47

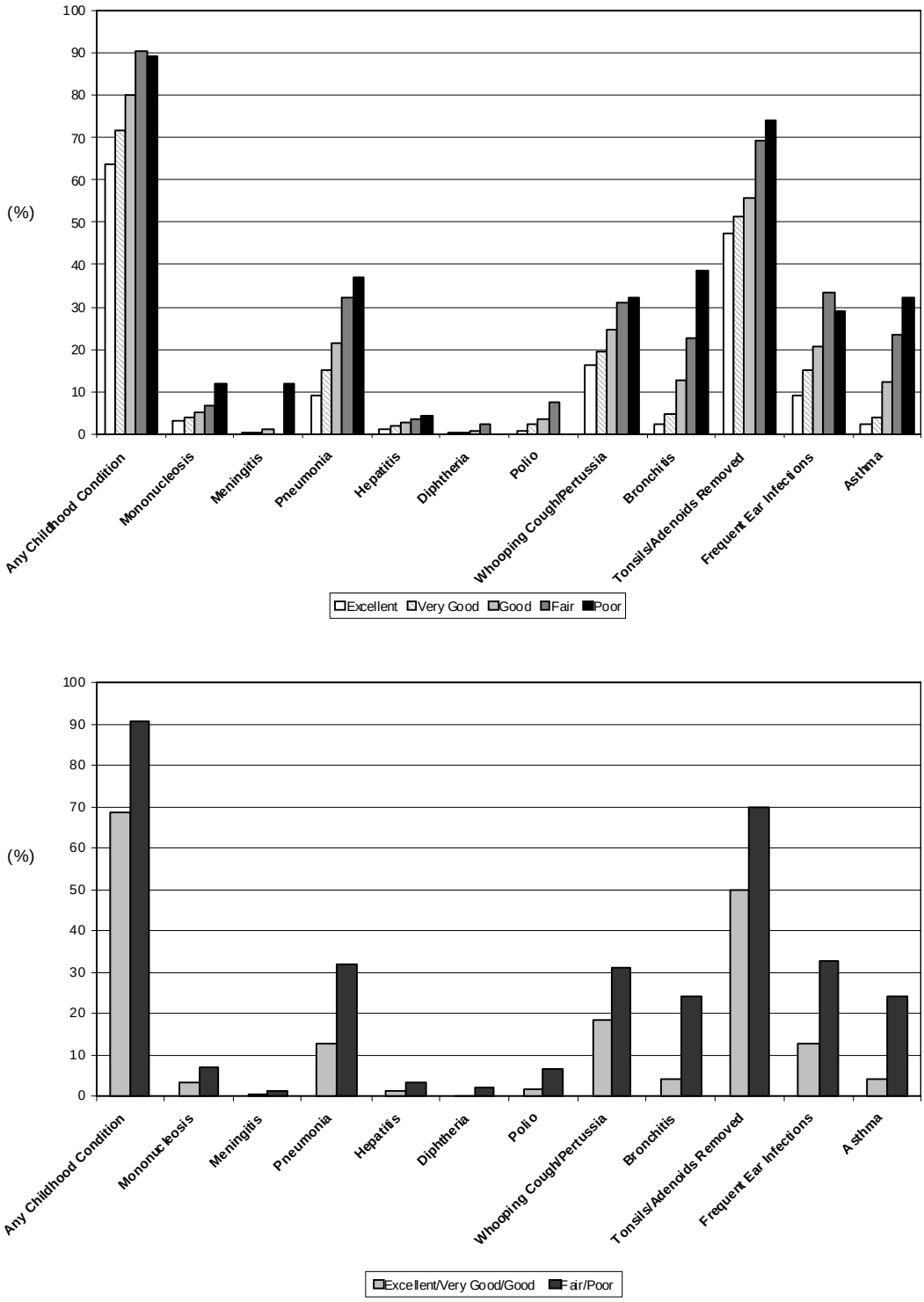

Figure 1. Prevalence of Childhood Health Conditions by Subjective Childhood Health Status

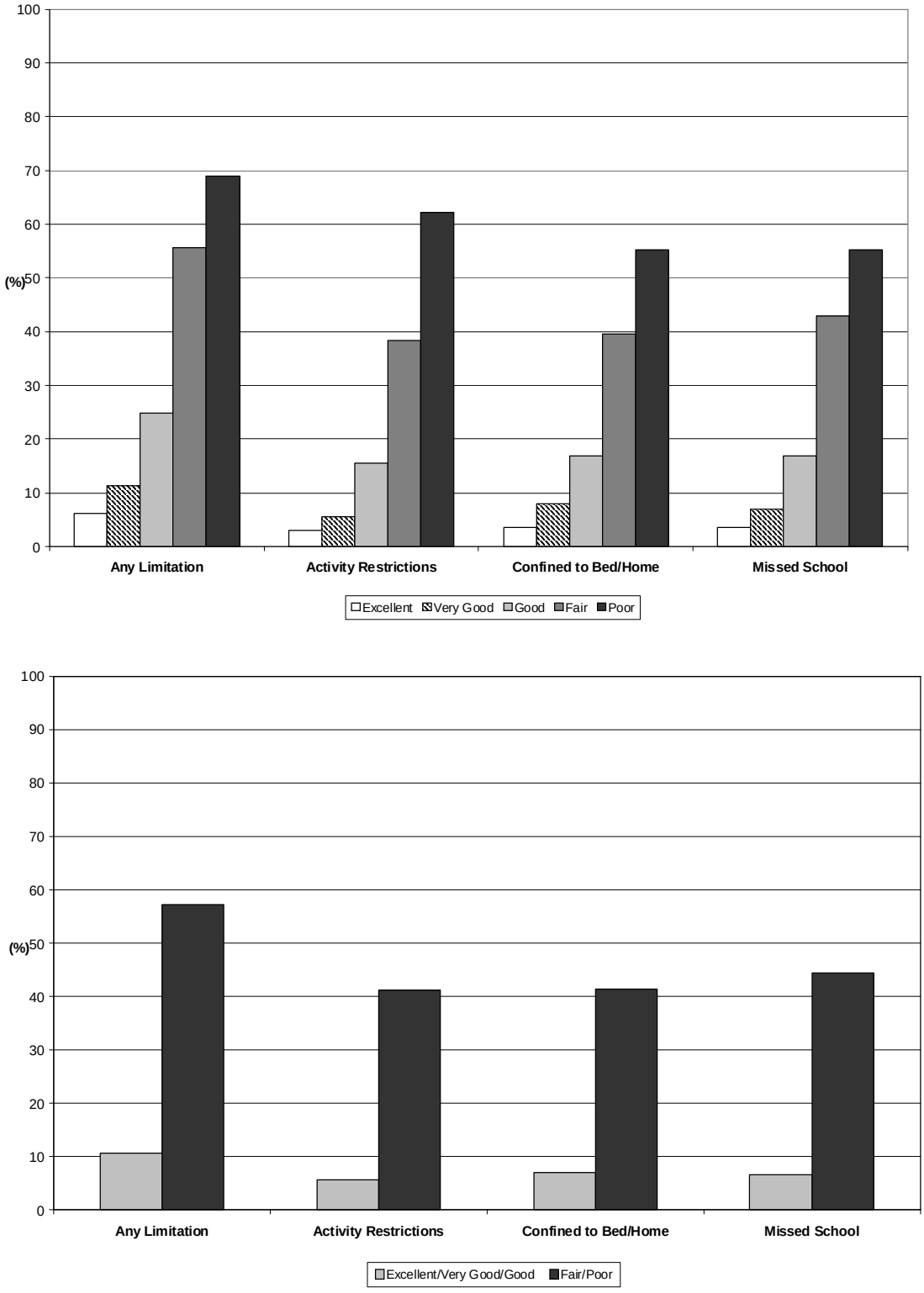

Figure 2. Prevalence of Childhood Activity Limitations by Subjective Childhood Health Status