

Methods, Issues, and Results in Evaluation and Research

Complete Health: Prevalence and Predictors Among U.S. Adults in 1995

Corey L. M. Keyes, PhD; Joseph G. Grzywacz, PhD

Abstract

Purpose. To operationalize, estimate the prevalence, and ascertain the epidemiology of complete health.

Design. Cross-sectional analyses of self-reported survey data collected via a telephone interview and a self-administered questionnaire.

Setting. Households in the 48 contiguous states in the United States in 1995.

Subjects. Random-digit dialing sample of 3032 adults between the ages of 25 and 74, with a response rate of 61%.

Measures. Physical illness and health were measured with a total of 37 items—a checklist of 29 chronic health conditions, a six-item scale of limitations of daily living, and a single item for perceived current health and for perceived 5-year change in energy. Mental illness and health were measured with the Composite International Diagnostic Interview Short Form diagnostic scale of major depression, panic, and generalized anxiety disorders and three established multi-item scales of subjective well-being (emotional, psychological, and social well-being). Completely healthy adults have high levels of physical and mental health and low levels of physical and mental illnesses; completely unhealthy adults have high levels of physical and mental illnesses and low levels of physical and mental health. Incompletely healthy adults consisted of two groups: one group is physically healthy (high physical health and low physical illness) and mentally unhealthy, and the second group is mentally healthy (high mental health and low mental illness) and physically unhealthy.

Results. Nineteen percent of adults were completely healthy, 18.8% were completely unhealthy, and 62.2% had a version of incomplete health. Compared with completely unhealthy adults, completely healthy adults are likely to be young (25–34 years of age) or old (55–64 and 65–74 years), are married, are male, are college educated, and have higher household incomes.

Conclusions. Operationalizing complete health highlights objectives for increasing the prevalence of complete health, and reducing the prevalence of complete ill-health and incomplete health. (*Am J Health Promot* 2002;17(2):122–131.)

Key Words: Complete Health, Physical Health, Mental Health, Well-Being, Prevention Research

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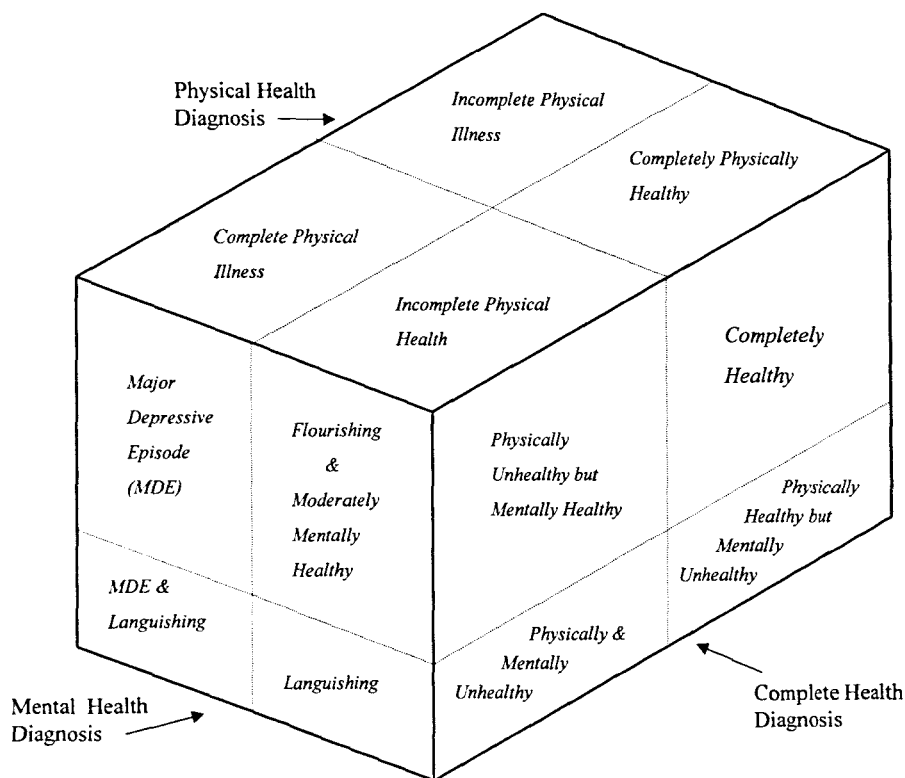
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INTRODUCTION

In practice, complete health remains an idealized concept because it has not been adequately operationalized and examined.^{1,2} This omission leaves health promotion practitioners with only disease prevention strategies such as risk factor reduction. The extent to which these strategies promote optimal health or well-being in addition to reducing morbidity remains unclear³ and debatable.^{4,5} It is therefore essential to operationalize and study complete health to guide the art and science of health promotion in the 21st century. Consistent with the World Health Organization's definition, complete health in this study is an index derived from combined measures of physical and mental health and physical and mental illness.⁷ The objectives of the study are to estimate the prevalence of complete health and its distribution in the U.S. population of adults between the ages of 25 and 74 in 1995.

Introduced by the World Health Organization in the 1940s, the concept of complete health has been in the public health lexicon for decades. However, it has not been operationalized, creating a major gap that, if filled, would benefit the science and art of health promotion in several ways. First, recognition that health is more than the absence of physical or mental illness is the philosophical underpinning of health promotion,^{1,2,7} and this philosophy distinguishes health promotion as a discipline from others such as behavioral health, which focus on rehabilitation and the prevention of disease.⁸ Thus, a tool that captures optimal or

Figure 1
The Model of Complete Health



complete health is essential for demarcating health promotion research and practice from other disciplines.

Operationalization of complete health would benefit health promotion research and practice by creating a more comprehensive framework for characterizing risk. Depression, for example, elevates risk of coronary heart disease⁹ and addictive disorders¹⁰ that collectively compound further risk for additional morbidity and premature mortality. Therefore, integrated surveillance of both physical and mental illness (at a minimum) could better identify populations at risk for subsequent morbidity generated from states of multidimensional incomplete health. Additionally, a multidimensional typology of health provides a wider lens for studying transitions toward optimal health and testing different intervention techniques designed to promote high-level wellness. Clearly, behavioral risk factor reduction reduces physi-

cal morbidity and its sequela such as lost time on the job,^{11,12} but it remains unknown if such interventions promote many of the intangibles characterized by "wellness" programs such as *enhanced* productivity or output at work or a greater social consciousness.¹³ Such research may become increasingly important as competition increases with the new global economy and as the baby boom cohort ages and demand increases for services that add health and wellness to daily life.¹⁴ Operationalization of complete health also provides an important complement to the almost exclusive focus on disease that has created an escalating attack on the "reservoir of disease" that cannot be won and erodes satisfaction with health in the population.^{4,15-18}

A version of complete health has been operationalized by the Centers for Disease Control and Prevention (CDC) as the number of days per month a population is free of physical or mental limitations or distress.¹⁶

The CDC employs three items from the Behavioral Risk Factor Surveillance System that assess healthy days in terms of the number of days free from ill-health or limitations of normal activity (i.e., "How many days during the past 30 days was your physical [or mental] health not good?"). While the CDC's operationalization of complete health includes physical and mental functioning, it measures health indirectly as the absence of illness.

However, health is not merely the absence of illness; it is also the presence of well-being. The distinctions between objective disease or disorder and subjective appraisals of well-being are frequently invoked using two intersecting axes. As shown in Figure 1, the physical health and the mental health diagnoses include a horizontal axis that represents (from left to right) high levels of symptoms or disease to asymptomatic, and a vertical axis that represents (from bottom to top) low levels to high levels of

health or subjective well-being. Domain-specific health then resides in the upper right quadrant and is characterized by low levels or the absence of morbidity and high levels of well-being (e.g., completely physically healthy). In the domain of mental health, for example, research shows that standard scales of mental well-being account for about 25% of the variance in depression,¹⁷ suggesting that individuals who may have very low levels of depressive symptoms may not have high levels of mental well-being. Research also shows that individuals free of major depression but who have low levels of mental well-being are prevalent and have levels of psychosocial impairment (e.g., work days cut back or lost) that are comparable to those of individuals who have major depression.¹⁸ Thus, it is imperative that scholars and practitioners recognize that domain-specific illness and well-being belong to distinct continuums, each of which ranges from low levels to high levels.^{2,16,17,19,20}

When the illness and the well-being continuums for physical and mental health are combined as in Figure 1, four categories of complete health emerge. Incompletely healthy adults will include two groups: one group will have a high level of well-being despite having a high level of morbidity or disorder, and a second group will have a low level of well-being despite also having a low level of morbidity or disorder illness. Completely unhealthy adults will have high levels of morbidity or disorder and low levels of well-being. To view the category of complete ill-health, Figure 1 would need to be rotated 180°, where the diagnoses of a mental illness and physical illness converge.

Completely healthy adults will have high levels of well-being and low levels of morbidity or disorder. Thus, complete health is the combination of complete physical health with the assessment of complete mental health (i.e., flourishing or moderately mentally healthy individuals). Individuals who are completely healthy are those who are free of chronic disease and activity limitations and have high levels of vitality

and energy, and they are free of mental illness and have high levels of subjective well-being. This approach permits identification and study of complete health and complete ill-health, as well as various forms of incomplete health (i.e., physically healthy but mentally unhealthy; physically unhealthy but mentally healthy). The present study investigates two primary questions. First, what are the prevalences of complete health, complete ill-health, and each type of incomplete health? Second, are complete health, complete ill-health, and incomplete health distributed unequally by age, gender, race, marital status, education, and income?

METHODS

Design

This study employed a cross-sectional self-reported survey study in which data were collected via an initial telephone interview and a subsequent self-administered questionnaire.

Sample

The data are from the National Survey of Midlife Development in the United States (MIDUS) conducted in 1995 by the John D. and Catherine T. MacArthur Foundation Research Network on Successful Midlife Development. This study involved a random-digit dialing sample of non-institutionalized English-speaking adults of age 25 to 74, living in the 48 contiguous states, whose household included at least one telephone. In the first stage of the multistage sampling design, investigators selected households with equal probability via telephone numbers. At the second stage, they used disproportionate stratified sampling to select respondents. The sample was stratified by age and gender, and males between ages 65 and 74 were oversampled. Field procedures were initiated in January of 1995 and lasted approximately 13 months.

Respondents were contacted and interviewed by professional personnel, and those who agreed to participate in the entire study took part in a computer-assisted telephone inter-

view lasting 30 minutes on average. Respondents were then mailed two questionnaire booklets requiring about 1.5 hours on average to complete. As incentives, respondents were offered \$20, a commemorative pen, periodic reports of study findings, and a copy of a monograph on the study. The sample consists of 3032 adults, with a 70% response rate for the telephone phase and an 87% response rate for the self-administered questionnaire phase. The combined response rate is 61% ($.70 \times .87 = .61$). Sampling weights correcting for unequal probabilities of household selection and respondent selection within households allow the MIDUS respondents to match the proportions of adults according to age, gender, education, marital status, race, residence (i.e., metropolitan and nonmetropolitan), and region (Northeast, Midwest, South, and West) on the basis of the October 1995 Current Population Survey. (This survey is conducted jointly by the U.S. Bureau of Labor Statistics and the Census Bureau. For more information about this survey, see <http://www.bls.census.gov/cps/cpsmain.htm>.)

Measures

In addition to the epidemiological variables, this study measured the constructs of complete physical health and complete mental health. Physical illness was measured using the self-administered questionnaire with a self-report checklist of 29 chronic health conditions, and a six-item scale of limitations of physical activities of daily living; physical health was measured with an item of perceived overall current health and perceived change in energy level over the past 5 years. Mental illness was measured in the self-administered questionnaire using the World Health Organization's Composite International Diagnostic Interview Short Form (CIDI-SF) structured interview to diagnose DSM-III-R major depression, panic, and generalized anxiety disorders. Mental health was measured using well-established multi-item scales of emotional well-being, psychological well-being, and social well-being.

Complete Physical Health. Physical health represents the absence of physical morbidity and presence of physical well-being. To identify the absence of morbidity we used an inventory of common chronic conditions developed for the MIDUS, and an index of functional impairments adapted from the Medical Outcomes Study.²¹ Specifically, respondents were asked in the self-administered questionnaire, "In the past 12 months, have you experienced or been treated for any of the following. . .," and then given a list of 29 common chronic conditions (e.g., asthma, arthritis, high blood pressure) to which they could answer Yes or No. Respondents were then asked to indicate if their health limited their involvement in six basic or instrumental activities of daily living, including (1) lifting or carrying groceries, (2) bathing or dressing, (3) climbing several flights of stairs, (4) bending, kneeling, or stooping, (5) walking several blocks, and (6) walking one block. Response categories for the functional limitation items were 1 = "A lot," 2 = "Some," 3 = "A little," and 4 = "Not at all" ($\alpha = .85$). Two single-item questions were used to identify the presence of physical well-being or the subjective experience of physical health.¹⁸ The first was "Using a scale from 0 to 10 where 0 means 'the worst possible health' and 10 means 'the best possible health,' how would you rate your health these days." The second item asked, "How would you rate yourself today compared to five years ago on. . . Energy level?" The response categories for the second item was 1 = "Better now," 2 = "No change," and 3 = "Worse now."

Physical health was then operationalized dichotomously by assigning a value of 1 to individuals who reported all of the following: (1) one or fewer chronic conditions, (2) one or fewer functional limitations, (3) self-assessed health status greater than or equal to 7 (i.e., in the top quartile), and (4) the "same" or "better" energy level compared with 5 years ago. Respondents with more than one chronic condition or functional limitation, a self-assessed level of health of 6 or less, and whose en-

ergy level compared with the last 5 years was "worse" were coded 0.

Complete Mental Health. Mental illness was assessed using the CIDI-SF scales.¹⁰ Specifically, this study focused on the diagnosis based on the DSM-III-R²² of major depressive episode (past 12 months), panic disorder, and generalized anxiety disorder.

Mental health is operationalized as a syndrome based on Keyes¹⁸ diagnostic system, which combines symptoms of emotional well-being with symptoms of psychological and social well-being. Respondents completed a structured scale of positive effect and a single life satisfaction item. Respondents also completed the six scales of psychological well-being and the five scales of social well-being. Altogether, the MIDUS included two symptom scales of emotional vitality and 11 symptom scales of positive functioning (i.e., six psychological, five social). The diagnostic scheme for mental health parallels the scheme employed to diagnose major depression disorder wherein individuals must exhibit just over half of the total symptoms (i.e., at least five of nine). To be *languishing* in life, individuals must exhibit a low level (low = lower tertile) on one of the two measures of emotional well-being, and low levels on 6 of the 11 scales of positive functioning. To be *flourishing* in life, individuals must exhibit a high level (high = upper tertile) on one of the two measures of emotional well-being and high levels on 6 of the 11 scales of positive functioning. Adults who are *moderately mentally healthy* are neither flourishing nor languishing in life. In short, individuals who are languishing or flourishing must exhibit, respectively, low or high levels on at least 7 or more of the 13 symptom scales.

To assess emotional well-being, respondents indicated how much of the time during the past 30 days—*all, most, some, a little, or none of the time*—they felt six positive symptoms of affect. The positive effect symptoms are (1) cheerful, (2) in good spirits, (3) extremely happy, (4) calm and peaceful, (5) satisfied, and (6) full of life. The internal reliability of the positive effect scale was .91.²³ Lastly,

respondents evaluated their life satisfaction as follows: "rate their life overall these days" on a scale from 0 to 10, where 0 meant the "worst possible life overall" and 10 meant "the best possible life overall."

The measures of dimensions of psychological well-being operationalize how much individuals see themselves thriving in their personal life.²⁴ The scales represent distinctive dimensions of overall psychological well-being.²⁵ Along with a representative item in parenthesis, the scales of psychological well-being are as follows: Self-Acceptance (I like most parts of my personality), Positive Relations with Others (Maintaining close relationships has been difficult and frustrating for me), Personal Growth (For me, life has been a continual process of learning, changing, and growth), Purpose in Life (I sometimes feel as if I've done all there is to do in life), Environmental Mastery (I am good at managing the responsibilities of daily life), and Autonomy (I tend to be influenced by people with strong opinions).

Each scale consisted of three items with a relative balance of positive and negative items self-administered using the questionnaire. On a scale from 1 to 7 (with 4 as a middle category of neither agree or disagree), respondents indicated whether they agreed or disagreed strongly, moderately, or slightly that an item described how they functioned (i.e., thought or felt). Negative items were reverse-coded. The three-item scales exhibit modest internal consistency (i.e., around .50),²⁵ and the internal consistency of the combined 18 items is .81.

The measures of dimensions of social well-being operationalize how much individuals see themselves thriving in their social life.²⁶ The social well-being scales, along with a representative item in parenthesis, are as follows: Social-Acceptance (People do not care about other people's problems), Social Actualization (Society isn't improving for people like me), Social Contribution (My daily activities do not create anything worthwhile for my community), Social Coherence (I cannot make sense of what's going on in the world), and

Table 1
Bivariate Association of Complete Physical Health and Mental Health, 1995, Ages 25 to 74
(Sample Weighted; Percent Shown is Percentage of Total)*

	Poor Objective and Poor Subjective Physical Health	Poor Objective but Good Subjective Physical Health	Good Objective but Poor Subjective Physical Health	Good Objective and Good Subjective Physical Health	Total
Two or three mental illnesses and languishing†	60 2.0%	3 0.1%	9 0.3%	1 0.01%	73 2.4%
One mental illness and languishing	82 2.7%	15 0.5%	10 0.3%	4 0.1%	111 3.7%
Two or three mental illnesses†	57 1.9%	12 0.4%	6 0.2%	5 0.2%	80 2.6%
One mental illness	163 5.4%	42 1.4%	47 1.6%	42 1.4%	294 9.7%
Languishing only	205 6.8%	38 1.3%	47 1.6%	34 1.1%	324 10.7%
Moderately mentally healthy	686 22.7%	274 9.1%	301 10.0%	360 11.9%	1621 53.7%
Flourishing	118 3.9%	104 3.4%	82 2.7%	214 7.1%	518 17.1%
Total	1371 45.4%	488 16.2%	502 16.6%	660 21.8%	3021

† Less than 1% of the sample had all three mental illnesses and was therefore combined with that portion of the same that had at least two mental illnesses over the past year.

* $\chi^2_{18} = 331.8, p < 0.001$ (two-tailed).

Social Integration (I feel close to other people in my community).

Each scale consisted of three items with a relative balance of positive and negative items and was self-administered. On a scale from 1 to 7 (with 4 as a middle category of neither agree or disagree), respondents indicated whether they agreed or disagreed strongly, moderately, or slightly that an item described how they functioned (i.e., thought or felt). Negative items were reverse-coded. The three-item scales have shown modest to excellent internal consistency,²⁴ and the internal consistency of the scale with all items combined is .81.

Sociodemographic Variables. Chronological age was coded into five dummy variables reflecting age cohorts—ages 25–34, 35–44, 45–54, 55–64, and 65–74. Gender was a dichotomous variable. Race was coded into the categories of Caucasian, African-American, and all others combined (i.e., Native American, Aleutian Islander or Eskimo, Asian or Pacific Islander, Multiracial, and Other Race). Marital status was coded as currently married (or cohabiting), never married, widowed, separated, and divorced (widowed, separated, and divorced were combined into “previously married” for the multivariate analysis). Education, measured as the highest grade or year of schooling completed at

the time of the interview, was coded into the following dummy variables: 11 or fewer years, high school or equivalent (General Equivalency Diploma [GED]), 13–15 years (some college), college graduate, and 17 or more years (advanced degree). Income was measured as the total household income from oneself, spouse, and from other sources (e.g., stocks). Income was recoded into the following dummy variables: less than \$15,000, \$15,000–\$24,999, \$25,000–\$34,999, \$35,000–\$44,999, \$45,000–\$64,999, \$65,000–\$84,999, \$85,000–\$104,999, and \$105,000–\$300,000 (all respondents with income over \$300,000 were top coded to 300,000).

Analysis

The research questions for this study were answered using bivariate and multivariate techniques. Cross-tabulations and appropriate chi-square statistics were used to describe the overall prevalence of complete health across the population and to test if complete health was unequally distributed in the population. All these descriptive analyses used weighted data to generate population estimates. Because some of the demographic indicators used in this study (e.g., marital status, education, and income) are frequently confounded with others (e.g., age, gender, race/ethnicity), this study also employed multinomial logistic regres-

sion to further examine the distribution of complete health within the population. Because the conclusions of the multivariate analyses were unchanged by sample weighting, unweighted results are presented.²⁷

RESULTS

Table 1 presents the cross-tabulation of complete physical and complete mental health ($\chi^2_{18} = 331.8, p < .001$). Given evidence showing that individuals with moderate mental health and those who are flourishing exhibit comparable emotional and psychosocial profiles,¹⁸ we combined these groups; thus, just over 70% of adults were completely mentally healthy. About 22% of adults were completely physically healthy. Another 33% of individuals were partly physically healthy, 16% reporting poor objective physical health but perceiving their health as good and 17% having good objective physical health but perceiving their health as poor. Consistent with the documented linkages between physical and mental illness,^{28–30} adults who had more complete mental illness were more likely to report more complete physical illness. Conversely, adults who were completely mentally healthy were more likely to also have complete physical health.

Table 2 contains the point prevalence of the various states of com-

Table 2
Unadjusted Prevalence of Complete Health by Sociodemographic Characteristics (Sample Weighted)

	Completely Unhealthy 567 18.8%	Physically Healthy, Mentally Unhealthy 85 2.8%	Physically Unhealthy, Mentally Healthy 804 26.6%	Partly Physically Healthy, Mentally Unhealthy 228 7.6%	Partly Physically Healthy, Mentally Healthy 761 25.2%	Completely Healthy 574 19.0%	χ^2
Gender							57.3*
Females	373 21.9%	51 3.0%	471 27.6%	148 8.7%	396 23.2%	267 15.7%	
Males	193 14.7%	34 2.6%	332 25.3%	81 6.2%	364 27.8%	306 23.4%	
Age							163.6*
25 to 34	136 17.4%	27 3.5%	158 20.2%	78 10.0%	206 26.4%	176 22.5%	
35 to 44	182 22.0%	35 4.2%	163 19.7%	79 9.5%	198 23.9%	172 20.7%	
45 to 54	108 18.8%	16 2.8%	159 27.7%	48 8.4%	136 23.7%	107 18.6%	
55 to 64	78 17.1%	7 1.5%	161 35.2%	17 3.7%	126 27.6%	68 14.9%	
65 to 74	58 16.4%	0 0.0%	157 44.5%	7 2.0%	87 24.6%	44 12.5%	
Race							12.3
Caucasian	472 19.0%	67 2.7%	640 25.8%	198 8.0%	631 25.4%	473 19.1%	
African-American	54 16.3%	9 2.7%	106 31.9%	16 4.8%	85 25.6%	62 18.7%	
Other†	40 19.5%	9 4.4%	57 27.8%	15 7.3%	45 22.0%	39 19.0%	
Marital status							60.9*
Married	338 16.4%	50 2.4%	587 28.5%	133 6.5%	553 26.9%	397 19.3%	
Previously married	159 25.7%	20 3.2%	138 22.3%	70 11.3%	128 20.7%	103 16.7%	
Never married	70 20.4%	15 4.4%	79 23.0%	26 7.6%	80 23.3%	73 21.3%	
Education							91.6*
Less than 12 years	102 25.8%	12 3.0%	123 31.1%	27 6.8%	83 21.0%	48 12.2%	
12 years or GED	233 20.1%	34 2.9%	326 28.2%	92 8.0%	280 24.2%	192 16.6%	
13 to 15 years	158 20.5%	19 2.5%	183 23.8%	65 8.5%	186 24.2%	158 20.5%	
College graduate, 16 years	44 10.7%	11 2.7%	98 23.8%	30 7.3%	128 31.1%	101 24.5%	
17 or more years	29 10.2%	10 3.5%	75 26.3%	13 4.6%	83 29.1%	75 26.3%	
Income							122.6*
Less than \$15,000	195 24.9%	20 2.6%	239 30.6%	47 6.0%	170 21.7%	111 14.2%	
\$15,000 to \$24,999	64 18.2%	14 4.0%	108 30.7%	32 9.1%	87 24.7%	47 13.4%	
\$25,000 to \$34,999	75 18.2%	10 2.4%	100 24.3%	44 10.7%	104 25.2%	79 19.2%	
\$35,000 to \$44,999	61 14.7%	12 2.9%	120 29.0%	37 8.9%	113 27.3%	71 17.1%	
\$45,000 to \$64,999	84 15.4%	19 3.5%	129 23.6%	34 6.2%	156 28.6%	124 22.7%	
\$65,000 to \$84,999	28 14.1%	5 2.5%	42 21.2%	11 5.6%	56 28.3%	56 28.3%	
\$85,000 to \$104,999	16 11.3%	3 2.1%	38 26.8%	8 5.6%	38 26.8%	39 27.5%	
\$105,000 to \$300,000	19 10.9%	2 1.1%	35 20.1%	11 6.3%	58 33.3%	49 28.2%	

† Includes Native American Indian, Asian American, Pacific Islander; all were combined because of low cell sizes.

* $p < 0.001$ (two-tailed).

plete health, and the bivariate associations of the complete health categories by the sociodemographic variables. Only 19% of the sample fit the criteria for complete health, and another 18.8% were completely unhealthy. The majority of adults, i.e., 62.2%, had a type of incomplete health. A small portion of adults with incomplete health is physically healthy (or partly physically healthy) but mentally unhealthy. Rather, most adults with incomplete health are

physically unhealthy (or partly physically healthy, i.e., with good objective but poor subjective health or good subjective but poor objective physical health) but are also mentally healthy. (Note: Physical health could not be computed for 14 respondents because of missing data. These individuals, 12 of whom had high levels of mental health and two had poor mental health, were coded as 0 on physical health.)

Each of the demographic variables

considered in this study was reliably associated with relative health status. Consideration of Table 2 suggests that males, younger adults, more educated people, and wealthier individuals are disproportionately represented among the completely healthy. Males, married people, more educated individuals, and wealthier individuals are disproportionately represented among adults who are partly physically healthy and mentally healthy. Females, younger adults between 35

and 44 years old, previously married (i.e., divorced and separated) persons, less educated people, and less wealthy individuals were overrepresented among adults who were completely unhealthy. Individuals who were physically healthy (or partly physically healthy) but mentally unhealthy were likely to be younger. Individuals who were physically unhealthy but mentally healthy were likely to be older and married, and were either very educated (i.e., had 17 or more years of education) or had 12 or fewer years of education.

Table 3 contains the results of the multivariate, multinomial logistic regression models reporting sociodemographic differences in each of the health states in contrast to complete ill-health (i.e., the reference category for the outcome). Results in the first column of Table 3 compare individuals who were completely unhealthy with those who have good physical health but have poor mental health. Although estimates suggest that the odds of being in this category as opposed to being in the complete ill-health category are greater for those with higher education, these effects should be interpreted cautiously because overall occupancy in this category is low (2.8% of the population) and multiple comparisons were made.

The models reported in the second and third columns of Table 3 create demographic profiles of individuals who are characterized as being in various types of incomplete health as opposed to those in complete ill-health. Individuals described in the second column could be referred to as "resilient" because they are mentally healthy while being physically unhealthy. Adults aged 55-74 and blacks were more likely to be in the resilient form of incomplete health than in complete ill-health compared with 25- to 34-year-old adults and whites, respectively. Additionally, higher levels of education and household earnings were also associated with increased odds of being in this health category as opposed to complete ill-health, although there is some evidence of non-linearity. The odds of being mentally healthy but physically unhealthy in contrast with completely unhealthy were lower for

those aged 35-44 and for the never married in contrast to young adults and currently married respectively.

The pattern of results differentiating individuals with partial physical health (i.e., good objective/poor subjective or poor objective/good subjective) and poor mental health suggests that higher levels of education and higher levels of household earnings are associated with a greater likelihood of being in incomplete health vs. complete ill-health. As would be expected given the increased prevalence of chronic conditions among elders, adults aged 55-74 were less likely than those aged 25-34 to be in incomplete health than in complete ill-health. However, this pattern of results should be interpreted cautiously because only 7.8% of the population was classified as being in this category of incomplete health, and multiple comparisons were made, thereby increasing the risk of type-2 statistical error.

The demographic predictors of being in the health category closest to complete health—partial physical health with complete mental health—are described in the fourth column of Table 3. These results suggest that the odds of being in "nearly complete health" as opposed to complete ill-health were greater for adults aged 55-74, men, and blacks in contrast to 25- to 34-year-olds, females, and whites, respectively. Additionally, higher levels of educational attainment and household earnings are associated with increased likelihood of being in nearly complete health vs. complete ill-health. By contrast, adults aged 35-44 as well as those who were never married or previously married were less likely than those aged 25-34 and the currently married to be in "nearly complete health" vs. complete ill-health.

The demographic profile of individuals with complete health closely parallel the profile just described for "nearly complete health." More specifically, men, and individuals with more education and more household earnings, are more likely to be in complete health as opposed to incomplete health. Conversely, midlife adults (i.e., those aged 35-54) and those who have been previously mar-

ried have lower odds than young adults and currently married adults, respectively, of being completely healthy as opposed to completely unhealthy.

DISCUSSION

The primary goals of this study were to operationalize a measure of complete health reflecting the spirit of O'Donnell's and the World Health Organization's definitions, as well as to estimate the prevalence of complete health and examine its descriptive epidemiology. Barely 2 in 10 adults could be characterized as being without infirmity and being physically and mentally well. The prevalence of complete health was nearly identical to the prevalence of complete ill-health, with almost 2 in 10 adults having infirmity as well as absence of physical and mental well-being. Moreover, about two-thirds of the sample had incomplete health, with some infirmity combined with some degree of physical or mental well-being.

Consistent with other epidemiological studies, the demographic profile of complete health is characterized by young men from advantaged socioeconomic groups (in terms of education and income). Similarly, some aspects of the demographic profile of the completely unhealthy group are as expected: individuals with the lowest level of education and the lowest level of earnings are disproportionately characterized by poor physical and mental health. However, a surprising proportion of younger adults (22.0% of adults aged 35-44) and females (21.9%) were also classified as being completely unhealthy.

In contrast to other studies consistently outlining health disparities between blacks and whites, our analyses yielded a more complex description of racial differences in health. Race did not differentiate complete health from complete ill-health, but it did differentiate partly physically healthy and mentally healthy (nearly complete health) as well as physically unhealthy but mentally healthy ("resilient") individuals from completely unhealthy ones. Here, African-Americans exhibited a health advantage such that they were more likely to be

Table 3

Multinomial Logistic Regression of Complete Health (With "Completely Unhealthy" as the Reference Category) Onto the Sociodemographic Variables (n = 2991; Sample Unweighted)[†]

Predictors	Physically Healthy, Mentally Unhealthy vs. Completely Unhealthy		Physically Unhealthy, Mentally Healthy vs. Completely Unhealthy		Partly Physically Healthy, Mentally Unhealthy vs. Completely Unhealthy		Partly Physically Healthy, Mentally Healthy vs. Completely Unhealthy		Completely Healthy vs. Completely Unhealthy	
	B (95% CI) [‡]	OR	B (95% CI) [‡]	OR	B (95% CI) [‡]	OR	B (95% CI) [‡]	OR	B (95% CI) [‡]	OR
Ages 25-34	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0
Ages 35-44	-0.29 (0.42-1.5)	0.80	-0.40* (0.47-0.97)	0.67	-0.29 (0.54-1.0)	0.75	-0.49** (0.43-0.87)	0.61	-0.49** (0.43-0.88)	0.62
Ages 45-54	-0.30 (0.37-1.9)	0.74	0.29 (0.97-1.9)	1.3	0.29 (0.97-1.9)	1.3	-0.31 (0.46-1.2)	0.73	-0.40* (0.46-0.99)	0.67
Ages 55-64	-0.65 (2.3-3.7)	0.52	0.76*** (1.5-3.2)	2.2	-0.81** (0.25-0.80)	0.45	0.22 (0.22-0.74)	0.40	-0.26 (0.54-1.1)	0.78
Ages 65-74	-2.2* (0.01-0.91)	0.11	1.4*** (2.5-6.4)	4.0	-1.2*** (0.12-0.74)	0.30	0.61** (1.1-3.0)	1.8	-0.09 (0.57-1.5)	0.92
Female	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0
Male	0.21 (1.0-1.5)	1.2	0.21 (1.0-1.5)	1.2	.21 (1.0-1.5)	1.2	0.32** (1.1-1.7)	1.4	0.47*** (1.2-2.1)	1.6
White	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0
Black	0.87 (1.6-3.7)	2.4	0.71** (1.3-3.3)	2.0	.87 (1.6-3.7)	2.4	0.49* (1.0-2.7)	1.6	0.29 (0.84-2.1)	1.3
Other	0.23 (0.88-1.8)	1.3	0.23 (0.88-1.8)	1.3	.23 (0.88-1.8)	1.3	-0.16 (0.47-1.6)	0.85	-0.12 (0.60-1.3)	0.89
Currently married	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0
Never married	-0.42 (0.46-0.94)	0.66	-0.72*** (0.37-0.65)	0.49	-0.42 (0.46-0.94)	0.66	-0.41* (0.45-0.99)	0.67	-0.27 (0.54-1.1)	0.77
Previously married	-0.12 (0.40-0.65)	0.51	-0.40 (0.45-1.0)	0.67	-0.68 (0.40-0.65)	0.51	-0.48*** (0.46-0.82)	0.62	-0.34* (0.52-0.97)	0.71
Less than high school	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0
High school or GED	0.21 (1.1-2.1)	1.5	0.41* (1.0-2.2)	1.5	0.41 (1.1-2.1)	1.5	0.48* (1.1-2.4)	1.6	0.53* (1.1-2.7)	1.7
Some college	0.27 (1.0-2.0)	1.4	0.36 (1.0-2.0)	1.4	0.36 (1.0-2.0)	1.4	0.47* (1.1-2.4)	1.6	0.65** (1.2-3.0)	1.9
College graduate	1.1* (1.0-7.5)	2.8	1.0*** (1.7-4.5)	2.8	0.88** (1.2-4.8)	2.4	1.2*** (2.1-5.6)	3.4	1.4*** (2.3-6.7)	3.9
Graduate degree	1.2* (1.1-9.1)	3.2	0.91*** (1.5-4.2)	2.5	0.83 (1.5-3.6)	2.3	1.1** (1.7-4.9)	2.9	1.4*** (2.3-7.2)	4.1
Income \$0-\$14,999	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0	Reference	1.0
Income \$15,000-\$24,999	0.45 (1.1-2.2)	1.5	0.60** (1.2-2.7)	1.8	0.57* (1.0-3.1)	1.8	0.53** (1.1-2.6)	1.7	0.21 (1.0-2.2)	0.77
Income \$25,000-\$34,999	0.28 (0.87-1.7)	1.4	0.28 (0.87-1.7)	1.4	0.67** (1.2-3.3)	2.0	0.55** (1.2-2.6)	1.7	0.54** (1.1-2.6)	1.7
Income \$35,000-\$44,999	0.52 (1.2-2.4)	1.7	0.75*** (1.4-3.2)	2.1	0.71** (1.2-3.6)	2.0	0.79*** (1.5-3.4)	2.2	0.57** (1.1-2.8)	1.8
Income \$45,000-\$64,999	0.41 (1.1-2.1)	1.5	0.43* (1.0-2.3)	1.5	0.41 (1.1-2.1)	1.5	0.72*** (1.4-3.0)	2.0	0.72*** (1.3-3.1)	2.1
Income \$65,000-\$84,999	0.41 (1.1-2.1)	1.5	0.31 (1.1-2.1)	1.4	0.41 (1.1-2.1)	1.5	0.75** (1.2-3.7)	2.1	0.99*** (1.5-4.8)	2.7
Income \$85,000-\$104,999	0.41 (1.1-2.1)	1.5	0.67* (1.0-3.8)	2.0	0.41 (1.1-2.1)	1.5	0.82** (1.2-4.4)	2.3	1.1** (1.5-5.7)	2.9
Income \$105,000-\$300,000	0.40 (1.1-2.1)	1.5	0.33 (1.1-2.1)	1.4	0.41 (1.1-2.1)	1.5	1.0** (1.4-5.1)	2.7	1.0** (1.4-5.3)	2.8

[†] R² (Nagelkerke's) = 0.14; -2LL = 5377, X²₁₀₀ = 33.4, < 0.001.

[‡] OR = Exp(B) and 95% CI is for the OR.

* p < 0.05; ** p < 0.01; *** p < 0.001 (two-tailed).

"resilient" or in "nearly complete health" as opposed to complete ill-health than were Caucasians. Although this pattern of findings may be attributed to a self-selection bias on the part of the blacks who participated in the MIDUS, further inquiry into these effects may yield important insights into the modifiable characteristics that promote resiliency across racial and ethnic lines.

Before discussing the implications of this study, it is important to acknowledge its limitations. First, the study was limited to the items available in the instrument, and our primary goal was to offer a preliminary rather than penultimate operationalization of an elusive concept. Thus, additional research examining the most appropriate thresholds for characterization is warranted. Next, it is important to recognize that the results of this study are based on self-reported measures, which are subject to a host of reporting and recollection biases resulting from individual and contextual circumstances (e.g., individual differences in personal disposition, and differential access to resources for diagnosing physical ailments).³¹

Further, although gender and race (ethnicity) are largely exogenous and causality may be inferred, the pattern of effects surrounding age, marital status, education, and income need to be interpreted with caution because they are more endogenous with the health outcomes. The pattern of findings related to age, for example, could reflect survivor effects, whereas the negative associations between health and marital status, education, and income may reflect selection as opposed to causation. These limitations notwithstanding, this study provides several insights.

Results of this study parallel other epidemiological studies of health, thereby raising the fundamental question, What is the benefit for public health and health promotion of shifting from a disease prevention to a complete health perspective, which includes disease prevention and health promotion? First, these analyses make clear that the absence of morbidity does not converge with the presence of well-being within and across broad domains of health (i.e.,

physical and mental). One in seven adults without physical disease or restrictions to activities in daily living report one or more major mental illnesses such as depression, panic attacks, or generalized anxiety disorder, whereas a substantial majority of individuals without mental morbidity reported two or more chronic conditions and activity restrictions. To the extent that health promotion is a field that is committed to protecting population health, targeted interventions for physical and mental comorbidity appear warranted.

The complete health perspective can also help to protect population health by better identifying groups within types of risk. With regard to risk of mortality, it seems reasonable to conclude that the completely unhealthy population is most in need of health intervention. With regard to morbidity, the population with incomplete health may be most in need of prevention. Moreover, another objective ought to be to maintain or increase the prevalence of complete health in populations or to prevent the incidence of either type of incomplete health (e.g., good physical but bad mental health). From these data, continued intervention with socioeconomically disadvantaged groups is clearly warranted; however, these data also suggest that greater attention may need to be directed toward whites, females, and adults in midlife because they are also disproportionately represented among the completely unhealthy. Thus, the complete health perspective provides a tool for identifying necessary interventions for improving population health and for prioritizing health promotion and public health resources.

With additional research, the complete health perspective can influence health promotion practice through additional research. Compelling research questions can be formed about individuals in the various categories of incomplete health that inform practice. For example, it would be helpful to know the behavioral, psychological, and social factors that facilitate mental health despite physical limitation. Similarly, what differentiates the individuals in the completely healthy group from those

in the physically healthy but mentally unhealthy group? These factors, assuming they are modifiable, could be targeted for intervention as aging baby boomers come of age and acquire common age-related conditions (e.g., arthritis) and related limitations. Conceptually, these types of implications are directly linked to the second fundamental goal of the Healthy People 2010 objectives, namely, enhancing population health and improving quality of life.

CONCLUSIONS

Using the complete health status as a genuine and valid marker of population health, we conclude that an alarmingly small portion of the American adult population between the ages of 25 and 74 as of 1995 was healthy. Public health and health promotion are key agents of the health system, which the World Health Organization defines to include "... all activities whose primary purpose is to promote, restore, or maintain health" (p. 5). Our findings suggest that the health care system of the United States is falling far short of its objective of a healthier population. In a recent World Health Report that ranked the health care systems of 191 nations, the United States ranked first in per capita health expenditures. Despite spending the most on health, the United States ranked 71st in level of health and 37th in terms of overall health system performance. Interestingly, the United States also ranked 24th in life expectancy, which has been a leading marker of population health.³² Our findings are therefore consistent with other evidence of the deficient accomplishments of the U.S. health care system.

Population health promotion has the dual mission of preventing and reducing rates of disease, and promoting and increasing rates of health. The complete health perspective provides a way for researchers and practitioners to embrace this dual mission. This perspective highlights the limitations of a unidimensional model of health as the absence of disease and thereby helps to protect population health by targeting

segments of the population with the highest levels of physical and mental comorbidity. Moreover, the complete health perspective helps to improve population health by directing attention to the modifiable factors that may facilitate well-being regardless of level of morbidity. By conceptualizing and operationalizing health across physical and mental dimensions as well as dimensions of illness and health, a more complete understanding of the determinants of health may be achieved. This schema provides a more precise view of the prevalence, etiology, and prevention opportunities for health promotion.

SO WHAT?: Implications for Health Promotion Practitioners and Researchers

(1) This study suggests that about one-fifth of the U.S. population between the ages of 25 and 74 is completely healthy, whereas a comparable percentage is completely unhealthy.

(2) The implications of this study for practitioners are that efforts to reduce or prevent ill health may not necessarily result in complete health characterized by the absence of illness and the presence of well-being; therefore, efforts must also be directed toward the promotion and/or maintenance of complete health.

(3) The implications of this study for researchers are that complete health can be operationalized in large-scale surveys, and more efforts should be directed toward refinement of its measure and investigation of its etiology.

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