

SECTION I

FROM SNEEZES TO ADIEUX: STAGES OF HEALTH FOR AMERICAN MEN AND WOMEN

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Abstract—This article traces health from daily symptoms to death for American (U S) men and women in three age groups 17–44, 45–64, 65+. How do leading problems change as our perspective shifts from daily symptoms to annual incidence and prevalence rates of diseases and injuries, then to problems that induce long term limitations, to conditions brought to physicians for care, to diagnoses for hospital stays, and finally to causes of death? We study the top 15 conditions in each of these stages of health. Young adults are bothered most by acute and chronic respiratory diseases, but deaths among them are due to diseases and violent injuries that seldom figure in daily life. Fatal chronic diseases become more prevalent in middle ages and spur professional care, but they rarely cause daily symptoms. For older people, life threatening chronic conditions stretch through all stages of health. Arthritis also becomes a dominant facet of symptoms, social limitations and ambulatory care. Men's and women's leading daily symptoms are very similar, so are their leading acute and chronic conditions, limiting conditions, diagnoses for health care and causes of death. What distinguishes the sexes is the rates, not the ranks, of health problems they suffer. We elaborate the iceberg of morbidity metaphor, as a device to highlight stage, age and sex differences in health.

Health is a decidedly dynamic affair for individuals. It is experienced and remembered as a day by day, year to year and lifetime phenomenon. Symptoms come and go, levels of discomfort rise and fall, ailments are one time events or reappear all too often, chronic conditions are held in check or progress or sometimes disappear. These experiences are monitored and evaluated, and they prompt decisions

about role accommodations and therapeutic actions in short time frames and long ones. Severe or prolonged symptoms spur people to change their regular activities for several days or sometimes permanently. Self care with drugs, home remedies or first aid is applied to many symptoms, either initially or routinely. Especially bothersome or ambiguous symptoms are brought to physicians and other health professionals for diagnosis and care. The most serious episodes of trauma and disease propel individuals into hospitals for controlled therapy and surgical repair. Ultimately, one condition or a pernicious group of them brings an end to one's days by death.

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This article is dedicated to the author's father, Frank Verbrugge, who was an important mentor for her and who died in 1985, far too soon.

*For the United States, the National Health Interview Survey provides acute incidence and chronic prevalence rates. Incidence rates are based on only those problems which caused people to restrict activities or seek medical care. Until recently, chronic condition rates were based on health problems that inhibited performance of major (job, housework) or secondary (clubs, shopping, church attendance, etc) activities. Now rates are based on simply the presence of chronic disease or impairment. Frequency of visits to physicians and of hospital stays are also measured in the survey, but not contacts with other health professionals. Mortality rates are typically based on the principal, or underlying, cause of death, comorbidities are ignored. This situation may change as data with all causes shown on the death certificate are becoming available.

†A monograph titled *The Symptom Iceberg* [19] seems relevant but uses the term very differently, namely, for symptoms that people consider severe or serious but nonetheless do not seek medical care. The term symptom iceberg refers to only this kind of symptom and nothing more.

A central purpose of health statistics is to measure the human experience of ill health—the levels of morbidity and its consequences in a population. Statistics are selective, usually being limited in two ways. First, statistical series truncate counts of morbidity events by using severity thresholds. And counts of health service contacts are truncated by excluding nonphysician care.* Second, and much more limiting for our knowledge of population health, series are entirely absent for symptoms and discomforts of daily life and for self care activities, especially actual use of nonprescription and prescription drugs. These symptoms and actions are the majority of ill health experience, not the minority.

A visual metaphor—the iceberg of morbidity—captures this situation. Above water is visible, or measured, morbidity. This is diseases and injuries that propel permanent limitations, medical services and death. Below water is the larger expanse of unmeasured morbidity. This is day to day problems that prompt self care or no care. Moving from bottom to top, one encounters more serious health problems and more intensive professional care. The iceberg metaphor has been used casually, simply to distinguish minor ailments of daily life from major ones that induce medical care and death [1–3]†

Rudimentary estimates of seen and unseen morbidity have been made by White *et al.* [4], they do not employ the iceberg metaphor in their analysis.

A similar, but less visual, concept is stages of health. The notion was coined by Suchman [5] and has been developed since then [6–13]. The stages reflect decision points along the course of morbidity, namely, whether people perceive discomforts or not, whether symptoms are labelled as illness or not, and how severe they are judged to be, how symptoms influence role performance, and whether symptoms receive self care, ambulatory medical care or hospital care. The stages can be seen as filters, some symptoms have minor personal attention and accommodation, while others pass through to more public, expensive and long-term consequences. Severity (degree of bother) and seriousness (life threat) are key determinants of people's responses to symptoms. But demographic and psychosocial factors are also important, and medical sociologists study how they too affect cognitive evaluations of symptoms and how they trigger therapeutic actions.

The iceberg and stage concepts are heuristic, and they do not have fixed definitions or standard empirical uses. Their common substantive thread is to contrast personal and public facets of health. The iceberg notion arises from epidemiology and its purpose is to describe population health. One way to operationalize it is to compare a variety of morbidity and health care rates, often drawn from independent sources. The stage notion is sociological and its purpose is to understand individuals' decisions about therapeutic care. Operationally, researchers want to estimate probabilities that symptomatic people will be disabled or obtain health care. This requires a single data source, which queries symptoms and ensuing actions from the same people.

But the notion of stages is apt for population level analyses, too. Each statistical series (symptom rates, physician visit rates, hospital discharge rates, etc) can be said to represent a stage of health. Rates are cumulative events or actions taken by individuals. We shall use the term stage in this second manner.

This article traces health from daily symptoms to death for American men and women. What are the leading health problems at different stages: daily symptoms, incidence and prevalence of diseases, injuries, impairments in a year's time, problems that induce long term limitations in role performance, problems brought to office-based physicians for care, conditions that compel hospitalization, and lastly causes of death? In answering this, we will emphasize ranks of health problems rather than numerical rates. We will see that leading health problems shift, sometimes markedly, across stages of health. Changes in leading problems across the life course (age groups) and sex differences within each age group are also considered. The age spans analyzed are 17–44, 45–64 and 65+ (differing slightly from this in a few surveys). They are called young, middle-aged and older adults, respectively.

Several prior analyses have a similar style to this one [14, 15]. Their data are much more rudimentary than this article's, but they contain fine insights into population health.

DATA SOURCES

Age–sex–cause specific rates for seven stages of health were secured from a variety of United States health surveys and vital statistics.

National data

Six statistical series are national in scope. Acute condition incidence and chronic condition prevalence rates were computed from unpublished tabulations of the 1979 National Health Interview Survey*. Rates of activity limitation due to chronic conditions were computed from pooled 1979–1980 National Health Interview Survey data†. Detailed rates for physician visits based on the 1979 National Ambulatory Medical Care Survey and rates for short stay hospital episodes based on the 1979 National Hospital Discharge Survey are published in Hing *et al.* [16]. Death rates for the three broad age groups studied here are seldom published, and 1980 rates were obtained from the National Center for Health Statistics on request. Further details about the health survey designs are in issues of *Vital and Health Statistics*, Series 10 and 13, published by the National Center for Health Statistics‡.

Data were obtained for the time period 1979–1980. Although cause-specific rates vary from year to year, their ranks are highly stable over time. (The author has confirmed this by comparing results here with other years available to her.) Since this analysis concentrates on ranks, results are as true now as for 1979–1980. Changes will occur only if current leading diseases/injuries are prevented or cured on a wide-spread basis, and thereby drop notably in rank. This is a possibility over the long run of decades, but not in the short run.

All of the statistical series use the International Classification of Diseases (ICD) as the basis for coding morbidity, but they vary in how the ICD codes are aggregated in final rates. Exact comparability of titles across the series is not possible, but high similarity is. Each series typically allows several levels of aggregation, we have chosen comparable

*Chronic prevalence rates can also be derived from the Medical History Questionnaire of the National Health and Nutrition Examination Survey (NHANES). But it contains only a limited set of titles, and we needed a full set spanning all chronic titles for this analysis. Age–sex specific rates for the NHANES titles are available from the author on request or can be computed from public use data tapes.

†Another important kind of limitation is mobility. From time to time, mobility limitations have been queried in the National Health Interview Survey, but no age–sex–cause specific rates are available.

‡Residence rates for long term care are not considered here. The population of nursing home residents is relatively small (about 0.5% for the total U.S. population, and under 1% of adults) and mostly elderly (about three-quarters are 75+ years). Age–sex–cause specific rates which identify the principal health problems of residents are published in National Center for Health Statistics, *Vital and Health Statistics*, Series 13, No. 51, Table 8. The foremost conditions for both sexes are cardiovascular diseases (heart disease and stroke) and mental disorders.

levels, so the number of titles used in all series here is similar (Further details are in initial footnotes of Tables 1-4)

In each series, the leading 15 titles were identified for each age-sex group. Rates and ranks for them are shown in tables here. Rates for other titles are available from the author on request, or for two series are published in Hing *et al.* [16] as noted above.

Rates from sample surveys have been evaluated for sampling error using National Center for Health Statistics procedures and criteria (relative standard error under 30%).

Presentation of age-sex-cause specific rates from these surveys and comparisons across the surveys are innovative aspects of this article. Despite their importance, rates specific to the three factors are rarely published for the US health surveys (They are, however, routinely published for mortality, with 10 year age spans.) This has inhibited detailed analyses of stages of health for Americans.

The tables included here are dense with information, and many facets of them will not be discussed. Readers may enjoy pursuing them hereafter.

Community data

One series is community-level in scope. No national statistics exist for daily symptoms, and we have therefore chosen relevant data from the Health In Detroit Study. The study has a population based sample of metropolitan Detroit white residents aged 18+. Respondents were first interviewed and then kept daily health records for 6 weeks in Fall 1978. To date, it is the only general population survey in the US to use prospective health diaries as a principal data source, rather than as a memory aid for later retrospective questioning or as an experimental device to test health survey methods [17].

The health diaries yield age-sex-cause specific rates of daily symptoms. We discuss 10 major groups of symptoms and also the top 10 specific symptoms (The symptom classification used yields rates that are either more aggregated or less so than the other series studied here, so we have opted to report both levels.) Respondents also wrote down the causes of their symptoms, and we discuss the top 10. Rates are standardized to 6 weeks for all diary-keepers to adjust for age-sex variation in dropout [18].

The Detroit results will be compared with other community-level surveys which asked about recent morbidity by retrospective interviews.

YOUNG ADULTS

The principal daily health problems are very similar for young men and women (Table 1). Respiratory ailments stand out from all the rest. Second come musculoskeletal symptoms, followed by general (tiredness, edema, ache all over), nervous system (almost entirely headache) and then psychological (tension, nervousness) symptoms. After that point, genitourinary problems rank higher for women, and skin/nails/hair (mostly skin) problems for men.

Reflecting this general picture, specific symptoms are also similar for the sexes. Respiratory symptoms and others associated with colds are at the top. These are headache, nasal congestion, tiredness, sinus prob-

lems and sore throat, with cough farther down the list. Musculoskeletal symptom rank next for men, but not so strongly for women. Women have a greater diversity of daily symptoms than men do (only 57% of all women's symptoms are in the top 10, compared to 74% of men's).

When asked about the causes of their symptoms, young adults point first to upper respiratory infections. Most other causes named are injuries and behavior/environment factors rather than diseases. Men and women accord similar prominence to insufficient sleep, drinking and overwork. Physical exertion, weather/season and injuries rank higher in men's lives, menstruation and childbirth (called recent surgery in the code scheme) in women's.

The prominence of respiratory infections for young adults also appears in national data on acute conditions. Of all acute problems severe enough to prompt restricted activity or medical care, flu and colds are topmost for both sexes (Table 2). Rates for all other problems are much lower. Among them, injuries rank higher for men, and reproductive (includes menstrual) and urinary disorders for women. (Normal deliveries are included in the table though they are a nonmorbidity title; see Table 2 footnote.)

Only a small percentage of young adults report having chronic diseases or impairments (Table 2). Respiratory disorders due largely to allergies (chronic sinusitis and hay fever) stand out from all other problems. Below them are chronic back conditions, hypertensive disease (i.e. hypertension without heart disease), hemorrhoids and skin problems. The sexes have similar profiles with just a few exceptions: Sensory and skeletal impairments are more prominent for men; but arthritis, chronic reproductive and urinary disorders, and migraine for women. All of these except for hypertension are nonfatal problems; i.e. they rarely if ever cause death. Fatal diseases are seldom in the list for young adults, and those that appear rank low (heart conditions, asthma, bronchitis). (Hypertension can be classified either way. It is only occasionally fatal by itself, but acts as a powerful risk factor for heart and cerebrovascular diseases. We will class it as a fatal condition in this analysis.)

Limitations in job, housework and other social activities due to chronic conditions are uncommon for young adults. When they do occur, back trouble is most frequent (Table 3). Next come asthma, other skeletal impairments and musculoskeletal disorders other than arthritis. Only a few fatal disease titles appear among the leading causes of limitation. Men's and women's lists are quite similar overall.

The acute incidence and chronic prevalence lists for young adults have some interesting parallels. In both domains, respiratory problems are foremost. Beyond that, injuries generate transient and persistent problems for men, while genitourinary problems bother women more. But the chronic prevalence and limitations lists differ greatly from each other. Note how the leading chronic diseases (such as sinusitis, hay fever, hypertension) seldom cause limitations, whereas rare ones (such as asthma, heart disease) ascend in that regard. And, although disease titles dominate the prevalence lists for men and women, impairments share top ranks with diseases in the

Table 1 Leading daily symptoms (1978) for Detroit men and women¹

(1) Major groups of symptoms		(Average no. of symptoms in 6 week period) ²	
Rank	Men 18-44	Men 18-44	Women 18-44
1	Respiratory, 9.4 (\bar{x})	Respiratory, 13.3 (\bar{x})	
2	Musculoskeletal, 5.2	Musculoskeletal, 6.2	
3	General, 3.6	General, 5.4	
4	Nervous system, 2.8	Nervous system, 5.0	
5	Digestive, 1.8	Digestive, 4.3	
6	Psychological ^a , 1.3	Psychological, 2.4	
7	Skin, nails and hair, 0.6	Genitourinary, 2.1	
8	Eyes and ears, 0.3	Eyes and ears, 1.7	
9	Genitourinary, 0.1	Skin, nails and hair, 1.0	
10	Cardiovascular,*	Cardiovascular, 0.2	
	(N = 157 diary-keepers)	(N = 213)	
	Men 45-64	Women 45-64	
1	Musculoskeletal, 5.5 (\bar{x})	Musculoskeletal, 16.5 (\bar{x})	
2	Respiratory, 4.8	Respiratory, 9.8	
3	General, 2.2	Nervous system, 4.9	
4	Nervous system, 2.2	General, 3.7	
5	Digestive, 1.7	Digestive, 3.1	
6	Skin, nails and hair, 0.5	Psychological, 2.9	
7	Psychological, 0.4	Eyes and ears, 1.7	
8	Eyes and ears, 0.3	Genitourinary, 1.2	
9	Cardiovascular,* Genitourinary,*	Skin, nails and hair, 0.5	
10	—	Cardiovascular, 0.2	
	(N = 59)	(N = 98)	
	Men 65+	Women 65+	
1	Musculoskeletal, 19.4 (\bar{x})	Musculoskeletal, 13.7 (\bar{x})	
2	General, 6.3	Respiratory, 7.7	
3	Skin, nails and hair, 5.5	General, 4.8	
4	Respiratory, 5.0	Eyes and ears, 3.6	
5	Eyes and ears, 3.6	Nervous system, 3.2	
6	Digestive, 3.1	Psychological, 2.3	
7	Nervous system, 1.6	Cardiovascular, 1.9	
8	Cardiovascular, 0.8	Digestive, 1.8	
9	Genitourinary, 0.7	Genitourinary, 1.5	
10	Psychological, 0.7	Skin, nails and hair, 0.2	
	(N = 27)	(N = 35)	
(2) Specific symptoms ^{a,f,g}			
Rank	Men 18-44	(% of all symptoms)	
		Men 18-44	Women 18-44
1	Headache, 13.3%	Nerv (210)	Headache, 12.7%
2	Nasal congestion, 13.0	Resp (400)	Tiredness, 7.5
3	Tiredness, 8.7	Gen (015)	Nasal congestion, 7.1
4	Sore throat, 7.5	Resp (455)	Sinus problems, 6.3
5	Sinus problems, 7.0	Resp (410)	Tension/nervousness, 5.1
6	Back trouble (pain, stiffness), 5.4	Musc (905)	Back trouble, 4.9
7	Leg trouble, 5.3	Musc (920)	Cough, 4.5
8	Tension/nervousness, 4.9	Psych (100)	Sore throat, 2.8
9	Cough, 4.7	Resp (440)	Upset stomach (incl nausea), 3.2
10	Neck trouble, 4.7	Musc (900)	Menstrual pain, 3.0
	(N = 2720 symptoms)		(N = 7283)
	Men 45-64		Women 45-64
1	Headache, 13.2%	Nerv	Headache, 9.7%
2	Nasal congestion, 7.6	Resp	Back trouble, 6.7
3	Leg trouble, 7.1	Musc	Knee trouble, 5.5
4	Tiredness, 7.0, knee trouble, 7.0	Gen, Musc	Tension/nervousness, 5.4
5	Cough, 4.2		Joint pain, unspecified, 5.1
6	Neck trouble, 4.0, back trouble, 4.0	Musc (900), Musc	Sinus problems, 4.6, leg trouble, 4.6
7	Sore throat, 3.4	Resp	Tiredness, 4.1
8	Generalized pain (ache all over), 2.3, Hand/finger trouble, 2.3	Gen (060), Musc (960)	Nasal congestion, 4.1
9	Tension/nervousness, 2.2	Psych	Neck trouble, 3.9
10	—		Cough, 3.2
	(N = 919)		(N = 3818)
	Men 65+		Women 65+
1	Leg trouble, 11.0%	Musc	Knee trouble, 8.8%
2	Skin irritation (itching, pain), 8.0	Skin (870)	Leg trouble, 8.2
3	Hand/finger trouble, 6.9	Musc	Tiredness, 8.1
4	Generalized pain, 5.6	Gen	Back trouble, 7.4
5	Back trouble, 5.2	Musc	Tension/nervousness, 6.0
6	Foot/toe trouble, 5.1	Musc (935)	Nasal congestion, 5.6
7	Shoulder trouble, 4.4	Musc (940)	Circulation problems (pallor, flushed), 4.8
8	Knee trouble, 4.1	Musc	Headache, 4.5
9	Chest area pain (excl heart), 4.0	Gen (050)	Shoulder trouble, 4.2
10	Hip trouble, 3.0	Musc (915)	Eye problems (allergy, swelling), 3.6
	(N = 1218)		(N = 1236)

Table 1 *cont'd*

(3) Attributed causes of symptoms ^b		(% of all causes)	
Rank	Men 18-44		Women 18-44
1	Respiratory diseases, 25.7%	D	Respiratory diseases, 26.4%
2	Physical exertion (esp. job, household work, sports), 7.5	K	Sleep troubles, 11.2
3	Sleep troubles, 7.3	K	Gynecological/obstetrical troubles (esp. menstruation), 10.7
4	Physical environment (weather, season), 7.0	K	Physical exertion, 9.0
5	Adverse effects (esp. too much alcohol), 7.0	J	Musculoskeletal disease, 7.8
6	Too much work or stress, 5.9	K	Adverse effects, 7.5
7	Injury, type unspecified, 5.7	J	Too much work or stress, 5.8
8	Sprains and strains, 5.4	J	Medical treatments (esp. recent surgery), 5.4
9	Eating (esp. ate too much, rich food), 3.4	K	Physical environment, 5.2; Eating, 5.2
10	Musculoskeletal diseases, 3.3 (N = 1793 causes)	D	Skin diseases, 3.1 (N = 2893)
	Men 45-64		Women 45-64
1	Musculoskeletal diseases, 21.8%	D	Musculoskeletal diseases, 24.3%
2	Respiratory diseases, 19.7	D	Respiratory diseases, 15.1
3	Physical exertion, 7.5	K	Medical treatments (esp. old surgery), 5.1
4	Accident, injury unspecified, 6.9	J	Physical exertion, 5.0
5	Adverse effects, 4.8	J	Digestive diseases, 4.6
6	Sleep troubles, 4.6	K	Physical environment, 3.2
7	Physical environment, 4.3	K	Sprains and strains, 3.2
8	Too much work or stress, 3.6	K	Sleep troubles, 3.0
9	Digestive diseases, 3.3	D	Social problems (esp. with family/kin), 2.2
10	— (N = 670)		Circulatory diseases, 2.1 (N = 2345)
	Men 65+		Women 65+
1	Musculoskeletal diseases, 38.4%	D	Medical treatments (esp. recent/old surgery), 14.2%
2	Respiratory diseases, 7.3	D	Respiratory diseases, 13.8
3	Circulatory diseases, 7.0	D	Musculoskeletal diseases, 9.1
4	Skin diseases, 6.7	D	Circulatory diseases, 7.6
5	Malignant neoplasms, 6.5	D	Eye diseases, 6.8
6	Physical exertion, 5.3	K	Physical environment, 6.4
7	Endocrine/metabolic diseases, 4.8	D	Injury, type unspecified, 5.2
8	Medical treatments, 4.6	K	Ear diseases, 4.4
9	Sleep troubles, 4.1	K	Genitourinary diseases, 4.3
10	Physical environment, 3.8 (N = 628)	K	Sleep troubles, 3.9 (N = 927)

* < 0.1

—All further symptoms/causes have small *n* (<20 diary days).General note: titles have the same rank only if their sample *ns* are identical.^aThe Health In Detroit Study had a representative sample of white adult (ages 18+) residents of the Detroit metropolitan area, who kept daily health records for 6 weeks in Fall 1978.^bSymptoms were coded according to the Reason For Visit Classification developed for the National Ambulatory Medical Survey [58]. Its Symptom Module (S) has 10 major groups, about 160 more specific symptoms (3 digit), and a further level (4th digit) as well. In this table, we rank the 10 major groups in Item 1 and the specific symptoms (3 digit) in Item 2.^cData are standardized to a 6 week period for each diary-keeper. This adjusts for some dropout during the diary phase of the study [18].^dThe Detroit study concentrated on physical symptoms. Respondents rarely reported distinctly emotional ones such as anxiety or depression, but they did frequently report stress related symptoms such as tension and nervousness. These physically felt, but psychologically toned, symptoms are classified in the Psychological group [58].^eEach symptom's major group and 3 digit code are indicated on the right.^fThe symptom 'cold' or 'head cold' (S445) is removed from Item 2 and included as an attributed cause in Item 3. Most respondents with colds listed symptoms such as headache, cough, etc. and then named cold as the disease causing them. Colds are added into the disease 'upper respiratory infections' (D600) (Note: this adjustment is not made in Item 1, so cold is included in the Respiratory group averages.)^gWe use the word 'trouble' in Item 2 to indicate musculoskeletal pain, stiffness, aching, soreness, and spasms in the location named.^hAttributed causes may be diseases, injuries, or other reasons. The Disease Module (D) and Injury Module (J) of the Reason For Visit Classification were used, plus an Other Cause Module (K) designed specially for the Detroit study. The Other Cause Module covers environmental, behavioral, medical treatment, and some reproductive (menstruation, menopause, pregnancy) causes for symptoms. Ranks here are based on 37 groups (15 major groups of diseases, 12 subgroups of injuries/adverse effects, and 10 major groups of other causes). The most common specific causes are given in parentheses. The module type is indicated on the right.ⁱLess common are: air pollution, reaction to medication.

limitation lists. Both points mirror the fact that young adults typically have good health. Chronic diseases that do occur are usually not severe or life threatening, and they have minimal consequences for role involvement. This leaves an open field for the limitations list; the few limitations suffered come from enduring effects of injuries/deformities and occasional fatal diseases.

Reasons for office visits reflect the principal symptoms that young adults experience (Table 3). Respiratory problems propel visits most often for both sexes.

Beyond that, effects of injuries are often leading diagnoses for men; these are superseded by reproductive disorders, urinary diseases, and weight problems for women (Normal pregnancy and postpartum care are excluded from Table 3, being non-morbidity titles. If included, pregnancy visits would rank first for young women.)

For office visits, mental distress also ranks very high as a diagnosis for both sexes. This might seem extremely high to some readers, since the title is absent from the incidence and prevalence lists. This

Table 2 Leading acute and chronic conditions for American men and women

Rank	Incidence of acute conditions (1979) (No of conditions per 1000 population per year)* (counted only if they caused restricted activity or medical care)		Prevalence of chronic conditions (1979) (No of conditions per 1000 population) ^b	
	Ages 25-44 or 17-44			
	Men 25-44	Women 25-44	Men 17-44	Women 17-44
1	Influenza ^c , 424.7	Influenza, 524.6	Chronic sinusitis, 119.6	Chronic sinusitis, 175.6
2	Common cold, 338.8	Common cold, 372.2	Hay fever, without asthma, 84.8	Hay fever, without asthma, 97.4
3	Sprains and strains, 135.3	Genitourinary disorders, 170.3	Impairments of back or spine ^f , 61.6	Impairments of back or spine, 68.5
4	Open wounds and lacerations, 104.0	Oth upper respiratory conds., 149.9	Hypertensive disease ^g , 60.5	Arthritis, 58.1
5	Oth upper respiratory conds., 85.1	Oth infec/paras diseases, 129.5	Hearing impairments, 56.3	Hypertensive disease, 57.1
6	Oth infec/paras diseases, 79.7	All other acute conds., 129.4	Hemorrhoids, 44.7	Hemorrhoids, 52.0
7	All other acute conds., 76.4	Virus NOS, 118.5	Diseases of sebaceous glands (acne), 41.8	Diseases of sebaceous glands (acne), 51.3
8	Other current injuries, 67.3	Deliveries and disorders of pregnancy/puerperium ^d , 90.7	Visual impairments, 41.5	Eczema, dermatitis, and urticaria, 47.5; migraine, 47.5
9	Virus NOS, 62.5	Sprains and strains, 73.6	Arthritis, 36.9	Diseases of urinary system, 42.4
10	Contusions and superf inj., 61.7	Musculoskeletal diseases, 61.2	Heart conditions, 33.5	Heart conditions, 41.2
11	Musculoskeletal diseases, 58.4	Other current injuries, 56.0	Impairments of lower extremity or hip ^f , 26.8	Female troubles except breast ^h , 35.0
12	Upper gastroint disorders, 49.5	Contusions and superf inj., 55.6	Eczema, dermatitis, and urticaria, 26.4	Chronic bronchitis, 34.9
13	Dental conditions, 49.3	Open wounds and lacerations, 44.5	Func/sympt upper gastro- intestinal disorder, 24.5	Hearing impairments, 34.1
14	Genitourinary disorders, 43.9	Upper gastroint. disorders, 40.1	Diseases of nail, 22.8	Varicose veins, 31.8
15	Fractures and dislocations, 38.7	Bronchitis, 39.1	Asthma w/ or w/o hay fever, 22.1	Anemias, 27.0
Ages 45-64				
	Men 45-64	Women 45-64	Men 45-64	Women 45-64
1	Influenza, 281.0	Influenza, 298.5	Hypertensive disease, 202.9	Arthritis, 311.5
2	Common cold, 257.4	Common cold, 239.7	Arthritis, 188.4	Hypertensive disease, 225.0
3	Virus NOS, 88.2	Virus NOS, 103.7	Chronic sinusitis, 164.1	Chronic sinusitis, 212.2
4	Other current injuries, 63.6	All other acute conds., 89.1	Hearing impairments, 147.8	Heart conditions, 125.5
5	Sprains and strains, 59.1	Oth upper respiratory conds., 76.9	Heart conditions, 131.8	Hearing impairments, 93.1
6	Contusions and superf inj., 53.0	Genitourinary disorders, 73.9	Visual impairments, 74.4	Hay fever w or w/o asthma, 79.2
7	All other acute conds., 52.5	Contusions and superf inj., 71.7	Impairments of back or spine, 71.8	Impairments of back or spine, 77.1
8	Open wounds and lacerations, 51.0	Sprains and strains, 69.0	Hemorrhoids, 59.9	Varicose veins, 77.0
9	Oth infec/paras diseases, 49.9	Upper gastroint disorders, 57.8	Hay fever, without asthma, 58.5	Hemorrhoids, 69.1
10	Musculoskeletal diseases, 36.8	Other current injuries, 52.8	Diabetes, 56.0	Migraine, 63.1
11	Diseases of the ear, 36.6	Open wounds and lacerations, 47.8	Hernia of abdominal cavity, 49.8	Diabetes, 59.7
12	Oth upper respiratory conds., 35.6	Oth digestive system conds., 42.3	Synovitis, bursitis, and tenosynovitis, 46.0	Corns and callosities, 56.6
13	Upper gastroint. disorders, 33.3	Musculoskeletal diseases, 40.6	Impairments of lower extremity or hip, 36.4	Synovitis, bursitis and tenosynovitis, 56.2
14	Dental conditions, 25.9	Diseases of the ear, 30.6	Func/sympt upper gastrointestinal disorder, 36.2	Diseases of urinary system, 45.1
15	Fractures and dislocations, 25.3	Oth infec/paras diseases, 25.4	Ulcer of stomach and duodenum, 33.7	Eczema, dermatitis and urticaria, 43.6
Ages 65+				
	Men 65+	Women 65+	Men 65+	Women 65+
1	Common cold, 198.6	Common cold, 270.1	Arthritis, 354.6	Arthritis, 504.4
2	Influenza, 151.7	All other acute conds., 166.0	Hearing impairments, 327.2	Hypertensive disease, 434.2
3	All other acute conds., 114.8	Influenza, 160.3	Hypertensive disease, 315.0	Heart conditions, 280.6
4	Musculoskeletal diseases, 71.8	Genitourinary disorders, 72.6	Heart conditions, 265.7	Hearing impairments, 249.6
5	Other current injuries, 57.6	Other current injuries, 62.0	Chronic sinusitis, 135.4	Chronic sinusitis, 171.1
6	Contusions and superf inj., 39.5	Contusions and superf inj., 61.6	Arteriosclerosis, 121.5	Varicose veins, 126.3
7	Sprains and strains, 39.1	Fractures and dislocations, 48.2	Visual impairments, 119.7	Arteriosclerosis, 125.0

Table 2 *cont'd*

		Incidence of acute conditions (1979) (No. of conditions per 1000 population per year) ^a (counted only if they caused restricted activity or medical care)		Prevalence of chronic conditions (1979) (No. of conditions per 1000 population) ^b	
		Ages 65+			
		Men 65+	Women 65+	Men 65+	Women 65+
8	Genitourinary disorders, 38.5	Upper gastroint. disorders, 45.8	Impairments of back or spine, 76.5	Visual impairments, 117.6	
9	Pneumonia, 34.4	Musculoskeletal diseases, 44.9	Diabetes, 73.7	Impairments of back or spine, 109.0	
10	Oth. upper respiratory conds., 33.9	Diseases of the ear, 37.2	Hernia of abdominal cavity, 71.3	Diabetes, 83.9	
11	Other respiratory conds., 30.7	Virus NOS, 37.0	Emphysema, 68.2	Frequent constipation, 79.6	
12	Oth. digestive system conds., 30.5	Other respiratory conditions, 36.2	Diseases of prostate ^c , 58.0	Hemorrhoids, 75.8	
13	Virus NOS, 30.4	Oth. upper respiratory conds., 29.8	Hemorrhoids, 52.3	Corns and callosities, 73.9	
14	Fractures and dislocations, 29.2	Sprains and strains, 28.6	Impairments of lower extremity or hip, 48.1	Diseases of urinary system, 71.2	
15	Oth. infec./paras. diseases, 27.6	Oth. infec./paras. diseases, 27.7	Hay fever, without asthma, 44.6	Impairments of lower extremity or hip, 61.6	

Sources For acute conditions based on unpublished tabulations from the 1979 National Health Interview Survey, provided by the National Center for Health Statistics. For chronic conditions based on unpublished tabulations from the 1979 National Health Interview Survey, provided by the National Center for Health Statistics.

All rates shown here have low sampling error (relative standard error under 30%).

^aRanks are based on 25 disease or injury subgroups (Diagnostic Recode No. 2, NCHS). They belong to five major groups: Infective and Parasitic Diseases (common childhood diseases, virus not otherwise specified, other infective and parasitic diseases), Respiratory Conditions (common cold, other upper respiratory conditions, influenza with digestive manifestations, other influenza, pneumonia, bronchitis, other respiratory conditions), Digestive System Conditions (dental conditions, functional and symptomatic upper gastrointestinal disorders not elsewhere classifiable, other digestive system conditions), injuries (fractures and dislocations, sprains and strains, open wounds and lacerations, contusions and superficial injuries, other current injuries) and All Other Acute Conditions (diseases of the ear, headaches, genitourinary disorders, deliveries and disorders of pregnancy and the puerperium, diseases of the skin, diseases of the musculoskeletal system, all other acute conditions). The final subgroup includes diseases of the eye, acute circulatory conditions (such as arterial rupture, peripheral vascular symptoms, short term hypotension) and all others NEC (symptoms of unclear origin). Rates for the 25 subgroups are reported by age and also by sex in *Vital and Health Statistics* issues (see Series 10, Nos. 132, 136), but not for age-sex groups.

^bRanks are based on 71 disease and impairment titles that encompass all chronic conditions in the International Classification of Diseases. The rates are based on questions about (a) specific diseases and impairments experienced in the past 12 months and (b) recent disability or medical care and the conditions causing them.

^cRate here combines influenza with digestive manifestations and other influenza. The first title is a small fraction of all influenza (typically 5-10%). If the two types are treated separately, other influenza continues to hold the rank shown.

^dNormal childbirth typically involves some restricted activity and medical care. The event can be viewed as nonmorbidity and thus out of the scope of this analysis. But the raw data did not allow separation of deliveries, so the title is necessarily included.

^eIncludes upper respiratory allergy.

^fThese are deformities and orthopedic impairments. Excluded are absence and paralysis.

^gHypertension without heart involvement. Commonly called high blood pressure.

^hIncludes chronic inflammatory diseases, endometriosis, prolapse, fistula and cysts, menstrual and menopausal problems, infertility and lesser titles.

ⁱExcludes genital organ cancers, which are always classified as malignant neoplasms.

is because frequency of mental problems is not queried in their data source. Consequently, we cannot compare the relative importance of experienced mental problems with their treatment rates from these statistical series*. By contrast, limitations statistics do encompass mental conditions. They appear in the list of leading titles for young men and women but cause much less trouble for their social activities than do physical ailments.

Hospitalizations are infrequent for young adults and do not center on their most common problems (Table 3). Respiratory conditions do not figure at all

among the leading diagnoses, nor do young adults' other leading diseases. Instead, it is injuries that prompt hospital stays most often for men, reproductive disorders for women, and atypical diseases (urinary system/gallbladder diseases, alcoholism, hernia, appendicitis, neoplasms) for these ages. This reflects the efficacy of medical intervention for injuries and reproductive problems on one hand, and the nonserious nature of most chronic diseases that young adults suffer on the other. (Normal deliveries and sterilization procedures in the absence of diseases are excluded from Table 3, being nonmorbidity titles. If included, deliveries would rank first for young women.)

Lastly, causes of death show a still different picture for young adults (Table 4). Diseases and violent injuries which rarely figure in daily symptoms, annual health, ambulatory care, and even hospital stays now rank very high. Because common conditions in this age span do not kill, it leaves room for uncommon, often abrupt, events to take the lead as killers. The only strong parallel with prior stages is injuries,

*What about mental symptoms in daily life? The Detroit survey focused on physical symptoms, and this was made clear during the initial interview and training for diary-keeping. Nevertheless, many psychologically toned symptoms (especially stress related ones like tension) were reported. They are relatively common for women of all ages and for young men (Table 1). If mental distress had been solicited in the survey, more reports would certainly have occurred.

Table 3 Impact of health problems on American men and women limitations, office visits and hospital stays

Rank	Limitation from chronic conditions (1979-1980) (Persons with limitation in major or secondary activity due to condition, per 1000 population) ^a		Visits to office-based physicians (1979) (Visits per 1000 population) (principal diagnosis) ^b	
	Males Under 45 ¹	Females Under 45	Men 15-44	Women 15-44
1	Back/spine impairment ^c , 9.2	Back/spine impairment, 10.0	Acute upper resp infections, 84.6	Acute upper resp infections, 142.4
2	Lower extremity/hip impairment ^c , 9.1	Asthma, 5.6	Fractures, 73.5	Anxiety states and oth neuroses 113.3
3	Other impairments ^f , 7.0	Oth musculoskeletal dis, 5.0	Anxiety states and oth neuroses, 69.9	Diseases of female pelvic org ⁿ , 103.6
4	Asthma ^g , 6.6	Lower extremity/hip impairment, 5.0	Sprains and strains of back, 51.2	Obesity, 86.7
5	Oth musculoskeletal disorders ^h , 5.9	Arthritis, 4.5	Laceration and open wound, 50.3	Oth female genital tract prob ⁿ , 73.6
6	Upper extrem /shoulder imp ^s , 3.7	Other impairments, 4.3	Essential hypertension ⁱ , 38.8	Diseases of urinary system, 71.1
7	Visual impairments, 3.2	Diseases of heart, 2.8	Bursitis and synovitis, 28.2	Sprains and strains of back, 52.5
8	Diseases of heart, 3.2	Hypertensive disease, 2.4	Prostate and oth male genital, 26.5	Menstruation disorders, 42.5
9	Specific mental disorders ^j , 3.0	Specific mental disorders, 1.9	Bronchitis, 23.7	Diseases of breast, 42.0
10	Arthritis, 2.7, Hearing imp, 2.7	Diabetes, 1.8	Diseases of urinary system, 23.4	Complications of pregnancy, etc ^k , 38.0
11	Paralysis, 2.6	Visual impairments, 1.7	Asthma, 17.0	Essential hypertension, 37.1
12	Hypertensive disease ^l , 1.9	Paralysis, 1.7	Dislocation w/o fracture, 15.0	Benign neoplasms, 33.7
13	Chronic/allergic skin diseases, 1.6	Mental symptoms, 1.7	Obesity, 13.9	Fractures, 26.5
14	Mental symptoms ^l , 1.5	Upper extrem /shoulder imp, 1.6	Hemorrhoids, 13.4	Asthma, 26.4
15	Hay fever w/o asthma, 1.5	Hearing impairments, 1.5	Displaced intervertebral disc, 12.9	Laceration and open wound, 25.0
	Men 45-64	Women 45-64	Men 45-64	Women 45-64
1	Diseases of heart, 59.4	Arthritis, 59.0	Essential hypertension, 227.4	Essential hypertension, 244.3
2	Arthritis, 36.2	Diseases of heart, 38.2	Ischemic heart disease, 118.9	Malignant neoplasms, 110.8
3	Hypertensive disease, 26.5	Hypertensive disease, 33.9	Diabetes mellitus, 98.4	Menopausal disorders, 96.1
4	Back/spine impairment, 25.1	Back/spine impairment, 22.0	Prostate & oth male genital, 73.6	Acute upper resp infections, 95.3
5	Oth musculoskeletal disorders, 23.9	Oth musculoskeletal dis, 21.4	Bursitis and synovitis, 63.9	Obesity, 94.0
6	Lower extremity/hip imp, 20.4	Diabetes, 17.2	Acute upper resp infections, 63.7	Diabetes mellitus 92.9
7	Diabetes, 14.8	Lower extremity/hip imp, 13.9	Malignant neoplasms, 60.0	Anxiety states and oth neuroses, 92.4
8	Arteriosclerosis ^k , 14.1	Arteriosclerosis, 9.8	Anxiety states and oth neuroses, 51.3	Diseases of urinary system, 84.1
9	Emphysema, 13.4	Malignant neoplasms, 9.6	Arthritis, 45.6	Arthritis, 81.2
10	Visual impairments, 8.9	Asthma, 8.4	Diseases of urinary system, 44.9	Fractures, 65.6
11	Other respiratory diseases ^l , 8.5	Mental symptoms, 7.9	Fractures, 43.3	Sprains and strains of back, 55.1
12	Paralysis, 8.0	Other digestive diseases, 6.5	Hernia of abdominal cavity, 39.1	Bursitis and synovitis, 54.9
13	Upper extrem /shoulder impl, 7.7	Visual impairments, 6.4	Sprains and strains of back, 38.0	Benign neoplasms, 48.6
14	Other digestive diseases ^m , 7.5	Other impairments, 5.9	Bronchitis, 34.4	Diseases of breast, 44.8
15	Hernia of abdominal cavity, 7.1	Emphysema, 5.3	Laceration and open wound, 32.6	Ischemic heart disease, 41.3
	Men 65+	Women 65+	Men 65+	Women 65+
1	Diseases of heart, 135.0	Arthritis, 143.1	Essential hypertension, 275.1	Essential hypertension, 504.0
2	Arthritis, 82.4	Diseases of heart, 93.2	Ischemic heart disease, 264.1	Ischemic heart disease, 198.2
3	Hypertensive disease, 46.5	Hypertensive disease, 65.3	Malignant neoplasms, 178.6	Arthritis, 159.2
4	Emphysema, 39.0	Diabetes, 30.7	Diabetes mellitus, 166.2	Diabetes mellitus, 154.4
5	Arteriosclerosis, 34.9	Lower extremity/hip imp, 29.7	Prostate and oth male genital, 111.1	Malignant neoplasms, 153.1
6	Visual impairments, 31.1	Visual impairments, 29.6	Diseases of urinary system, 90.1	Cataract, 140.4

(cont on p 1204)

(cont on p 1204)

Table 3 *contd*

		Hospital stays (1979) (Discharges from short stay hospitals per 10,000 population) (principal diagnosis ²)	
		Men 15-44	Women 15-44
1	Fractures, 65.3		Pregnancy w abortive outcome, 94.9
2	Laceration and open wound, 38.1		Complications of pregnancy, etc., 88.4
3	Alcohol dependence syndrome, 36.7		Oth female genital tract prob., 74.4
4	Diseases of urinary system, 36.6		Diseases of female pelvic org., 71.4
5	Hernia of abdominal cavity, 31.0		Menstruation disorders, 69.1
6	Displaced intervertebral disc, 24.2		Benign neoplasms, 53.2
7	Sprains and strains of back, 23.9		Diseases of urinary system, 49.6
8	Dislocation w/o fracture, 22.9		Gallbladder diseases, 33.9
9	Intracranial injury ² , 22.7		Anxiety states and oth neuroses, 30.9
10	Appendicitis, 19.8		Fractures, 23.6
11	Prostate and oth male genital, 19.4		Chronic tonsils/adenoids disease, 23.0
12	Anxiety states and oth neuroses, 17.2		Diseases of breast, 21.2
13	Malignant neoplasms, 15.1		Malignant neoplasms, 19.6
14	Diabetes mellitus, 13.4		Genital prolapse, 15.0
15	Gastritis and duodenitis, 12.6		Displaced intervertebral disc, 14.8
		Men 45-64	Women 45-64
1	Malignant neoplasms, 139.9		Malignant neoplasms, 158.8
2	Ischemic heart disease, 116.3		Benign neoplasms, 71.1
3	Hernia of abdominal cavity, 84.6		Diseases of urinary system, 67.1
4	Diseases of urinary system, 78.6		Gallbladder diseases, 63.1
5	Alcohol dependence syndrome, 66.9		Diabetes mellitus, 58.0
6	Acute myocardial infarction, 64.6		Ischemic heart disease, 54.3
7	Prostate and oth male genital, 62.7		Fractures, 47.4
8	Coronary atherosclerosis, 61.2		Oth female genital tract prob., 44.6
9	Fractures, 51.6		Menstruation disorders, 41.4
10	Cerebrovascular disease, 42.5		Hernia of abdominal cavity, 34.7
11	Diabetes mellitus, 40.9		Breast dis., Displaced disc, 34.5
12	Displaced intervertebral disc, 38.1		Cerebrovascular disease, 32.8
13	Ulcer of stomach and duodenum, 35.7		Essential hypertension, 31.4
14	Gallbladder diseases, 31.9		Genital prolapse, 30.0
15	Pneumonia, 30.9		Arthritis, 27.8
(cont.) Hospital stays			
		Men 65+	Women 65+
1	Malignant neoplasms, 481.0		Malignant neoplasms, 306.2
2	Cerebrovascular disease, 244.3		Cerebrovascular disease, 232.0
3	Prostate and oth male genital, 194.5		Fractures, 212.0
4	Diseases of urinary system, 180.9		Coronary atherosclerosis, 155.8
5	Coronary atherosclerosis, 175.9		Cataract, 134.9
6	Ischemic heart disease, 144.5 (cont on right)		Congestive heart failure, 123.4
7	Hernia of abdominal cavity, 140.4		7 Pneumonia, 135.4
8	Pneumonia, 135.4		9 Congestive heart failure, 133.7
9	Congestive heart failure, 133.7		10 Acute myocardial infarction, 118.2
10	Acute myocardial infarction, 118.2		11 Cataract, 103.0
11	Cataract, 103.0		12 Fractures, 87.4
12	Fractures, 87.4		13 Cardiac dysrhythmias, 86.0
13	Cardiac dysrhythmias, 86.0		14 Gallbladder diseases, 73.0
14	Gallbladder diseases, 73.0		15 Diabetes mellitus, 72.1
15	Diabetes mellitus, 72.1		Diseases of urinary system, 115.5
			Diabetes mellitus, 115.4
			Ischemic heart disease, 106.2
			Pneumonia, 91.4
			Gallbladder diseases, 83.6
			Acute myocardial infarction, 76.5
			Cardiac dysrhythmias, 71.4
			Diverticula of intestine, 64.8
			Arthritis, 64.6

Table 3 *cont'd*

	Limitation from chronic conditions		Visits to office-based physicians	
	Men 65+	Women 65+	Men 65+	Women 65+
	(cont from p 1202)		(cont from p 1202)	
7	Diabetes, 27.7	Arteriosclerosis, 25.5	Arthritis, 76.9	Diseases of urinary system, 116.5
8	Lower extremity/hip imp., 25.1	Back/spine impairments, 20.5	Acute upper resp infections, 74.0	Acute upper resp infections, 107.1
9	Cerebrovascular disease, 24.5	Oth musculoskeletal dis., 17.2	Cataract, 69.6	Fractures, 97.7
10	Paralysis, 21.0	Cerebrovascular disease, 15.0	Cerebrovascular disease, 59.7	Anxiety states and other neuroses, 62.1
11	Oth musculoskeletal disorders, 18.4	Paralysis, 12.4	Benign neoplasms, 51.8	Hypertensive heart disease, 51.7
12	Back/spine impairments, 18.0	Malignant neoplasms, 12.4	Hernia of abdominal cavity, 47.3	Cerebrovascular disease, 51.1
13	Malignant neoplasms, 17.7	Other digestive diseases, 11.4	Fractures, 41.3	Anemias, 50.6
14	Other respiratory diseases, 17.3	Hearing impairments, 11.4	Ulcer of stomach and duodenum, 40.7	Bursitis and synovitis, 50.1
15	Hearing impairments, 14.3	Hernia of abdominal cavity, 9.2	Bronchitis, 40.4	Hernia of abdominal cavity, 42.8

Sources: For limitations based on unpublished tabulations from the 1979 and 1980 National Health Interview Surveys, provided by the National Center for Health Statistics. Rates are calculated for pooled 1979-1980 data to increase their stability. For office visits and hospital stays: *Vital and Health Statistics*, Series 3, No. 24, Tables 6,9 [16]. The office visit data are from the 1979 National Ambulatory Medical Care Survey. The hospital discharge data are from the 1979 National Hospital Discharge Survey.

All rates shown here have low sampling error (relative standard error under 30%).

[†]A condition is considered chronic if it has lasted 3 or more months or is a problem always classified as chronic regardless of onset (e.g. diabetes, emphysema). Ranks are based on 53 disease and impairment titles (Diagnostic Recode No. 3, National Center for Health Statistics) that encompass all chronic conditions in the International Classification of Diseases. Major activity is job or housework; secondary activities are clubs, shopping, church attendance, etc. Ranks are rounded for presentation in this table; titles have the same rank only if their rates are identical at the second decimal place.

[‡]Ranks are based on about 60 disease and injury titles, both acute and chronic, which encompass the International Classification of Diseases (ICD). Excluded are nonmorbidity visits (for vaccination, examination, contraception, normal pregnancy, postpartum care, etc.; these are V codes in the ICD). If normal pregnancy visits were included, they would rank first for women 15-44 (rate of 443.1). Reproductive titles shown exclude genital organ cancers, which are always classified as malignant neoplasms.

[§]Ranks are based on about 60 disease and injury titles, both acute and chronic, which encompass the International Classification of Disease (ICD). Excluded are nonmorbidity stays (for deliveries, sterilization procedures in absence of disease, renal dialysis, organ donation, etc.; these are V codes in the ICD). If normal deliveries were included, they would rank first for women 15-44 (rate of 710.8). All reproductive titles exclude genital organ cancers, which are always classified as malignant neoplasms. Patients can be alive or dead at time of discharge.

[¶]Tabulations for ages 17-44 are not available. Rates for children (under 17) are very low for most conditions, so the ranks shown here pertain adequately to adults 17-44.

^{‡‡}This is deformities and orthopedic impairments. Excluded are absence and paralysis.

^{††}A residual group excludes back/spine, upper extremity/shoulder, lower extremity/hip, and multiple impairments. Includes such problems as loss of smell/taste, learning disability, absence/loss of toes/fingers, ankle/foot/toe impairment, disfigurement of face area and jaw/dentofacial anomalies.

^{‡‡‡}With or without hay fever.

^{†††}A residual group. Excludes arthritis. Includes such problems as chronic joint pain and stiffness, sacroiliitis, displacement of intervertebral disc, vertebrogenic pain syndrome (low back pain), osteomyelitis and osteoporosis.

^{§§}Specific mental disorders are psychoses, neuroses, personality disorders and mental retardation. Mental symptoms include such problems as depression, anxiety, nervousness, eating disorder and sleep disturbance.

^{¶¶}Hypertension without heart involvement. Commonly called high blood pressure.

^{‡‡‡‡}Also called atherosclerosis.

^{††††}A residual group. Excludes chronic bronchitis, emphysema, asthma, hay fever and chronic sinusitis. Includes such diseases as nasal polyp, chronic rhinitis, chronic laryngitis, bronchiectasis and pneumoconioses/other lung diseases due to external agents.

^{§§§}A residual group. Excludes ulcer of stomach and duodenum, hernia of abdominal cavity, and gallbladder diseases. Includes such diseases as esophagitis, gastritis, enteritis, colitis, diverticula of intestine, peritonitis, cirrhosis and diseases of teeth/gums/jaw/mouth.

^{¶¶¶}Diseases of female pelvic organs includes cervicitis, endocervicitis, salpingitis, endometriosis and other inflammatory diseases. Other female genital tract problems includes fistula, cervical erosion, dysmenorrhea, premenstrual tension syndrome, infertility, and other noninflammatory disorders.

^{‡‡‡‡‡}The full title is complications of pregnancy, childbirth, and the puerperium.

^{†††††}Except those with skull fracture.

which rank high both in young men's lives and also their deaths.

MIDDLE-AGED ADULTS

Musculoskeletal problems are the uppermost symptoms of daily life for middle-aged people, standing out especially for women. Respiratory symptoms rank second. All the other symptom groups have distinctly lower rates.

The leading specific symptoms reflect this general picture, being almost exclusively from the musculoskeletal and respiratory domains. Headache, a symptom often but not solely linked to respiratory

infections, is the top problem for both men and women. Pain and stiffness are common in many body sites and sometimes all over. Cold symptoms (nasal congestion, cough, sore throat), tiredness and tension/nervousness are also common. Daily troubles are similarly concentrated on the top 10 titles for men and women (60% of all men's symptoms are in the list, and 54% of women's).

In contrast to young adults, diseases are now named as the main causes for daily symptoms. Musculoskeletal diseases (mostly arthritis) are at the top. Respiratory diseases are second (a mix of acute and chronic titles when we look at the specific ones named). For the lesser causes, both sexes note phys-

Table 4 Leading causes of death for American men and women*

Causes of death (1980)		(No. of deaths per 100,000 population)	
Rank		Men 25-44	Women 25-44
1	Accidents, 68.6		Malignant neoplasms, 30.1
2	Diseases of heart, 34.6		Accidents, 17.3
3	Homicide, 29.4		Diseases of heart, 11.9
4	Malignant neoplasms, 25.8		Suicide, 7.7
5	Suicide, 24.0		Homicide, 6.4
6	Chronic liver disease and cirrhosis, 10.3		Chronic liver disease and cirrhosis, 5.0
7	Cerebrovascular diseases, 5.1		Cerebrovascular diseases, 5.0
8	Pneumonia and influenza, 2.9		Diabetes mellitus, 2.0
9	Diabetes mellitus, 2.7		Pneumonia and influenza, 1.8
10	Congenital anomalies, 1.5		Congenital anomalies, 1.1
11	Nephritis and nephrosis, 1.2		Chronic obstructive pulmonary diseases, 0.9
12	Chronic obstructive pulmonary diseases, 1.0		Nephritis and nephrosis, 0.7
13	Benign neoplasms, 0.7		Benign neoplasms, 0.7
14	Septicemia, 0.6		Complications of pregnancy/childbirth/puerperium, 0.7
15	Ulcer of stomach and duodenum, 0.4		Septicemia, 0.6
		Men 45-64	Women 45-64
1	Diseases of heart, 505.3		Malignant neoplasms, 265.8
2	Malignant neoplasms, 348.0		Diseases of heart, 177.3
3	Accidents, 61.9		Cerebrovascular diseases, 39.9
4	Chronic liver disease and cirrhosis, 50.5		Chronic liver disease and cirrhosis, 23.2
5	Cerebrovascular diseases, 50.0		Accidents, 21.6
6	Chronic obstructive pulmonary diseases, 35.0		Diabetes mellitus, 17.7
7	Suicide, 23.7		Chronic obstructive pulmonary diseases, 17.6
8	Diabetes mellitus, 18.2		Suicide, 8.9
9	Pneumonia and influenza, 17.8		Pneumonia and influenza, 8.7
10	Homicide, 15.4		Nephritis and nephrosis, 5.5
11	Nephritis and nephrosis, 7.1		Benign neoplasms, 3.4
12	Septicemia, 5.0		Homicide, 3.4
13	Ulcer of stomach and duodenum, 4.0		Septicemia, 3.2
14	Atherosclerosis, 4.0		Hypertension w/ or w/o renal disease, 2.5
15	Benign neoplasms, 3.8		Atherosclerosis, 2.0
		Men 65+	Women 65+
1	Diseases of heart, 2778.6		Diseases of heart, 2027.5
2	Malignant neoplasms, 1371.6		Malignant neoplasms, 767.8
3	Cerebrovascular diseases, 557.0		Cerebrovascular diseases, 584.0
4	Chronic obstructive pulmonary diseases, 297.9		Pneumonia and influenza, 154.9
5	Pneumonia and influenza, 212.5		Atherosclerosis, 113.9
6	Accidents, 124.4		Diabetes mellitus, 102.7
7	Atherosclerosis, 104.0		Chronic obstructive pulmonary diseases, 84.5
8	Diabetes mellitus, 92.8		Accidents, 78.9
9	Nephritis and nephrosis, 63.6		Nephritis and nephrosis, 42.1
10	Chronic liver disease and cirrhosis, 56.0		Chronic liver disease and cirrhosis, 24.6
11	Suicide, 35.0		Septicemia, 24.0
12	Septicemia, 30.9		Hypertension w/ or w/o renal disease, 23.4
13	Hypertension w/ or w/o renal disease, 25.9		Hernia of abdominal cavity and intest. obstruction, 17.9
14	Ulcer of stomach and duodenum, 23.2		Ulcer of stomach and duodenum, 14.6
15	Benign neoplasms, 16.2		Benign neoplasms, 13.9

Source: unpublished rates from 1980 vital statistics, provided by the National Center for Health Statistics.

*Ranks are based on 72 disease and injury titles that encompass the International Classification of Diseases. For titles with the same rate (at one decimal place), the relative ranking was determined from the number of deaths reported for them.

ical exertion, weather/season, and too little sleep. Men attribute symptoms to accidents and drinking relatively more than women do, and women name past surgery more.

Annual rates of acute conditions, serious enough to cause short term disability or medical care, show that respiratory diseases are most frequent and nonspecific viruses next. Injuries form the third tier for middle-aged men, but they come after reproductive (includes menopausal) and urinary disorders for middle-aged women.

Five chronic conditions stand out for middle-aged people of both sexes, arthritis, hypertensive disease, chronic sinusitis, heart conditions and hearing impairments. The significant presence of cardiovascular problems at this stage but not in daily symptoms reflects their diagnosed but usually asymptomatic status at middle ages. Compared to young adults,

diseases are now more prominent in the prevalence list, and fatal diseases join nonfatal ones in the top-rank titles. Skeletal impairments descend in importance, sensory impairments rise and end up superceding skeletal ones. No reproductive problems make the list of leading chronic conditions in middle ages. Men's and women's lists are very similar (exceptions are higher ranks for hernia among men and for varicose veins and migraine among women).

The chief causes of limitations for middle-aged adults are diseases. Now the most prevalent diseases are the most limiting ones as well. Arthritis takes Rank 1 for women and Rank 2 for men, up from its middle ranks at younger ages. Many fatal diseases now appear in the limitation list. Titles new to this age group are diseases of heart, hypertensive disease, diabetes, arteriosclerosis, emphysema and malignant neoplasms. Diseases of heart take on striking

prominence, being the chief limiter for men and in second place for women. Among the fatal titles are several low prevalence diseases (emphysema, asthma, arteriosclerosis, malignant neoplasms), this signals their debilitating nature for middle-aged persons when they do occur. Among the impairments, skeletal titles surpass sensory ones. The key limiting conditions are very similar for men and women. (The only notable difference is the higher importance of neoplasms and mental problems for women; those titles are not in men's list.)

Office visits center on chronic diseases which are infrequently symptomatic for middle-aged people but stand to benefit from medical treatment and counsel. The leading reason for medical care is hypertension, and it is distinctly set apart from all other titles. Near the top are ischemic heart disease (for men), diabetes, and malignancies—all life threatening conditions. Compared to young adults, reproductive disorders rise in middle-aged men's list (prostate and other genital disorders). But they are less pervasive in middle-aged women's, two titles appear in contrast to five at younger ages. (Note all reproductive titles exclude genital organ cancers, always classified with neoplasms.) Acute respiratory conditions, mental distress, and injuries (men) shift down to middle ranks, now supplanted by chronic physical diseases. The leading reasons for physician visits are generally similar for men and women. The exceptions are, ischemic heart disease is more prominent for men, whereas malignant neoplasms rank higher for women. This difference foreshadows causes of death, where heart disease ranks higher for men and malignant neoplasms for women. Weight problems are also more important in women's visits.

The leading reasons for hospital stays now closely parallel those for ambulatory care. Life threatening diseases are preeminent for men (malignant neoplasms, cardiovascular diseases, alcoholism—a risk factor for liver disease, and diabetes). Women have a greater diversity of fatal diseases, reproductive disorders, and seldom fatal diseases in their leading diagnoses for hospital care.

Deaths for middle-aged men and women are largely due to diseases of heart and malignant neoplasms. Rates are markedly lower for violent injuries and other diseases. The leading killers are presaged in hospital stays, ambulatory care and even limitations. But they remain very different from the symptoms of daily life.

OLDER ADULTS

The foremost daily symptoms for older adults are musculoskeletal, being over twice as frequent as any other kind. General symptoms (such as ache all over,

fatigue, chest pain other than heart) rank close to the top. Leading specific symptoms also center on musculoskeletal troubles for both sexes. There is frequent pain in many body sites (leg, knee, back, hip, shoulder, foot/toe). About 90% of the musculoskeletal symptoms reported are of pain, the remainder are mostly stiffness. Tiredness and aching all over are also prominent specific symptoms. Respiratory and headache symptoms virtually disappear from the list compared to other ages. Older men and women report a similar variety of daily symptoms (57% in their top 10 for men, and 61% for women).

Causes named for daily symptoms are largely diseases, especially arthritis. Circulatory diseases make their first appearance as a high rank cause. Women commonly cite after-effects of recent and past surgery as reasons for their aches and pains. Injuries and behavior/environment reasons now rank low compared to diseases.

Acute problems diminish sharply in frequency for older adults compared to earlier ages. Nevertheless, colds and flu maintain the top ranks. 'All other acute conditions' move up from middle ranks in other ages and now vie with respiratory infections in frequency. This residual group is largely transient ambiguous troubles, discomforts whose origin is unclear. Lower in rank are injuries, genitourinary disorders and musculoskeletal inflammations. The lists of leading acute problems are very similar for men and women (but note that genitourinary problems continue to surpass injuries among women).

Four chronic conditions predominate at older ages for both sexes: arthritis, hypertensive disease, heart conditions and hearing impairments. Among the cardiovascular titles, fatal diseases become more dominant (hypertensive disease, heart conditions, arteriosclerosis) and nonfatal ones less so (hemorrhoids and relative rates for varicose veins). Several killer diseases make their debut as leading problems at older ages: arteriosclerosis for both sexes, and emphysema for men. Sensory impairments clearly outdistance skeletal ones in prevalence*. And for the first time, reproductive disorders (prostate problems) are in men's list of leading conditions.

Persistent limitations in work and leisure activities come mostly from three diseases: arthritis, heart conditions, and hypertensive disease. The nonfatal one (arthritis) tops the list for women but remains second to heart disease for men. The fatal diseases in the list are generally the same as at middle ages, but their ranks now rise reflecting increasing severity at older ages. Visual impairments equal or exceed skeletal ones in causing limitations. The very high prevalence of hearing problems (Table 2) is not translated into many limitations. This is due to their nature (they do not prevent activities so much as diminish their enjoyment) and correction by hearing aids. The leading limiting conditions and their ranks are similar for men and women.

Physician visits for older people concentrate on fatal chronic diseases, distinctly more so than at middle ages. Hypertension continues to hold Rank 1. The next ranks go to ischemic heart disease, malignant neoplasms, and diabetes (with one exception for women). Farther down are cerebrovascular diseases, bronchitis and hypertensive heart disease. Accom-

*Why are sensory problems so infrequent in older adults' health diaries, even though prevalence rates of hearing and vision conditions rise sharply with age? (This rise appears in Detroit interviews as well as national data.) Interviews with older people about yesterday symptoms also yield low reporting of sensory symptoms [25]. Most likely, sensory problems are quite constant from day to day, so people may fail to count them as symptoms unless overtly queried.

panying this overall elevation of fatal diseases, one nonfatal one—arthritis—also rises in prominence as a propeller of medical care, especially for women. Cataracts appear in the list, paralleling the increased importance of visual problems in prevalence, limitations, and as we soon see, hospital stays. Acute respiratory infections and mental distress fall in rank, and all injuries except fractures disappear from the list. Prostate problems continue to be a leading reason for men's visits, but reproductive troubles vanish altogether from women's array of leading diagnoses. The leading reasons for men's and women's visits are generally very similar (with exceptions of prostate problems for men, and higher ranks for arthritis and fractures for women).

The main reasons for hospital stays are almost entirely life threatening diseases for both sexes. Malignant neoplasms top the list, cerebrovascular disease is second, and a variety of cardiovascular titles appear thereafter. Pneumonia appears for the first time, compared to earlier ages; although it is an acute condition with low incidence, it can be very serious for the frail elderly. Looking at other titles: Prostate problems rank very high for men, but reproductive titles now vanish from women's list. Fractures rank high for women, reflecting both more osteoporosis among females and also more frailty among women 65+ (because of their older age distribution than men 65+).

Heart diseases are the principal cause of death for older men and women, with cancer and stroke in Ranks 2 and 3. Deaths from these diseases are usually no surprise. They have already prompted extensive

health services and activity limitations, especially the heart problems, and their symptoms have stretched into daily life as well. Violent deaths come predominantly from accidents; suicide and homicide are less prominent at older ages than earlier ones.

ACROSS THE LIFE COURSE

How do the kinds of problems people suffer change with advancing age? Do young and older adults differ more in their daily symptoms than their causes of death?

We have noted some shifts from one age group to the next in prior sections. Now we take the entire span of adulthood and summarize changes across age. We will concentrate on how the ranks of morbidity titles change, with cursory attention to how rates change*.

The differentials we note are likely to be very stable over time, true for this decade and several to come. They will change only if risks and disease experience are very different for now young cohorts across their lifetimes than they have been for now old cohorts.

We begin with people's overall evaluation of their health status: *Physical wellbeing* declines with age for broad age groups. This appears both in the Detroit survey (Table 5) and also in national ones (Table 6). The decline across age is much gentler than we might expect given the sharp increases in chronic health problems with advancing age†.

Does the *frequency of daily symptoms* increase with age? The Detroit study finds that symptom rates are quite constant across age for women. Men have a curvilinear pattern, with least symptom experience in middle ages and a pronounced rise at older ages (Table 5). There is little other research evidence on this point and it shows diverse patterns: An English study finds small increases in recent symptoms (number in past two weeks) for men and women across broad age groups [computed from 2, p 19]. A Scottish study of recent symptoms (past 2 weeks) shows small steady increases with age for men, but peak rates in middle ages for women [19, p 92]. A Baltimore sample shows a large jump in symptom rates (percent with health problem in past two weeks) for people 65+ compared to middle-aged and young adults, who have similar rates [20, Fig 5.16]. A study of Los Angeles adults with repeated interviews over a year's time finds a small negative association between recalled morbidity and age [21]. This is attributed to the high incidence of acute problems (colds, flu, digestive upsets) among young adults‡.

Thus, some very basic questions about daily health of contemporary adults are scarcely answered. How do rates of symptomatic days and number of symptoms change with age? Do acute condition days diminish and chronic condition days increase, as we would expect? Do older people have more multiplicity of troubles than other age groups; that is, more-bothersome conditions on symptomatic days and also more symptoms per condition? (The Detroit study supports the first but not the second point, data are in Table 5.) Are episodes of ill health longer for older adults? Do their chronic conditions flare up (thus, in repeated episodes) more often?

*Overall rates of acute conditions, limitations, ambulatory care, hospital stays, and mortality by age are published in issues of *Vital and Health Statistics*, Series 10 and 13, and *Monthly Vital Statistics Report*, publications of the National Center for Health Statistics. A compilation of such statistics is in Hing *et al.* [16]. Health profiles of middle-aged people are analyzed in Nathanson and Lorenz [27] and of older people in Shanas [26], Kovar [28, 29], Siegel and Davidson [30] and Verbrugge [31, 32].

†When detailed age groups are used, surveys often find a curvilinear pattern across age instead—the very oldest groups (above age 75) having more positive assessments than adjacent groups (ages 60–75) [33–37]. Four reasons proposed for this are (1) the oldest people are robust survivors and have genuinely better health with respect to fatal diseases and their symptoms than many just younger people, (2) the most ill elderly are institutionalized and thus not in the survey population, (3) the oldest group evaluate their health compared to decedent peers, and (4) they have a lower standard of what constitutes good health.

‡Several surveys from earlier decades provide sickness rates over *month* or *year* periods for age-sex groups. Rates tend to increase with age for men and women [38–42]. A few statistics from these are republished in White *et al.*, [4, Tables 1 and 2].

Two other sources merit mention: well known studies from the 1950s in San Jose and California State have monthly rates of acute and chronic sicknesses, based on diaries and interviews, but rates are not shown by age [43–44]. Similarly, a recent Illinois study yields monthly rates of days felt ill, based on diaries and interviews, but none by age [45]. Both studies classify rates by whether the sickness caused restricted activity or not.

Table 5 Short term health problems of Detroit men and women^a
(Based on daily health records for 6 weeks)

	Men			Women		
	18-44	45-64	65+	18-44	45-64	65+
No of symptomatic days (per person) ^b	13.1	11.2	17.9	17.6	18.5	18.1
No of health problems (per person) ^c	16.3	13.0	31.0	25.8	28.7	31.0
No of specific symptoms (per person) ^d	25.0	17.7	46.7	41.6	44.6	40.6
Daily physical wellbeing (from 1 = terrible to 10 = wonderful) (average) ^e	7.8	7.8	7.5	7.6	7.3	7.2
No of diary-keepers (N)	157	59	27	213	98	35

^aThe Health in Detroit Study had a representative sample of white adult (ages 18+) residents of the Detroit metropolitan area, who kept daily health records for 6 weeks in Fall 1978. Figures here are based on the 589 persons who kept at least 1 week of records. Data are standardized to a 42-day period for each diary-keeper to adjust for some dropout during the diary phase of the study.

^bQ2 "Did you have any symptoms or discomforts today?" Days with Yes checked are symptomatic ones.

^cThe daily health record had a Symptom Chart for each day. Respondents wrote down all symptoms of the day, grouping the ones they considered due to the same cause. Each such grouping is counted as a distinct health problem. If the same problem occurs on several days, it is counted each day it appears.

^dSymptoms were coded according to the Symptom Module of the Reason For Visit Classification [58] (See note b of Table 1 for further details).

^eQ1 "How did you feel physically today?" Responses are on a ten-point scale, with 1 labeled terrible and 10 labeled wonderful.

Types of daily symptoms change markedly across age. The Detroit study shows the following: respiratory problems and headaches dominate for young adults; they fall in incidence and rank in middle ages, and still farther down at older ages. Musculoskeletal problems ascend in prominence across age, being increasingly due to arthritis and decreasingly to physical exertion and injuries. Sensory and cardiovascular symptoms rise in importance with age. Young adults frequently name injuries and behavior/environment factors as the causes of their symptoms; disease names become more common in middle ages; and they dominate the causes named by older people.

Several other contemporary studies in the U.S. and Great Britain have details about recently experienced symptoms by age [2, 3, 19, 22-24] or for just older adults [25, 26]. None of them uses a prospective health diary like Detroit*; instead, all have retrospective questions for a short recent time interval or questions about current complaints. Despite many differences among these surveys, they all concur with the statements above for the Detroit diaries†. Thus,

the differences we have noted are likely to be true for Americans, or Britons, as a whole.

Although rates of *acute conditions* fall sharply with age, the topmost problems stay constant, namely, respiratory infections. Injuries of many kinds rank next for young men and descend only a little in rank at middle and older ages. For women of all ages, reproductive and urinary disorders rank next after respiratory ones, and injuries thereafter. Ambiguous acute symptoms, not clearly due to a particular disease or injury, rise in prominence across age. The rankings of acute conditions are very stable across age; thus, the same basic problems recur through life although their frequency changes.

The likelihood of having *chronic conditions* rises sharply with age, and the leading ones change radically. Diseases ascend in importance, especially life threatening ones. One nonfatal disease, arthritis, also ascends; it moves into first place for older adults, followed by a cluster of cardiovascular conditions. Chronic sinusitis, the key chronic problem for young adults, descends in rank across age as other diseases pass it. Skeletal impairments diminish in importance, while sensory impairments become more prominent. Chronic reproductive organ disorders are not frequent in any age group. But note how they appear in young women's list and not thereafter, and enter older men's list but not before.

Limitations due to chronic conditions increase with age. At young ages, they are typically due to skeletal impairments and asthma. The picture changes in

*Long-term prospective data over a year or longer have been gathered for very selective samples by Hinkle *et al* [46-48] and by Dingle *et al* [49]. The descriptive statistics are fascinating and often inventive, though they cannot be used for general population estimates.

†An exception is Shanas [26]. The survey finds different ranks for recent symptoms among older persons than the other surveys do, for no obvious reason.

Table 6 Self rated health status of American men and women*
(% distribution)

	Men			Women		
	17-44	45-64	65+	17-44	45-64	65+
Excellent	56.9	39.6	29.3	48.5	33.5	27.5
Good	36.0	39.5	39.9	41.6	44.2	42.5
Fair	5.8	14.5	21.1	8.4	16.7	22.1
Poor	1.3	6.4	9.7	1.5	5.6	7.9

Source: 1978 National Health Interview Survey. Computed from data published in *Vital and Health Statistics*, Series 10, No. 142, Table 2 [36]. Persons with health status NA are excluded here.

*Compared to other persons ____'s age, would you say that his health is excellent, good, fair, or poor? Self reports, rather than proxy reports, were secured for adults whenever possible. (The question was changed in 1982 and now reads "Would you say ____ health in general is excellent, very good, good, fair, or poor?")

middle ages, as arthritis and killer diseases appear and become severe for some people. Their domination in the limitations list becomes even more pronounced at older ages. Impairments do not disappear but simply shift farther down the list. Among them, visual impairments mount in importance as limiters of social activity, and they reach comparable status to the principal skeletal impairments.

Physician visit rates rise with age for both sexes, especially for men. Colds and flu dominate visits by young adults, with mental distress, injuries and (for women) reproductive disorders taking up most other leading titles. In middle ages, fatal chronic diseases displace all of these and take topmost ranks, and more such diseases appear in lower ranks as well. This becomes even more true at older ages. Physician visits for one nonkiller, arthritis, also gain prominence with age, especially for women. Although important at young ages, reproductive titles disappear from women's list by older ages. By contrast, prostate and other genital disorders maintain middle ranks for men throughout life.

Hospital stays increase in frequency with age for men and at older ages for women. In young adulthood, injuries are the leading reason for men's stays, and reproductive disorders for women. These give way to fatal chronic diseases (especially malignancies) and nonfatal chronic ones (especially digestive and urinary) in middle ages. By older ages, injuries and reproductive titles have almost left the list (with the important exceptions of fractures for both sexes and prostate disorders for men). Fatal diseases take up virtually all positions, with malignancies decisively at the top.

Death rates rise very rapidly across the three age groups. But the titles of leading causes are virtually invariant throughout life, being mostly degenerative chronic diseases and violent injuries. Their ranks shift, however: Injuries are very prominent for young adults, then decline in importance at later ages. Malignant neoplasms and heart diseases always head the disease titles. But with age, other cardiovascular diseases rise in rank and so do chronic obstructive pulmonary diseases (bronchitis, emphysema, asthma). Diabetes maintains middle ranks at all ages. Pneumonia/influenza appears at all ages but makes a noteworthy ascent in rank at older ages*.

Summing up: The leading problems change with age in every stage of health. That is, the *ranks* of given titles almost always change and the array of component *titles* often changes too. The shifts tend to be greater from young to middle ages than from middle to older ones. This is especially evident for chronic condition prevalence and health services use, as fatal diseases make their appearance in middle age and progress from then on. Two stages show relatively great stability: Leading acute conditions tend to be similar across age. And, remarkably, the greatest stability of all is in mortality, whose component titles and ranks change less across age than for any other health stage.

SEX DIFFERENCES

Are the health experiences of men and women vastly different, or do they actually tend to suffer the same kinds of health problems? We begin by noting sex differences in rates†, then concentrate on how ranks of health problems differ for men and women.

Women experience more daily symptoms, higher incidence of all types of acute conditions (except injuries at young ages), higher prevalence of nonfatal chronic diseases, more physician visits per year, and more hospital stays (young ages). These excesses persist even if reproductive events and disorders are removed. Men surpass women in only a few respects. They have higher prevalence of the principal fatal chronic diseases and most impairments, higher limitation rates from those problems and overall limitation rates, more hospitalization in older ages, and higher mortality rates for leading causes. Thus, despite popular notions, morbidity and mortality statistics are not contradictory about men. The health statistics show that they are more bothered by serious life threatening diseases, and this culminates in higher death rates for them.

These sex differences in rates tend to be largest for young adults, and smallest for older adults. (This is true even when all reproductive events or all sex-specific titles are removed.) In brief, women suffer more frequent but less serious morbidity than men. One sex tends to be sicker in the short run of life, but the other in the long run.

Now we consider ranks. Despite pervasive sex differences in rates, men and women tend to suffer from the same kinds of health problems. That is, the leading conditions (titles and ranks) at each stage of health are more similar than they are different. This becomes increasingly true at older ages.

Evidence abounds in Tables 1-4. Note that the foremost daily symptoms are similar for men and women in each age group. The top acute conditions are the same for them at all ages, and the whole lists of acute problems become more similar with age. Leading reasons for professional care also become more similar with age, as diseases rise and displace men's injuries and women's reproductive disorders. In each age group, the leading chronic conditions and limiting conditions are strongly similar for men and women, in both the component titles and their ranks. Lastly, the array of causes of death is similar, especially for middle-aged and older adults. Although readers will find many specific differences in the data, and certainly important ones, they are surrounded by basic similarities.

Thus, what distinguishes men and women most is their *frequency* of illness, injury, health care and mortality, not the *types* of morbidity they typically suffer. In brief, what differs most is the rates not the ranks. This point has been missed heretofore in comparisons of contemporary men's and women's health.

CONNECTIONS ACROSS STAGES OF HEALTH

Do daily symptoms have much relationship to office visit diagnoses and causes of death? Are there

*Its role as a contributing cause of death, rather than principal one, also rises for older adults.

†Sex differences in morbidity and mortality rates have been studied extensively and are reviewed in [16, 50-57].

more such connections at older ages than younger ones?

For young adults, the most commonality appears at the initial stages of daily symptoms, annual health (the incidence and prevalence rates) and ambulatory care. Respiratory problems and acute ones dominate in these stages. Later stages are markedly different from them, and also from each other. Limitations are topped by impairments and nonfatal musculoskeletal troubles, also asthma. Hospital stays center on injuries for men, reproductive disorders for women, and low prevalence diseases for both. Causes of death are atypical diseases and violent injuries.

At middle ages, more links begin to appear across the stages. They form most strongly at the terminal stages. Hospital stays involve the diseases that are leading causes of death. And those diseases also begin to penetrate ambulatory care (often in the form of the risk factor hypertension) and limitations, though they do not yet dominate those stages. A different set of links form at earlier stages from arthritis. As it rises in prevalence, more limitations and daily symptoms due to it are reported. But overall, the endpoints of daily health vs causes of death still remain distinctly different.

Commonalities across stages are strongest at older ages. The leading causes of death stretch back into all prior stages. They take over most ranks for hospital stays and the top ones for ambulatory care. They vie with nonfatal diseases and impairments for prominence in limitation and prevalence rates. And they are now manifest in daily symptoms—not the most frequent ones but certainly present. Arthritis also establishes greater hold on life. Aches and pains become the principal complaints of daily life, the most prevalent chronic problem, the top or second rank limiter, and a common reason for ambulatory care.

In sum, the health profile for young adults differs greatly depending on which stage we look at. More similarity develops in middle ages, and the profile is most consistent for older adults. The increasing connections mirror the growing penetration of fatal diseases and arthritis into all facets of health status and health care as people age.

ICEBERGS OF MORBIDITY

Visual images are economical, capable of summarizing abundant statistics. So let us return to the iceberg metaphor and elaborate it. Our aim in pursuing the image is not fanciful but instead scientific, to facilitate analyses of population health.

Imagine an iceberg with distinct *layers*, the boundaries between them being permeable. Each layer is a different accounting of health events. Daily symptoms are at the bottom, symptoms treated by oneself next, then problems which cause short term restricted activity, conditions which cause long term limitation next, visits to health professionals, hospital episodes and then deaths at the top. These are stages of health

Layers above water are routinely measured facets of health, layers below water are facets seldom or never measured for a population.

Assume there is an iceberg for each age group. All icebergs have the same height and a simple overall shape. But the *diameters* of their layers, which reflect the overall rates of health events, vary greatly. Comparing diameters (actually volumes) of a certain layer across the icebergs indicates how rates change with age. Comparing diameters across the layers in one iceberg indicates how readily symptoms translate into disability and medical care. What would we see? From the young to middle to older iceberg, a given layer's diameter (such as daily symptoms) increases. Within icebergs, the young adult one looks peaked, with relatively little professional care and few deaths compared to symptoms. But the older adult iceberg is broad-topped, with relatively frequent professional care and deaths compared to symptoms.

Within each layer are colored sections, representing rates for types of conditions. There are *colors* for seven basic types: (1) acute disease, (2) injury (acute conditions such as bruises, causes of death such as homicide), (3) nonfatal chronic disease (rarely or never causes death), (4) fatal chronic disease (degenerative disease that inherently progresses to death), (5) sensory impairment, (6) skeletal and other impairment and (7) reproductive events and procedures (normal pregnancy/childbirth, sterilization in absence of disease). Reproductive disorders (complications of pregnancy/childbirth puerperium and reproductive organ diseases other than cancer) are in sections (1) and (3). Section (7) is actually nonmorbidity, and it can be excluded from the iceberg if solely morbidity conditions are desired. (We did this in Tables 2 and 3.) The relative size of color sections within a layer shows the ranks of conditions, for example, the importance of acute problems compared to chronic ones. Comparing the salience of a color across layers reveals how conditions penetrate through facets of daily life, health care, and death.

An inventive illustrator might also denote rates of sex-specific conditions by applying *gloss* to the relevant fraction of a section. Sex-specific morbidity is reproductive disorders (defined above) and reproductive organ cancers. It occurs in sections (1), (3) and (4). Sex-specific nonmorbidity is section (7), which if included is glossed completely. Such glossing would reveal the importance of reproductive problems for young women and older men.

Lastly, color *shading* can be used to indicate sex differences, the ratio of male to female rates. Using some standard shade for parity (sex ratio of 1.00) in all colors, deeper shades would mean higher male rates, and lighter shades, higher female rates*. We would see that lighter shades prevail in the bottom layers of icebergs, and deeper ones at the very top. The young adult iceberg has the largest gradations in shade from bottom to top (daily health being especially feminine, but death especially masculine), and the older adult iceberg has the smallest gradations.

Thus, the iceberg metaphor allows analysis of rates, ranks, component diseases and injuries, reproductive disorders and events, sex differences and age differences. It can serve either as a means of

*The frequency of sex-specific conditions will especially affect a section's overall shade. Darkest hues occur when male specific disorders are very common, and lightest hues when female specific disorders are

mentally organizing data or as a real pictorial device for showing them

This article has focused on colors, i.e. the ranks of conditions within a stage of health (layer) and also across stages, ages and sex. We have used specific disease, injury and impairment titles rather than collecting them into the seven basic types above. The leading causes for each stage (Tables 1-4) were drawn from complete sets of age-sex-cause specific rates. They make up the bulk of ill health in any stage, but one would nevertheless use the complete sets of rates to construct pictorial icebergs for the population.

CONCLUSION

The diverse views of population health derived from health statistics are all true and all valuable. All of the series concern people's health experiences, some private and others inherently public. The origin of some series in self reports rather than medical diagnoses does not diminish their truthfulness.

Each view is especially valuable to different parties. For example, daily symptoms are the essence of physical wellbeing for individuals, and they influence mental and emotional wellbeing too. Incidence and prevalence rates reveal the extent of population morbidity (symptomatic or not) to epidemiologists. Limitations are important not only to the sufferers but also their family, friends, employers and helping professionals. Physician visit and hospital stay statistics are crucial for planning primary, secondary and tertiary health services, for production of pharmaceuticals and medical instruments, for training new physicians, and for planning reimbursement programs. Mortality rates are of interest to living individuals, giving them signals about likely endpoints that they might strive to avoid. Those rates have greatest immediate importance to health professionals and planners, who construct a fabric of services to help slow disease progress in patients, reduce limitations, and ideally prevent such diseases and injuries from occurring at all.

We have called these views stages of health, and visually they constitute layers of the iceberg of morbidity. The stage and iceberg concepts help convey the multiplicity of health experience in a population, which health professionals need to appreciate and which scientists should measure completely.

Health statistics in the US and other industrial nations began many decades ago with attention to mortality. Gradually, statistical series have been added for medical care, disability and morbidity incidence and prevalence. But the bulk of the iceberg still remains under water. We know virtually nothing about daily health experiences, self care actions, and help seeking from nonmedical health professionals for the US or other national populations. With increasing longevity and improving control of chronic diseases, concern has shifted toward the quality of people's lives. That quality depends greatly on physical symptoms felt in daily life and the strategies individuals devise to care for them. It is high time that we measure people's sneezes as well as their adieux.

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