Arthritis in New Jersey

Findings from the New Jersey Behavioral Risk Factor Surveillance System

NEW JERSEY DEPARTMENT of HEALTH and SENIOR SERVICES

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Dear Colleague:

It is my pleasure to share with you a copy of *Arthritis in New Jersey: Findings from the New Jersey Behavioral Risk Factor Surveillance System.* Funded through a Cooperative Agreement with the Centers for Disease Control and Prevention (CDC), the document represents a collaborative effort between the Department's Division of Senior Affairs and Center for Health Statistics.

In 1999, following the release of the *National Arthritis Action Plan: A Public Health Strategy*, CDC sought applications for a program entitled "Reducing the Burden of Arthritis and Other Rheumatic Conditions." The New Jersey Department of Health and Senior Services was selected to participate as one of thirty establishment states. One of our objectives to be accomplished during the following year was to analyze the arthritis data collected as part of the Behavioral Risk Factor Surveillance System (BRFSS) from 1996 through 1998. New Jersey was the only state to have included the CDC arthritis module in the BRFSS for three years. We have resumed collection of arthritis data in 2000.

The information presented in this document serves as a starting point in the effort to define the burden of arthritis. It will increase the awareness of arthritis as a public health issue and will provide direction for the planning and implementation of interventions.

I hope you will find this report of benefit to you and your associates. My staff and I will welcome your comments and suggestions.

Sincerely,

Christine Grant
Commissioner

NEW JERSEY
Many Faces. One Family.

Arthritis in New Jersey:
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EXECUTIVE SUMMARY

Arthritis is a major contributor to morbidity, disability, and poor quality of life in New Jersey and throughout the United States. The Arthritis Quality of Life Initiative Act signed by Governor Whitman in 1999 allowed funding to make arthritis a public health priority in the state. The New Jersey Department of Health and Senior Services and the Arthritis Foundation, New Jersey Chapter, collaborated to achieve this goal. New Jersey is on the forefront of exploring the prevalence and behavioral risk factors implicated with arthritis on the state level. The information reported here is intended to impart a reference guide and thought provoking groundwork for future research within and among all states and territories of the United States as a foundation for prevention and control programs.

Arthritis in New Jersey presents findings from the 1996-1998 New Jersey Behavioral Risk Factor Surveillance System (BRFSS). For this report as much information as possible was gained from the BRFSS on the prevalence and impact of arthritis in New Jersey. In the years 1996-1998, the New Jersey Department of Health and Senior Services surveyed a total of 8,283 non-institutionalized adults aged 18 and over. This report includes a narrative and 29 tables that provide detail on the characteristics examined. Highlights of the data analysis are presented below.

Demographics

- Approximately 28% (1.5 million) of New Jersey adults are estimated to have some form of arthritis.
- About 21% of New Jersey adults have been diagnosed with arthritis by a physician.
- Approximately 7% of New Jersey adults have chronic joint symptoms but have not been diagnosed with arthritis by a physician.
- Almost half (47%) of those who have been diagnosed with arthritis do not know what type of arthritis they have.
- Among the New Jersey adults with a diagnosis of arthritis, less than one quarter (22%) report currently being treated by a doctor for their arthritis.
- Prevalence rates increase with increasing age: 15% of 18 to 44 year olds have arthritis, 36% of 45 to 64 year olds have arthritis, and greater than one half (52%) of those 65 years and older have arthritis.
- Higher rates of arthritis are present in women (32%) than men (23%).
- Age-adjusted and age-specific prevalence estimates of arthritis are fairly similar in the three race/ethnicity groups of White, non-Hispanic, Black, non-Hispanic, and Hispanic.
- Among adults with a high school education or less, an estimated 33% have arthritis and among those with some college education the rate is approximately 29%, while among those with a college degree or greater the prevalence rate is approximately 20%. This association appears to be largely independent of age, with age-adjusted results for persons without a college degree about 50% higher than for those with a college degree.

- About half (52%) of adults who are retired have arthritis.
- A full 70% of those who describe themselves as unable to work have arthritis.
- New Jersey's 21 counties show variation in prevalence of arthritis. Generally, there are lower prevalence rates in the north and higher prevalence rates in the south.

Health Care Access and Utilization

- For persons in the 18-64 year age range, the percentage of persons without any kind of health care coverage is about the same (13%) for persons with and without arthritis.
- When asked if there was any time in the past year when they needed to see a doctor but could not because of cost, almost 12% of those with arthritis responded "yes" compared to about 8% of those without arthritis.
- Among adults with arthritis, 88% report a usual place of care compared to about 80% of adults without arthritis. The proportions of those with a regular source of care increases with advancing age in both groups.
- With regard to the use of health services, 83% of those with arthritis had a check up within the past year, compared to about 72% of those without arthritis.

Lifestyle Characteristics of People with Arthritis

- Among persons with arthritis, nearly two thirds (62%) are inactive or perform irregular activity compared to about half (54%) of those without arthritis. In general, individuals with arthritis are less active than individuals without arthritis.
- Approximately 60% of those with arthritis are overweight or obese as compared with approximately 49% of those without arthritis.
- The prevalence of smoking is approximately 21% in individuals both with and without arthritis.
- Approximately the same percentages of individuals with arthritis (30%) as those without arthritis (26%) report an intake of five servings of fruit and vegetables per day.
- Almost 40% of those with arthritis have received influenza vaccines in the past year compared to about 22% of those without arthritis.
- Almost 20% of those with arthritis have ever received pneumococcal vaccines compared to about 11% of those without arthritis.
- Hypertension is present in about 40% of those with arthritis compared to just 17% of those without arthritis.
- Diabetes is present in about 10% of those with arthritis compared to about 3% of those without arthritis.
- Among those adults who report having their blood cholesterol tested, high blood cholesterol is present in almost 40% of those with arthritis and about 23% of those without.

- Among women aged 35 and over, the percentage who report having experienced a fracture of the hip, wrist, or spine due to falling is similar in those with arthritis (6%) and those without arthritis (4%).

Health Related Quality of Life

- The percentage of adults who describe their general health as fair or poor as opposed to good or excellent is about 27% among those with arthritis compared to only about 8% among those without arthritis.
- Persons with arthritis experience an average of 9 unhealthy days (the sum of poor physical and mental health days) out of every 30 days while those without arthritis experience just 4 unhealthy days out of every 30 days.
- Persons with arthritis experience approximately 4 days of poor health that keep them from doing their usual activities out of every 30 days. In contrast, persons without arthritis experience approximately 1 day of poor health out of every 30 days that keeps them from doing usual activities such as self-care, work, or recreation.

Implications

While public health planning and policy are not within the scope of this report, a number of specific findings are brought to light in this report with implications for intervention and further studies.

1. Implement primary prevention for youth and adults alike with specific focus on (a) prevention of overweight, obesity, sports injuries, and workplace injuries and (b) promotion and maintenance of exercise and physical activity as part of daily healthy living throughout the life span.
2. Inform and educate people with arthritis about the specific type of arthritis they have via collaboration among patients, physicians, and public health providers.
3. Target special populations including women, individuals aged 65 and over, those who are unable to work, and individuals with "undiagnosed" arthritis, i.e., those having chronic joint symptoms without a diagnosis.
4. Direct intervention and prevention programs particularly towards individuals who have less than a college education.
5. Concentrate interventions on the proven effective means of controlling arthritis: increasing exercise and decreasing weight.
6. Since persons with arthritis suffer disproportionately from coexisting conditions, many of which can also be controlled in part by exercise and weight management, provide particular focus on these individuals and the interplay of their comorbidities.
7. Continue prevalence and impact studies on the state level as a means of initiating and monitoring the progress of prevention and intervention measures.

INTRODUCTION

Arthritis and related musculoskeletal disorders were estimated to affect 15% of all Americans (40 million) in 1995. The National Arthritis Data Workgroup (NADW) estimates that by the year 2020, 18% of all Americans (59 million) will be affected with some form of arthritis.[1] The annual economic costs (in 1992 dollars) of arthritis are estimated to be approximately $65 billion.[2] Of the estimated 35-39 million persons in the United States with a disability, the most commonly reported condition associated with disability is arthritis or rheumatism, affecting approximately 7.2 million persons.[3]

The federal initiative, *Healthy People 2010,* has two overarching goals of (1) increasing quality and years of healthy life and (2) eliminating health disparities. Together, arthritis, osteoporosis and chronic back conditions represent one of its focus areas.[4] *Healthy New Jersey 2010* has the same overarching goals on its agenda. Risk factors related to arthritis are addressed under "Overall Health Status", "Access to Health Care", and "Fundamentals of Good Health".[5] The Arthritis Quality of Life Initiative Act signed by Governor Whitman in 1999 allows funding to make arthritis a public health priority in the state. The New Jersey Department of Health and Senior Services and the Arthritis Foundation, New Jersey Chapter are collaborating to achieve this goal.

The Behavioral Risk Factor Surveillance System (BRFSS) is one of the primary tools which enable health professionals to monitor progress toward achieving both national and state health objectives in the area of chronic disease. This report used available data from the BRFSS on the prevalence and impact of arthritis in New Jersey. The information reported here is intended to provide a basis for future research on the prevalence and impact of arthritis, both within the state and among all states and territories of the United States. The first part of this report provides background information on arthritis and studies of arthritis. The second part of this report presents the findings from the New Jersey BRFSS.

Overview of Arthritis and Selected Types of Arthritis

Arthritis means inflammation of a joint, usually accompanied by pain, swelling, and changes in structure. Rheumatism is a general term for acute and chronic conditions characterized by inflammation, muscle soreness and stiffness, and pain in joints and associated structures, including arthritis (infectious, rheumatoid, gouty), arthritis due to rheumatic fever or trauma, degenerative joint disease, neurogenic arthropathy, hydroarthrosis, myositis, bursitis, fibromyositis and many other conditions.[6]

The Arthritis Foundation defines arthritis as encompassing more than 100 diseases and conditions affecting joints, the surrounding tissues, and other connective tissues, including osteoarthritis, rheumatoid arthritis, systemic lupus erythematosus, juvenile rheumatoid arthritis, gout, fibromyalgia, bursitis, rheumatic fever, and Lyme disease. The three most common forms of arthritis are osteoarthritis, rheumatoid arthritis, and fibromyalgia.[7] Approximately 21 million Americans are estimated to have osteoarthritis, approximately 4 million are estimated to have fibromyalgia, and approximately 2 million are estimated to have rheumatoid arthritis.[1]

Additional common conditions of arthritis include gout and bursitis/tendonitis. Other numerous uncommon conditions collectively make up most of the remaining prevalence.

In 1995, the NADW identified the ICD-9-CM diagnostic codes for all potential conditions of arthritis and rheumatism. From the individual codes, 39 groups and selected individual codes were formed. To assist in studies, 10 categories were developed from the groups and individual codes.[8,9] A brief overview of four of the more common specific types of arthritis follows. Prevention, causation, treatment, and acuity or chronicity may vary significantly depending upon the specific condition under consideration.

Osteoarthritis

Osteoarthritis (OA) is the most common form of arthritis. It may be defined as a heterogeneous group of conditions that lead to joint symptoms and signs that are associated with defective integrity of the joint cartilage, in addition to related changes in the underlying bone and at joint margins.[10] Radiologic evidence of OA is present almost universally in at least one joint after the age of 75.[11] Yet, in population studies, only 40% to 80% of those with radiologic OA have joint symptoms. Subjects with more severe x-ray findings have higher rates of symptoms.[12] The joints most commonly affected are those of the hand, lumbosacral and cervical spine, hip, knee, and foot.

Estimating the prevalence of OA is problematic. Objective diagnosis of OA is based on radiographic findings. The radiographs must show the presence of osteophytes, or bony outgrowths.[13] This implies that the prevalence of OA should be reported for specific joints. In addition, the decision to include mild as well as moderate or severe changes will affect prevalence estimates.[1]

The strongest known risk factors for OA are older age and female sex. Osteoarthritis rates are similar in men and women under age 45, but after age 50, women in all populations have a higher prevalence than men, with more joints involved and more symptoms.[14] Obesity and overweight have demonstrated a positive relationship with OA of the knee and possibly OA of the hip and hand.[15] Socioeconomic factors associated with OA include having less than high school education and having a low family income.[16] The comparative role of biological, lifestyle, and socioeconomic factors in ethnic differences in osteoarthritis is uncertain. Additionally, the role of genetics is strong in determining who will get osteoarthritis.[17]

Occupations requiring repetitive trauma to joints may have an effect on later development of OA in those joints.[11] Continuous overuse of a particular joint may also influence later development of OA.[18] Acute major joint injuries common during sports activities frequently lead to OA. This may explain the high rate of OA of the knee in retired professional athletes. The association between leisure time sports and OA is not clear, although acute major joint injuries rather than repeated joint use may account for the higher rates of OA seen among sports enthusiasts.[14]

Osteoarthritis leads to pain, stiffness, mobility problems, and activity limitations. Prevention measures include preventing obesity and joint injury, and use of ergonomics in the workplace.

Treatment measures are typically comprised of medications for pain, physical therapy, surgery (hip and knee replacement and other surgical procedures) and programs for self-management, exercise, weight loss and nutrition.[19]

Rheumatoid Arthritis

Rheumatoid arthritis (RA) is a chronic, inflammatory, systemic disease affecting the lining of the joints. The usual symptoms are pain, stiffness, and swelling of multiple joints. It commonly affects the small joints of the hands and wrists leading to nodules and deformities. It affects other joints as well and can affect the connective tissue throughout the body, as well as such organs as the lungs, heart, and eyes.[20]

Peak incidence of RA occurs between the fourth and sixth decade of life. Other known risk factors include genetic predisposition, hormonal factors, and a positive test for rheumatoid factor. The disease occurs two to three times more frequently in females than males. It has a worldwide distribution and affects all ethnic groups.[21] A protective relationship between the use of oral contraceptives and RA was indicated in some studies[22,23] although not found in others.[24,25]

Primary prevention of RA is not possible, as the cause is unknown, although attempts have been made to find an infectious agent. However, since most joint destruction occurs early in the disease, prompt diagnosis and treatment may help prevent the irreversible joint damage. The median lag time between the onset of symptoms and diagnosis is 36 weeks, with a range from 4 weeks to more than 10 years.[26] Treatment embraces the use of medications, occupational and physical therapy, surgery, and self-management programs.

Life span may be shortened by 3 to 18 years in those with more severe disease and comorbidities. This is due to infections, gastrointestinal complications of therapy, and pulmonary and renal disease.[27] One important area for tertiary prevention in connection with this disease stems from the excess mortality from respiratory and infectious diseases. This underscores the need for a major public health effort with respect to immunization with pneumococcal and influenza vaccine.[28]

Encouraging news is that the incidence of RA may be declining[29,30,31] although some studies have not shown a decline.[32,33] Also, the severity of the disease may be decreasing.[33,34] These changes may be due to a change in a causative infectious agent, increased use of oral contraceptives, early initiation of treatment, or improved socioeconomic conditions.[14] The role of oral contraceptives in particular is highly uncertain, due to the wide discrepancy in results among studies.[35]

Juvenile rheumatoid arthritis (JRA) is the most common form of childhood arthritis, affecting about the same number of children as juvenile diabetes.[36] Onset is usually at less than 16 years of age. Up to half of those with JRA diagnosed as children may no longer have symptoms as adults. However, up to 30% of JRA patients may have significant functional limitations after 10 or more years of follow-up. In addition, mortality rate estimates for individuals with JRA range from 3 to 14 times greater than the rate for a similarly aged US population.[37]

The most commonly cited prevalence estimate is of 70,000 to 100,000 active and inactive cases of JRA in the United States under age 16.[38] An estimate of the number of people over age 16 with active JRA in the United States is 35,000 to 50,000.[39]

Fibromyalgia

Fibromyalgia is the most common rheumatic cause of chronic diffuse pain. It is defined as a syndrome involving pain and multiple tender points throughout the body, sleep disorders, irritable bowel syndrome, and headaches. It has predominance in females (more than 75%), and a peak incidence among persons 20-60 years of age. Factors associated with fibromyalgia include a history of major depression[40] and or trauma, migraine, irritable bowel syndrome, sleep disturbances and sleep apnea.[41] It has been observed among 15% of rheumatology patients and in 5% of patients in a general medical practice.[42] Prevalence was 2% in a random sample of midwestern residents[43], which is also in agreement with the NADW estimates.[1]

Gout

Gout is defined as a metabolic disease characterized by recurrent attacks of acute arthritis due to increase in serum uric acid concentration (hyperuricemia) or deposition of sodium urate monohydrate crystals in and around joints.[28] Known risk factors for gout include elevated uric acid level, obesity, use of diuretics, and high alcohol intake.[44] Nationally, the prevalence rate for gout has been estimated to be approximately 8.4 per 1,000 persons, corresponding to an estimated 2.1 million persons, (1.6 million men and 500,000 women). It is more frequent in Blacks than Whites over age 45. However, these estimates are based on self-report and not physician diagnosis, and may overstate prevalence by as much as 100%.[1]

Methodological Issues in the Study of Arthritis

Methodological problems are inherent in the study of arthritis. First, a case definition for arthritis is problematic. The disease may be defined either clinically or radiographically, or both ways (e.g., OA). Different levels of disease (i.e., mild, moderate, and severe) affect the reporting and therefore use of subjects in a study. Studies of particular locations of disease (i.e., hands, hips, wrists, knees or elsewhere) are difficult to join for overall prevalence estimates. Also, various distinct arthritic conditions may have similar symptoms. Secondly, identifying the disease is partly dependent upon access to and use of medical care. Thirdly, remissions may occur and therefore affect prevalence estimates. Finally, the occurrence of specific rare conditions is difficult to evaluate accurately in population studies. Such limitations make investigations of arthritis and rheumatic diseases more difficult than investigations of many other diseases.[1, 14]

In epidemiologic studies, use of radiographs based on a scale such as that developed by Kellgren and Lawrence may be used in addition to clinical criteria.[13] This scale is based on the presence of osteophytes, or bony outgrowths, and/or joint space narrowing visible on x-ray. In clinical studies, laboratory findings may be used in addition to radiographs and other clinical criteria. The American College of Rheumatology (formerly the American Rheumatism

Association) and other specialties have published criteria for the classification of many of the rheumatic diseases, including rheumatoid arthritis, osteoarthritis of the hand, hip or knee, fibromyalgia, and numerous other conditions.[10,45,46,47,48]

Reliance on self-report for documenting the presence of conditions of arthritis, as is done with the National Health Interview Survey (NHIS) and the BRFSS, presents particular limitations because persons often do not know the type of arthritis they have. Therefore, such data are best used to identify the more nonspecific condition of arthritis. Obviously, then, the study of arthritis based on self-report will not make it possible to gain much information about the relationships between certain factors and specific forms of arthritis.

The surveillance definition of arthritis for BRFSS currently recommended by the Centers for Disease Control and Prevention (CDC) is based on the reporting of either chronic joint symptoms and/or a physician diagnosis of arthritis. Chronic joint symptoms (CJS) is a term used to describe persons in the NHIS and the BRFSS who answer "yes" to the questions "*During the past 12 months, have you had pain, aching, stiffness or swelling in or around a joint?*" and "*Were these symptoms present on most days for at least one month?*". "Diagnosed arthritis" or a "diagnosis" of arthritis are the terms used to describe persons in the BRFSS who answer "yes" to the question "*Have you ever been told by a doctor that you have arthritis?*". The CDC is conducting validation studies for this surveillance definition of arthritis. Use of this surveillance definition is believed to be more appropriate than use of a previous definition, which was based solely on the presence of chronic joint symptoms (with or without a diagnosis of arthritis), in identifying those with arthritis and other rheumatic conditions.[49,50]

Studies on the Validity of Self-reporting of Arthritis

Studies on the validity of self-reporting of specific conditions of arthritis have yielded conflicting results. Being in specific age groups, having higher socioeconomic status, and attending a rheumatology clinic resulted in very good sensitivity (approximately 81% and 65%) for self-reporting of several conditions of arthritis.[51,52] Among the general population (aged 20 through 79), however, very poor sensitivity (about 20%) resulted for the self-reporting of rheumatoid arthritis. Specificity was particularly good (100%) for rheumatoid arthritis (i.e., those who did not report rheumatoid arthritis actually did not have it).[53,54]

An issue to consider in evaluating self-reports of diagnoses is the reliability of physician diagnoses. Studies have suggested that general practitioners and referring physicians request referrals in order to establish or confirm a diagnosis in greater than 68% of cases, and that their diagnoses are modified once the patient visits a rheumatologist in greater than 50% of cases.[55,56,57]

Approaches to Measuring the Prevalence of Arthritis

National estimates of arthritis prevalence include the NHIS and the National Health and Nutrition Examination Survey (NHANES) conducted by the National Center for Health Statistics. The BRFSS may address the issue of arthritis prevalence at the state level through use of the arthritis module. The BRFSS provides estimates of state specific variations in illness,

health behaviors and perceptions to health agencies for proper allocation of resources and funding.

The NHIS is a multistage probability sample survey conducted annually by interviewers of the Bureau of the Census for the National Center for Health Statistics. Data are collected during face to face in-home interviews of the civilian non-institutionalized U.S. population. In 1996 each respondent was asked about the presence or absence of many chronic conditions including arthritis.

For NHIS data, a case of arthritis is defined as those that answered "yes" to the question "During the past 12 months, did anyone in the family have arthritis or any kind of rheumatism?" NHIS also separated the condition of arthritis from the other conditions of gout, intervertebral disc disorders, bone spur or tendinitis, disorders of bone and cartilage, and bursitis. Arthritis was reported to be the chronic condition with the highest prevalence rate of approximately 13% in 1996 according to the NHIS. The estimated prevalence of arthritis among those under age 45 years was 3%. The estimated prevalence of arthritis among those aged 45 through 64 years was 24% while the prevalence of arthritis among those aged over 64 years was 48%. Prevalence rates for Whites and Blacks were similar.[58]

NHANES is a series of national studies on health and diet in the United States that began in 1960. These studies are unique in that they combine a home interview and a series of health tests done in a mobile examination center. Prior to NHANES III (1988-1994), the arthritis history supplement was only administered to those examinees who answered positively to the household adult questionnaire, which included questions on joint pain, stiffness and swelling in the hands, wrists, and knees, back pain, and medical history of arthritis.[59]

NHANES I (administered from 1971 to 1975 to adults from ages 25 through 74 years) showed a prevalence of 12.1% of OA by clinical examination.[60] The NADW calculated (using age-specific prevalence from the NHANES I and the 1990 United States population estimates) this rate to equal approximately 20.7 million adults having physician-diagnosed OA.[1] When available, results of NHANES III (administered from 1988-1994) will yield information on the prevalence of specific rheumatic diseases via radiographs, lab tests, and physical examinations done on a broad sample of the population.

The Tecumseh Community Health Study (TCHS) was a broad study of health and disease in a total community setting of 9500 inhabitants undertaken in 1957 in the city of Tecumseh, Michigan. In the Tecumseh study, about one third of respondents answered "yes" to having pain or aching in joints. Thirteen percent of males and 17% of females reported joint swelling. Thirteen percent of males and 19% of females reported ever having arthritis or rheumatism. Gender specific prevalence rates increased with age. Male and female rates were similar during the first four decades of life, but thereafter were higher for females. Of interest, in this study, joint pain and swelling were more often attributed to arthritis by females and to accident or injury by males. Prevalence rates for pain, swelling and morning stiffness leveled off later in life, but the prevalence of arthritis and rheumatism continued to rise.[61]

The BRFSS is an ongoing, state based, random-digit-dialed telephone survey that collects self-reported health information from a representative sample of the civilian, non-institutionalized U.S. population aged 18 and over. It is the world's largest continually operating survey. The survey is a cooperative effort between the national Centers for Disease Control and Prevention (CDC) and all states, the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands. It has been in existence since 1984.

The New Jersey Department of Health and Senior Services has been participating in the survey since 1991, collecting approximately 125 interviews per month through 1995 and nearly double that number since 1996. This survey is designed to monitor modifiable risk factors for chronic diseases and other leading causes of morbidity and death. Numerous methodological studies have been done on the BRFSS. A bibliography and brief summary of articles on methods, validity, and reliability are currently available.[62]

In 1995, the CDC and the state health departments developed an optional questionnaire module on arthritis to address the lack of data available on the prevalence and impact of arthritis on the state level. As of 2000, thirty-seven states have used the arthritis module. However, as of 1999, New Jersey was the only state to have accumulated three years' worth of arthritis data. The arthritis module for the years 1996-1998 consists of the following six questions:

- "During the past 12 months have you had pain, aching, stiffness or swelling in or around a joint?"
- "Were these symptoms present on most days for at least one month?" (Asked only of those who responded "yes" to the previous question.)
- "Are you now limited in any way in any activities because of joint symptoms?"
- "Have you ever been told by a doctor that you have arthritis?"
- "What type?" (Asked of those who responded "yes" to the previous question.) ("Don't know" and "not sure" are allowed.)
- "Are you currently being treated by a doctor for arthritis?"

FINDINGS FROM THE NEW JERSEY BRFSS

The New Jersey Department of Health and Senior Services surveyed a total of 8,283 adults in the years 1996-1998. Based on the survey results, an estimated one third (31%) of adults in New Jersey have experienced pain, aching, stiffness and swelling in or around a joint during the previous 12 months. Approximately half of this group, an estimated 16% of all adults, report chronic joint symptoms (i.e., joint symptoms which are present on most days for at least one month). Activity limitation due to joint symptoms is present in about 44% of individuals who have chronic joint symptoms and 14% of individuals who have acute joint symptoms (Table 1). An estimated 21% of New Jersey adults report being told by a doctor that they have arthritis. Overall, applying CDC's current surveillance definition of arthritis (i.e., CJS and/or a physician's diagnosis of arthritis, see page 5) to the 1996-1998 BRFSS data, nearly 28% of New Jersey adults are estimated to have some form of arthritis. (Note that prevalence estimates from the BRFSS will be higher than those from NHIS (all ages) and NHANES I (ages 25-74) because of the inclusion of all persons aged 18 and over and use of a less restrictive definition of arthritis.)

Among persons diagnosed with arthritis, osteoarthritis is the most commonly reported type of arthritis (reported by 29%). Rheumatoid arthritis is reported by 12% of the respondents. Another 12% report other types of arthritis. A full 47%, however, do not know what type of arthritis they have (Figure 1). Among New Jersey adults with a diagnosis of arthritis, only an estimated 22% report currently being treated by a doctor for their arthritis.

Table 1. Estimated percentage of adults with joint symptoms[*] and activity limitation due to joint symptoms[†], New Jersey, 1996-1998

Joint Symptoms/Activity Limitation	%[‡]
Joint symptoms	
Acute	
With limitation	2.1
Without limitation	12.9
Chronic	
With limitation	6.9
Without limitation	8.9
No joint symptoms	69.1
Total	**100.0**

[*]"Acute" joint symptoms is defined by a "Yes" answer to the question "During the past 12 months, have you had pain, aching, stiffness, swelling in or around a joint?" "Chronic" joint symptoms" is defined by a "Yes" answer to both the above question and to the question "Were these symptoms present on most days for at least one month?'
[†]"Activity limitation" means "Yes" to the question " Are you now limited in any way in any activities because of joint symptoms?"
[‡]Percentages do not total to 100% because of rounding.
Source: Behavioral Risk Factor Surveillance System

Figure 1

Type of Arthritis Reported

Other Selected Conditions 7%

Lyme Disease 1%

Rheumatism 4%

Rheumatoid Arthritis 12%

Don't Know 47%

Osteoarthritis 29%
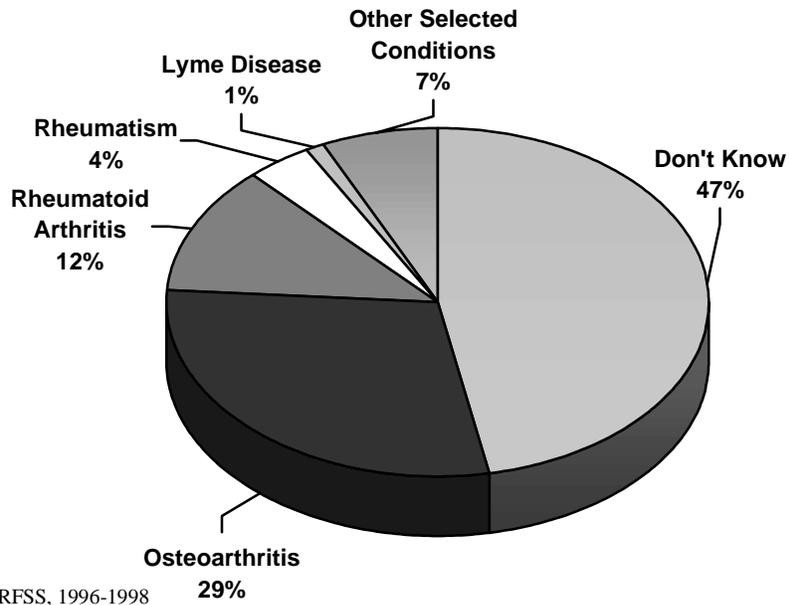
Source: NJ BRFSS, 1996-1998

Figure 2

Arthritis Among Adults in NJ According to a Physician Diagnosis and Chronic Joint Symptoms

Diagnosis with Chronic Joint Symptoms 9%

Diagnosis without Chronic Joint Symptoms 12%

Chronic Joint Symptoms without a Diagnosis 7%
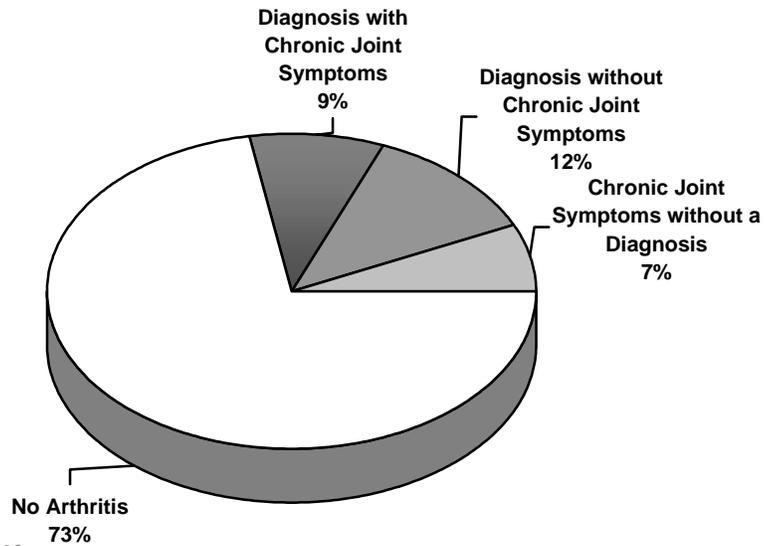
No Arthritis 73%

Source: NJ BRFSS, 1996-1998

In 1998, CDC reported on arthritis prevalence in seven states, including New Jersey, that had used the BRFSS arthritis module in 1996. Approximately 12% of New Jersey adults were estimated to have had arthritis in 1996, according to that report, based on the presence of chronic joint symptoms (i.e., symptoms present on most days for at least one month).[50] The present surveillance definition of arthritis (i.e., chronic joint symptoms and/or a diagnosis of arthritis) permits a more comprehensive ascertainment of arthritic conditions. Applying this current definition to the same data produces an estimated prevalence of approximately 27% for New Jersey in 1996.

Utilizing the responses to the BRFSS arthritis module to the fullest extent, six mutually exclusive categories can be identified based on whether or not joint symptoms are present, whether any existing symptoms are chronic or not, and whether or not there is a diagnosis of arthritis. Based on aggregated results from the 1996-1998 BRFSS arthritis module, approximately 9% of New Jersey adults have physician-diagnosed arthritis with chronic joint symptoms, almost 5% of all adults report a diagnosis of arthritis and joint symptoms that are not chronic, and roughly 7% report a diagnosis of arthritis without any joint symptoms at all. Those having chronic joint symptoms without a diagnosis make up almost 7% of the total. The remaining 72% of adults report either joint symptoms that are not chronic (11%) or no joint symptoms and no arthritis diagnosis at all (62%).

The estimated 28% of New Jersey adults with arthritis can be divided into three major groups based on the BRFSS findings described above (Figure 2). The first group is the estimated 9% of New Jersey adults having both a diagnosis of arthritis and chronic joint symptoms (CJS). The second group is made up of estimated 12% of adults having a diagnosis of arthritis without chronic joint symptoms (CJS). The third group is the estimated 7% of adult individuals in New Jersey with chronic joint symptoms (CJS) without a diagnosis. Elucidating the differences among the groups provides evidence of the severity of the impact of CJS, and in particular, the impact of having both CJS and a diagnosis, on the risk factors examined. Additionally, the need for early diagnosis and treatment in those having CJS only without a diagnosis is apparent. Throughout this monograph, data are presented for each of these major subcateories of the arthritis "case definition", in order to underscore the importance and utility of the data while the validation process for the case definition continues.

One possible explanation for the significant number of adults reporting a diagnosis without CJS may be that these persons have had CJS in the past which have remitted for the present time. Some forms of arthritis or their symptoms may be temporary or remitting, such as Reiter's syndrome, gout or bursitis, some infectious disorders, etc. Furthermore, joint symptoms may not be part of the symptomatology of the particular diagnosis of arthritis, as with fibromyalgia.

Another possible explanation for the significant number of adults reporting a diagnosis without CJS involves the interpretation of the word "joint" in the BRFSS arthritis questions. Many respondents may understand this term to refer to the diarthroses, or synovial joints. Therefore, in answering this question, a respondent might only consider joints such as those of the shoulders, elbows, hands, hips, knees, and feet. Another joint class is that of the amphiarthroses, that is, the vertebral bodies in the back and neck. If the respondents did not consider these "joints", then arthritis of the back and neck would have resulted in a negative

answer to questions pertaining to joint symptoms, resulting in an underestimate of joint symptoms associated with arthritis. How much arthritis is attributed to the neck and back is difficult to estimate. Specific rheumatic conditions that may give rise to neck and low back disorders are osteoarthritis, rheumatoid arthritis, fibromyalgia, ankylosing spondylitis, Reiter's syndrome, psoriatic arthritis, polymyalgia rheumatica, and several others. In general, about 10 to 20% of the United States population suffers from neck or back pain each year.[63]

Demographic Characteristics of Adults with Arthritis in New Jersey

New Jersey is the most densely populated state in the United States, ranking ninth in population size with a total population of approximately eight million. Of these eight million residents, approximately six million are aged 18 and over. As of 1997, about 80% of the population are White, 15% are Black, and 5% are Asian or Pacific Islander. Hispanics (mostly classified as White) make up 12% of the population. New Jersey's population is slightly older than that of the nation, with 13.7% estimated to be age 65 and over, compared to 12.7% nationally.[64]

Age, Gender, and Race/Ethnicity

The prevalence of self-reported arthritis (CJS and/or a diagnosis) increases with increasing age. The higher prevalence of arthritis is pronounced among older adults. Among persons aged 18 through 44 years, approximately 15% have arthritis according to the New Jersey BRFSS. Among 45 through 64 year-olds, more than one third (36%) have arthritis. Among those 65 and over, more than half (52%) have arthritis (Table 2).

Approximately 23% of men and 32% of women in New Jersey have some form of arthritis (Table 2). As expected, the higher estimated prevalence among women is consistent across age groups, and the overall prevalence remains about 30% higher among women than men after age adjustment. Women are about 50% more likely than men to report a diagnosis of arthritis with or without CJS regardless of age. On the other hand, women and men appear almost equally likely to have CJS in the absence of a diagnosis (Table 3).

Non-Hispanic Black adults and non-Hispanic White adults have similar estimated prevalence rates of arthritis (27% and 29% respectively) while adults of Hispanic ethnicity have an estimated prevalence of only about 19%. These differences are largely attributable to age differences in the respective populations. Age-adjusted and age-specific prevalence estimates are similar in non-Hispanic Whites, non-Hispanic Blacks, and Hispanics (Table 2).*

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*To the extent that arthritis is an age related phenomenon, it can be useful to control for age when comparing population subgroups. While crude estimated prevalence rates are indicative of the experience of the population and are important for public health planning, examining age-adjusted prevalence estimates is also important when the underlying population age structures differ markedly between groups, to help identify unexpected differences. For this reason, age-adjusted figures are presented throughout this report and, when appropriate, age-specific statistics are also provided.

Table 2. Estimated prevalence of arthritis among adults[*] by age, gender, and race/ethnicity, New Jersey, 1996-1998

Characteristic	Sample Size[†]	Number[‡]	%	95% Confidence Interval	Age Adjusted[§] %
		Estimated Prevalence			
Age group (yrs)					
18-44	3903	429 000	14.5	(13.2-15.9)	—
45-64	2211	581 000	36.2	(33.8-38.6)	—
65+	1375	538 000	52.1	(49.2-55.0)	—
Gender					
Females					
18-44	2221	230 000	15.7	(14.0-17.6)	—
45-64	1296	349 000	42.3	(39.1-45.5)	—
65+	856	354 000	57.8	(54.1-61.5)	—
All	4373	939 000	32.0	(30.4-33.7)	30.5
Males					
18-44	1682	198 000	13.3	(11.5-15.5)	—
45-64	915	232 000	29.8	(26.4-33.4)	—
65+	519	185 000	43.7	(39.2-48.4)	—
All	3116	620 000	22.9	(21.2-24.7)	23.4
Race/Ethnicity					
Black, non-Hispanic					
18-44	445	39 000	14.0	(10.6-18.2)	—
45-64	219	57 000	39.6	(32.3-47.4)	—
65+	85	38 000	59.2	(47.0-70.3)	—
All	756	135 000	27.2	(23.7-31.1)	27.2
White, non-Hispanic					
18-44	2776	328 000	15.4	(13.9-17.2)	—
45-64	1763	465 000	36.8	(34.2-39.5)	—
65+	1226	472 000	51.5	(48.5-54.6)	—
All	5812	1 273 000	29.4	(28.0-30.8)	27.7
Hispanic					
18-44	452	45 000	12.6	(9.4-16.6)	—
45-64	125	34 000	33.9	(25.0-44.1)	—
65+	29	14 000	50.8	(31.4-70.0)	—
All	610	93 000	19.2	(15.8-23.1)	27.3
Other					
18-44	199	13 000	7.6	(4.3-13.2)	—
45-64	83	18 000	22.3	(12.9-35.7)	—
65+	26	11 000	54.7	(33.8-74.1)	—
All	309	42 000	15.5	(11.1-21.2)	21.5
Total	**7561**	**1 559 000**	**27.7**	**(26.5-28.8)**	**27.2**

Table 2. Estimated prevalence of arthritis among adults[*] by age, gender, and race/ethnicity, cont., New Jersey, 1996-1998

NOTE: Numbers do not always equal the total due to missing, don't know and refused responses.
  [*]Estimated prevalence was calculated for the 1996-1998 civilian, non-institutionalized population aged $\geq$ 18 years.
  [†]Sample size refers to total number of respondents for the three years 1996-1998.
  [‡]Estimated prevalence number in thousands is a simple average of annual estimates for the three-year period.
  [§]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

A breakdown of the arthritis cases into subcategories based on the presence or absence of CJS and/or a physician diagnosis reveals that differences in prevalence estimates between Hispanic and non-Hispanic race/ethnicity groups primarily reflect differences in the rate of diagnosed arthritis. Only about 4% of Hispanic adults have a diagnosis of arthritis in combination with CJS, compared to about 10% of non-Hispanic White and non-Hispanic Black adults (Table 3). Similarly, only about 8% of Hispanic adults have a diagnosis of arthritis in the absence of CJS, compared to about 11% of non-Hispanic Black adults and 13% of non-Hispanic White adults. Age-adjusted results (Table 3) indicate that the lower likelihood of having a diagnosis of arthritis in conjunction with CJS among Hispanics is somewhat independent of age. However, the likelihood of having an arthritis diagnosis in the absence of CJS appears to be higher among Hispanics than among non-Hispanics after adjusting for age. For CJS only (without a diagnosis of arthritis), prevalence estimates are similar (between 6% and 7%) for non-Hispanic Whites, non-Hispanic Blacks, and Hispanics, even after age adjustment.

Of those adults in New Jersey having a diagnosis of arthritis with CJS, less than half (44%) are currently being treated by a physician for their arthritis. Of those adults having a diagnosis of arthritis without CJS, barely 18% are currently being treated by a doctor for their arthritis (data not shown).

Education and Income

Education and income levels underlie many of the health disparities in the United States. Often educational attainment and income are highly correlated. In general, the populations that experience the poorest health status are those with the least education and the lowest incomes.[4] The association of socioeconomic status with arthritis may in part be explained by the complex link of factors related to access and utilization of medical care, diet and nutrition including overweight, obesity and bone mass, and occupation including level of physical demand and other factors in the work environment.[65]

The prevalence of arthritis varies by educational attainment. Among adults with a high school education or less, an estimated 33% have arthritis, among those with some college education the rate is approximately 29%, while among those with college degree or greater the prevalence rate reduces to approximately 20%. This association appears to be largely independent of age, with age-adjusted results for persons without a college degree remaining about 50% higher than for those with a college degree (Table 4).

The relationship between educational attainment and arthritis is similar for men and women. For males, about 27% with a high school or less education have arthritis. For males with some college education, roughly 24% have arthritis. For males with a college degree or higher education level, this rate is much lower (about 17%). For females, about 38% of those with high school or less education have arthritis, and about 32% of those with some college have arthritis. Finally, an estimated 23% of females in New Jersey with college degrees or greater have arthritis. In general, those with a higher education have less arthritis with the greatest differences between those with a college degree or greater versus those without one (data not shown).

In general, income is negatively related to the prevalence of arthritis among New Jersey adults. In particular, the estimated prevalence of arthritis among adults living in households with an annual income of less than $25,000 is nearly twice as high as the estimated prevalence for adults living in households with an annual income of greater than $50,000 (37% vs. 21%, respectively). Age-adjusted results suggest, however that at least part of the difference is due to age differences in these two income brackets. In the income bracket of $25,000 to $49,999, 28% have arthritis (Table 4).

For the years 1996-1998 for New Jersey income non-response is almost 18%. Therefore inferences about the relationship between household income and arthritis need to be considered as more tentative than other types of inferences.

Employment Status

Arthritis is the leading cause of disability in the United States. Disability was not addressed in the New Jersey BRFSS during the years 1996-1998. However, the single question relating to employment reveals some of the impact that arthritis has upon employment status.

The prevalence of arthritis clearly varies by employment status. Twenty-one percent of those employed have arthritis as compared to about 27% of those out of work who have arthritis. Twenty percent of those who responded they were homemakers or students have arthritis. Almost 52% of those retired have arthritis. It is notable that 70% of those who describe themselves as unable to work have arthritis. Age-adjusted results suggest that much of the variation in arthritis prevalence rates associated with employment status has to do with factors other than age (Tables 3 and 4).

Of the 70% of those adults unable to work who have arthritis, about half (49%) reportedly have both a diagnosis and CJS, while only about one fourth (29% and 23%, respectively) have either a diagnosis of arthritis without CJS or CJS without a diagnosis.

Table 3. Estimated prevalence of arthritis according to the presence or absence of a diagnosis and chronic joint symptoms among adults[*] by age, gender, race/ethnicity, education level, employment status, and annual household income, New Jersey, 1996-1998

Characteristic	Both Diagnosis and CJS			Diagnosis Only (without CJS)			CJS Only (without Diagnosis)		
	%	95% Confidence Interval	Age Adjusted[†] %	%	95% Confidence Interval	Age Adjusted[†] %	%	95% Confidence Interval	Age Adjusted[†] %
Age									
18-44	2.7	(2.1- 3.5)	—	5.2	(4.4- 6.1)	—	6.6	(5.8- 7.6)	—
45-64	11.9	(10.5-13.5)	—	17.1	(15.3-19.1)	—	7.1	(5.9- 8.6)	—
≥65	23.2	(20.9-25.7)	—	22.9	(20.6-25.4)	—	6.0	(4.8- 7.4)	—
Gender									
Males									
18-44	2.3	(1.4- 3.7)	—	4.1	(3.0- 5.2)	—	7.0	(5.7- 8.5)	—
45-64	11.1	(9.0-13.7)	—	11.7	(9.4-14.5)	—	7.0	(5.2- 8.5)	—
≥65	16.3	(13.1-19.9)	—	19.3	(15.9-23.2)	—	8.2	(6.0-11.0)	—
All	7.0	(6.0- 8.2)	7.5	8.7	(7.7- 9.9)	8.8	7.2	(6.2- 8.3)	7.1
Females									
18-44	3.2	(2.5- 4.1)	—	6.2	(5.1- 7.7)	—	6.3	(5.2- 7.5)	—
45-64	12.7	(10.8-14.8)	—	22.3	(19.6-25.2)	—	7.3	(5.7- 9.2)	—
≥65	28.0	(24.8-31.4)	—	25.4	(22.4-28.7)	—	4.4	(3.2- 6.1)	—
All	11.1	(10.1-12.2)	10.1	14.8	(13.6-16.1)	14.3	6.1	(5.4- 7.0)	6.2
Race/Ethnicity									
White, non-Hispanic									
18-44	3.1	(2.3- 4.1)	—	5.6	(4.6- 6.7)	—	6.7	(5.7- 7.9)	—
45-64	12.0	(10.4-13.8)	—	17.4	(15.3-19.6)	—	7.4	(6.0- 9.1)	—
≥65	23.1	(20.6-25.7)	—	22.6	(20.2-25.2)	—	5.9	(4.6- 7.4)	—
All	9.9	(9.1-10.8)	9.1	12.7	(11.8-13.7)	11.9	6.7	(6.0- 7.5)	6.7
Black, non-Hispanic									
18-44	3.0	(1.6- 5.5)	—	4.5	(2.7- 7.3)	—	6.5	(4.3- 9.8)	—
45-64	13.5	(9.0-19.6)	—	18.5	(13.3-25.0)	—	7.7	(4.2-13.6)	—
≥65	30.7	(20.8-42.9)	—	22.4	(14.3-33.3)	—	6.1	(2.1-16.4)	—
All	9.6	(7.4-12.4)	11.0	10.9	(8.6-13.7)	11.7	6.7	(4.8- 9.2)	6.5

Hispanic								
18-44	1.4	(.6- 3.0)	—	3.8	(2.4- 6.0)	—	7.4	(4.8-11.1)	—
45-64	12.1	(7.0-20.2)	—	15.1	(8.7-24.7)	—	6.7	(3.4-13.0)	—
>65	14.1	(5.9-30.1)	—	36.7	(20.1-57.3)	—	0.0	(0.0- 0.0)	—
All	4.4	(3.0- 6.5)	7.0	8.0	(5.8-10.9)	14.5	6.8	(4.7- 9.7)	5.8
Other								
18-44	0.4	(0.1- 2.0)	—	3.1	(1.2- 7.6)	—	4.1	(1.8- 8.9)	—
45-64	4.5	(1.7-11.6)	—	14.3	(6.5-28.4)	—	3.5	(1.1-10.8)	—
>65	19.3	(6.6-44.5)	—	17.8	(7.1-37.9)	—	17.7	(5.4-44.7)	—
All	3.1	(1.5- 6.0)	4.7	7.5	(4.4-12.6)	9.9	4.9	(2.7- 8.6)	6.8
Education Level								
HS or <	12.3	(11.0-13.7)	10.2	14.3	(13.0-15.7)	12.6	6.7	(5.7- 7.9)	6.8
Some college	8.8	(7.4-10.4)	9.8	12.2	(10.6-14.1)	13.3	7.7	(6.3- 9.3)	7.7
College grad.	5.3	(4.5- 6.3)	7.1	8.6	(7.4-10.1)	8.5	5.8	(4.9- 6.9)	5.4
Employment Status								
Employed	5.3	(4.6- 6.1)	6.0	9.0	(8.1-10.1)	9.5	6.7	(5.9- 7.5)	6.6
Out of work	10.4	(7.1-14.8)	11.1	9.5	(6.4-13.8)	10.5	7.3	(4.6-11.4)	6.3
Homemaker/student	5.0	(3.6- 7.0)	7.7	9.5	(7.5-12.0)	12.9	5.5	(3.9- 7.6)	6.0
Retired	22.3	(20.0-24.8)	7.4	23.2	(20.9-25.8)	25.9	6.0	(4.8- 7.5)	6.2
Unable to work	34.0	(26.3-42.7)	27.3	20.1	(14.0-28.0)	17.8	15.8	(10.4-23.2)	21.0
Annual household Income								
<$25,000	15.4	(13.2-17.7)	11.1	15.4	(13.6-17.5)	11.2	6.6	(5.3- 8.2)	8.0
$25,000-$49,999	8.3	(7.0- 9.8)	7.9	12.2	(10.6-14.0)	12.1	7.7	(6.4- 9.2)	7.4
≥$50,000	5.6	(4.7- 6.6)	7.0	9.5	(8.2-10.9)	9.2	6.0	(5.0- 7.1)	5.8
Refused‡	10.6	(8.9-12.4)	8.2	12.4	(10.5-14.4)	10.5	6.4	(5.1- 8.0)	7.2
Total	**9.1**	**(8.4- 9.9)**	**8.9**	**11.9**	**(11.1-12.8)**	**11.7**	**6.6**	**(6.0- 7.3)**	**6.6**

*Prevalence was calculated for the 1996-1998 civilian, non-institutionalized population aged ≥ 18 years.

†Age adjusted prevalence to the US population for the year 2000 aged 18 and over.

‡A total of 1320 respondents (17.5%) refused to state their income.

Source: Behavioral Risk Factor Surveillance System

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Table 4. Estimated prevalence of arthritis[*] among adults by education, employment, and income, New Jersey, 1996-1998

Characteristic	Sample Size[†]	Estimated Prevalence			
		Number[‡]	%	95% Confidence Interval	Age Adjusted[§] %
Education Level					
HS or <	3081	791 000	33.2	(31.3-35.1)	29.6
Some College	1861	342 000	28.7	(26.3-31.2)	30.9
College Graduate or >	2599	216 000	19.8	(18.1-21.7)	21.1
Employment Status					
Employed	4953	490 000	21.0	(19.6-22.4)	22.2
Out of work	310	46 000	27.1	(21.8-33.1)	27.8
Homemaker/student	750	69 000	20.0	(17.1-23.4)	26.6
Retired	1366	815 000	51.6	(48.6-54.5)	39.5
Unable to work	170	173 000	69.9	(61.4-77.2)	66.0
Annual Household Income					
<$25,000	1545	465 000	37.4	(34.6-40.3)	30.2
$25,000-$49,999	2002	356 000	28.1	(25.9-30.5)	30.5
>$50,000	2694	265 000	21.0	(19.3-22.9)	21.9
Refused[‖]	1320	265 000	29.3	(26.6-32.1)	25.9
Total	**7561**	**1 559 000**	**27.7**	**(26.5-28.8)**	**27.2**

NOTE: Numbers do not always equal the total due to missing, don't know and refused responses.
[*]Estimated prevalence was calculated for the 1996-1998 civilian, non-institutionalized population aged ≥ 18 years.
[†]Sample size refers to total number of respondents for the three years 1996-1998.
[‡]Estimated prevalence number in thousands is a simple average of annual estimates for the three-year period.
[§]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
[‖]A total of 1320 Respondents (17.5%) refused to state their income.
Source: Behavioral Risk Factor Surveillance System

County of Residence

Prevalence of arthritis varies by geographic location. Generally, there are lower prevalence rates in the north and higher prevalence rates in the south. Hudson, Hunterdon, and Passaic Counties have rates ranging from 20% to 23%. Bergen, Essex, Middlesex, Monmouth, Morris, Somerset, and Union counties have prevalence rates ranging from 24% to 28%. Atlantic, Burlington, Camden, Gloucester, Mercer, Sussex, and Warren counties have rates ranging from 29% to 33%. Cape May, Cumberland, Ocean, and Salem counties have prevalence rates ranging from 34% to 38% (Figure 3). As evidenced in the age-adjusted figures, some of the lower prevalence in counties such as Hudson County and higher prevalence in counties such as Ocean County and Salem County are attributable to differences in the age distribution of the populations in these counties (Figure 4) (Table 5).

Figure 3

Estimated Arthritis Prevalence by County
New Jersey BRFSS 1996-1998

Sussex 29%

Passaic 23%

Bergen 25%

Warren 30%

Morris 26%

Essex 24%

Hudson 21%

Union 24%

Hunterdon 20%

Somerset 24%

Middlesex 28%

Mercer 30%

Monmouth 28%

Ocean 37%

Camden 31%

Burlington 30%

Gloucester 32%

Salem 38%

Atlantic 30%

Cumberland 36%

Cape May 36%

Prevalence (%)
- 20 to 23
- 24 to 28
- 29 to 33
- 34 to 38
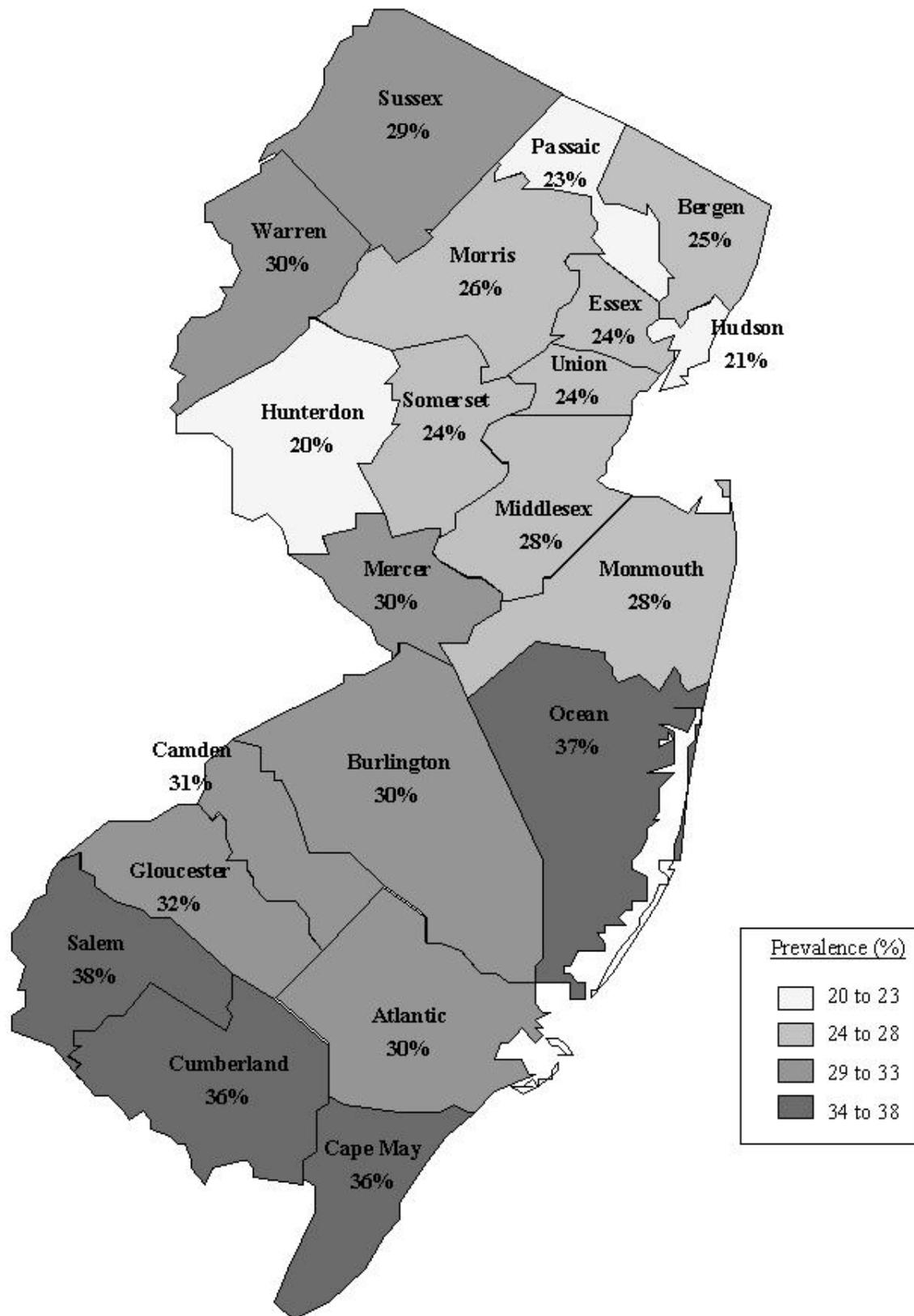
Figure 4 Age-Adjusted Arthritis Prevalence by County
New Jersey BRFSS 1996-1998

Sussex 30%
Passaic 25%
Bergen 23%
Warren 29%
Morris 26%
Essex 26%
Hudson 24%
Union 26%
Hunterdon 20%
Somerset 24%
Middlesex 28%
Mercer 28%
Monmouth 27%
Ocean 31%
Camden 31%
Burlington 29%
Gloucester 32%
Salem 32%
Atlantic 30%
Cumberland 38%
Cape May 34%

Age-Adjusted
Prevalence (%)

20 to 23
24 to 28
29 to 33
34 to 38

20
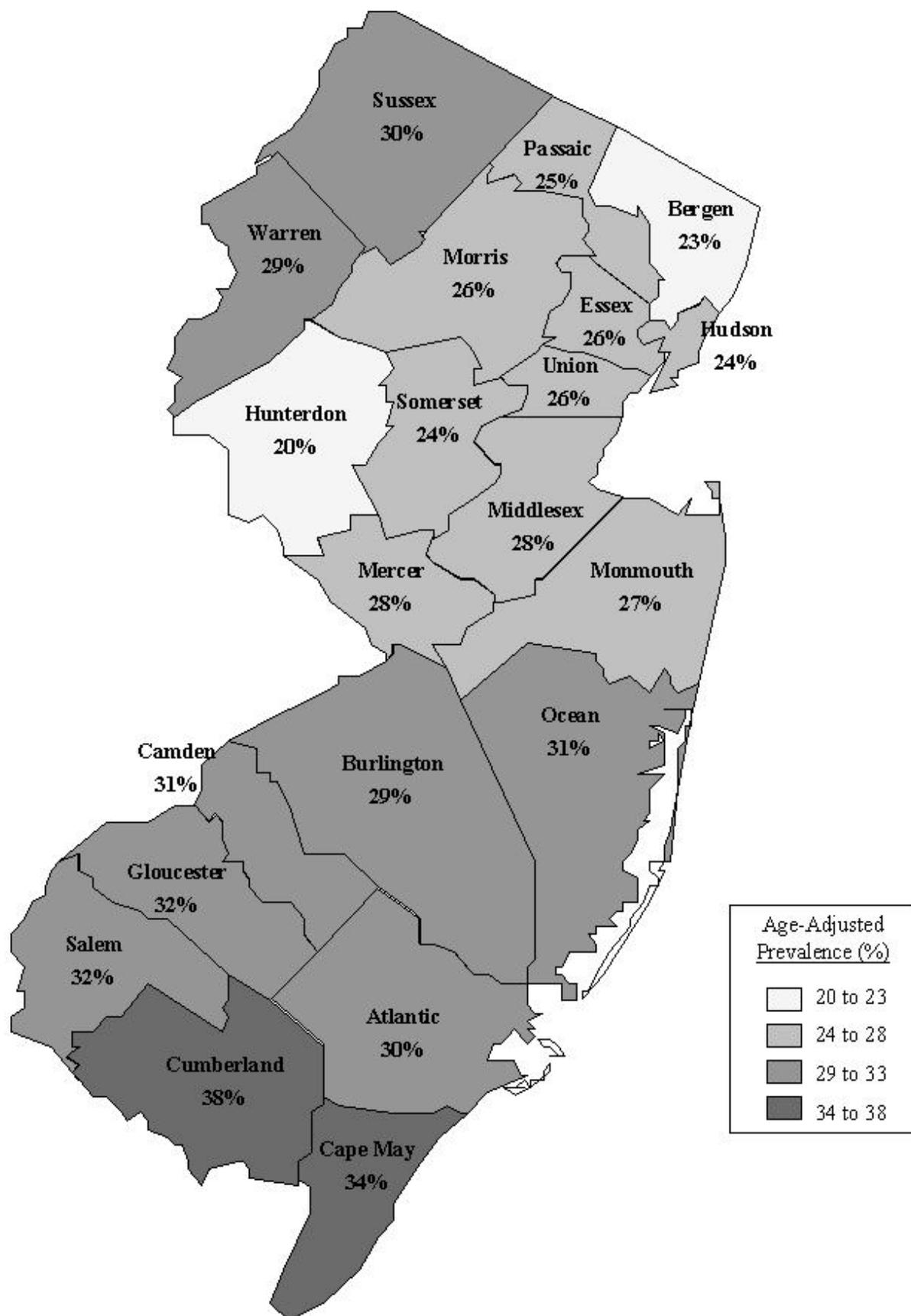
Table 5. Estimated prevalence of arthritis among adults by county of residence, New Jersey, 1996-1998

County	Sample Size	Estimated Prevalence			
		Number	%	95% Confidence Interval	Age Adjusted[*] %
Atlantic	221	47 000	30.2	(23.9-37.4)	29.8
Bergen	798	147 000	25.1	(21.9-28.7)	23.1
Burlington	429	103 000	30.1	(25.2-35.4)	29.1
Camden	448	107 000	31.0	(26.3-36.1)	31.3
Cape May	128	36 000	36.2	(26.2-47.5)	33.8
Cumberland	116	33 000	36.3	(27.4-46.3)	37.5
Essex	627	105 000	23.8	(20.2-27.8)	26.1
Gloucester	251	65 000	31.5	(24.9-38.9)	32.4
Hudson	406	64 000	20.8	(16.9-25.5)	23.9
Hunterdon	138	21 000	20.4	(13.9-29.0)	20.3
Mercer	333	73 000	29.8	(23.6-36.8)	27.7
Middlesex	608	128 000	27.6	(23.7-32.0)	27.9
Monmouth	568	114 000	28.1	(24.0-32.6)	27.1
Morris	485	86 000	25.7	(21.1-31.0)	25.8
Ocean	489	135 000	36.5	(31.8-41.5)	30.5
Passaic	392	67 000	23.0	(18.6-28.1)	24.5
Salem	71	18 000	37.9	(26.4-50.9)	32.2
Somerset	232	39 000	24.4	(18.9-30.8)	24.2
Sussex	173	39 000	28.8	(22.0-36.7)	29.9
Union	433	80 000	24.3	(20.0-29.2)	25.5
Warren	123	29 000	29.6	(20.7-40.3)	29.1
Total State	**7469**	**1 536 000**	**27.7**	**(26.5-28.9)**	**27.2**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

The Arthritis Quality of Life Initiative described previously included funding for two pilot regional arthritis centers to focus on prevention, early diagnosis and treatment of arthritis and other rheumatic diseases. The Atlantic Health System and Virtua Health were selected to develop these centers. The Atlantic Health System sponsors the North Jersey Regional Arthritis Center (NJRAC). NJRAC serves the six counties of Essex, Hudson, Morris, Passaic, Union, and Sussex. In the NJRAC service area the prevalence of arthritis is about 24%. Virtua Health sponsors the Southern New Jersey Regional Arthritis Center (SNJRAC). SNJRAC serves the five counties of Burlington, Camden, Gloucester, Salem and Cumberland. In the SNJRAC service area the prevalence rate of arthritis is almost 32% (Table 6).

Table 6. Estimated prevalence of arthritis among adults by arthritis center[*] catchment area, New Jersey, 1996-1998

Center	Sample Size	Number	%	Estimated Prevalence 95% Confidence Interval	Age Adjusted[†] %
North Jersey Regional	2497	439 000	24.1	(22.2-26.1)	25.3
Southern New Jersey Regional	1303	324 000	31.6	(28.7-34.6)	31.0
Counties not served	3602	761 000	28.6	(26.9-30.4)	27.3
Total State	**7489**	**1 524 000**	**27.7**	**(26.5-28.9)**	**27.2**

[*]North Jersey Regional Arthritis Center (NJRAC) counties are Essex, Hudson, Morris, Passaic, Sussex, and Union Counties. Southern New Jersey Regional Arthritis Center (SNJRAC) counties are Burlington, Camden, Cumberland, Gloucester, and Salem Counties. Counties not served are Atlantic, Bergen, Cape May, Hunterdon, Mercer, Middlesex, Monmouth, Ocean, Somerset, and Warren Counties.
[†]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

At the present time, the ten counties not served by the regional centers are Atlantic, Bergen, Cape May, Hunterdon, Mercer, Middlesex, Monmouth, Ocean, Somerset, and Warren. In the counties not yet served the prevalence of arthritis according to the BRFSS is approximately 29% (Table 6). Once the effectiveness of the two regional pilot centers is established and other factors are taken into account, expansion to the counties not served will be justified.

Health Care Access and Utilization

As defined by the Institute of Medicine (IOM), health care access is the timely use of personal health services to achieve the best possible health outcomes.[66] Health care access is often evaluated by the presence of health insurance coverage and a regular provider of health care.[67] These are considered to be the strongest predictors of health service use, the so-called "enabling factors" for health service use, as referred to by Anderson.[68] For the NHIS, "unmet medical need" refers to the perceived need for medical care that does not result in the use of medical services. For BRFSS, "underinsurance" refers to being insured but failing to see a doctor because of cost.

Overall, for adults under age 65, the percentage of persons without any kind of health care coverage is about the same (13%) for those with and without arthritis. Among persons aged 18 through 44, the proportion of adults without coverage is about 17% and 14% respectively. In the 45 through 64 year age group, about 10% of those with arthritis and 9% of those without arthritis lacked any kind of health care coverage (Table 7).

Table 7. Estimated percentage of adults without any kind of health care coverage by age group and arthritis status, New Jersey, 1996-1998

Arthritis Status/Age	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis				
18-44	591	16.6	(12.4-21.7)	—
45-64	808	10.1	(7.7-13.0)	—
All	**1399**	**12.8**	**(10.5-15.5)**	**15.3**
No arthritis				
18-44	3292	14.4	(13.0-16.0)	—
45-64	1402	8.5	(6.9-10.4)	—
All	**4694**	**12.7**	**(11.6-13.9)**	**12.5**

(Estimated Percentage heading spans the %, 95% Confidence Interval, and Age Adjusted columns)

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

When asked if there was any time in the past year when they needed to see a doctor but could not because of cost, almost 12% of those adults with arthritis responded "yes" compared to 8% of those without arthritis. Among all age groups, persons with arthritis were more likely to be unable to see a doctor due to cost than those without arthritis. This may be reflective of the need to seek health care in those with arthritis while those without arthritis may not need to seek health care as often. The proportion of New Jersey adults unable to see a doctor due to cost decreases with advancing age (Table 8). This may be reflective of that fact that more older persons are insured.

Among adults with arthritis, 88% report a usual place of care compared to 80% of adults without arthritis. The proportion of those with a regular source of care increase with advancing age in both groups (Table 9). Higher rates of having a usual source of care for persons with arthritis may once again reflect their need for health care. Among those adults without a usual source of care, 42% of those with arthritis and 44% of those without arthritis cite the reason as not needing a doctor. In regard to the use of health services, significantly more of those with arthritis compared to those without arthritis (83% vs. 72%) report having had a check-up within the past year. This difference persists among different age groups (Table 10).

Lifestyle Characteristics of People with Arthritis

Physical Activity and Exercise

The 1996 Report of the Surgeon General on Physical Activity and Fitness is a comprehensive report of existing literature on the relationship between physical activity and health status. This

Table 8. Estimated percentage of adults reporting a time they could not afford to see a doctor due to cost by arthritis status and age, New Jersey, 1996-1998

Arthritis Status/Age	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis				
18-44	592	19.6	(15.4-24.6)	—
45-64	807	12.0	(9.7-14.8)	—
≥65	738	4.5	(3.2- 6.3)	—
Total	**2157**	**11.5**	**(9.9-13.3)**	**14.7**
No arthritis				
18-44	3302	9.5	(8.4-10.7)	—
45-64	1401	6.9	(5.5- 8.6)	—
≥65	633	2.4	(1.5- 3.9)	—
Total	**5388**	**8.0**	**(7.2- 8.9)**	**7.5**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

report was prepared collaboratively by the CDC, the President's Council on Physical Fitness and Sports, the National Institutes of Health (including the National Institute of Arthritis and

Table 9. Estimated percentage of adults having one particular place to go if sick or need advice by arthritis status and age, New Jersey, 1996

Arthritis Status/Age	Sample Size	%	95% Confidence Interval	Age Adjusted* %
CDC defined arthritis				
Age				
18-44	203	81.7	(74.2-87.4)	—
45-64	274	89.5	(84.6-92.9)	—
≥65	258	90.9	(86.6-93.9)	—
Total	**740**	**88.0**	**(85.1-90.4)**	**86.0**
No arthritis				
18-44	1267	79.1	(76.3-81.7)	—
45-64	509	82.6	(77.9-86.4)	—
≥65	218	83.6	(76.8-88.7)	—
Total	**2006**	**80.3**	**(78.1-82.4)**	**81.0**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Table 10. Estimated percentage of adults who received a check-up in the past year by arthritis status and age, New Jersey, 1996-1998

		Estimated Prevalence		
Arthritis Status/Age	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis				
Age				
18-44	585	72.4	(67.3-76.9)	—
45-64	801	82.4	(79.0-85.3)	—
≥65	731	92.3	(90.0-94.1)	—
Total	**2137**	**83.2**	**(81.1-85.1)**	**79.6**
No arthritis				
18-44	3261	68.2	(66.2-70.2)	—
45-64	1388	73.9	(71.1-76.6)	—
≥65	627	86.1	(82.8-88.8)	—
Total	**5324**	**71.7**	**(70.3-73.2)**	**73.1**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Musculoskeletal and Skin Diseases), and many others.[69] A few pertinent highlights from this report as it relates to the BRFSS data are as follows:

- The benefits of regular vigorous activity were realized in the 1970s.
- A vigorous exercise period of 20 minutes or greater at least three times per week has been recommended.
- An emerging consensus is that activity need not be of vigorous intensity in order to provide health benefits, i.e., moderate activities will also achieve health benefits.
- Although health benefits of intermittent physical activity have not been demonstrated, three studies have shown evidence of cardiorespiratory benefits with intermittent exercise, for example, three ten-minute sessions.
- Any increase in activity is of benefit. The increase in benefits is proportional to the amount of activity.
- Resistance exercises such as lifting weights are now known to improve the health and quality of life for the elderly by maintaining and improving muscular endurance, preventing falls, and improving mobility required for maintaining independent living status.
- Physical activity reduces the risk of premature death, of heart disease, colon cancer, hypertension, diabetes and obesity and overweight, improves mental health and the health of muscles, bones, and joints, and improves health related quality of life.

In New Jersey, adults with arthritis are significantly less active than adults without arthritis. Comparing persons with arthritis to those without arthritis, 37% vs. 26% are inactive, 25% vs. 28% perform irregular activity, 24% vs. 31% perform regular activity, and about 14% in both groups perform regular and vigorous activity. As indicated by the age-adjusted results, the significantly lower level of physical activity among people with arthritis is not explained simply by the older average age of people with arthritis (Table 11). Those with inactive or irregular levels of activity represent an estimated two thirds (62%) of adults with arthritis who are not gaining the health benefits of regular or regular and vigorous activity, thus increasing their risks of avoidable morbidity.

Weight

About 97 million people in the United States are overweight or obese. The health risks of being overweight or obese include hypertension, dyslipidemia, type 2 diabetes, heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea and respiratory problems, and endometrial, breast, prostate, and colon cancers. Being overweight or obese increases death from all causes. Obesity and overweight are present in higher proportions among those with lower incomes and less education and among some minority groups as well. Obesity and overweight result in part from a sedentary lifestyle and excessive caloric intake, or both.[70]

Weight values are categorized into normal, overweight, and obese by use of the body mass index. Body mass index (BMI) is defined as weight in kilograms divided by height in meters squared. Current National Institute of Health definitions do not have different indices for males and females. A normal weight is a body mass index of less than 25. Overweight is a BMI greater than or equal to 25 and less than 30. Obesity is a BMI greater than or equal to 30. The prevalence of overweight and obesity is higher than if the previous guidelines are used (a BMI greater than or equal to 27.8 kg/m^2 for men and greater than or equal to 27.3 kg/m^2 for women).[70]

Only about 40% of New Jersey adults with arthritis compared to 51% of those without arthritis are of normal weight (Table 12). The prevalence of overweight (37%) is similar in both groups. However, almost one quarter (23%) of those with arthritis compared to approximately 12% of those without arthritis are obese. Age-adjusted results suggest that little of this increased tendency towards obesity is accounted for by differences in age between those with and without arthritis. Most notably, the likelihood of obesity among those having both a diagnosis of arthritis and CJS compared with those having neither remains more than doubled after age adjustment.

The relationship of weight to arthritis has been described. Current studies have indicated overweight precedes the development of knee osteoarthritis.[71,72] Clearly, weight management and reduction are of great significance for public health planning. Furthermore, an alarming trend noted over the three years of data (1996-1998) is that the prevalence of normal weight is shrinking while that of obesity is getting larger (data not shown). In particular, adults diagnosed with arthritis who have CJS have the most pronounced trend.

Approximately 50% of overweight or obese persons with arthritis are trying to lose weight, according to New Jersey BRFSS (data not shown). The success or failure of their efforts and the importance of the fact that the other 50% do not report they are trying to lose weight are of great public health significance in the realm of the management and prevention of arthritis.

Table 11. Self-reported level of physical activity* by arthritis category, New Jersey, 1996-1998

Arthritis Category	Inactive			Irregular			Regular			Regular and vigorous		
	%	95% Confidence Interval	Age Adj.† %	%	95% Confidence Interval	Age Adj. %	%	95% Confidence Interval	Age Adj. %	%	95% Confidence Interval	Age Adj. %
CDC defined arthritis	36.7	(34.4-39.1)	35.7	25.1	(23.0-27.2)	25.2	24.2	(22.1-26.4)	25.4	14.1	(12.3-15.9)	13.6
Diagnosis with CJS	42.5	(38.3-46.7)	34.6	25.0	(21.5-28.8)	27.7	20.9	(17.4-25.0)	26.0	11.6	(9.3-14.4)	11.8
Diagnosis without CJS	32.5	(29.1-36.2)	34.3	26.0	(23.0-29.4)	22.8	26.0	(22.9-29.4)	25.8	15.4	(12.6-18.8)	17.2
CJS without a diagnosis	36.3	(31.4-41.5)	37.1	23.4	(19.3-28.0)	23.8	25.5	(17.4-25.0)	24.8	14.9	(11.8-18.5)	14.4
No arthritis	26.5	(25.1-27.9)	27.6	28.4	(27.0-29.9)	28.4	30.8	(29.3-32.3)	29.4	14.3	(13.3-15.5)	14.6
All	**29.7**	**(28.5-30.9)**	**29.7**	**27.5**	**(26.4-28.7)**	**27.6**	**28.7**	**(27.5-29.9)**	**28.8**	**14.1**	**(13.2-15.0)**	**14.0**

*Inactive – No reported activity. Irregular – Activity for less than 20 minutes or less than three times per week. Regular – Activity for 20 or more minutes three or more times per week done at 50% or less than functional capacity. Vigorous – Activity that requires rhythmic contraction of large muscle groups or 50% functional capacity for 20 or more minutes three or more times per week.
† Age adjusted to the US population for the year 2000 aged 18 and over.
Source: Behavioral Risk Factor Surveillance System

Table 12. Estimated percentage of adults who are of normal weight, overweight, or obese* by arthritis category, New Jersey, 1996-1998

Arthritis Category	Normal Weight			Overweight			Obese		
	%	95% Confidence Interval	Age Adjusted† %	%	95% Confidence Interval	Age Adjusted %	%	95% Confidence Interval	Age Adjusted %
CDC defined arthritis	40.1	(37.7-42.6)	43.8	36.6	(34.2-39.1)	33.4	23.2	(21.2-25.5)	22.7
Diagnosis with CJS	35.2	(31.0-39.7)	41.0	36.5	(32.4-40.7)	31.2	28.3	(24.6-32.3)	27.9
Diagnosis without CJS	40.6	(37.0-44.4)	42.7	37.3	(33.5-41.1)	34.7	22.1	(19.0-25.5)	22.6
CJS without a diagnosis	45.8	(40.7-51.1)	47.4	35.7	(30.9-40.9)	34.6	18.4	(14.6-23.0)	18.0
No arthritis	51.2	(49.6-52.8)	50.8	36.5	(35.0-38.1)	37.0	12.3	(11.2-13.4)	12.2
All	**49.0**	**(42.7-49.9)**	**49.1**	**36.4**	**(35.2-37.7)**	**36.2**	**15.0**	**(14.1-16.0)**	**14.7**

*Normal weight is defined as BMI <25, overweight is defined as BMI 25-29, obese is defined as BMI ≥ 30.
† Age adjusted to the US population for the year 2000 aged 18 and over.
Source: Behavioral Risk Factor Surveillance System

Smoking

Cigarette smoking and other uses of tobacco form the single most preventable cause of death and disease in the United States.[73] A relationship between smoking and arthritis has not been documented in the literature. A few studies have attempted to link smoking with rheumatoid arthritis but have not been conclusive.[74,75]

In New Jersey, the prevalence of smoking is roughly 21% among adults with or without arthritis. However, those with arthritis have higher age-adjusted rates of smoking than those without arthritis (26% vs. 21%). In particular, those with both a diagnosis of arthritis and CJS have age-adjusted smoking rates about 75% higher than those without arthritis (Table 13). Conversely, the percentage of adults who have "never smoked" is higher among adults without arthritis than adults with arthritis (55% and 48%, respectively) (data not shown).

Diet: Intake of Fruits and Vegetables

Studies have been done to evaluate an association between arthritis and diet.[76] One study suggested the intake of olive oil and cooked vegetables was inversely and independently associated with risk of RA in a population in southern Greece.[77] Another study on the intake of antioxidant micronutrients, especially vitamin C, indicated that it might slow the progression although not the incidence of knee OA.[78] These studies warrant further research but suggest that a healthy diet might have a beneficial impact on persons with arthritis.

The 1995 *Dietary Guidelines for Americans* recommends a variety of foods, balancing food intake with physical activity, a diet plentiful in grains, vegetables, and fruits. Moderation in

Table 13. Estimated prevalence of regular and irregular smoking among adults by arthritis category, New Jersey, 1996-1998

Arthritis Category	Sample Size	%	Estimated Prevalence 95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	2131	21.1	(19.0-23.3)	26.3
Diagnosis with CJS	709	21.0	(17.4-25.2)	33.5
Diagnosis without CJS	929	19.0	(16.1-22.3)	23.4
CJS without a diagnosis	493	24.8	(20.5-29.7)	25.1
No Arthritis	5319	21.4	(20.1-22.7)	20.5
All	**7450**	**21.3**	**(20.2-22.5)**	**21.5**

[†]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

consumption of salt, sodium, and sugars, low intake of fat, saturated fat and cholesterol and alcohol is recommended. The fruit and vegetable index is utilized to monitor the Healthy People objective of five or more servings (at least 2 servings of fruit and 3 servings of vegetables) of fruit and vegetables per day.[4]

Intake of fruits and vegetables among New Jersey adults is not found to vary substantially by arthritis status. Among adults with arthritis, approximately 30% consume the recommended "5 a day" servings of fruit and vegetables. Among adults without arthritis, approximately 26% consume at least five servings of fruit and vegetables a day. Age-adjusted results are also similar (Table 14).

Table 14. Estimated percentage of adults with an intake of 5 or more servings per day of fruits and vegetables by arthritis category, New Jersey, 1996-1998

Arthritis Category	Sample Size	%	Estimated Prevalence	
			95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	2143	30.1	(27.8-32.5)	28.1
Diagnosis with CJS	715	31.9	(27.8-36.2)	32.4
Diagosis without CJS	931	30.6	(27.2-34.2)	28.0
CJS without diagnosis	497	26.6	(22.1-31.7)	26.6
No Arthritis	5341	26.3	(24.9-27.7)	27.0
All	**8170**	**26.7**	**(25.5-27.8)**	**26.5**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Influenza and Pneumococcal Vaccinations

Increasing the proportions of adults who are vaccinated annually against influenza and ever vaccinated against pneumococcal disease is one of the goals of *Healthy People 2010.*[4] Vaccination of persons with arthritis may be particularly important to the extent that they are more likely to have comorbid high risk conditions compared to persons without arthritis. In New Jersey, approximately 39% of adults with arthritis compared to approximately 22% of adults without arthritis are vaccinated annually against influenza. Influenza vaccination rates are highest (49%) among individuals with both a diagnosis of arthritis and CJS (Table 15). Just 20% of persons with arthritis compared to 11% of persons without arthritis have ever had a pneumococcal vaccination (Table 16).

Age-adjusted results suggest that influenza vaccination is more common among adults with arthritis than among adults without arthritis, regardless of age. This may reflect a closer involvement with the health care system among persons with arthritis. However, age-adjusted rates of pneumococcal vaccination are similar among adults with or without arthritis.

Table 15. Percentage of adults receiving influenza vaccine within the past year by arthritis category, New Jersey, 1996-1998

| | | | Estimated Prevalence | |
Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	2133	39.2	(36.8-41.6)	32.4
Diagnosis with CJS	714	48.8	(44.6-53.1)	41.9
Diagnosis without CJS	924	38.2	(34.5-42.0)	28.3
CJS without diagnosis	495	27.6	(23.3-32.4)	33.2
No Arthritis	5307	22.1	(20.9-23.5)	26.4
All	**7440**	**26.9**	**(25.7-28.1)**	**26.4**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Approximately 68% of adults with arthritis aged 65 and over have received an influenza vaccine within the past year compared to 58% of those without arthritis aged 65 and over. Approximately 40% of adults with arthritis aged 65 and over have received a pneumococcal vaccine compared to 36% of those without arthritis aged 65 and over (data not shown).

Table 16. Percentage of adults ever receiving pneumococcal vaccine by arthritis category, New Jersey, 1996-1998

| | | | Estimated Prevalence | |
Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	2062	19.5	(17.6-21.6)	13.6
Diagnosis with CJS	694	23.3	(20.0-27.0)	10.9
Diagnosis without CJS	896	20.9	(17.8-24.4)	13.4
CJS without diagnosis	472	11.5	(8.8-14.9)	12.9
No Arthritis	5082	11.0	(10.0-12.0)	12.5
All	**7144**	**13.4**	**(12.5-14.3)**	**13.1**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Coexisting Medical Conditions

In addition to arthritis, medical conditions which have been ascertained in the New Jersey BRFSS include hypertension, diabetes, hypercholesterolemia, and, among women aged 35 and over, fractures of the hip, wrist, and spine.

Hypertension

Increased rates of hypertension that persist after age adjustment are reported among adults with arthritis. The prevalence of self-reported hypertension is approximately 40% among adults with arthritis in New Jersey, as compared to 17% among those without arthritis. Age-adjusted rates of hypertension are about 68% higher among those with arthritis compared to those that do not have arthritis. In particular, among people diagnosed with arthritis who have CJS, roughly half (52%) also have hypertension (Table 17).

Table 17. Prevalence of self-reported hypertension by arthritis category among adults, New Jersey, 1997

Arthritis Category	Sample Size	Estimated Prevalence		
		%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	715	40.0	(35.9-44.3)	32.4
Diagnosis with CJS	245	52.3	(45.3-59.2)	49.1
Diagnosis without CJS	293	36.3	(30.0-43.0)	26.8
CJS without diagnosis	177	30.1	(22.8-38.7)	30.5
No Arthritis	1716	17.4	(15.4-19.6)	19.3
All	**2650**	**23.6**	**(21.8-25.6)**	**22.9**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Diabetes Mellitus

Persons with arthritis are more likely to have coexisting diabetes than persons without arthritis. In New Jersey, the estimated prevalence of diabetes among adults with CDC defined arthritis is 10%, compared with an estimated 3% prevalence of diabetes among adults without arthritis (Table 18). While this higher percentage reflects to some extent the higher age of those with arthritis, the age-adjusted rate of diabetes for those with arthritis is still nearly double that for those without arthritis. This may reflect to some extent that persons with arthritis receive more medical attention than persons without arthritis, and are therefore more likely to have any existing diabetic condition detected.

Table 18. Prevalence of self-reported diabetes by arthritis category among adults, New Jersey, 1996-1998

Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
			Estimated Prevalence	
CDC defined arthritis	2161	10.0	(8.6-11.6)	7.2
Diagnosis with CJS	720	13.9	(11.2-17.0)	7.6
Diagnosis without CJS	941	9.1	(7.1-11.4)	7.3
CJS without a diagnosis	500	6.4	(4.3- 9.4)	6.1
No Arthritis	5390	3.0	(2.5- 3.6)	3.8
All	**8268**	**5.1**	**(4.6- 5.7)**	**4.8**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Hypercholesterolemia

Adults with arthritis are more likely to report that they have been told that their blood cholesterol was high (40%) as compared to persons without arthritis (23%) (Table 19). This association cannot be fully explained by age differences, as the rate of self-reported hypercholesterolemia remains about 40% higher among persons with arthritis after age adjustment.

Table 19. Prevalence of self-reported high blood cholesterol level by arthritis category among adults, New Jersey, 1996-1997

Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
			Estimated Prevalence	
CDC defined arthritis	1261	39.6	(36.5-42.7)	32.3
Diagnosis with CJS	417	43.8	(38.5-49.2)	33.9
Diagnosis without CJS	601	39.3	(34.9-43.9)	30.3
CJS without a diagnosis	243	33.4	(27.0-40.5)	31.6
No Arthritis	2768	23.0	(21.2-25.0)	23.0
All	**4396**	**28.1**	**(26.5-29.7)**	**26.2**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Female Hormonal Status

The higher prevalence of arthritis among women as compared to men is seen throughout the literature. For the nation, men over 64 years of age have an estimated prevalence of 41% while women over 64 have an estimated prevalence of 53%.[79] Women have higher rates of rheumatoid arthritis and fibromyalgia while men have higher rates of gout and ankylosing spondylitis. Hormonal factors, including pregnancy, are often suspected of having a role in the occurrence or severity of rheumatic diseases in females.[80]

A literature review showed no consistent association of postmenopausal estrogen therapy with OA or RA but did show a nearly threefold increased risk of lupus erythematosus after two or more years of hormone therapy.[81] Additionally, effects of the use of diethylstilbestrol (DES) given to approximately 4.8 million pregnant women from the 1938 to 1971 have been seen in the women and their children.[82] While the observed effects are largely of a reproductive nature, questions have been raised about the impact of DES on the autoimmune system and such diseases as lupus and rheumatoid arthritis.[83,84]

Age-adjusted results indicate that the percentage of women with arthritis aged 35 and over who have undergone surgical or natural menopause is not disproportionate for their age (Tables 20 and 21). Interestingly, women with CJS not having a diagnosis of arthritis appear to be less likely than other women with arthritis to report having experienced menopause, regardless of age (Table 21). In New Jersey, use of estrogen replacement therapy is reported by approximately 37% of women with arthritis compared to 32% of women without arthritis after age adjustment (Table 22).

Table 20. Percentage of women aged 35 and older who report having their ovaries removed by arthritis category, New Jersey, 1996 and 1998

Arthritis Category	Sample Size	%	Estimated Prevalence 95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	928	15.2	(12.8-17.9)	9.5
Diagnosis with CJS	319	21.6	(17.1-26.8)	11.2
Diagnosis without CJS	429	14.3	(11.1-18.4)	9.2
CJS without a diagnosis	180	6.1	(3.0-12.0)	6.3
No Arthritis	2023	6.0	(5.0- 7.3)	7.5
All	**3172**	**8.9**	**(7.9-10.1)**	**8.1**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Table 21. Percentage of women age 35 and older who report having experienced menopause by arthritis category, New Jersey, 1996 and 1998

| | | Estimated Prevalence | | |
| | | | | |
Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	838	73.9	(70.5-77.0)	65.3
Diagnosis with CJS	310	81.9	(76.8-86.2)	60.6
Diagnosis without CJS	397	75.0	(70.1-79.4)	64.9
CJS without a diagnosis	131	51.4	(41.6-61.2)	54.1
No Arthritis	1330	44.2	(41.1-47.3)	61.2
All	**2322**	**56.9**	**(54.6-59.2)**	**68.2**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Table 22. Percentage of women age 35 and older who report ever use of estrogen replacement therapy by arthritis category, New Jersey, 1996 and 1998

| | | Estimated Prevalence | | |
| | | | | |
Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	599	33.4	(29.3-37.8)	36.8
Diagnosis with CJS	247	34.0	(27.9-40.8)	29.2
Diagnosis without CJS	287	30.2	(24.7-36.4)	33.3
CJS without a diagnosis	65	44.7	(30.5-59.9)	55.6
No Arthritis	547	28.9	(24.6-33.6)	32.1
All	**1246**	**30.5**	**(27.6-33.5)**	**33.7**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

The age-adjusted prevalence of hysterectomy with or without oophorectomy is approximately 15% for those with arthritis vs. 11% for those without arthritis (Table 23). However, associations cannot be accurately evaluated here for numerous reasons including trends over time in use of surgical and medical treatments for female hormonal issues, sample size, and the nature of the reporting.

Table 23. Percentage of women aged 18 and over who report having had a hysterectomy by arthritis category, New Jersey, 1996-1998

| | | Estimated Percentage | | |
Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	1413	23.9	(21.5-26.5)	14.6
Diagnosis with CJS	499	28.3	(24.2-32.8)	13.7
Diagnosis without CJS	638	25.4	(21.8-29.4)	15.0
CJS without a diagnosis	276	12.1	(8.2-17.5)	11.6
No Arthritis	3002	8.8	(7.8-10.0)	10.7
All	**4726**	**13.8**	**(12.7-14.9)**	**12.6**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System
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Fractures of the Hip, Wrist and Spine

An inverse relationship between osteoarthritis (OA) and osteoporosis has been suggested for many years because of the higher bone mineral density seen in patients with OA as compared to patients with osteoporosis. However, at least two major studies suggest that the higher bone mineral density in patients with OA does not result in a reduced rate of osteoporotic fractures. The increased risk of fracture was associated with both increased number and more serious type of falls.[85,86] Among New Jersey adults, similar rates of fracture due to falling are seen among women over age 34 with arthritis (6%) compared to those without arthritis (4%) (Table 24).

Table 24. Percentage of women age 35 or older who ever experienced a fracture of wrist, hip, or backbone from falling since the age of 35 by arthritis category, New Jersey, 1996

| | | Estimated Prevalence | | |
Arthritis Category	Sample Size	%	95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	431	5.5	(3.6- 8.1)	3.9
Diagnosis with CJS	142	8.9	(5.0-15.4)	5.9
Diagnosis without CJS	238	4.3	(2.4- 7.8)	3.2
CJS without a diagnosis	51	1.4	(0.2- 9.6)	3.0
No Arthritis	736	3.6	(2.1- 5.9)	3.9
All	**1282**	**4.3**	**(3.2- 5.9)**	**4.1**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Quality of Life of Adults with Arthritis in New Jersey

While morbidity and mortality rates provide biomedical measures of the health of a population, measures of health related quality of life provide an objective and subjective evaluation of the well being of a population. In turn, the prevalence of and the efforts in the prevention of dysfunction and disability associated with chronic diseases such as arthritis can then be measured.[87] Together, *Healthy People 2010* and *Healthy New Jersey 2010* have the goal of increasing quality and years of healthy life. Nationally, data on quality of life (QOL) is collected via the NHIS.

To address the need for regional and state data, in 1993, four QOL questions were developed and added to the BRFSS. With the addition of these questions to the BRFSS, state data can be obtained and monitored for the purpose of improving public health policy. A discussion on the rationale for and the concepts measured by the four QOL questions is available.[87] Beginning in 1995, an expanded ten-question optional module on QOL has been available. New Jersey is using the expanded module in 2000.

General Health

Adults with arthritis in New Jersey are three time more likely to report fair to poor health than adults without arthritis. Of New Jersey adults with arthritis, approximately 27% consider their health fair or poor as compared to just 8% of those adults without arthritis (Table 25). The age-adjusted estimates are also substantially different (22% and 9%, respectively), suggesting that the disproportionate prevalence of poor self-perceived health status among adults with arthritis in New Jersey is relatively independent of their higher average age.

Table 25. Percentage of adults reporting self-perceived general health as fair or poor by arthritis category, New Jersey, 1996-1998

Arthritis Category	Sample Size	%	Estimated Prevalence 95% Confidence Interval	Age Adjusted[*] %
CDC defined arthritis	2151	26.5	(24.4-28.7)	21.9
Diagnosis with CJS	715	40.6	(36.5-44.8)	29.0
Diagnosis without CJS	938	19.3	(16.6-22.2)	15.7
CJS without diagnosis	498	20.1	(16.4-24.5)	20.7
No Arthritis	5393	7.9	(7.1- 8.8)	8.9
All	**8261**	**13.1**	**(12.3-14.0)**	**13.2**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

A particularly high estimated prevalence of self-rated fair to poor health is found among those having both a diagnosis of arthritis and CJS (41%). Of those having either a diagnosis of arthritis or CJS but not both, about 20% describe their health as fair or poor (Table 25).

Physical Health

Adults with arthritis in New Jersey are likely to have three times as many days of self-reported poor physical health as adults without arthritis. In New Jersey, individuals with arthritis average 6 days of poor physical health per month while individuals without arthritis average about 2 days of poor physical health per month (Table 26). Persons having both a diagnosis of arthritis and CJS again fare the worst, having an average of approximately 10 days of poor physical health per month, while persons having either a diagnosis of arthritis or CJS but not both average approximately 4 to 5 days of poor physical health per month.

Mental Health

While more days of poor mental health are reported by adults with arthritis than adults without arthritis, the disparity between the two groups is not as great as that seen in those measures that involve physical functioning. The mean number of days per month when mental health is not good is about 4 days for persons with arthritis, while those without arthritis experience approximately 3 days per month when mental health is not good. Persons having CJS with or without a diagnosis of arthritis experience an average of almost 5 days of poor mental health per month while persons having a diagnosis of arthritis without CJS experience only about 3 days of poor mental health per month (Table 27).

Table 26. Mean number of days in the past 30 days when self-reported physical health was not good by arthritis category, New Jersey, 1996-1998

		Estimated Number of Days		
Arthritis Category	**Sample Size**	**Mean**	**95% Confidence Interval**	**Age Adjusted[*] Mean**
CDC defined arthritis	2116	6.0	(5.5- 6.6)	5.6
Diagnosis with CJS	693	9.8	(8.7-10.9)	10.0
Diagnosis without CJS	928	3.8	(3.2- 4.4)	3.4
CJS without a diagnosis	495	4.9	(4.0- 5.8)	4.9
No arthritis	5346	1.8	(1.6- 2.0)	1.8
All	**8163**	**2.9**	**(2.8- 3.1)**	**2.9**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

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Table 27. Mean number of days in the past 30 days when self-reported mental health was not good by arthritis category, New Jersey, 1996-1998

Arthritis Category	Sample Size	Estimated Number of Days		
		Mean	95% Confidence Interval	Age Adjusted[*] Mean
CDC defined arthritis	2117	4.1	(3.7- 4.5)	4.6
Diagnosis with CJS	704	4.8	(4.0- 5.6)	6.5
Diagnosis without CJS	921	3.1	(2.5- 3.6)	3.8
CJS without a diagnosis	492	5.0	(3.9- 6.0)	4.9
No Arthritis	5339	2.5	(2.3- 2.7)	2.4
All	**8154**	**2.9**	**(2.7- 3.1)**	**2.9**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

Activity Limitation

The profound physical toll of arthritis is again suggested by measurement of limitations on activity. Adults with arthritis in New Jersey reportedly experience nearly four times as many days of activity limitation on average as those without arthritis, according to the BRFSS (Table 28). Those with arthritis average about 4 days per month when poor physical or mental health

Table 28. Mean number of days in the past 30 days when self-reported poor physical or mental health kept an individual from doing usual activities such as self-care, work, or recreation by arthritis category, New Jersey, 1996-1998

Arthritis Category	Sample Size	Estimated Number of Days		
		Mean	95% Confidence Interval	Age Adjusted[*] Mean
CDC defined arthritis	2123	3.5	(3.1- 3.9)	3.3
Diagnosis with CJS	703	5.6	(4.7- 6.5)	4.7
Diagnosis without CJS	928	1.8	(1.3- 2.2)	1.7
CJS without a diagnosis	492	3.8	(2.8- 4.8)	3.8
No arthritis	5381	1.0	(.9- 1.2)	1.1
All	**8212**	**1.7**	**(1.6- 1.9)**	**1.7**

[*]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

does not allow usual activities such as self care, work, or recreation, while those without arthritis average about 1 day per month. Furthermore, again the presence of CJS impacts heavily on physical functioning. Those with both a diagnosis of arthritis and CJS have a substantially higher number of activity limitation days (averaging 6 days per month), compared to those having either a diagnosis of arthritis without CJS (averaging 2 days per month), and those having CJS without a diagnosis of arthritis (averaging 4 days per month) (Table 28).

Unhealthy Days

The term "unhealthy days" is defined as the sum of days out of the past 30 when physical health and/or mental health are not good, and this sum is not to exceed 30.[49] The impact of arthritis on daily life can clearly be seen in this measure. Those with CDC-defined arthritis average more than twice as many unhealthy days (about 9 days per month) as those without arthritis (about 4 days per month) (Table 29). Persons having both a diagnosis of arthritis and CJS average a substantially higher number of unhealthy days (12 days per month) than others. Persons having a diagnosis of arthritis without CJS average about 6 unhealthy days in the past 30 days, while persons having CJS without a diagnosis of arthritis average 9 unhealthy days in the past 30 days (Table 29).

Table 29. Mean number of unhealthy days[*] in the past 30 days by arthritis category, New Jersey, 1996-1998

Arthritis Category	Sample Size	Estimated Number of Days		
		Mean	95% Confidence Interval	Age Adjusted[†] Mean
CDC defined arthritis	2080	8.6	(8.0- 9.2)	8.8
Diagnosis with CJS	678	12.0	(10.8-13.2)	13.9
Diagnosis without CJS	914	6.2	(5.5- 6.9)	6.7
CJS without a diagnosis	488	8.5	(7.3- 9.7)	8.4
No Arthritis	5293	4.0	(3.7- 4.2)	3.9
All	**8056**	**5.2**	**(4.9- 5.4)**	**5.2**

[*]The sum of poor physical and mental health days reported, not to exceed 30 days.
[†]Age-adjusted using the estimated 2000 U.S. population aged 18 and over as a standard.
Source: Behavioral Risk Factor Surveillance System

TECHNICAL NOTES

The BRFSS is a telephone survey of non-institutionalized adults aged 18 years and older sponsored by CDC. Several subgroups of the general population are not represented in sample population, which may affect our findings. It does not include persons residing in nursing homes, members of the armed forces, institutionalized persons, persons residing in college dormitories, and United States nationals living abroad and persons without telephones. The largest portion of these may be the residents of nursing homes, who, in the United States in 1997, totaled approximately 1.5 million persons aged 65 and over. Additionally, in New Jersey in 1998, 4% of households did not have telephone service. Furthermore, New Jersey did not start collecting data from non-English speaking respondents until 1999.

Confidence intervals are provided in this report to take into account the random error introduced by sampling. These confidence intervals were calculated from variance estimates generated by the statistical software package SUDAAN®[88], used for surveys such as the BRFSS that incorporate complex sampling designs. The confidence intervals themselves were calculated using the same method as that used for the National Household Survey of Drug Abuse.

Population estimates for New Jersey used to weight the BRFSS for the survey years 1996 through 1998 were provided by Claritas, Inc. Discrepancies in sample versus population makeup of those interviewed are explored and reported by the CDC.[89]

Non-response rates for the household income question in the BRFSS range from 1.2 to 31.1% across states with a median of 5.6%, while non-response for educational attainment has a median of less than 1% and a maximum of 5.6%.

New Jersey did not collect data on arthritis during the first four months of 1996. This may affect prevalence estimates for those characteristics of persons with arthritis that are seasonal, such as physical activity.

Responses of "don't know" or "refused" are generally excluded from analysis. For this reason, totals are not identical from one table to another. Rounding will also affect totals.

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APPENDIX

New Jersey BRFSS Questions

Each section indicates the questions used for analysis in this report. Straightforward demographic questions regarding gender, age, race, education, income, and county of residence have been omitted.

Employment

The only question pertaining to work and disability available from the New Jersey BRFSS for the years 1996-1998 was the following:

- Are you currently: a. Employed for wages; b. Self-employed; c. Out of work for more than 1year; d. Out of work for less than 1 year; e. Homemaker; f. Student; g. Retired; h. unable to work.

The responses were combined for this analysis: a with b, c with d, and e with f.

Health Care Access and Utilization

BRFSS data for the years 1996-1998 incorporated the following six questions pertaining to health care access and utilization:

- Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs (health maintenance organizations), or government plans such as Medicare?
- Was there a time during the last 12 months when you needed to see a doctor, but could not due to the cost?
- About how long has it been since you last visited a doctor for a routine checkup?
  Asked in 1996 only:
- Is there one particular clinic, health center, or doctor's office, or other place that you usually go to if you are sick or need advice about your health?
- What is the main reason that you do not have a usual source of medical care?

Physical Activity

The New Jersey BRFSS questions for the 1996-1998 period pertaining to physical activity and exercise were:

- During the past month, did you participate in any physical activities such as running, calisthenics, golf, gardening, or walking for exercise?
- What type of physical activity or exercise did you spend the most time doing during the past month?

- How far do you usually walk/ run/ jog/ swim? (Asked only of those who engage in these exercises.)
- How many times per week or per month did you take part in this activity during the past month?
- And when you took part in this activity, for how many minutes or hours did you usually keep at it?
- Was there another physical activity or exercise that you participated in during the last month?

To determine physical activity levels, answers to the above questions are transformed into calculated variables for analysis. Activity levels are grouped into the following categories: physically inactive, irregular activity, regular activity and regular and vigorous activity. "Physically inactive" describes a person with no reported activity. "Irregular activity" is any physical activity or pair of activities done for less than 20 minutes or less than three times per week. "Regular activity" is any physical activity or pair of activities done for a total of 20 or more minutes three or more times per week done at less than 50% of functional capacity. "Regular and vigorous activity" is any physical activity requiring rhythmic contraction of large muscle groups at 50% of functional capacity for 20 or more minutes three or more times per week (*Healthy People 2000* objective 1.4).[4]

Weight

The New Jersey BRFSS for the 1996-1998 period asked the following questions pertaining to weight:

- About how much do you weigh without shoes?
- About how tall are you without shoes?
- Are you now trying to lose weight?
- Are you eating fewer calories or less fat to lose/keep from gaining weight?
- Are you using physical activity or exercise to lose/keep from gaining weight?

The first two questions are transformed into a calculated variable for analysis.

Smoking

The New Jersey BRFSS for the 1996-1998 period asked the following question pertaining to smoking:

- Do you now smoke cigarettes everyday, some days or not at all?

Intake of Fruit and Vegetables

The New Jersey BRFSS for the 1996-1998 period asked the following questions pertaining to diet:

- How often do you drink fruit juices such as orange, grapefruit or tomato?
- Not counting juice, how often do you eat fruit?
- How often do you eat green salad?
- How often do you eat potatoes, not including French fries, fried potatoes, or potato chips?
- How often do you eat carrots?
- Not counting carrots, potatoes or salad, how many servings of vegetables do you usually eat?

The above questions are transformed into a calculated variable known as the fruit and vegetable index.

Hypertension

The following question about hypertension was included in the New Jersey BRFSS in 1997:

- Have you been told by a doctor, nurse, or other health practitioner that your blood pressure was high?

Diabetes Mellitus

The following question about diabetes was included in the New Jersey BRFSS in 1996 through 1998:

- Have you ever been told by a doctor that you have diabetes? (If "Yes" and female, ask "Was this only when you were pregnant?")

Hypercholesterolemia

The following question about serum cholesterol was included in the New Jersey BRFSS in 1996 through 1997:

- Have you ever been told by a doctor or other health professional that your blood cholesterol was high? (Asked only of those who had ever had their blood cholesterol checked.)

Female Hormonal Status

Questions which have been used on the New Jersey BRFSS in 1996 through 1998 relating to female hormonal issues are:

- Have you had surgery where both of your ovaries were removed?
- Have you gone through the change of life or menopause?
- Have you had a hysterectomy?
- Except for the time you have taken birth control pills, have you ever taken female hormones or estrogen replacement therapy?

Fractures

Questions which were used on the New Jersey BRFSS in 1996 and 1998 relating to fractures are:

- Since the age of 35, have you broken your wrist, hip, or backbone? (This was only asked of women aged 35 and over.) ,
- Under what circumstances did the break occur? (Responses include car, sports, fall, rest and other. This question was asked in 1996 only.)

Quality of Life

The questions on health related quality of life for BRFSS used in 1996-1998 are:

- Would you say in general your health is a. excellent, b. very good, c. good, d. fair, or e. poor?
- Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?
- Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?
- During the past 30 days for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?