

Increasing Prevalence of Gout and Hyperuricemia Over 10 Years Among Older Adults in a Managed Care Population

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ABSTRACT. Objective. To determine whether the prevalence of gout and/or clinically significant hyperuricemia increased in a managed care population over 10 years.

Methods. The study was a descriptive analysis utilizing an administrative claims database to ascertain 10-year trends in prevalence of gout and/or hyperuricemia. Prevalence rates were calculated cross-sectionally for each year (1990–99) and expressed/compared as rates per 1000 enrollees.

Results. The prevalence of gout and/or hyperuricemia in the overall population increased by about 2 cases per 1000 enrollees over 10 years. In the > 75 year age group, rates increased from 21 per 1000 persons in 1990 to 41 per 1000 in 1999. In the 65–74 year age group, prevalence increased from between 21 and 24 per 1000 persons in the years 1990–92 to over 31 per 1000 during the years 1997–99. Prevalence rates in younger age groups (< 65 years) stayed consistently low during the years under study. There were sex differences in most age groups, with men having the greater burden of disease at every time point.

Conclusion. Prevalence of gout and/or hyperuricemia in the overall study population increased during the 10-year period. When stratified by age, there were increases in prevalence among groups over age 65 in both sexes. Although gout prevalence increased in both sexes over the 10-year period, men still had most of the burden of disease. In ages younger than 65, men had 4 times higher prevalence than women (4:1 ratio), but in the older age groups (> 65), the gender gap narrowed to 1 woman to every 3 men with gout and/or hyperuricemia (3:1 ratio). (J Rheumatol 2004;31:1582–7)

Key Indexing Terms:

EPIDEMIOLOGY

GOUT

MANAGED CARE

PREVALENCE

Gout is an inflammatory arthritis caused by the deposition of monosodium urate crystals in tissues¹. This condition typically occurs after years of sustained hyperuricemia. It is estimated to affect 5.1 million people in the United States according to the most recent National Health and Nutrition Examination Survey (NHANES III)². Two important risk factors that have been implicated in the development of hyperuricemia and gout are obesity^{3,4} and aging. A substantial increase in obesity over time was reported between the years 1960 and 2000, according to data derived from the NHANES surveys^{5,6}. Given this “epidemic of obesity” in the United States^{6,7} coupled with an ever-increasing aging

population, it has been theorized that the prevalences of gout and hyperuricemia are also increasing^{8,9}.

The objective of our study was to determine whether the prevalence of gout (or clinically significant hyperuricemia) increased in a managed care population over the 10 years under study (1990–99). This study was a descriptive analysis providing cross-sectional prevalence estimates, and describes gout (or clinically significant hyperuricemia) within a managed care population. Estimates were generated from patient diagnosis codes, in order to facilitate the analysis of year-to-year trends.

MATERIALS AND METHODS

We conducted an observational, descriptive analysis of an administrative claims database to ascertain 10-year trends in the prevalence of gout or clinically significant hyperuricemia in a managed care population. Data from network plans located in various states throughout the Midwestern, Southeastern, Western, and Northwestern United States were analyzed. All plans are discounted fee-for-service, independent practice association (IPA) model plans, insuring commercial enrollees. These plans provide coverage for physician, hospital, and prescription drug services to over 4 million commercially insured members.

Dataset. Beginning with claims in 1990, the research database used for this study contains detailed information on about 8,000,000 current and past members in 21 network plans. The database contains demographic information on all health plan enrollees including: date of birth, sex, zip code, place of employment, and benefit package, as well as diagnosis and utilization (claims) information. The data used for this analysis were: enrollment

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information, physician claims, facility claims, and pharmacy claims linked together by a unique identifier. Medical claims or encounter data are collected from all health care sites (inpatient hospital, outpatient hospital, emergency room, physician's office, surgery center, etc.) for all types of services provided to enrollees. For each claim, up to 9 diagnoses and up to 6 procedures are coded with the International Classification of Diseases, 9th Revision (ICD-9-CM)¹⁰. A history of outpatient pharmacy claims is also available in the database for each member. The pharmacy claims contain drug name, dosage form, drug strength, fill date, days of supply, financial information, and patient and prescriber identification. Claims for pharmacy services are coded with the National Drug Codes, and are recorded as brand name, generic name, or therapeutic class.

Study population. To be included in the analysis, members had to be commercially insured (no Medicare or Medicaid patients were included) and have a medical claim with a gout diagnosis (ICD-9 code 274.xx). If a member had a pharmacy claim for a gout or serum urate-lowering medication (allopurinol, probenecid, colchicine, or sulfapyrazone) during a calendar year, they were also assumed to have gout and/or clinically significant hyperuricemia during that year. Because allopurinol is often used in the treatment of cancer, subjects with allopurinol use only (no other gout/serum urate-lowering medication use) and a diagnosis of lymphoma (ICD-9 codes 200.xx–203.xx), leukemia (204.xx–208.xx), or malignant neoplasm (140.xx–199.xx) with no diagnosis code for gout were excluded from this analysis. The 10-year study included all patients who met the above criteria and were enrolled in one of 21 network plans between the years of 1990 and 1999.

Data analysis. Observational and descriptive in design, this study was intended to ascertain cross-sectional prevalence rates over time in this population. Period prevalence rates were calculated for each individual year under study (1990 through 1999) and were estimated based on the number of enrollees with gout and/or clinically significant hyperuricemia over the total number of health plan enrollees in each calendar year:

$$\text{Period prevalence} = \frac{\text{All persons meeting criteria in a given year}}{\text{All persons enrolled in health plan for a given year}}$$

Prevalence rates were calculated overall, and were also stratified by sex, as well as the following age groups: 0–17, 18–44, 45–64, 65–74, and 75+.

The denominator steadily increased from 0.5 to 4.3 million enrollees over the 10-year period, depending on how many enrollees were in the system in a given year. Due to the nature of the managed care population, the incremental patients in the acquired plans (which increased the denominator) were similar to those patients already in the system, as they were obtained from the same overall managed care patient “pool.” In order to standardize prevalence rates amid the increasing denominator, rates are expressed in rates per 1000 persons. This standardization aids in the comparison of prevalence rates and trends over time.

RESULTS

Study population overall. Over the 10-year period (1990–99), annual prevalence rates of gout and/or clinically significant hyperuricemia (according to the 21 network plans included in the analysis) were calculated. The overall prevalence (all ages, both sexes) increased across the 10-year period from 2.9 per 1000 in 1990 to 5.2 per 1000 in 1999, as shown in Figure 1.

Age-specific prevalence rates. Table 1 and Figure 2 present the overall annual prevalence per 1000 enrollees, by age group. The overall prevalence estimates for all of the age groups under age 65 remained relatively stable over the 10-year period. In persons younger than 18 years, gout and/or

clinically significant hyperuricemia remained consistently rare at approximately 0.1 per 1000 persons over the 10-year period. In the 18–44 year age group, it was still relatively uncommon, affecting less than 3 per 1000 persons, even at its highest prevalence. The 45–64 age group shows higher prevalence compared with the 18–44 age group, affecting between 12 and 14 per 1000 persons over the 10-year period.

Persons in the 65–74 and over 75 year age groups continually had the highest overall prevalence rates in the study. It is also the case that in these 2 groups the prevalence of gout and/or clinically significant hyperuricemia increased over the 10-year period. Figure 2 shows that all trend lines for the age groups under age 65 stay relatively stable over time, but the 65–74 group and the over 75 age group both show increases over the 10-year period. These 2 oldest age groups both had prevalence estimates under 25 per 1000 in 1990, but they quickly diverged thereafter, as the burden of disease increased greatly in the over 75 age group and modestly in the 65–74 age group. In the 65–74 age group the prevalence rose steadily over time, increasing by a factor of nearly 10 per 1000 persons over the 10-year period. Specifically, estimates increased from between 21 and 24 per 1000 persons in the years 1990–92 to more than 31 per 1000 during the years 1997–99. The over 75 age group prevalence rates were the highest in the study, and they also increased markedly, resulting in approximately a doubling of rates over the 10-year period. The estimates for this group increased from about 21 per 1000 persons in 1990 to 41 per 1000 during 1999.

Sex-specific prevalence rates. Gout and/or clinically significant hyperuricemia prevalence in both men and women stayed relatively stable over the 10-year period for persons under age 45 (Figures 3 and 4). Prevalence between sexes is similar in the under 18 age group. During the childhood and teenage years, the prevalence was less than 1 per 1000 persons in both males and females. However, in every other subsequent age category, sex differences in prevalence rates did exist. Among men in the 18–44 age group, there were slight increases in rates from 3 to nearly 5 cases per 1000 persons during the 10-year period. Women 18–44 stayed stable over the time period, with only one-quarter of the prevalence seen in men, at an average rate of 1 per 1000 persons. In the 45–64 age group, prevalence rates stayed stable over time and retained the 4:1 male to female ratio of cases that was seen in the 18–44 age group.

Prevalence of gout and/or clinically significant hyperuricemia increased in both men and women over the 10-year period in persons over age 65. In the 65–74 age group, prevalence increased over the 10-year period in both sexes. Men increased from 36 cases per 1000 in 1990 to 45 cases per 1000 in 1999. Interestingly, prevalence among women increased at a rate comparable to that of men in this age group. Women increased markedly in prevalence during the

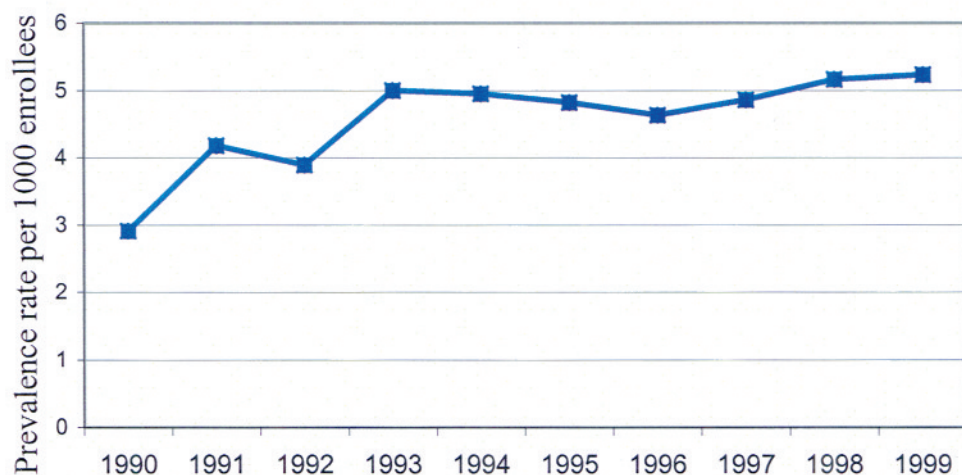


Figure 1. Overall gout prevalence among all enrollees, 1990-99.

Table 1. Annual gout prevalence — rate per 1000 enrollees (1990-99).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Age Group										
0-17	0.07	0.13	0.09	0.11	0.09	0.11	0.10	0.12	0.11	0.12
18-44	0.72	2.93	2.36	2.95	2.81	2.65	2.63	2.65	2.78	2.85
45-64	11.96	14.99	12.29	15.35	14.97	14.41	13.34	13.74	14.43	14.20
65-74	23.71	22.19	21.11	28.11	30.29	28.92	31.10	31.65	31.41	31.36
75+	20.55	26.84	31.18	41.04	43.36	41.54	39.65	43.17	42.33	41.28
Overall	2.91	4.18	3.89	5.00	4.95	4.82	4.63	4.86	5.16	5.23

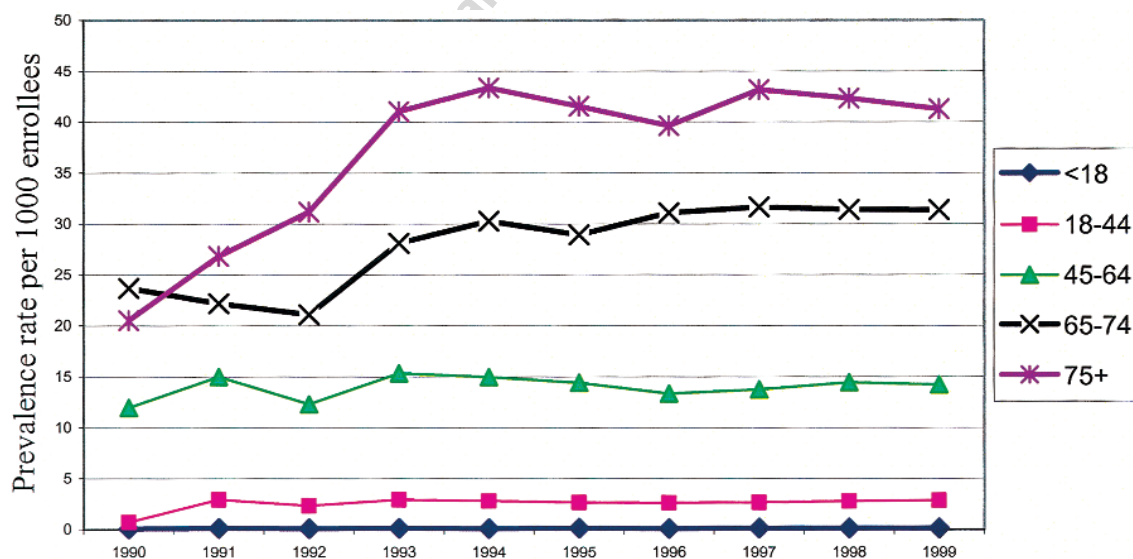


Figure 2. Annual gout prevalence among all enrollees by age group, 1990-99.

period under study from a rate of 9.5 cases per 1000 in 1990 to 15 cases per 1000 in 1999. Additionally, the ratio of male to female cases in the 65-74 age groups was no longer 4:1, as in the age groups between 18 and 64, but was roughly 3:1 during most time points. Men in the over 75 age group more than doubled in prevalence over the 10-year period, from a

1990 rate of 25 cases to 64 cases per 1000 in 1999. Women in the over 75 age group also increased in prevalence during the 10-year period, from a rate of 16 per 1000 in 1990 to 21 per 1000 in 1999, retaining the 3:1 ratio between the sexes.

Although the overall prevalence of gout and/or clinically significant hyperuricemia among women has indeed

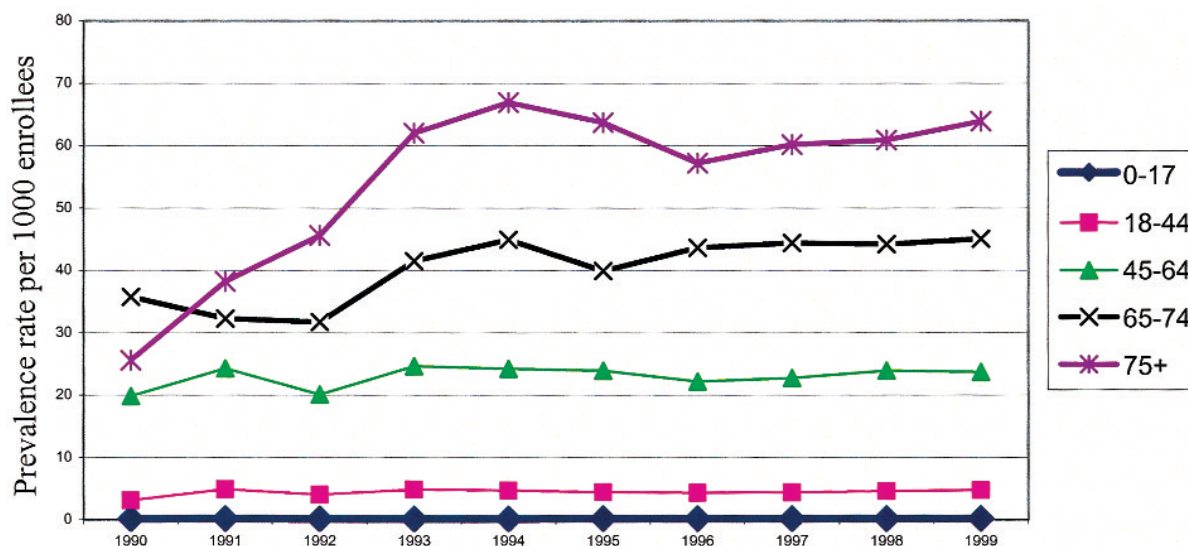


Figure 3. Annual gout prevalence among male enrollees by age group, 1990-99.

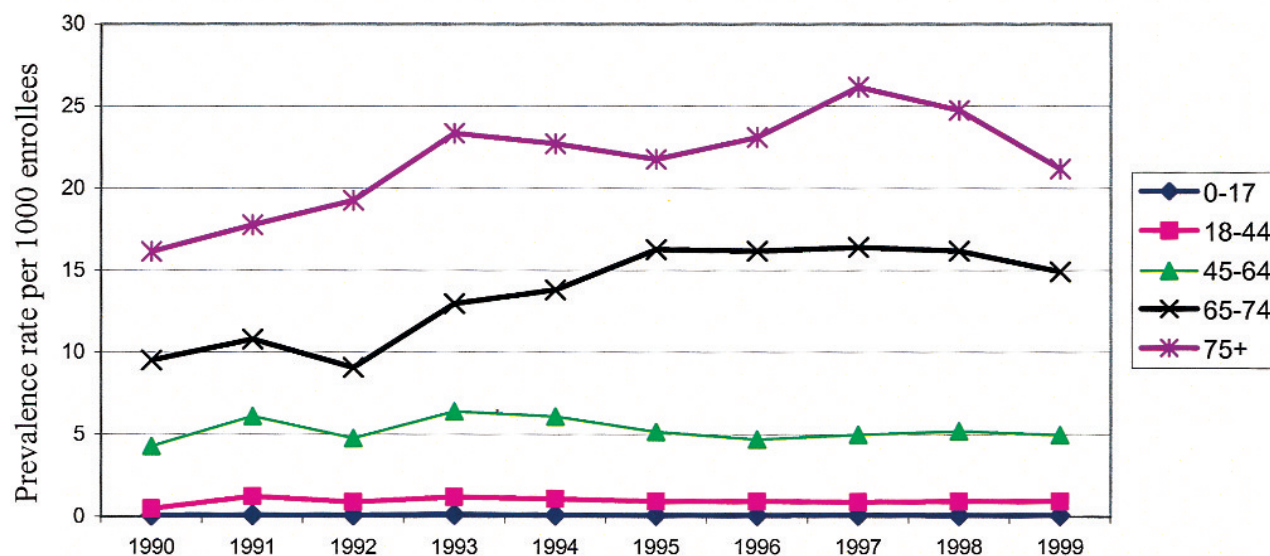


Figure 4. Annual gout prevalence among female enrollees by age group, 1990-99.

increased since 1990, as presented in Figure 4, prevalence rates among women over age 65 seem to have decreased in the years since 1997. Men, on the other hand, according to Figure 3, have continued to increase in prevalence. Figure 5 shows all persons in both of the highest prevalence age categories (65-74 and > 75), by sex. It is quite evident that even though prevalence has increased in both sexes over a 10-year period, men still make up 3 times the burden of disease over that of women in this population (the 3:1 ratio as described above).

DISCUSSION

This was a descriptive administrative claims analysis that examined cross-sectional prevalence rates of gout and/or clinically significant hyperuricemia over a 10-year period in a managed care population. Gout is one of the most common forms of inflammatory musculoskeletal disease, affecting an estimated 5.1 million people in the United States alone, according to the probability-based NHANES III survey².

Over the last hundred years in the United States there has been a shift in the burden of disease from infectious to

chronic conditions. Reduction in childhood infections during the 20th century led to a marked decrease in mortality¹¹. Additionally, declining death rates among middle-aged individuals over the past 30 years correspond with falling levels of heart disease. As a result of these medical advances, a larger proportion of the population is living longer, and is thus affected by chronic conditions that primarily occur at older ages^{11,12}. Additionally, obesity has substantially increased over time between the years 1960 and 2000, according to data derived from the NHANES surveys^{5,6}, and as a result of these findings, the US Surgeon General deemed obesity to be an “epidemic”⁷. Since major risk factors for the development of gout and hyperuricemia include obesity^{3,4} and older age, the study demonstrated that the prevalence of gout and/or clinically significant hyperuricemia has been increasing over time in this population, in tandem with the national increases in these 2 important risk factors.

The results suggest that the prevalence in this population has indeed increased in both sexes over age 65. Although the overall prevalence of gout among women has been increasing since 1990, rates among women over age 65 seem to have decreased since 1997. Men, however, continue to show an upward trend. It is quite evident that even though gout prevalence has increased in both sexes over a 10-year period, men still represent most of the total burden of disease. In ages younger than 65, men had 4 times more prevalence than women (4:1 ratio), but in the older age groups (> 65), the gender gap narrows to 3 men to every woman with gout (3:1 ratio). That gout prevalence has increased among women is vital information for medical professionals, as gout typically has not been a common disease among women. Our results suggest that, among age groups under 65 years, gout prevalence was not increasing, but this group had very low prevalence rates throughout the study.

National probability surveys as well as population-based epidemiological studies have also determined that the overall US prevalence of gout has increased over time^{9,13}. Some published prevalence estimates, however, utilize self-reported information to ascertain estimates, which are usually higher than estimates based on physician diagnoses^{3,13}. Using self-reported data from the probability-based National Health Interview Survey (NHIS) in 1992, the estimated overall US prevalence of gout is approximately 8.4 per 1000 persons of all ages and both sexes. The estimated gout prevalence rates from the NHIS increased to 9.4 per 1000 in 1996¹³. Although these figures may overestimate the population burden from gout by as much as 100%¹³, the estimates themselves may be compared because the method of ascertaining gout on the survey did not change.

In a population-based study in Rochester, Minnesota, gout incidence was found to have increased significantly from 1977–78 to 1995–96. During the 1977–78 time period,

the incidence in this population was 45 per 100,000 persons (95% CI 30.7–59.3). An increase over time was demonstrated between the 2 time periods, as the incidence rate during the 1995–96 time period was found to be 62.3 per 100,000⁹.

Additionally, there is information in the literature to suggest that the increasing prevalence trend is apparent in African and Asian countries as well¹⁴. This increase in gout prevalence is reported to also be coinciding with rising rates of obesity in those areas of the world¹⁴.

Our study had some potential limitations. Given that this is a working (managed care) population, the number of enrollees making up the denominator for the subjects over age 65 is lower than among other age groups. This means that prevalence estimates have a wider variance than among other age groups in the study.

This study was conducted using commercially insured managed care enrollees, and therefore the results are applicable only to similar managed care settings in the United States. The health plans used in this study are fee-for-service, independent practice association plans and have no gate-keeper model or capitation system. The plans include primarily employed individuals and their dependents as well as commercially insured Medicare-eligible individuals.

The diagnosis of gout was made with an algorithm based on administrative claims data (diagnoses and medications). This process does not ensure that all gout patients in the database were recorded in the analysis, or that every patient who was deemed to be a “gout patient” actually suffered from gout (a portion of patients identified by pharmacy claims alone may have had asymptomatic hyperuricemia). All possible efforts were made to minimize the error involved with the use of the algorithm. Laboratory values are not generally available in administrative claims data, so biomarkers for gout (such as serum urate) were not part of the diagnostic algorithm for this study.

Additionally, no undiagnosed gout patients (no ICD-9 code and not taking a gout medication) were included. These algorithm-building techniques are common in administrative claims research. Additionally, administrative claims data do not include many variables that would be useful in a multivariate regression for gout, such as laboratories, diet, alcohol/tobacco use, weight, or blood pressure.

While there is always a possibility that there was a detection bias operating over the 10 years under study (perhaps physicians finding and diagnosing more gout cases over time instead of more actual gout cases), the fact remains that the prevalence of gout in this population, based on the algorithm utilized for the case definition, has increased.

Importantly, the target population of managed care patients was increased from 0.5 to 4.3 million enrollees during the course of the 10-year period. This caused the denominator for the current study to shift during the period of time under study.

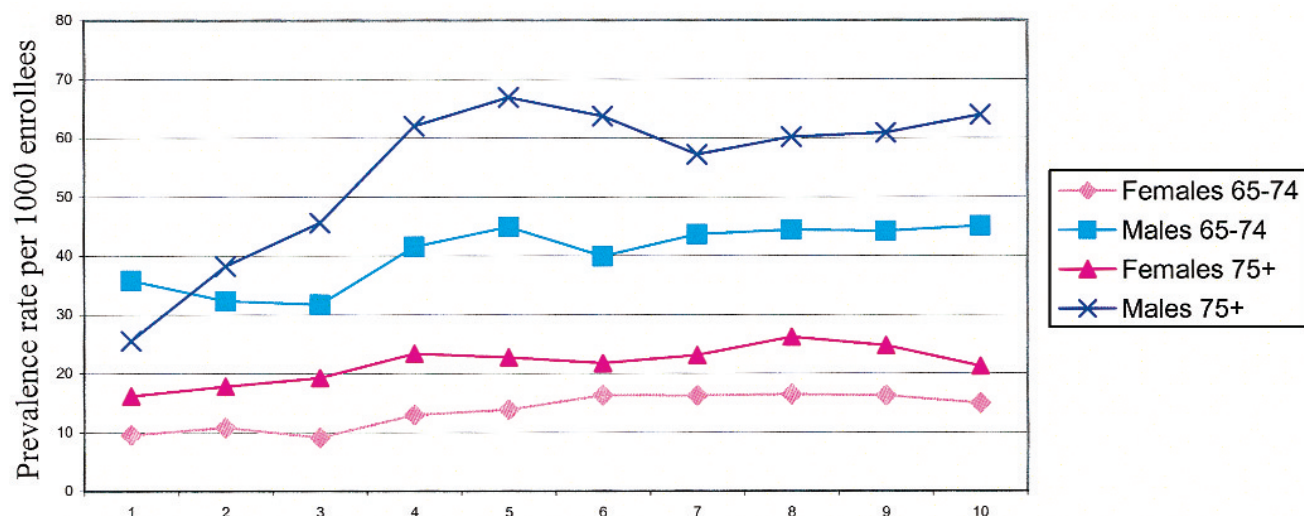


Figure 5. Annual gout prevalence among the oldest age groups (both sexes), 1990–99.

Prior to this analysis, no descriptive epidemiology has been published describing gout within a managed care population. That an increase in gout and/or hyperuricemia prevalence was observed in this population indicates the prevalence has likely increased in high-risk and older populations as well. Given the limitations of the data, this study can only be considered to be hypothesis-generating. Future studies will need to measure prevalence trends of gout in multiple populations before empirical evidence of an increasing trend is established.

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