The Quiet Crisis: Minority-Majority Disparities for Diabetes in Upstate New York Cities

A report of the EXPORT Center for the Elimination of Minority Health Disparities at the University at Albany, SUNY

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Executive Summary:

Data on annual hospitalizations for diabetes-related conditions in the 1998-2002 period demonstrate the extent of health disparity in upstate New York cities. We use the data to estimate several Prevention Quality Indicators (PQI) as developed by the Agency for Healthcare Research and Quality. The indicators are especially pertinent to the failures of the primary-care system to prevent diabetes from progressing to the point of hospitalization.

Our report follows up on *The New York Times* series about the diabetes "epidemic" in minority communities downstate. We show that, for several diabetes-related indicators, the degree of black-white disparity in major upstate cities rivals that in New York City. For Hispanics, who upstate are far more likely to be recent immigrants than is the case downstate, the picture is more mixed, since the PQI rates are lower and, in general, the disparity with whites is less than is true for blacks. The discrepancy between the upstate patterns for blacks and Hispanics, a sharp contrast to what is observed downstate, requires caution in interpretation, for it could be explained in different, contradictory ways and there are potentially confounding factors. For instance, it could be partly a function of underreporting of Hispanic ethnicity by hospital authorities, who in some communities are not yet sensitive to the growing immigrant population in their midst.

Overall, this report reveals that diabetes is as much a problem in the smaller cities of the state as it is in the largest cities.

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Diabetes is reaching crisis levels in many parts of the American population. These disturbing developments are in large part a function of rising rates of obesity that are now observable among all age groups, including the young. Obesity is not confined to the more affluent strata of US society but, if anything, is more common among the poor, who in previous eras could usually not afford the high-calorie diets, laden with sugars and fats, that induce obesity. Now they can, to their misfortune as far as this disease is concerned.

Diabetes seems to afflict minority communities even more than it does that of the white majority. In a series of articles on the diabetes epidemic in New York City, *The New York Times* earlier this year portrayed the raging spread of the disease and its complications as a crisis for the city's black and Hispanic populations. This report follows up on that earlier investigation by examining how the diabetes disparities in upstate New York cities compare to those found downstate.

Our investigation of diabetes-related disparities takes advantage of the data on hospitalization incidents collected by New York State and assembled each year into a comprehensive file called the SPARCS data (the acronym is for the Statewide Planning and Research Cooperative System). The reports in this file provide information on the place of residence (zip code) and race/ethnicity of the patient, as well as on the reason for the hospitalization (diagnostic code). Using these data to estimate diabetes-related hospitalization rates for upstate cities entails some methodological complications, which we describe in the appendix. Because of the very small minority populations in a few cities or their unusual nature (e.g., primarily college students or mainly prisoners), a few cities such as Auburn and Ithaca could not be included in the report. In addition, most of the race/ethnicity data was missing for Newburgh, and this city also had to be dropped from the analysis as a consequence. The results we report are based on five years worth of data (1998-2002), but the rates are calculated as annual averages.

To make substantive sense of the detailed diagnoses in the data, we group them into clusters defined by the Prevention Quality Indicators (PQI), as developed by the Agency for Health Care Research and Quality. There are four relevant PQI: short-term diabetes complications (PQI #1), such as coma and ketoacidosis; long-term diabetes complications (PQI #3), which involve kidney, visual and neurological complications due to poorly controlled diabetes; uncontrolled diabetes (PQI #14); and lower-extremity amputations due to diabetes (PQI #16). It must be emphasized here that the PQI rates are not direct measures of the prevalence of diabetes. Since diabetes is not reported to the state health department and since many individuals with diabetes are unaware of their condition, there is in fact no simple way to measure diabetes prevalence. Rather, the PQI reflect the underlying diabetes prevalence in combination with the adequacy of primary care: where individuals do not have ready access to primary care, they are more likely to show up in hospitals with complications from the disease, such as coma and renal failure. To assist in the interpretation of the hospitalization rates, we have standardized them for

age, so that the differences we then observe between population group no longer reflect their different age distributions.

The standardized annual rates of hospitalizations for short-term diabetes complications, such as coma, shown in Figures 1 and 2, demonstrate some basic patterns of disparity that appear for most of the diabetes-related Prevention Quality Indicators. For blacks, the rates of hospitalization and the degrees of disparity in relation to whites are on a par in major upstate cities to what is found in New York City, where *The New York Times* earlier this year (January 9, 2006) declared a crisis to exist.   For Hispanics, there is considerably more variation; in some upstate cities, the rates of hospitalization, even standardized for age, are below those for whites. On average, some degree of disparity for Hispanics in relation to whites exists but it is more muted than is true for blacks

The rates of black hospitalization for short-term complications (PQI #1) in the upstate cities with substantial black populations (say, at least 3,000 adults), are typically higher than that in New York City. For instance, in Buffalo, the age-standardized annual rate for blacks is 193.9 per 100,000, almost 50 percent higher than the equivalent rate for New York City, 132.3 per 100,000. But in cities with small black populations (these start at Binghamton in Figure1), the rates fall off.   In general, whites in larger upstate cities also have higher rates of hospitalization than do whites in New York City. But everywhere the black rates exceed the white rates by substantial margins. On the whole, the black-white disparities in upstate cities are not as extreme as that in New York City, where the ratio of black-to-white rates is about 4.5, but in a few cities, Syracuse and Schenectady, they attain this height, and everywhere the ratio is no smaller than 2.

In general, the hospitalization rates for Hispanics upstate are much closer to the rates for whites than is the case for blacks. On average, Hispanics are more likely to be hospitalized than are whites, but this is not true everywhere—in Albany, Schenectady, and Binghamton, the Hispanic rates are lower than those for whites. In these cities, as well as in Poughkeepsie, the Hispanic rates are also lower than is the case in New York City.   However, in several other upstate cities—Syracuse, Middletown, Utica, and Troy—the Hispanic rates are considerably higher than in the Big Apple. This variability leads to a great deal of fluctuation in the ratio that expresses Hispanic-white disparity, but generally speaking, that ratio is lower upstate than in New York City. Moreover, in New York City, the ratio is lower for Hispanics than for blacks. Hence, the disparity picture is considerably more favorable for Hispanics than for blacks.

Hospitalizations for long-term diabetes complications, such as renal failure, show a racial/ethnic profile that bears some similarities to that outlined in the preceding discussion, but there are also some differences (PQI #3; see Figures 3 and 4).   Most strikingly, there is a pronounced contrast between the disparities for blacks and those for Hispanics. For blacks, the overall standardized rate of hospitalization in the larger upstate cities fluctuates around the rate observed in New York City and falls off in some of the smaller cities. However, Middletown, a city with a small black population shows the highest standardized rate.   In all cities, the black rates are considerably above the white rates—nowhere is the ratio between them below about 2.   The disparity ratio is

nevertheless higher in New York City than it is in most upstate cities, but a few cities upstate show exceptionally high disparities between blacks and whites—this is true for Albany and Middletown, with Rochester and Syracuse having ratios roughly equal to that in New York City.

For Hispanics upstate, it is rather common for their standardized rate to be lower than that for whites, although in most cities the white rate is the lower one. Only in Troy, however, is the Hispanic rate of hospitalization higher than it is in New York City. In general, then, the upstate Hispanic-white disparity in hospitalizations for long-term diabetes complications is modest compared to the disparity that exists between blacks and whites. In only a few upstate cities does the Hispanic-white ratio come close to the value (about 2) observed in New York City. In Rochester and Troy, it is higher than the New York City value. Otherwise, the highest upstate values are found in Buffalo and Amsterdam, where the ratio is about 1.5.

Hospitalizations for the diagnosis of uncontrolled diabetes (PQI #14) show very sharp variations across cities for all groups, testifying either to discrepancies in diagnosis or in practice (see Figures 5 and 6). Nevertheless, the disparity between blacks and whites is very marked and reasonably stable across the larger cities. The rates themselves shift around unpredictably—for instance, the black rate in Rochester is less than a quarter of that in New York City, while the rate in Niagara Falls is almost double the downstate value. However, the ratio of black-to-white rates is almost the same in Rochester and in New York City: in both places, it is close to 5; the black hospitalization rate is close to five times as high as the white rate, in other words. In Niagara Falls, this ratio is about 6, and it reaches its zenith in Troy, where it is about 8.

The picture of Hispanic-white disparity is not as extreme. In a few cities, Albany, Schenectady and Troy, Hispanics are less likely to be hospitalized for uncontrolled diabetes than whites are. In most cities upstate, however, as in New York City, they are more likely, but the degree of disparity, like the standardized rate itself, is quite variable. In only two cities upstate, Utica and Amsterdam, does the ratio of Hispanic-to-white hospitalization rates exceed that in New York City (about 4). Only in Utica, however, does the standardized value of the hospitalization rate for Hispanics surpass that found in New York City.

The final indicator is based on lower-extremity amputations due to diabetes (PQI #16; see Figures 7 and 8). The discrepancy between the patterns of blacks and Hispanics upstate is again notable. For blacks, the standardized rate of hospitalization for amputation is generally higher upstate than it is in New York City; three cities—Niagara Falls, Poughkeepsie, and Kingston—show lower rates. The disparity between whites and blacks, as measured by the ratio between their rates, is frequently as high as, or higher than, it is in New York City, where the ratio is about 2.5. It reaches its highest value, about 4, in Albany.

For Hispanics, by contrast, hospitalization for diabetes-related amputations is about as common upstate as it is for whites. In four upstate cities—Rochester, Syracuse, Troy and

Binghamton--the standardized rate for Hispanics exceeds that for whites. In three of these cities--Binghamton is the exception--the Hispanic-white disparity is on a par with that found in New York City, where the ratio of rates is about 2. Elsewhere upstate, the Hispanic-white ratio is well below this value.

In conclusion, we find that, for the various diabetes-related indicators, the degree of black-white disparity in major upstate cities rivals that in New York City, where *The New York Times* portrays diabetes to be at epidemic levels in minority communities. For Hispanics, however, who upstate are far more likely to be recent immigrants than is the case downstate, the rates of diabetes-connected hospitalization are lower and, in general, the disparity with whites is less than is true for blacks.

The discrepancy between the upstate patterns for blacks and Hispanics, a sharp contrast to what is observed downstate, requires caution in its interpretation for it could be explained in different, contradictory ways and there are potentially confounding factors. We believe that a key to the upstate-downstate differences for Hispanics is the greater presence of very recent immigrants upstate. This suggests the following possible explanations and/or confounding factors:

      1. The so-called "epidemiological paradox" for new immigrants, which refers to their apparently robust health by comparison with US natives and also by comparison with immigrants of long residence in the US. It seems likely that the epidemiological paradox is largely a function of the selectivity of the migration process—in other words, because of the rigors of the migration process, individuals choose to immigrate during very healthy periods of their lives, and those who suffer from serious chronic diseases are unlikely to migrate in the first place. Studies have shown that over time the health of immigrants appears to decline, though there is controversy over how this finding should be interpreted.

      2. The possibility that immigrants who become ill return to their home countries in order to recover. Anecdotal reports suggest that this is true to some extent, at least, and this would obviously reduce the appearance of Latin American immigrants at US hospitals for treatment of chronic conditions such as diabetes.

      3. The reluctance of unauthorized immigrants to call attention to themselves and their medical problems. The recency of arrival of many Hispanic immigrants in upstate cities implies a relatively high presence of undocumented immigrants.

      4. A very different explanation would see the much lower disparity for Hispanics as a consequence of ethnic "underreporting." This may be especially likely in upstate cities because of the recency of Hispanic immigration and the small size of the Hispanic populations in many places; health providers have not yet been sensitized to the Hispanic presence and may report the immigrants and their children as "white" or "black" rather than as Hispanic. It is impossible to tell from inspection of the data how much misclassification may have occurred.

All of these possible explanations, with the partial exception of the first, suggest that the rates of hospitalization in this report underestimate the prevalence of diabetes and the problems of primary care in upstate Hispanic communities.

For the minority populations upstate, but for blacks especially, the disparities revealed in this report demonstrate that the epidemic of diabetes is not confined to the largest cities and metropolitan regions, where the extreme problems of residential segregation and poverty might be thought to contribute to a higher incidence of this disease. In general, diabetes is as much a problem in the smaller cities of the state as it is in the largest cities.

Methodological appendix

The rates we present in this report are standardized estimates of annual hospitalizations for specific diabetes-related diagnoses and are based on numerators that come from the SPARCS data set and denominators that come from Census 2000 data. Only adults, individuals 18 or older, are counted in our estimates.

Hospitalization data are only meaningful where civilian, non-institutionalized populations are involved. In a few upstate cities, the presence of a minority population arises because of the siting of a state prison—Auburn is an example—and these cities are not included in our analysis. We have also omitted Ithaca because of the large number of college students in its minority (and, for that matter, majority) populations. Further, where number of group members is small, estimates may be swamped by random error. For this reason, we eliminate from consideration in the analysis of a minority population any city where the number of adults in that group is less than 1,000.

The estimation of hospitalization rates for upstate cities, those cities located north of primarily suburban counties surrounding New York City, was not as straightforward as it was for the state's largest city. Two problems had to be solved in the estimation process: first, the race/ethnic data are missing for a significant proportion of cases and had to be imputed; second, the basic locational information in the SPARCS data set is the zip code of residence of the patient, and hence zip codes had to be translated into city locations, a process that requires interpolation in some cases. In this appendix, we describe the procedures we used to solve these two problems.

For the imputation of missing race/ethnicity codes, we used a standard procedure called the "mean imputation method." To state it simply, we assigned race/ethnic codes to the cases missing them in proportion to the distribution of these codes among other cases in the same zip code. Using the known race/ethnic distribution for a diagnosis within a zip code, in effect, takes the local health demography as the best guide for the imputation process. This is eminently logical. Because of the extreme amount of missing race/ethnic data for the city of Newburgh, we had to remove it from the analysis. Without Newburgh, the total amount of missing data is on the order of 11-16 percent for all hospitalization reports.

The problems with matching zip codes arise because upstate cities are generally small enough that some zip codes are not wholly contained within them but cross their boundaries into surrounding suburbs. Hence, such zip codes cannot tell us whether patients live inside or outside cities. In order to arrive at estimates for cities, we had to interpolate the cases in these zip codes. We did this using census data that showed the breakdown of the city and non-city portions of the zip codes; we built up such tabulations from block-level data in Summary File 1 of the 2000 Census. These tabulations showed the age by gender distributions for various race groups and Hispanics. Hence, in deciding what portion of each case to assign to a city, we used our knowledge of the patient's age, gender and race to make the most informed interpolation.

Finally, we have standardized the rates we report here for differences in age between majority and minority groups. Age standardization removes one obvious source of difference between groups and brings the data closer to what they would be if disparities in disease prevalence and access to care were the sole factors responsible for group difference. To standardize for age, we used a straightforward, so-called direct standardization procedure, taking the upstate New York population as the reference population. A direct standardization procedure applies the group-specific rates by age and city to a standard population, thus creating the rates that would hold if every group had the same age distribution, that of the reference population.

Figure 1. Short-term complications (standardized PQI #1) for whites and blacks, 1998-2002
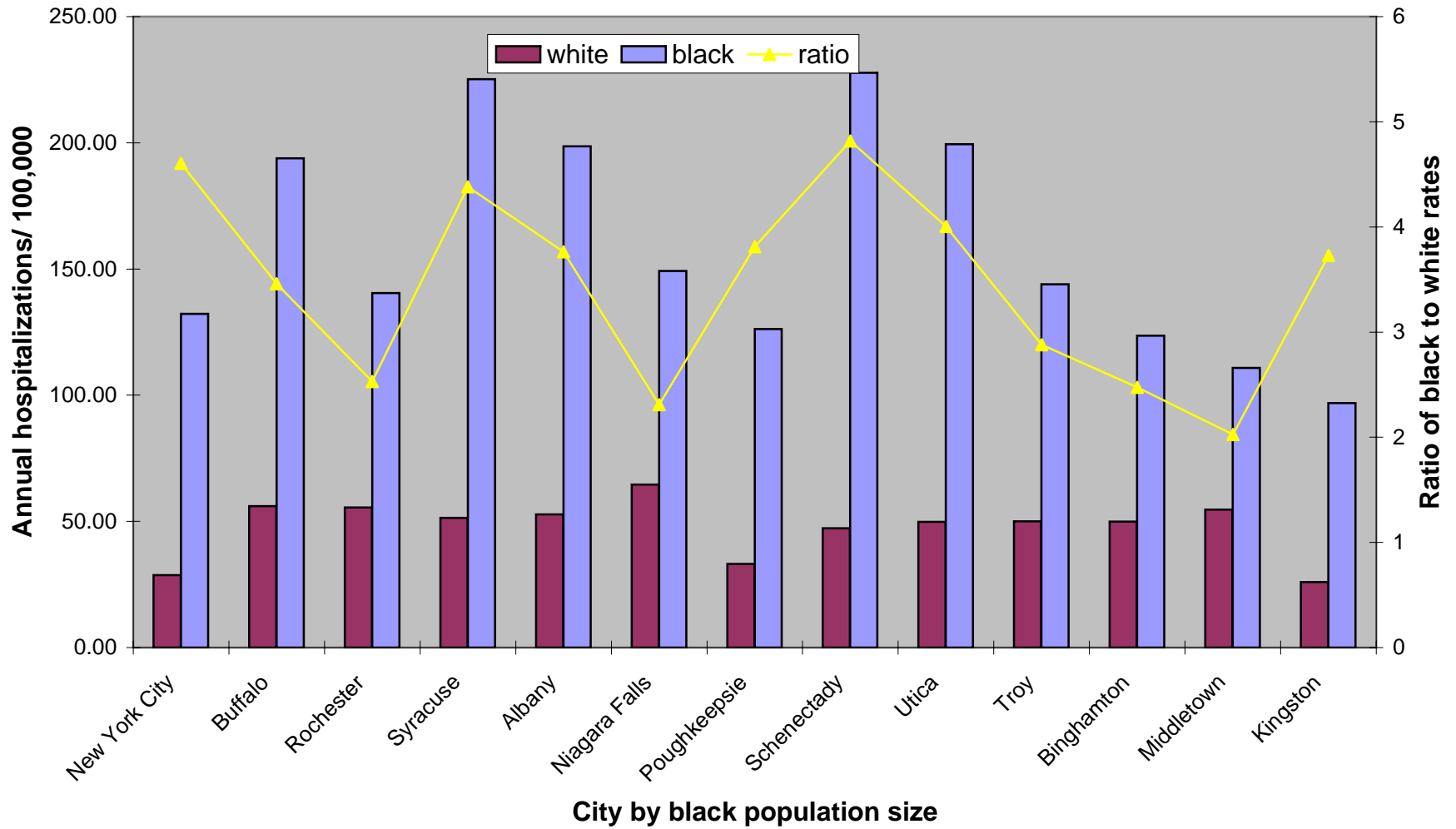
Figure 2. Short-term complications (standardized PQI #1) for whites and Hispanics, 1998-2002
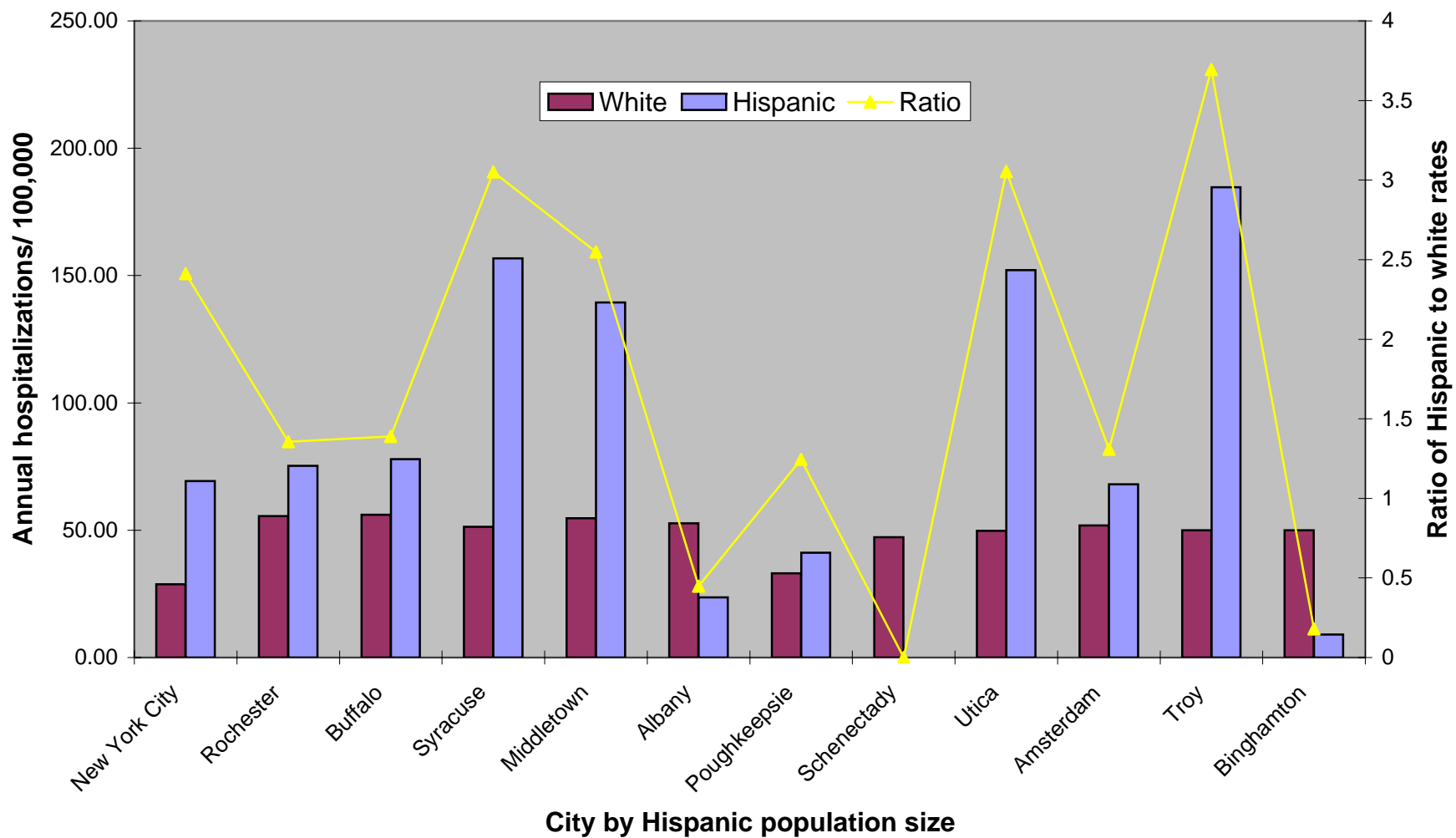
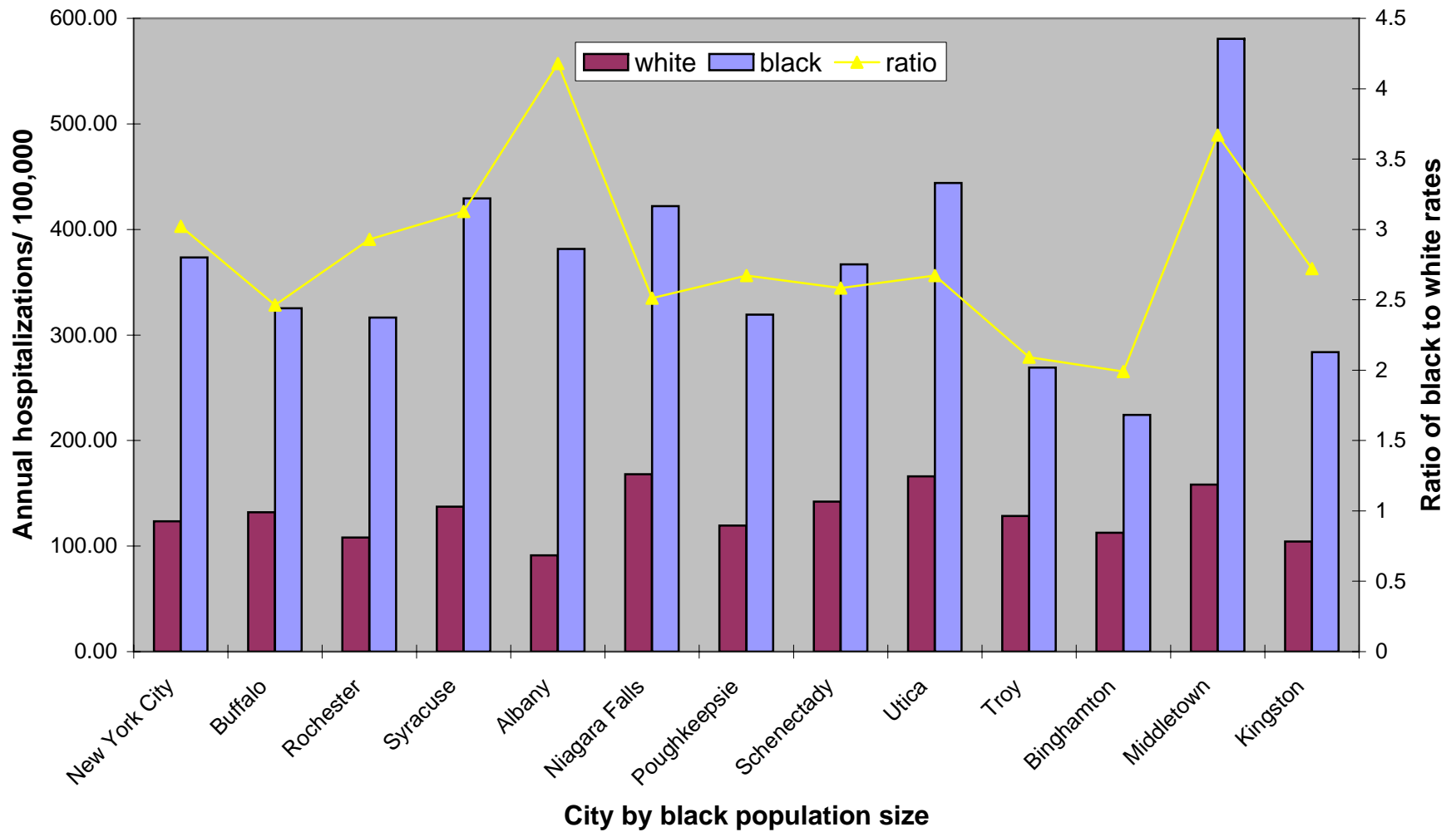**Figure 3. Long-term complications (standardized PQI #3) for whites and blacks, 1998-2002**

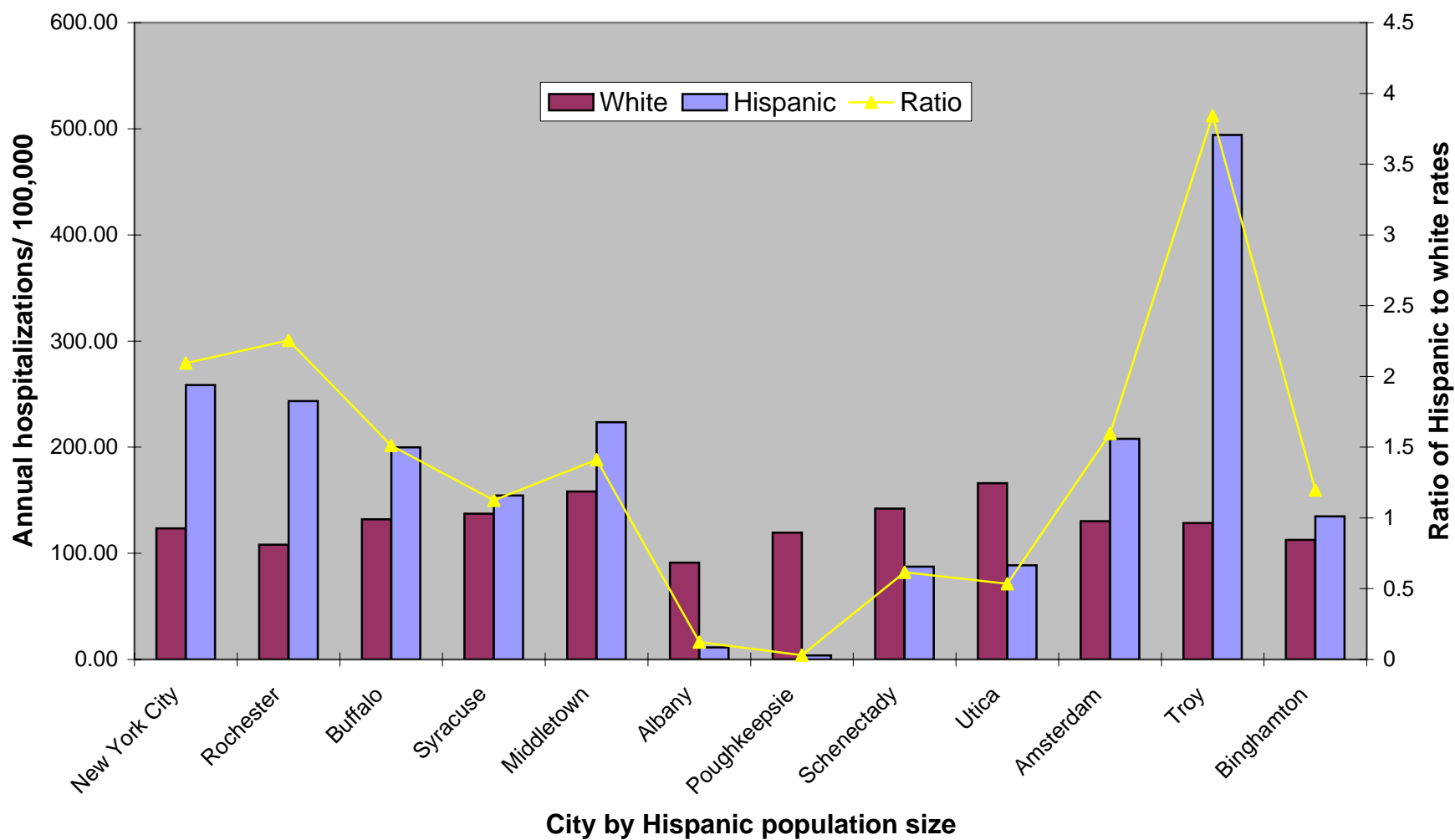**Figure 4. Long-term complications (standardized PQI #3) for whites and Hispanics, 1998-2002**

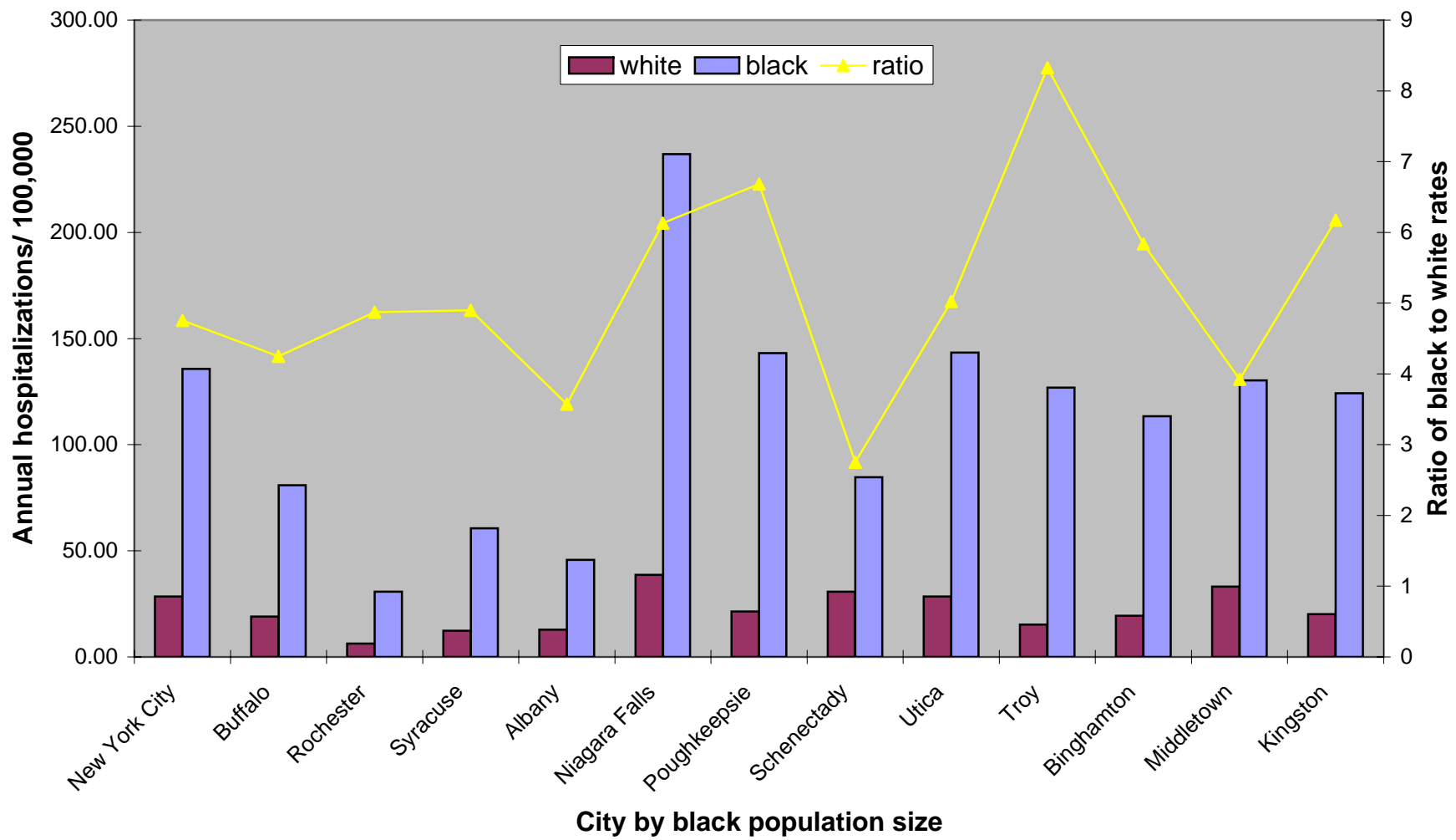Figure 5. Uncontrolled diabetes (standardized PQI #14) for whites and blacks, 1998-2002

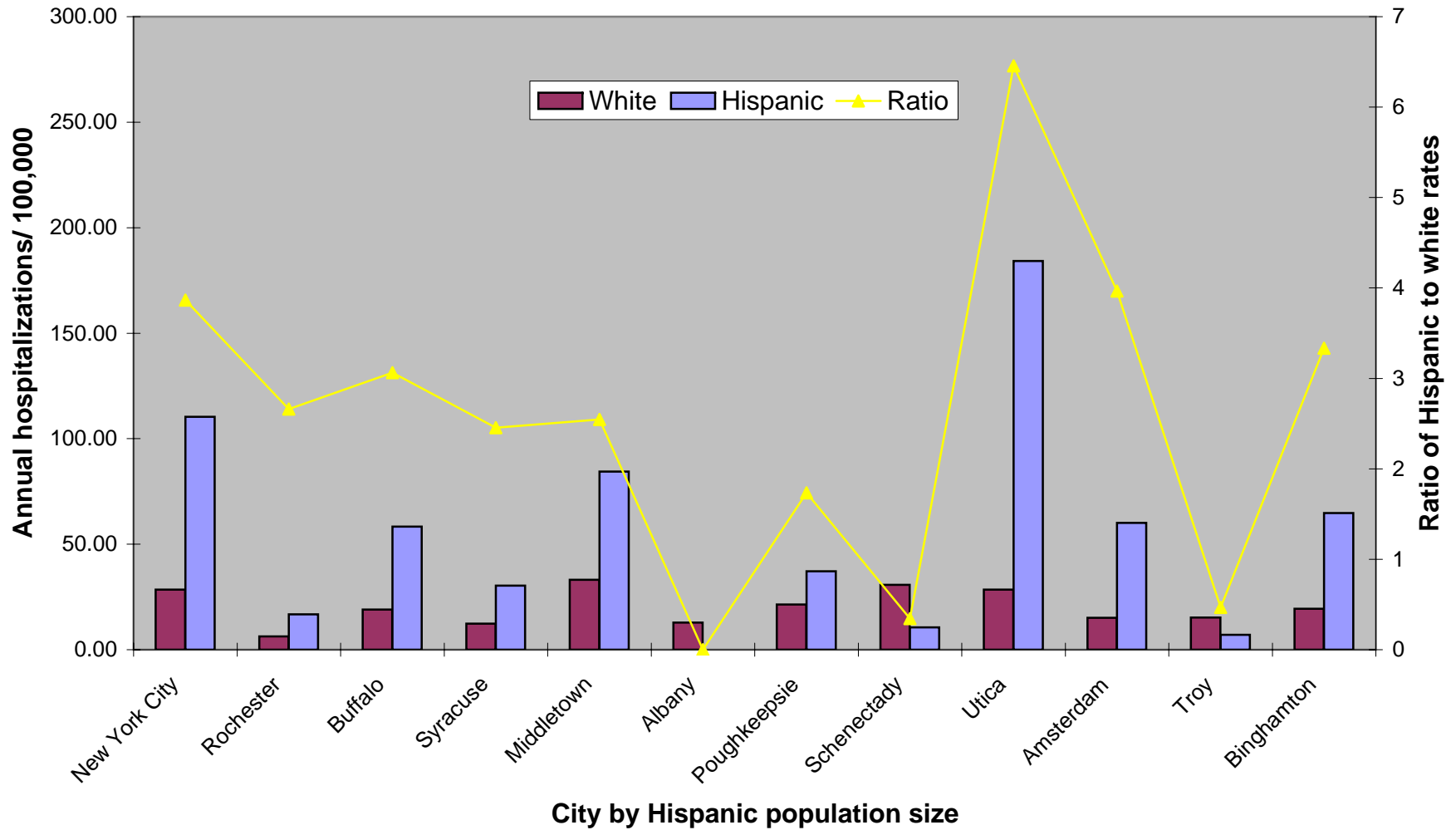**Figure 6. Uncontrolled diabetes (standardized PQI #14) for whites and Hispanics**

Figure 7. Lower-extremity amputations due to diabetes (standardized PQI #16) for whites and blacks, 1998-2002
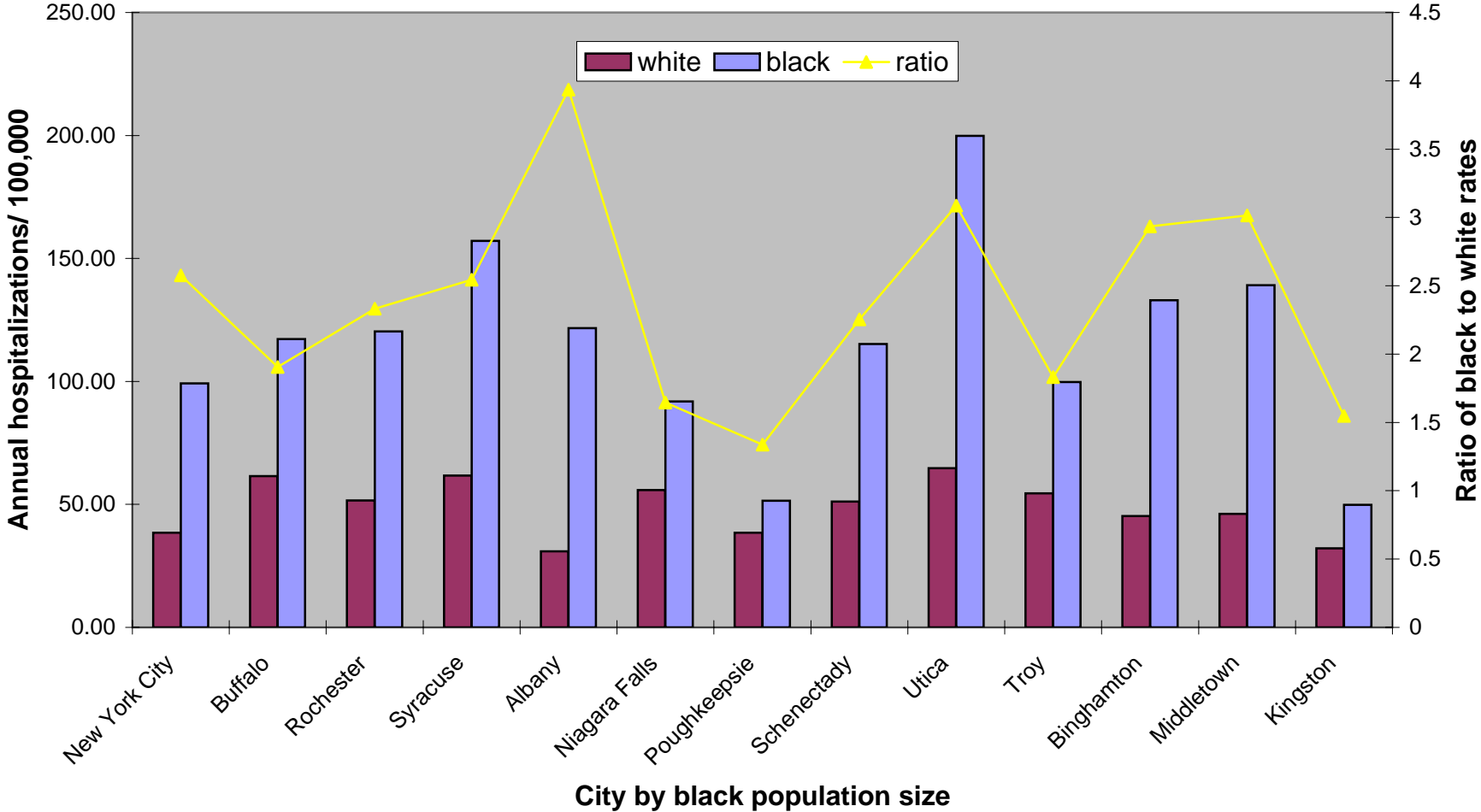
Figure 8. Lower-extremity amputations due to diabetes (standardized PQI #16) for whites and Hispanics