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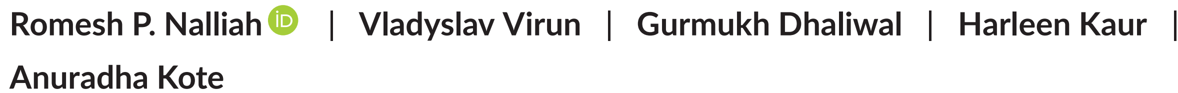
# Fifteen-year gap between oral health of blacks and whites in the USA



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## Abstract

**Aim:** The purpose of the present study was to consider racial differences across three survey questions related to adult oral health in the National Oral Health Surveillance System (NOHSS) between 1999 and 2014.

**Methods:** The NOHSS tracks population-level progress made toward improved oral health in the USA. NOHSS adult indicators of oral health data were extracted for 1999-2014, and trends were studied by race.

**Results:** Among adults ≥18 years in 1999, 70.7% of whites and 60.3% of blacks had visited a dentist in the past year. By 2014, 68.4% of whites and 56.5% of blacks had visited a dentist in the past year. Among adults aged ≥65 years in 1999, 24.5% of whites and 33.2% of blacks had lost all natural teeth due to dental caries or gingival/periodontal disease. By 2014, 14.3% of whites and 22.1% of blacks had lost all natural teeth.

**Conclusions:** There have been overall gains in key indicators of oral health in the USA; however, blacks remain far behind whites in the NOHSS adult oral health indicators.

KEYWORDS

blacks, National Oral Health Surveillance System, oral health, racial difference, whites

## 1 | INTRODUCTION

Can the color of your skin affect the health care you receive? Recent research has evaluated the verbal and non-verbal interaction of hospital physicians with black and white patients at the end of life and found far fewer positive non-verbal and rapport-building cues among blacks.[1] Similar research has shown that physicians were more verbally dominant in conversations with black patients than with white patients.[2] Extensive research has shown that pain experienced by blacks is undertreated compared to whites.[3-6] Unfortunately, this finding holds true when the patient is a child.[7] However, it is important to acknowledge that relational issues between doctor and patient are not the only factor affecting health outcomes of minorities in the USA. Research by the Center for American Progress has demonstrated that there is a wealth gap between blacks and whites.[8] Moreover, financial resources tend to be more volatile for blacks, and there is no trend toward closure of that racial gap.[9] This gap affects resources available to seek and gain health-care services.

Research among heart failure patients has shown that there is a racial difference in health literacy, even after adjusting for other variables, such as socioeconomic status (SES) and social support.[10] Clearly, there is a multitude of factors working together to create health disparities between blacks and whites in the USA.

The Center for Disease Control and Prevention (CDC) reports that blacks can expect lower life expectancy than whites in the USA and that gap is growing.[11] In fact, infant mortality rate among blacks in the USA is increasing, whereas the rate for whites is decreasing.[12] Finally, there is also evidence that blacks experience poorer oral

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health outcomes than whites;[13,14] however, little is known about long-term trends between racial groups in oral health. Public health programming frequently targets socioeconomic factors, such as access to insurance. The goal of such programs is to enable lower income groups to have similar access to care as higher income groups. However, research has demonstrated that only 71% of the gap between blacks and whites in preventive dental services received can be explained by SES;[14] resolving health disparities cannot occur without specifically addressing the issue of race.

The purpose of the current study was to evaluate trends in the three key indicators of adult oral health developed by the CDC and the Association of State and Territorial Dental Directors in the National Oral Health Surveillance System (NOHSS).

## 2 | MATERIALS AND METHODS

The NOHSS is a partnership between the Division of Oral Health (part of the CDC) and the Association of State and Territorial Dental Directors. The NOHSS is a survey tool that tracks the burden of oral disease and monitors population-level progress made toward improved oral health in the USA. The purpose of the current study is to consider racial differences across the three NOHSS indicators of adult oral health (listed below) between 1999 and 2014:[15]

a adults aged ≥18 years who have visited a dentist in the past year;
b adults aged ≥65 years who lost all natural teeth due to dental caries or gingival/periodontal disease;
c adults aged ≥65 years who lost six/more teeth due to dental caries or gingival/periodontal disease

Responses to the above queries from the NOHSS for the indicators of adult oral health are publicly available datasets. This dataset was imported into the JMP data analysis software, JMP, and stratified by race.[16] JMP functions as a data visualization software and enables trends analyses to be conducted. This project was approved by University of Michigan Medical School Committee on Research as “not regulated as human subjects research (HUM00148281)”.

## 3 | RESULTS

All data are presented in age-adjusted rates, which enable a more reasonable comparison between groups with differing age distributions. In the primary NOHSS dataset, an increasing number of participants responded to the question related to “adults aged ≥18 years who have visited the dentist in the past year” from 103 278 in 1999 to 302 516 in 2014. Answers to this question are shown in Figure 1; Figure 1 also shows that among adults

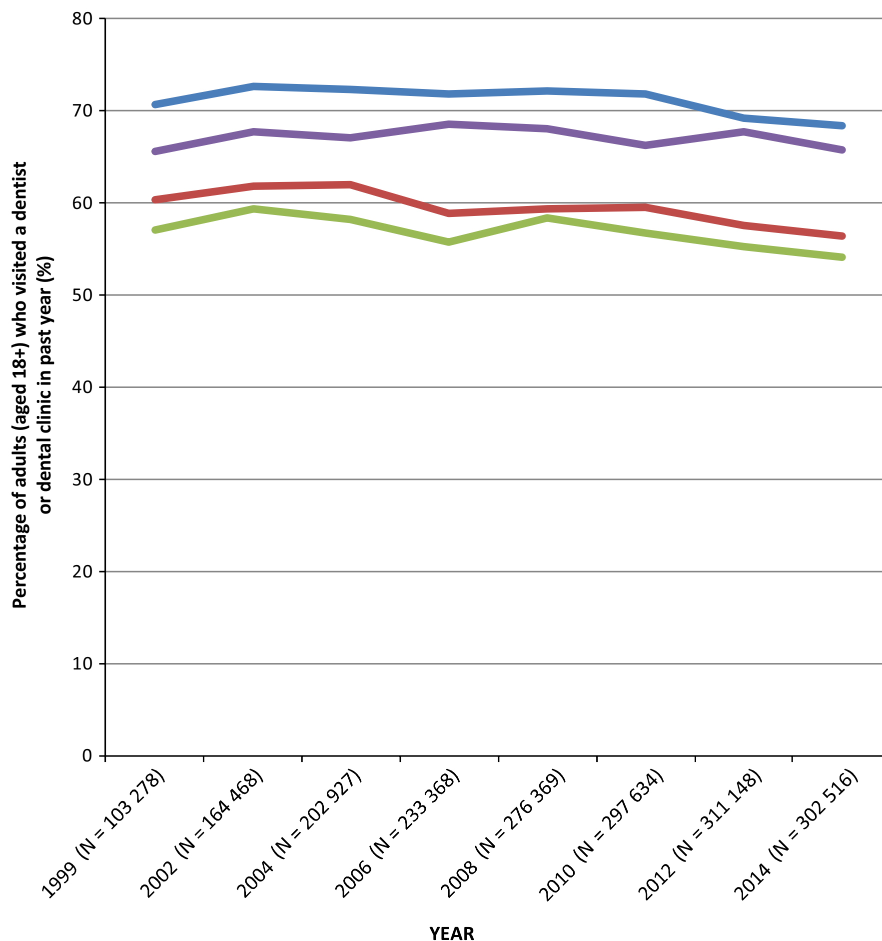


**FIGURE 1** Number of adults (≥18 y) who responded to the National Oral Health Surveillance System survey saying they had visited a dentist in the past year, broken down by years (1999-2014) and race (line colors indicate different racial groups). Data shown that in 1999, 70.7% of whites, 60.3% of blacks, and 57.1% of Hispanics had visited a dentist in the past year. By 2014, 68.4% of whites, 56.5% of blacks, and 54.2% of Hispanics had visited a dentist in the past year. ——, Whites; ——, Blacks; ——, Hispanics; ——, Others

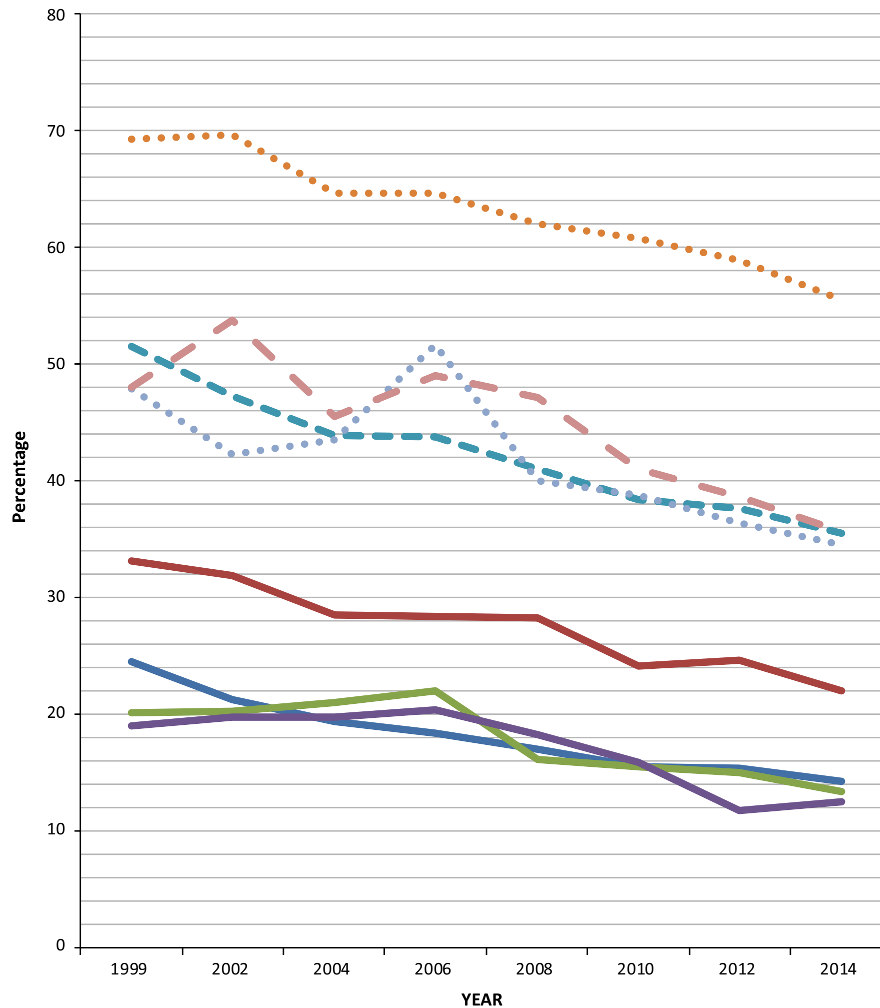


**FIGURE 2** Number of adults (≥65 y) who responded to the National Oral Health Surveillance System survey saying they lost some teeth. Broken lines indicate ≥6 teeth lost due to caries or gum disease and unbroken lines indicate teeth lost to caries or gum disease, broken down by years (1999-2014) and race (line colors indicate different racial groups). Data shown that in 1999, 24.5% of whites, 33.2% of blacks, and 20.2% of Hispanics had lost all of their natural teeth due to dental caries or gingival/periodontal disease. By 2014, 14.3% of whites, 22.1% of blacks, and 13.4% of Hispanics had lost all of their teeth. Among adults aged ≥65 y in 1999, 51.5% of whites, 69.3% of blacks, and 47.9% of Hispanics had lost ≥6 teeth due to dental caries or gingival/periodontal disease. By 2014, 35.6% of whites, 55.5% of blacks, and 34.5% of Hispanics had lost ≥6 teeth. ——, Whites who lost all natural teeth due to decay or gum disease (N = 122 807); ——, Blacks who lost all natural teeth due to decay or gum disease (N=13 257); ——, Hispanics who lost all natural teeth due to decay or gum disease (N = 4949); ——, Others who lost all natural teeth due to decay or gum disease (N = 4015); – –, Whites who lost 6 or more teeth due to decay or gum disease (N = 277 207); . . . ., Blacks who lost 6 or more teeth due to decay or gum disease (N = 29 586); . . . ., Hispanics who lost 6 or more teeth due to decay or gum disease (N = 10 679); – -, Others who lost 6 or more teeth due to decay or gum disease (N = 8972)

≥18 years in 1999, 70.7% of whites, 60.3% of blacks, and 57.1% of Hispanics had visited a dentist in the past year. By 2014, 68.4% of whites, 56.5% of blacks, and 54.2% of Hispanics had visited a dentist in the past year.

As shown in Figure 2, among adults aged ≥65 years in 1999, 24.5% of whites, 33.2% of blacks, and 20.2% of Hispanics had lost all of their natural teeth due to dental caries or gingival/periodontal disease. Across the 15 years of the dataset, information was captured from 122 807 whites, 13 257 blacks, and 4949 Hispanics. By 2014, 14.3% of whites, 22.1% of blacks, and 13.4% of Hispanics had lost all of their teeth.

Among adults aged ≥65 years in 1999, 51.5% of whites, 69.3% of blacks, and 47.9% of Hispanics had lost six or more teeth due to dental caries or gingival/periodontal disease (Figure 2). This survey question was answered by 277 207 whites, 29 586 blacks, and 10 679 Hispanics over the 15 years of data collection from 1999 to 2014. By 2014, 35.6% of whites, 55.5% of blacks, and 34.5% of Hispanics had lost six or more teeth.

## 4 | DISCUSSION

Data from the CDC show that 20-64 years olds have, on average, 24.9 teeth.[17] For whites, that average was 25.2, and for blacks it was 23.7. It can be argued that this is not a clinically significant finding, and therefore, not an area of concern. Additionally,

CDC data showed that the percentage of whites with no teeth was 3.96% compared with 4.14% of blacks, which is a small difference.[18] However, the current study included information from hundreds of thousands of individuals and the findings included more than just averages (Figure 1). The current study revealed that, in 2014, the percentage of blacks who had lost six or more teeth (55.5%) was higher than the percentage of whites who had lost six or more teeth in 1999 (51.5%). Similarly, the percentage of blacks who had lost all of their teeth in 2014 (22.1%) was only slightly better than the percentage of whites who lost all of their teeth in 1999 (24.5%). By 2014, only 14.3% of whites had lost all of their teeth. The present study highlighted that, within the limitations of the NOHSS indicators, although the oral health of blacks has improved, it is similar to the oral health of whites 15 years ago. Existing public health programs have targeted low-income and uninsured individuals and have been successful in improving the minimum standard for oral health in the USA. These programs have addressed equality by giving lower income groups better access to dental services. However, there is still no equity for blacks, as they continue to suffer large gaps in oral health outcomes compared to whites.

A universal health-care system in isolation is an example of equality; it provides all citizens access to the same health-care services. However, this does not take into consideration the fact that some people face language barriers, others face transportation barriers, and others face barriers of low health literacy and recognition of a need for care for themselves. In contrast, equity would dictate that those with language barriers receive additional services (which is in conflict with equality), such as interpreter services. The end result of equity is that everyone has access to all the health and support services that they need to thrive. The end result of equality is that everyone has the same access to health care, which could result in maintained gaps between wealthy or highly-educated populations and poorer or less educated ones. What equality in a health-care system does is rais the minimum standard. The current study suggests that public health programs have only succeeded in raising the minimum standard in oral health, but have done little to close the gap between blacks and whites.

In the current study, we presented data on the proportion of adults who visited a dentist in the past year (this does not differentiate between emergency or routine visits) (Figure 1). We found that this measure of access suggests circumstances have not improved much for whites or blacks over 15 years. The current study demonstrated that there have been overall gains in key indicators of oral health; however, a much larger proportion of blacks remain worse off than whites.

Unfortunately in the USA there is a parallel between racial and socioeconomic lines, that is blacks and Hispanics are overrepresented in lower socioeconomic cohorts. Blacks and Hispanics also experience higher poverty rates within their race.[18] In fact, statistics from the Federal Government also suggest that blacks and Hispanics are more likely to be chronically in poverty than whites and Asians.[18]

In order to ensure equity for blacks in oral health, there is a need for race-specific oral health-care policy, which could be a controversial ideology. In the USA, adult Medicaid (state-governed insurance for lower income groups) coverage of dental services is very limited. Expanded dental coverage through Medicaid for blacks could reduce the gap between blacks and whites; however, this might not be a realistic health policy.

A recent literature review from field experts has come to similar conclusions: "racial health inequalities should be of primary concern for both policy makers and researchers".[19] However, the authors caution that much of the inequality can be attributed to the overrepresentation of racial minorities in lower income groups.[19]

Previous research has shown that blacks and Hispanics are more likely to have government insurance than whites.[20] The gap in the access and utilization of health-care services was studied between 1977 and 1996; it was found that the black-white gap did not narrow over the 19-year study period.[21] A 1994 study showed that blacks enrolled in Medicare were less likely than similarly enrolled whites to gain access to any of the 16 most common hospital procedures.[22] A file review revealed that there was delayed diagnosis and failure to manage chronic disease among black patients. Clearly, insurance, access, and even quality of care can be cross-influenced by race; this matter is complex and multifactorial.

## 4.1 | Limitations

The present study has several important limitations that should be considered when evaluating the data. First, information was sought from individuals in a retrospective manner, which means there could have been recall bias by participants. Second, the three NOHSS indicators of adult oral health are fairly superficial questions that lack depth about true barriers to care. Third, the dataset is not broken down by race and SES. As previously discussed, race and SES have a strong relationship in the USA, and it would have been more ideal to separate the effect of SES.

The findings from the current evaluation of the NOHSS indicators for adult oral health suggest that existing public health strategies have not improved the gap between blacks and whites in 15 years in the USA; new approaches to policy are necessary.

## 4.2 | Conclusion

In the USA, public health strategies and legislative changes have succeeded in increasing the minimum standard in oral health over the past 15 years. However, they have not succeeded in closing the gap in oral health between blacks and whites, and have failed to bring equity.


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