ORIGINAL ARTICLE

Health Status and Access to Care for the North Carolina Medicaid Gap Population

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BACKGROUND North Carolina remains one of several states that has not expanded Medicaid eligibility criteria to cover all low-income adults, leading to the so-called Medicaid gap, a population ineligible for Medicaid and too poor for premium subsidies through the federal Health Insurance Marketplace. Our objective was to characterize the health care access and health status of the Medicaid gap population in North Carolina.

METHODS We combined annual data from the Behavioral Risk Factor Surveillance Survey (2013-2016). Respondents who were uninsured and earning below 100% of the federal poverty guidelines (FPG) were classified as falling within the Medicaid gap and were compared to insured populations below FPG, representing the traditional Medicaid population, and to individuals above the FPG, regardless of insurance status. We reported health care access, receipt of preventive care, and current health status in unadjusted and demographically adjusted models.

RESULTS Compared to either traditional Medicaid or above FPG groups, those in the Medicaid gap were 3 times as likely to have no regular source of care and twice as likely to report delaying needed care due to cost. Individuals in the Medicaid gap were more likely than individuals above FPG to report multiple chronic conditions (22% versus 16%) or a functional disability (35% versus 15%), but less likely than the traditional Medicaid population to do so.

CONCLUSION While less likely than the traditional Medicaid population to have complex health needs, we found that individuals in the North Carolina Medicaid gap report numerous health care access barriers and lower use of preventive care.

Medicaid is a joint federal and state program that currently provides insurance coverage to approximately 67 million Americans [1]. Since the establishment of Medicaid in 1965, the federal government has defined minimum eligibility criteria. For most of Medicaid's history, these criteria have included income and asset requirements, as well as categorical eligibility, which is defined as membership in medically vulnerable groups such as pregnant women, children, and people with disabilities [2]. Non-disabled adults aged below 65 who were not pregnant or did not have dependent children were traditionally not eligible for Medicaid, unless the state had received a waiver to expand coverage [3].

A key feature of the 2010 Affordable Care Act (ACA) was expansion of Medicaid eligibility to most persons under 138% of the federal poverty guidelines (FPG), regardless of categorical eligibility. The ACA also created insurance exchanges where individuals between 100% and 400% of the FPG could purchase private health insurance at subsidized rates [4]. Together, these provisions were intended to ensure low-income individuals without access to affordable employer-based health insurance could obtain coverage.

Though the ACA expansion of Medicaid eligibility was intended to be mandatory for all states, a 2012 Supreme Court ruling effectively made this provision optional, resulting in a "Medicaid gap" in states that chose not to expand [5]. In non-expansion states, individuals in the Medicaid gap have incomes below 100% of the FPG and are therefore not eligible for subsidized health coverage in ACA marketplaces. Additionally, they either do not fall into one of the traditional Medicaid eligibility categories or do not qualify because income requirements in some categories are set well below the FPG [6]. Nearly 80% of individuals who fall in the Medicaid gap are estimated to be childless adults, and 60% are estimated to work full- or part-time [5].

In North Carolina, Medicaid covers nearly 2 million North Carolinians, approximately 18% of the state's population [6]. As of 2019, North Carolina remains among the 14 states that have not expanded Medicaid coverage [7]. With few exceptions, North Carolina Medicaid does not cover non-disabled, childless adults at any income level. For parents of dependent children to qualify for Medicaid in North Carolina, their income must be below 43% of the FPG [8]. This results in an estimated 208,000 low-income adults in North Carolina without access to subsidized health insurance coverage [5].

Individuals in the Medicaid coverage gap have limited ability to obtain health insurance coverage, meaning they may face worse health care access and health outcomes. A better understanding of the relative health status and access to care for those in the Medicaid gap will help to shape policy solutions for addressing the health needs of this population. This study uses data from an annual, representative survey

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to characterize the health status and access to care of the Medicaid gap populations in North Carolina.

Methods

Data

The Behavioral Risk Factor Surveillance Survey (BRFSS) is a random-digit-dial telephone survey of non-institutionalized adults conducted by all 50 states, the District of Columbia, and 3 US territories. Respondents are asked for demographic information, as well as information regarding health behaviors, access to care, and health status. Many states include optional modules with additional questions specific to care access, cost of care, or other areas of interest. To create a sample of sufficient size for inference, we combined 4 years of survey data from North Carolina (2013-2016). Data were provided by the North Carolina State Center for Health Statistics.

Comparison Populations

Analyses were restricted to individuals aged 18 to 64 years. Individuals were divided into one of 3 categories based on household income, household size, and insurance status. Of those asked about their income across all years, 8.8% reported that they did not know and 10.7% refused to provide their income. These individuals were removed from analysis. All individuals were asked whether they have any form of health insurance; fewer than 1% of respondents did not respond.

FPG by household size was obtained for each year of study data from the US Department of Health and Human Services [9]. Household income is captured categorically in BRFSS; therefore, individuals were estimated to have an income at the median of their reported income category. From this income and the reported household size, percent of FPG was determined using guidelines from the survey year. Those who were uninsured and whose estimated household incomes fell below 100% of the FPG were classified as the *Medicaid gap* group. Those whose household incomes fell below 100% of the FPG but who reported having insurance were classified as the *traditional Medicaid* group. Those with household incomes above 100% of the FPG were classified as *above poverty*, regardless of insurance status.

Sociodemographic measures were self-reported and included age, gender, race, Hispanic ethnicity, employment status, marital status, whether respondent has one or more dependent children in the household (binary indicator), and highest level of educational attainment. Missingness of these variables was less than 2% overall; therefore, complete case analysis was performed.

Outcome Measures

Access to health care was measured through questions about primary care, cost-related health care barriers, and preventive care use. Respondents were asked whether they have someone they think of as their "personal doctor or health care provider" and how long it had been since they last visited a doctor for a checkup. Cost-related barriers were assessed through 2 questions: (1) if there was a time they needed to see a doctor in the previous year but did not due to cost, and (2) whether they had failed to take a medication as prescribed due to cost. A range of preventive care utilization measures were assessed, including reporting a dental visit in the previous year, a flu shot in the previous year, a pap smear in the previous 3 years (women only), a cholesterol check in the past 5 years, and having ever been tested for HIV.

A 5-level measure of overall health was collapsed to a binary indicator for self-reporting health as "fair" or "poor" (compared to a reference category combining "good," "very good," and "excellent"). Respondents were also asked to estimate the number of days in the previous month in which they had poor physical or mental health, and number of days in which poor physical or mental health kept them from regular activities (including self-care, work, or recreation). Functional disability was defined by a positive answer to one or more of 5 items, including experiencing a disability in cognition (difficulty concentrating, remembering or making decisions), ambulation (difficulty walking or climbing stairs), self-care (difficulty dressing or bathing), vision (blindness or difficulty seeing even with glasses), or independent living (difficulty doing errands alone). We identified individuals with multiple chronic conditions as those who reported a previous diagnosis with 2 or more of the following conditions: heart attack, angina, stroke, asthma (excluding childhood asthma), cancer, COPD, arthritis, depression, kidney disease, or diabetes [10]. Individuals also reported on smoking and drinking behaviors in the past 30 days. Binge drinking was defined as consuming on a single occasion more than 5 drinks (men) or 4 drinks (women).

Four years of data were available for all demographic measures and the majority of health measures. However, for several measures of interest (skipping medication due to cost, Pap smear in previous 3 years, dental visit in previous year, and cholesterol check in past 5 years) the question was only asked in 2 of the included years of data; therefore, sample sizes were smaller for these measures.

Analysis

To account for sampling methods used in the BRFSS and to produce estimates representative of the North Carolina population, all analyses were adjusted via survey weights and Taylor-linearized variance estimation using Stata 15 (College Station, Texas). Unadjusted sociodemographic, health status, and access measures are presented for those in the Medicaid gap compared to both the traditional Medicaid and above-poverty groups. These models describe the absolute difference in these 3 groups, representing a "total difference" in access and health status.

As a secondary analysis, we present adjusted models, which account for compositional differences between

groups. For the measures of "unhealthy days," we use a negative binomial model, producing a predicted number of unhealthy days. For the remainder of the outcomes (which are binary), we use logistic regression models and present predicted probabilities. All models included controls for age, gender, race, ethnicity, marital status, dependent children, and educational attainment. We present only predicted probability for our comparison groups of interest (Medicaid gap, traditional Medicaid, and above poverty). These estimates represent the difference in access and health status between groups, which is not explained by sociodemographic differences and therefore may be attributed to differences in income and insurance between groups. Statistical comparisons between groups are made using a Wald test with significance assessed at an alpha value of .05.

Results

Sample Characteristics

Combining all 4 years, 14,675 individuals provided information on income and household size, and all covariates were included in the sample. Of these, 73.1% were above poverty, 16.6% were traditional Medicaid, and 10.2% were in the Medicaid gap (see Table 1). On average, individuals in the Medicaid gap were younger (37.9 years) than either traditional Medicaid (40.5 years) or above-poverty North Carolinians (43.0 years). Those in the Medicaid gap were more likely to report their race as "other" (Medicaid gap 20.4% versus 4.3% traditional Medicaid and 1.7% above poverty, $P < .001$) and were more likely to be Hispanic (37.0% versus 7.7% versus 3.1, $P < .001$).

Individuals in the Medicaid gap were less likely to be employed than above-poverty individuals (53.1% versus 76.2%, $P < .001$), but more likely to be employed than traditional Medicaid (42.3%, $P < .001$). Among those in the Medicaid gap, 9.2% were unable to work due to health limitations, 1.4% were retired, 4.3% were students, and 10.6% were homemakers. The remaining 21.3% reported being out of work, with just over half of this group unemployed for more than a year. Those in the Medicaid gap generally had lower educational attainment than either comparison population; 40.3% report not finishing high school (compared to 23.7% for traditional Medicaid and 5.5% for above-poverty individuals, $P < .001$.) Below-poverty individuals, both insured and uninsured, were less likely to be married than above-poverty respondents ($P < .001$).

Health Care Access

Individuals in the Medicaid gap reported lower access to care across all measures (see Figure 1A), including being 3 times more likely to report no regular source of care com-

TABLE 1.
Population Characteristics by Poverty & Insurance

	Above-poverty N = 10,741	**Traditional Medicaid** N = 2,433	**Medicaid gap** N = 1,501	***P*-value**
Weighted Estimate of North Carolina Population (aged 18-64)	5,523,126	426,077	277,017	
Age (sd)	43.0 (12.6)	40.5 (13.0)	37.9 (10.8)	< .001
Female	49.4%	59.3%	49.8%	< .001
Race				
White	75.8%	56.1%	48.4%	< .001
Black	18.6%	34.0%	25.3%	
AI/AN	1.2%	3.2%	3.6%	
Asian	2.7%	2.2%	2.3%	
Other	1.7%	4.3%	20.4%	
Hispanic	3.1%	7.7%	37.0%	< .001
Employment Status				
Employed	76.2%	42.3%	53.1%	< .001
Out of work 1+ year	1.9%	5.3%	12.4%	
Out of work < 1 year	2.0%	5.4%	8.9%	
Homemaker	5.0%	4.9%	10.6%	
Student	4.2%	8.8%	4.3%	
Retired	5.9%	3.6%	1.4%	
Unable to work	4.7%	29.8%	9.2%	
Living with Dependent Children	63.5%	49.2%	43.7%	< .001
Educational Attainment				
Did not finish High School	5.5%	23.7%	40.3%	< .001
High School Graduate/GED	58.4%	67.9%	55.6%	
College Graduate	36.0%	8.3%	4.1%	
Marital Status				
Single	23.2%	38.8%	43.9%	< .001
Married	62.4%	34.7%	34.7%	
Divorced, Widowed, or Separated	14.4%	26.5%	21.4%	

Note. AI/AN: American Indian/Alaskan Native; Statistical significance is assessed using a X^2 test

pared to other groups (62% versus 21% traditional Medicaid and 20% above poverty $P < .001$). Those in the Medicaid gap were twice as likely to report their last checkup was more than a year ago (56% versus 24% and 25%, $P < .001$). Those in the Medicaid gap were twice as likely to report cost barriers to see a doctor (53%) compared to traditional Medicaid (26%) and 4 times as likely as the above-poverty group to do so (12%). Similarly, those in the Medicaid gap were one and a half times as likely to report not taking a prescription medication as recommended due to cost (34%) compared to traditional Medicaid (21%) and nearly 4 times as likely as the above-poverty group (9%). Controlling for demographic differences between these populations attenuated these differences to some degree; however, those in the Medicaid gap remained significantly more likely to report all access-related barriers than either the above-poverty or the traditional Medicaid population (see Table 2).

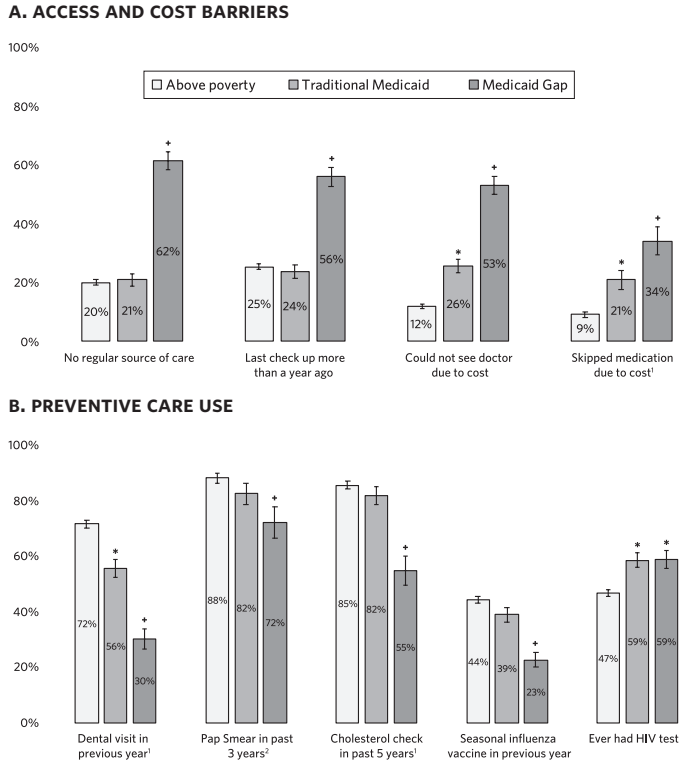
Medicaid gap individuals were also less likely to be up to date on a variety of preventive services, including annual dental visit, Pap smear, cholesterol check, or seasonal flu vaccination (see Figure 1B). The only measure where preventive service use was more likely among below-poverty populations was the measure of ever having had an HIV test (59% Medicaid gap versus 59% below-poverty insured and 47% above poverty). After adjustment for demographic characteristics, differences in HIV testing disappeared, suggesting that these differences were due to compositional differences between comparison groups; however, those in the Medicaid gap remained less likely to receive all other preventive services (see Table 2).

TABLE 2.
Health Care Access and Health Status, Adjusted

Health care access	Above-poverty % [95% CI]	Traditional Medicaid % [95% CI]	Medicaid gap % [95% CI]
No regular source of care	22.1% [21.0%,23.2%]	19.3% [17.4%,21.2%]	48.0%ˆ [44.7%,51.4%]
Last check up more than a year ago	25.9% [24.8%,27.0%]	23.5% [21.4%,25.7%]	52.1%ˆ [48.6%,55.7%]
Could not see doctor due to cost	12.8% [11.9%,13.6%]	21.1%* [19.1%,23.1%]	50.2%ˆ [46.5%,53.9%]
Skipped Rx due to cost1	9.7% [8.4%,10.9%]	17.7% [14.6%,20.7%]	33.9%ˆ [28.4%,39.3%]
Preventive Care			
Dental visit in previous year1	69.1% [67.5%,70.7%]	61.7%* [58.5%,64.9%]	37.7%ˆ [33.1%,42.2%]
Pap smear in past 3 years2	87.3% [85.4%,89.3%]	84.9% [81.3%,88.5%]	73.4%ˆ [67.2%,79.6%]
Cholesterol check in past 5 years1	84.0% [82.6%,85.5%]	83.4% [80.8%,86.0%]	66.1%ˆ [61.5%,70.8%]
Flu shot in previous year	42.6% [41.3%,43.8%]	43.0% [40.4%,45.7%]	25.7%ˆ [22.7%,28.8%]
Ever had HIV test	49.1% [47.8%,50.3%]	52.0% [49.3%,54.8%]	53.2% [49.6%,56.9%]
Health Status			
Functional disability	15.7% [14.8%,16.6%]	38.0%* [35.7%,40.3%]	34.4%* [31.2%,37.6%]
Multiple chronic conditions	17.3% [16.5%,18.2%]	35.0%* [32.7%,37.2%]	27.1%ˆ [24.0%,30.2%]
Health status fair/poor	10.9% [10.2%,11.7%]	29.5%* [27.4%,31.6%]	29.9%* [26.9%,32.9%]
Current smoker	18.5% [17.5%,19.5%]	27.8%* [25.6%,30.0%]	29.8%* [26.7%,32.8%]
Binge drinking	17.6% [16.6%,18.6%]	12.7%* [10.9%,14.5%]	14.5% [11.9%,17.1%]
Healthy Days			
Days in poor physical health	2.7 [2.6,2.9]	6.2* [5.6,6.7]	5.7* [4.9,6.6]
Days in poor mental health	3.2 [3.1,3.4]	5.9* [5.4,6.3]	5.9* [5.2,6.6]
Days when poor health kept you from your regular activities	1.8 [1.6,1.9]	4.6* [4.1,5.1]	4.1* [3.5,4.8]

Note. HIV – Human Immunodeficiency Virus; CI – confidence interval
*Significantly different from *above-poverty*
+Significantly different from both *above-poverty* and *traditional Medicaid*
Estimates are from logistic regression models (access, prevention, and health status variables) or negative binomial regression models (healthy days) adjusted for age, gender, race, ethnicity, having dependent children, education, and marital status
[1]Data only available for 2 years
[2]Only includes females, data only available for 2 years

FIGURE 1.
Health Care Access for North Carolina Adults (18-64)



Note. Data are unadjusted. HIV- Human Immunodeficiency Virus; bars represent 95% confidence intervals
*Significantly different from *above-poverty*
+Significantly different from both above-poverty and *traditional Medicaid*
[1]Data only available for 2 years
[2]Only includes females, data only available for 2 years

Health Status

Those in the Medicaid gap were more likely than above-poverty individuals to report a functional disability (33% versus 15%, $P < .001$; see Figure 2A), but less likely than the traditional Medicaid population (43%, $P < .001$). They were also less likely than the traditional Medicaid population to report multiple chronic conditions (21% versus 36%, $P < .001$) but more likely than above-poverty individuals to do so (18%, $P < .001$). Both the traditional Medicaid and Medicaid gap populations are much more likely to report their health as "fair" or "poor" than those above poverty (34% and 35%, respectively versus 10%, $P < .001$).

Those in the Medicaid gap reported, on average, 5.4 days per month spent in poor physical health compared to 7.4 days for traditional Medicaid populations and 2.7 days for above-poverty populations (see Figure 2B). Mental health was also worse for those in the Medicaid gap relative to above-poverty individuals (6.2 versus 3.1 poor health days per month, $P < .001$), but they did not significantly differ from the traditional Medicaid population (6.9 days per month, $P = 0.09$). Poor health kept those in the Medicaid gap from their regular activities an average of 4.0 days per month, compared to 5.6 days for traditional Medicaid and 1.7 days for above-poverty individuals.

Rates of current smoking were higher for below-poverty populations (see Figure 2A), both traditional Medicaid (34%) and Medicaid gap (30%), than for above-poverty groups (17%, $P < .001$). Rates of binge drinking were significantly lower for the traditional Medicaid population (13%) than for either above poverty (17%, $P < .001$) or those in the Medicaid gap (16%, $P = .03$).

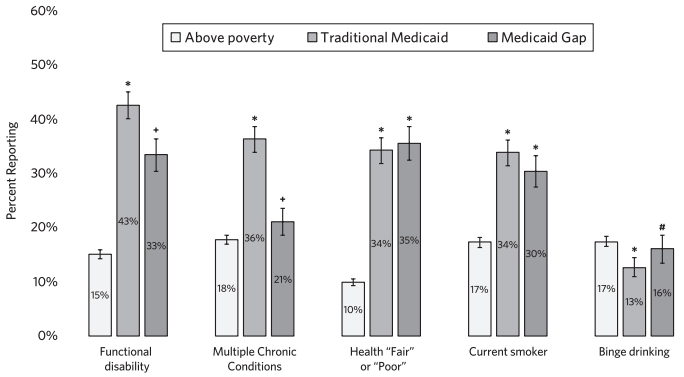
After adjustment for demographic characteristics (see Table 2), results remained similar in health behaviors, functional disability, and number of chronic conditions. However, gaps between the traditional Medicaid and Medicaid gap populations closed with regard to the number of days spent in poor health.

Discussion

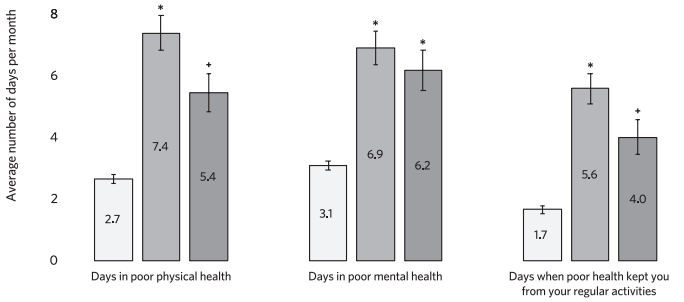
Using a large, representative sample of adults in North Carolina, we find those in the Medicaid gap report 2 to 3 times the rate of access barriers of either those above 100% of the FPG or the traditional Medicaid population. This results in numerous missed opportunities for preventive

FIGURE 2.

A. HEALTH STATUS AND HEALTH BEHAVIORS



B. DAYS OF POOR HEALTH



Note. Data are unadjusted. Bars represent 95% confidence intervals
*Significantly different from *above-poverty*
#Significantly different from *traditional Medicaid*
+Significantly different from both *above-poverty* and *traditional Medicaid*

care, as those in the Medicaid gap are less likely to receive dental care, cancer screening, seasonal flu vaccination, and other routine screening. This is important, as studies show preventive services are highly cost-effective, meaning that they improve health for a relatively lower cost than other services [11]. Some preventive services, including seasonal flu vaccination, have even been found to save health care costs by avoiding future costly illness [12].

Those in the Medicaid gap population generally report less disability and fewer chronic conditions than the traditional Medicaid population. While this is unsurprising, as disability itself is an eligibility category for traditional Medicaid, the gap population is just as likely to evaluate their own health as "fair" or "poor." Taken together, these findings suggest that the needs of the Medicaid gap may be less complex than those of the traditional Medicaid population, but remain unmet in the current environment.

Further, expansion of Medicaid has the potential to improve health equity in North Carolina, by increasing insurance and access to care among vulnerable populations. A recent report highlights numerous areas where black, Hispanic, and American Indian residents in North Carolina report worse outcomes than their white counterparts [13]. Nationally, the gap in life expectancy between those without a high school education and college graduates has never been larger [14]. Both racial/ethnic minorities and individuals without a high school diploma are over-represented within the Medicaid gap population, meaning expansion may have a disproportionate benefit for these historically underserved groups. Evidence from other states supports this, showing expansion reduces racial/ethnic disparities in insurance rates and access [15,16].

Finally, we note that the majority of individuals in the Medicaid gap are employed, with only 12% reporting unemployment for over 12 months. Four states (Arkansas, Indiana, Kentucky, and New Hampshire) have added work requirements as part of an approved 1115 waiver for their expansion population, with some including traditional Medicaid [17]. While the specifics of these plans vary, evidence suggests that work requirements will directly affect only a small percentage of enrollees, but the administrative burden may worsen outcomes by creating barriers among those who must prove employment or a qualifying exemption [18-20].

Limitations

Due to a categorical measure of income, we approximate household income by using the median of each of the 8 income categories. Those between 100% and 138% of the FPG would also potentially benefit from Medicaid expansion, but are not considered a part of the Medicaid gap as

they currently qualify for subsidies on the federal Health Insurance Marketplace. Missingness in our income variable, as well as the use of approximate rather than exact income, may lead to misclassification of our comparison groups. We find our estimates of the Medicaid gap population to be similar in size to other estimates [5], suggesting this misclassification is minimal. Further, while all respondents were asked whether they had any source of insurance, only a subset were asked specific questions regarding the source of insurance. Therefore, we only use the indicator of insurance and a categorical measure of income to define the traditional Medicaid population, which may result in slight misclassification of this group.

BRFSS does not include a measure of citizenship or residency status. Medicaid is available to non-citizens only in very limited circumstances or after a waiting period of 5 years. Therefore, some individuals included in the Medicaid gap estimates may remain ineligible for coverage, even in the case of expansion. Finally, we note that variables are self-reported; therefore, social desirability may result in over-reporting of preventive care and under-reporting of comorbidities and unhealthy behaviors, such as smoking and alcohol consumption.

Conclusion

The Medicaid gap population constitutes a missed opportunity for preventing future illness and disability in North Carolina. The Medicaid gap population is younger and has fewer complex health needs than the traditional Medicaid population, yet reports poor subjective measures of health, significant financial barriers to care, and low use of preventive services. Improving access to health services for this group—particularly preventative services—could have a significant impact in future health of North Carolinians. NCMJ

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Potential Conflicts of Interest. All authors have no relevant conflicts of interest.

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