Do Low Income Rural Adults Have Access to More Innovative Medicaid Dental Policies? A Comparative Analysis

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Abstract

Purpose: Compared to metro and urban populations, low-income adults in rural regions are disproportionately confronted by barriers to improving oral health outcomes. Financial constraints and rural professional shortages extend periods of forgone dental care, which leads to tooth decay and tooth loss. As a primary insurer for low-income adults, Medicaid is a critical source of access to dental care. Dental programs within Medicaid remain highly variable across the country. It is possible that variability has led to states adapting Medicaid dental programs to fit the needs of rural low-income adults. The aims of this study are (i) to quantify the Medicaid dental policy variation from a rural perspective and (ii) to identify if state Medicaid programs with more rural low-income adults adapt their Medicaid dental programs to meet the contextual realities of rural settings.

Methods: Publicly available data from the Centers for Medicare & Medicaid, Kaiser Family Foundation, American Dental Association, and Center for Connected Health Policy were used to construct a state-level Medicaid dental benefit policy dataset. Next, the proportion of rural low-income adults living in states with various Medicaid dental policies was compared with the proportion of non-rural counterparts. State waivers and action plans were then reviewed for state actions which specifically adapted Medicaid dental programs for rural beneficiaries.

Findings: Rural low-income adults were less likely to live in states that used policy to adapt Medicaid dental programs. The gaps were widest for comprehensive managed care programs (R=59%, NR = 68%), teledentistry coverage (R = 17%; NR = 34%), and state oral health action plans (R = 27%, NR = 43%). Among the 25 states that adopted Medicaid dental waivers or action plans, only four states used the waiver or plans focused on rural populations (ID, LA, NH, PA).

Conclusions: Comparing dental policies across states, rural low-income adults were less likely to live in states with innovative Medicaid dental programs. Still, the novel approaches by select model states should be further evaluated to promote evidence-based policy diffusion This study highlights opportunities for states to improve rural oral health by transforming service delivery and better accommodating rural dental environments.

Introduction

For decades, the healthcare system has struggled to improve oral health outcomes for low-income adults in rural America [1,2]. Compared to low-income metro and urban populations, low-income adults in rural regions are disproportionately confronted by barriers towards improving oral health outcomes. Regardless of income or geography, adults are more likely to forgo dental services than any other form of healthcare [3]. Rurality and individual financial constraints contribute to further delays in care [4,5], but it is not just delayed care which leads to poor outcomes for rural adults. Low-income adults in rural regions face myriad factors which ultimately lead to prolonged decay and early onset complete tooth loss. From a contextual standpoint, rural low-income adults are more likely than their urban counterparts to be less educated, earn lower wages, have a history of smoking, have a chronic illness, and have less access to fluoridated water [6,7, 8]. Each of these factors independently contributes to increased risk of tooth decay and tooth loss [9,10]. Additionally, the considerable shortage of dental professionals in rural regions can severely diminish rural low-income adults' ability to obtain care at any stage of the dental care continuum and even fail to benefit from increased access to care [11]. Specialized services may be even less available in rural settings [12]. Considering this perfect storm of oral health risks, limited availability of services to mitigate such risks, and the long-term effects of poor oral health on overall wellbeing, (i.e. reducing overall health status, employment opportunities, and social

engagement) rural oral health should be considered one of today's most prominent health disparities [13,14].

Purpose

Most adults lack dental insurance [15,16]. Some low-income adults may have access to dental coverage through Medicaid. Not all low-income adults are eligible for their state's Medicaid program and not all states cover dental services through Medicaid [17]. Still, Medicaid dental coverage remains a critical access point for low-income adults. However, Medicaid dental benefits available to low-income adults remain highly variable across the country.

Considered a laboratory for policy diffusion, state Medicaid policy has been heavily explored by researchers and policy-makers to improve the impact of health policies [18,19]. For example, well before the Affordable Care Act was signed into law in 2010, states had been experimenting with policies towards universal health coverage [20,21]. Not all state policies lead to increased access to dental coverage as many states dropped Medicaid dental benefits in the 2000's due to budget cuts [22]. The volatility of Medicaid dental programs over the past twenty years warrants greater understanding of what benefits states cover, how states manage their dental Medicaid program, and how states have adapted to changing contextual needs of their beneficiaries.

In addition to covering Medicaid dental benefits, the financial constraints, contextual factors, and rural professional shortages in rural communities may motivate policy-makers with large rural constituencies to implement policies that meet the elevated oral health needs. This study aims to better understand Medicaid dental policy variation from a rural population perspective and determine if rural low-income adults are more likely to live in states where policy-makers have innovatively adapted Medicaid dental programs.

Methods

Quantitative

Publicly available data from the Centers for Medicare & Medicaid Services (CMS), Kaiser Family Foundation, and Center for Connected Health Policy were used to construct a state-level policy dataset for the most recent year on record (2019-2020) [23-27-26]. This dataset of binary indicators encompassed state Medicaid policy dimensions related to the demand for dental services (coverage, co-pays, caps on benefits, preauthorization requirements, services covered), the supply of dental providers (reimbursing dental assistants, Medicaid participation incentives), managed care programs, teledentistry, Medicaid dental waivers, and state Medicaid oral health action plans. For consistency, these policy indicators were cross-referenced with documentation from each state's Medicaid program.

Next, 2010 U.S. Census data were used to estimate a census of low-income adults in each county [28]. County-level estimates were restricted to adults older than 18 and younger than 64, who reported income at or below 100% of the federal poverty level. Counties were then designated as rural (7-9) or non-rural (1-6) according to the USDA Rural-Urban Continuum Codes [298]. Finally, the total number of rural low-income adults in a state with each policy was divided by the total number of rural low-income adults in the United States. This proportion was then compared to the proportion of low-income, non-rural adults for each specific Medicaid policy.

$$Pr = \frac{\sum Low\ Income\ Rural\ Adults\ Living\ in\ States\ with\ Policy\ X}{\sum Low\ Income\ Rural\ Adults}$$

$$Pn = \frac{\sum Low\ Income\ Non{-}Rural\ Adults\ Living\ in\ States\ with\ Policy\ X}{\sum Low\ Income\ Non{-}Rural\ Adults}$$

For the purposes of this study, a Medicaid policy is considered "innovative" or adaptive if the policy does not directly relate to coverage, price controls, or services covered. This broad definition allows for more general comparisons across policies attempting to increase the supply of providers as well as policies aiming to transform the delivery of service through managed care or teledentistry.

Qualitative

To further investigate the extent to which rural low-income adults were the focus of Medicaid dental policies, this study integrated a qualitative analysis. Medicaid waiver and state oral health action plan documents were retrieved from CMS for each state adapting their Medicaid dental program. Each approved waiver and state plan document were reviewed for three themes. First, opportunities were identified where states could have, but did not, specifically target rural populations within the approved plan.

Table 1 – *Comparing Rural and Non-Rural Exposure to Medicaid Dental Policies*
[Compares the proportion of low-income rural adults living in states with various Medicaid dental policies with the proportion of low-income non-rural adults living in states with those same policies. The final column indicates the policy's potential impact on dental services utilization: + increase utilization, - decrease utilization]

	States	% of Low-Income Population		Expected Impact on Utilization
		Non-Rural	Rural	
Medicaid Dental Coverage				
No Coverage	4	5.80%	8.18%	-
Emergency Only	12	28.67%	23.59%	-
Comprehensive Coverage	35	65.53%	68.23%	+
Medicaid Dental Policies Influencing Utilization				
Requires Co-Pay	19	38.92%	56.17%	-
Cap on Benefits	9	19.01%	18.35%	-
Requires Pre-Authorization	6	11.53%	7.02%	-
Services Covered by Medicaid Dental Programs				
Examinations	28	54.75%	46.38%	+
Preventative Services	27	51.06%	45.21%	+
Basic Restorative Services	28	54.75%	46.38%	+
Advanced Restorative Services	24	47.38%	28.97%	+
Surgical Services	28	54.75%	46.38%	+
Periodontal Services	20	38.14%	37.20%	+
Dentures	28	55.93%	34.86%	+
Medicaid Dental Policies Influencing Provider Participation				
Reimburses Dental Assistant or Hygienist	22	43.68%	41.06%	+
Incentives for Medicaid Participation	10	14.97%	18.96%	+
Medicaid Dental Managed Care Programs				
Preventative Services Only	3	2.96%	7.87%	-
Surgery/Medical Services Only	4	6.71%	11.62%	-
Comprehensive	29	68.36%	58.71%	+
Dental Medicaid Innovation				
Medicaid Covers Teledentistry Services	9	33.54%	16.81%	+
Dental Health Waivers	5	7.38%	6.06%	+
State Plan of Oral Health Action Plan	20	42.86%	26.79%	+

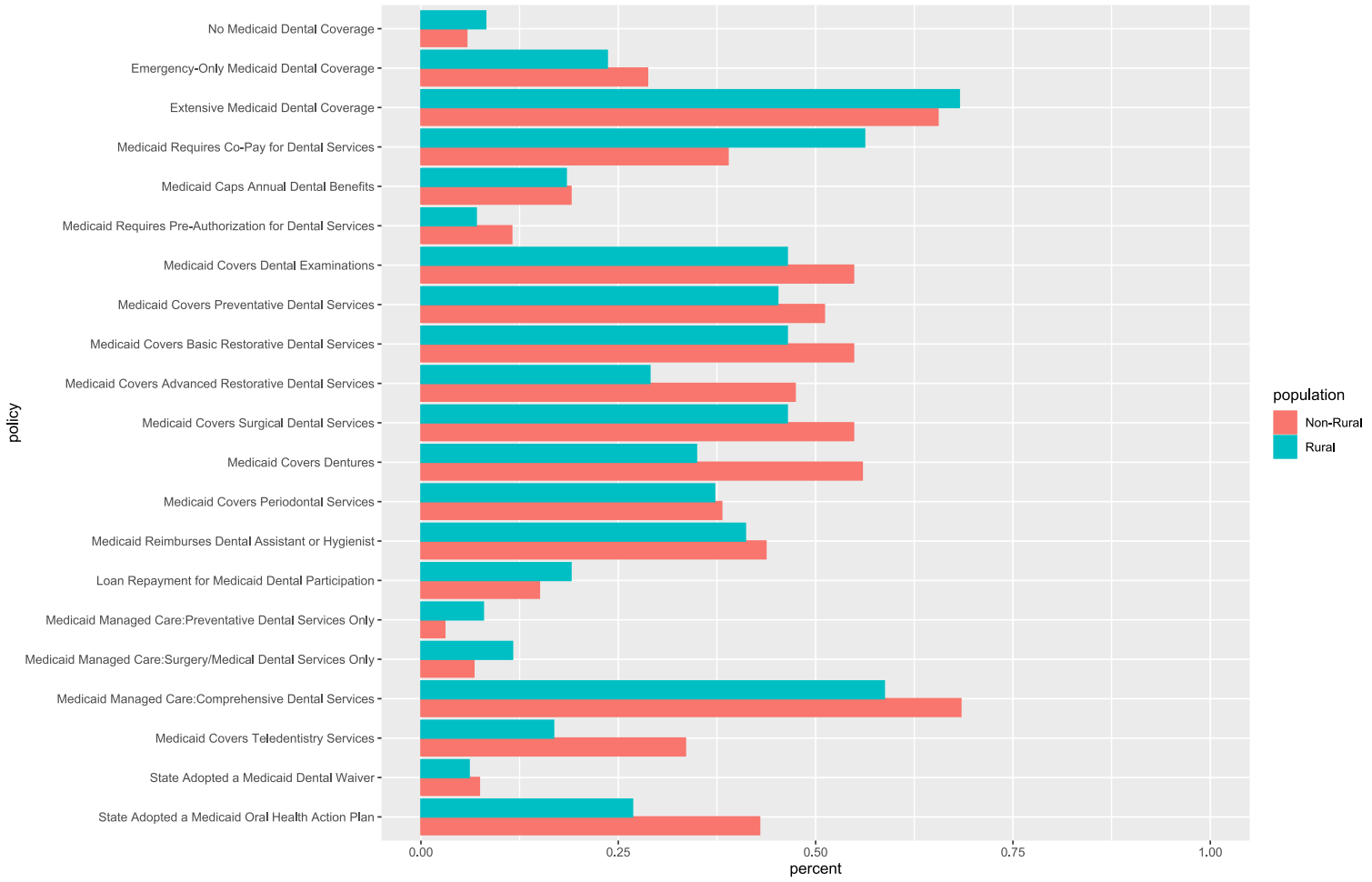

Figure 1: *Comparing the proportion of low-income rural and non-rural adults living in states with specific Medicaid dental policies* [Figure 1 visually depicts the results from table 1. Adults were defined as low-income if household income was under 100% FPL and defined as rural by RUCCA codes. Plot created by ggplot2 in R.]

Statutory authorities were also documented for each opportunity [30]. Second, instances where states discussed rural populations but did not provide implementation or statutory details within the plan, were summarized. Finally, state plans which adapted Medicaid programs by specifically targeting rural populations, which also provided technical implementation or statutory details, were identified. Each of these plans' authority and details were summarized and discussed for their implications towards improving rural oral health [30,31].

Results

Dental Coverage and Policies Influencing the Demand for Services

Compared to non-rural adults, a higher proportion of rural low-income adults reside in states where Medicaid does not cover any dental services (R = 8.18%, NR = 5.80%). CMS classifies a state as offering extensive dental coverage if a minimum set of services are reimbursed (i.e. preventative cleaning, examinations, restorative care, surgery) with an annual cap exceeding $1,000 [32]. Compared to non-rural low-income adults, a larger proportion of rural low-income adults live in states where Medicaid provides extensive dental coverage, (R = 68.23%, NR = 65.53%). Regarding policies which influence the demand for dental services, a larger proportion of rural low-income adults live in states that require a copay for dental services (R = 56.17%, NR = 38.95%). Co-pays tend to decrease patient use of services. Only nine and six states, respectively, have implemented caps on benefits or pre-authorization requirements for Medicaid dental services. A lower proportion of rural low-income adults live in states with these utilization controls, which may increase barriers to care, compared to non-rural counterparts. See table 1 for the full results.

As shown on Figure 1, a larger proportion of rural low-income adults live in states with extensive Medicaid dental

benefits. Not all states offering extensive dental coverage, however, cover all dental services [32]. These restrictions appear to disproportionately impact rural low-income adults. Across all dental service categories, a higher proportion of non-rural adults live in states with Medicaid coverage than rural counterparts. On the low-cost, high-value part of the spectrum of services, only 46.38% of rural low-income adults live in states where annual dental examinations are covered, compared to 54.75% of non-rural adults. Similarly, 45.21% of rural adults live in states covering preventative services (i.e. tooth cleaning), compared to 51.06% of non-rural low-income adults. There appears to be an even larger gap in service coverage on the other end of the cost-value spectrum, including a nine-point percentage gap for dental surgery coverage (R = 46.38%, NR = 54.75%). For advanced restorative and denture services, the gap in proportions between rural and non-rural low-income adults is nearly twenty percentage points. 28.97% of rural low-income adults live in states covering advanced restorative services compared to 47.38% of non-rural low-income adults, and 34.86% of rural low-income adults live in states covering denture services compared to 55.93% of non-rural low-income adults.

Adapting the Supply and Service Delivery of Medicaid Dental Programs

Two supply-side policies were identified in this study (reimbursing dental hygienists and incentivizing Medicaid participation via loan repayment). The differences between rural and non-rural access was minimal. However, it is important to note that less than half of all low-income adults reside in states that reimburse dental assistant or hygienists services under Medicaid (R = 41.06%, NR = 43.68%), and less than a quarter of all low-income adults live in states that explicitly link student loan repayment incentives to Medicaid participation (R = 18.96%, NR = 14.97%). Currently, nearly 50 million adults live in dental professional shortage areas [33]. Expanding either of these policies could potentially reduce that number and increase the availability of dental professionals accepting Medicaid patients.

Managed Care plans have continued to penetrate Medicaid programs across the country and dental programs appear to be no exception. Thirty-six states manage at least one non-elderly adult Medicaid managed care program that covers dental services. Such programs appear to be highly variable across contract assurances, network adequacy requirements, and quality reporting metrics [34]. Rural low-income adults are less likely to live in a state that implemented a comprehensive Medicaid managed care program, which covers both preventative and surgery/medical dental services, than non-rural counterparts (R = 58.71%, NR = 68.36%). Still evidence on managed care service delivery continues to be mixed [35]. From a patient perspective, managed care, by definition, seeks to manage the healthcare utilization of each beneficiary. Managed care plans may use cost controls or preauthorizations to limit unnecessary care. These barriers could create undue burden on low-income patients. Conversely, managed care plans are designed to focus on preventative health, and some even provide incentives for healthy behaviors [36]. From an economic perspective, managed care plans could reduce cost by focusing on high-value care, but issues arise if providers reduce the quality of care or plans reduce the risk in the pool of enrollees [35]. Clearly, more research is needed to determine if the gap in access to Medicaid managed dental care between rural and non-rural low-income adults is meaningful.

Teledentistry

Despite the well-documented issues of dental professional shortages in rural regions, as well as the proliferation of telehealth services over recent decades, a lower proportion of rural low-income adults reside in states where Medicaid covers teledentistry compared to non-rural counterparts (R = 16.81%, NR = 33.54%). Even among states covering Medicaid teledentistry there is stark variation between programs [25]. For example, certain plans only reimburse providers who receive a video consultation in conjunction with a certified provider at a designated location (i.e. dental assistant in a school or clinic), whereas some programs reimburse provider-to-patient virtual exams without another provider present. Note, this study used teledentistry data before the Covid-19 pandemic which will no doubt dramatically alter the landscape of teledentistry programs. It is expected that policy-makers will continue to revisit issues of quality and access in teledentistry for years to come.

Medicaid Waivers and State Action Plans

Rural low-income adults were less likely to live in states using Medicaid waivers or plans to adopt state Medicaid dental programs. Only five states had implemented an approved Medicaid dental waiver, which only affected 6.06% of rural low-income adults (compared to 7.38% of non-rural low-income adults). State Oral Health Action Plans, while more commonly implemented (20 states), were less likely to impact rural low-income adults than non-rural counterparts (26.70% vs 42.86%). Not only are rural low-income adults less likely to live in states adapting their Medicaid dental program by waiver or state plan, but amongst those states, rural low-income adults are less likely to be the focus of Medicaid innovation.

Table 2 – *States Using Medicaid Innovation to Transform Rural Oral Health Delivery*
[Table 2 reports the four states which implemented a Medicaid dental waiver or state plan to adapt Medicaid dental service delivery which specifically targeted rural oral health. SOHAP is "state oral health action plan"]

State	Mechanism	Goal
Idaho	1915(b) Waiver	Waiving requirement to offer multiple plan choices to rural residents and requiring MCO contractors to include out-of-network providers to rural residents further from 60 miles from the nearest dentist.
Louisiana	1915(b) Waiver	Permitting disenrollment of rural beneficiary in PAHP by MCO
New Hampshire	SOHAP	Expand technical and financial capacity of rural dental health clinics.
Pennsylvania	SOHAP	Implemented a payment methodology that allows for payment of services provided to consumers by newly-created public health mid-level dental providers when performed through Federally Qualified Health Centers (FQHCs) and Rural Health Clinics (RHCs).

Figure 2 shows the map of states adopting Medicaid efforts specifically for rural dental health. States were grouped into three categories. The thirty-six states categorized as not implementing any rural focus included states which do not cover dental services, did not implement a waiver or state plan, or states which did not acknowledge rural populations within a waiver or plan. The eleven states categorized as "Collaboration Only" implemented a dental waiver or state plan, but only indicated greater collaboration with dental colleges, rural clinics, and/or Federally Qualified Health Centers in rural settings. This left four states which specifically adapted state Medicaid dental programs for rural populations.

These four states (ID, LA, NH, PA) and details on their respective plans are shown in Table 2 [37-40]. Idaho and Louisiana both adapted their dental Medicaid programs through 1915(b) waivers, using authority provided by the 42 CFR § 438.52 - Choice of MCOs, PIHPs, PAHPs, PCCMs, and PCCM statute.21 [30] Both waivers specifically target Prepaid Ambulatory Health Plans (PAHP) and provide exceptions to support access for rural populations. Idaho, while waiving a requirement to offer multiple plans to rural populations, adds an additional requirement for managed care organizations (MCOs) to cover services at an out-of-network provider for rural beneficiaries living more than 60 miles from the nearest in-network dentist. Also targeting PAHPs, Louisiana attempts to improve access for rural populations by prohibiting MCOs from disenrolling rural beneficiaries for failing to comply with plan requirements. New Hampshire and Louisiana utilize the State Oral Health Action Plan, part of the Health and Human Services strategy, to improve rural oral health [22]. Pennsylvania attempts to accomplish this goal by modifying the prospective, fee-for-service (FFS) payment methodology to better reimburse (and hopefully attract and retain) mid-level dental providers at Rural Health Clinics (RHC). Similarly, New Hampshire attempts to improve access through RHCs by building the technical, financial, and structural capacity of RHCs.

These four states serve as potential models for other states aiming to adapt Medicaid dental programs to better serve rural low-income adults. Still, opportunities remain for all states, specifically related Medicaid MCO choice and provider regulations. Two additional authorities were not pursued by any state, within a 1915(b) waiver which could potentially increase access by automatically enrolling rural Medicaid beneficiaries into dental Medicaid Managed Care plans. Another policy approach not pursued by any state, was a waiver authority which could potentially increase rural health clinic capacity by adapting the regulatory requirements for dental providers in rural settings.

Discussion

Despite the critical need for health policies to overcome provider shortages, financial constraints, and contextual factors, rural low-income adults face considerable barriers to dental service utilization as a result of state Medicaid policy decisions. While this study found that most rural low-income adults live in states covering Medicaid dental services above emergency-only care, one-third of all rural low-income adults still lack access to dental coverage through Medicaid. In fact, this study may underestimate the proportion of rural low-income

Figure 2 – States Adapting Medicaid Dental Program to Improve Rural Oral Health

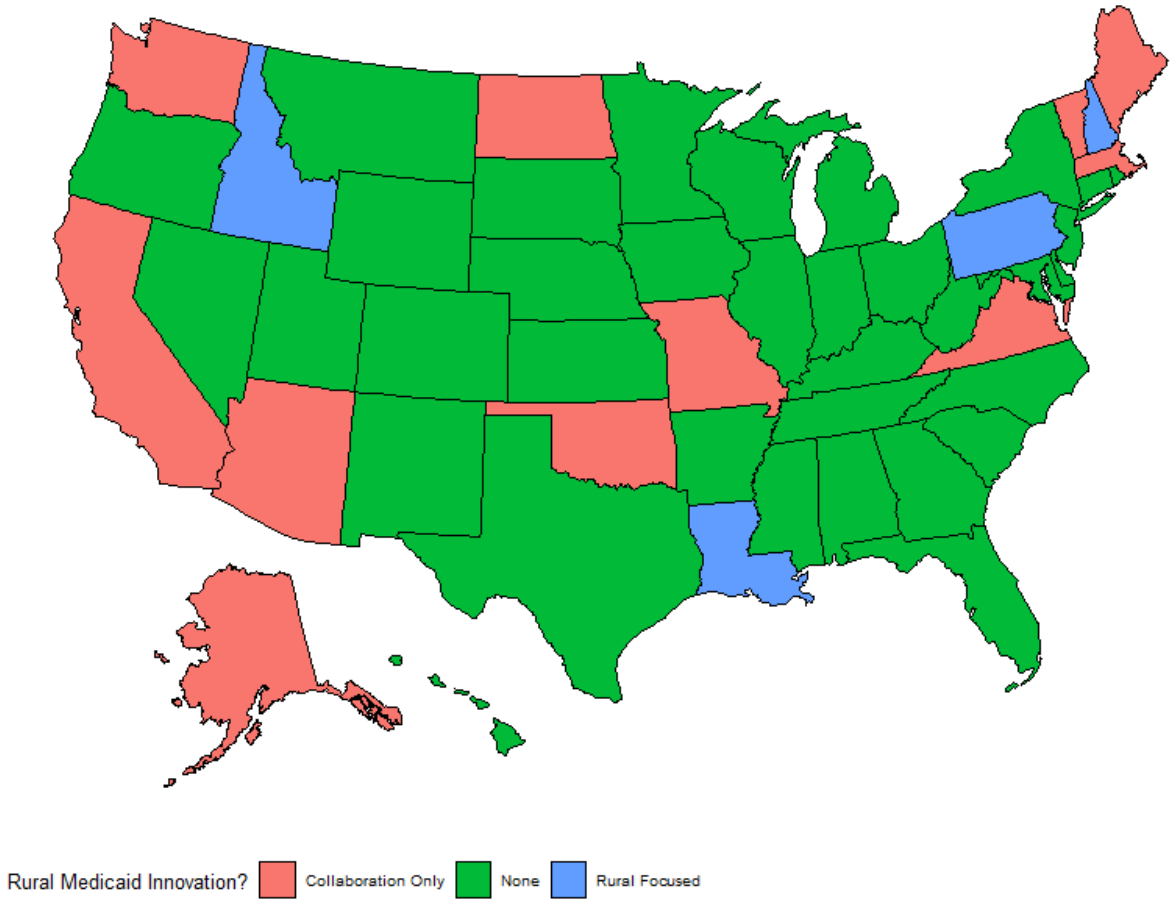

Figure 2 shows the map of states targeting Medicaid Innovation efforts specifically for rural dental health. The thirty-six states categorized as not implementing rural focused innovation included states which do not cover dental services, did not implement a waiver or state plan, or states which did not acknowledge rural populations within a waiver or plan. The eleven states categorized as "Collaboration Only" implemented a dental waiver or state plan, but only indicated greater collaboration with dental colleges, rural clinics, and/or Federally Qualified Health Centers in rural settings. This left four states which directly focused Medicaid Innovation efforts towards adapting state Medicaid dental programs for rural populations.

adults eligible for extensive services under Medicaid given that most of the states that did not expand Medicaid through the Affordable Care Act are southern states with large rural populations. Even in states that offer extensive Medicaid dental benefits to adults at 100% of the federal poverty level, rural adults are more likely to be further constrained by cost-sharing and service limits. While it may seem trivial to require a single digit copay, evidence suggests even minimal financial requirements can significantly reduce dental visits [41]. Further limiting the ability of rural low-income adults to obtain necessary dental services, service limits disproportionately impact rural Medicaid beneficiaries. This disparity is especially dire given that the service limits exist at both the preventative and recovery stages of dental care. Ironically, even as rural low-income adults are more likely than non-rural counterparts to lose all their teeth by age 65, rural beneficiaries are less likely to receive denture services through Medicaid.

The potential negative impact of these utilization controls is only further compounded by the limited reach of Medicaid policies aiming to increase the supply of providers or transform dental service delivery through comprehensive managed care or teledentistry. There is little doubt that such policies positively impact non-rural

populations. Given that the original goal of teledentistry was to make care available in places without providers, states with large rural populations who miss this policy opportunity put their rural beneficiaries at a disadvantage [42].

Finally, the limited adoption of Medicaid waivers adapting dental programs is surprising given the recent proliferation of waivers for other Medicaid programs [26]. As stated, this study found that fewer rural low-income adults live in states taking such innovative approaches. Perhaps in the coming decade, policy-makers will continue to see opportunities for and the benefits of transforming Medicaid dental programs through waivers. Nowhere is this more apparent and, arguably necessary, than for rural low-income adults who face higher rates of tooth decay and tooth loss amidst an environment of fewer providers, and as this policy found more barriers to accessing dental care.

Limitations

This study is not without its limitations. As a purely descriptive analysis, no causal claims or relationships can be drawn as no attempt was made to determine why certain states adopted such Medicaid dental policy positions. This question is left for further research. Additionally, this study was not intended, nor should it be mistaken for, a complete Medicaid dental policy scan. It should also be noted that, while this study identifies considerable variation in Medicaid policy approaches between states, there may also be variation with each policy dimension. This study only briefly discussed one such dimension, co-pays, which ranged from zero to seven dollars. While further investigating the variation within different policy dimensions lies outside the scope of this project, the reader should be highly conscious of multiple levels of variation existing for all Medicaid programs and policies. Most importantly, the policy data for this study was retrieved prior to the Covid-19 pandemic. Policy-makers at all levels of government responded quickly to the pandemic, and no doubt implemented policies which may have impacted dental services access for rural and non-rural low-income adults. The policy scan did not attempt to incorporate the rapidly changing federal and state policy landscape. Future researchers could investigate how the pandemic response may have changed policies impacting oral health.

Conclusions

When comparing dental policies across states, rural populations were less likely to live in states where Medicaid dental programs were adapted to improve access. Despite the higher need for policies responding to contextual and supply constraints limiting dental service utilization, most rural low-income adults do not reside in states implementing policies to respond to rural realities. Opportunities for improving Medicaid dental programs could begin by adapting policies to reimburse teledentistry or reimbursing dental assistants. In addition to expanding the comprehensiveness of state Medicaid managed care dental programs, states could also follow the lead of model states by adapting the programs to better fit the context of limited providers in rural regions through waivers or action plans. This study highlights opportunities for states aiming to improve rural oral health by transforming service delivery to better accommodate the reality of rural dental contexts.

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