FIGURE 1: NEBRASKA HEALTH PROFESSIONAL SHORTAGE AREAS; DENTAL CARE BY COUNTY, 2019

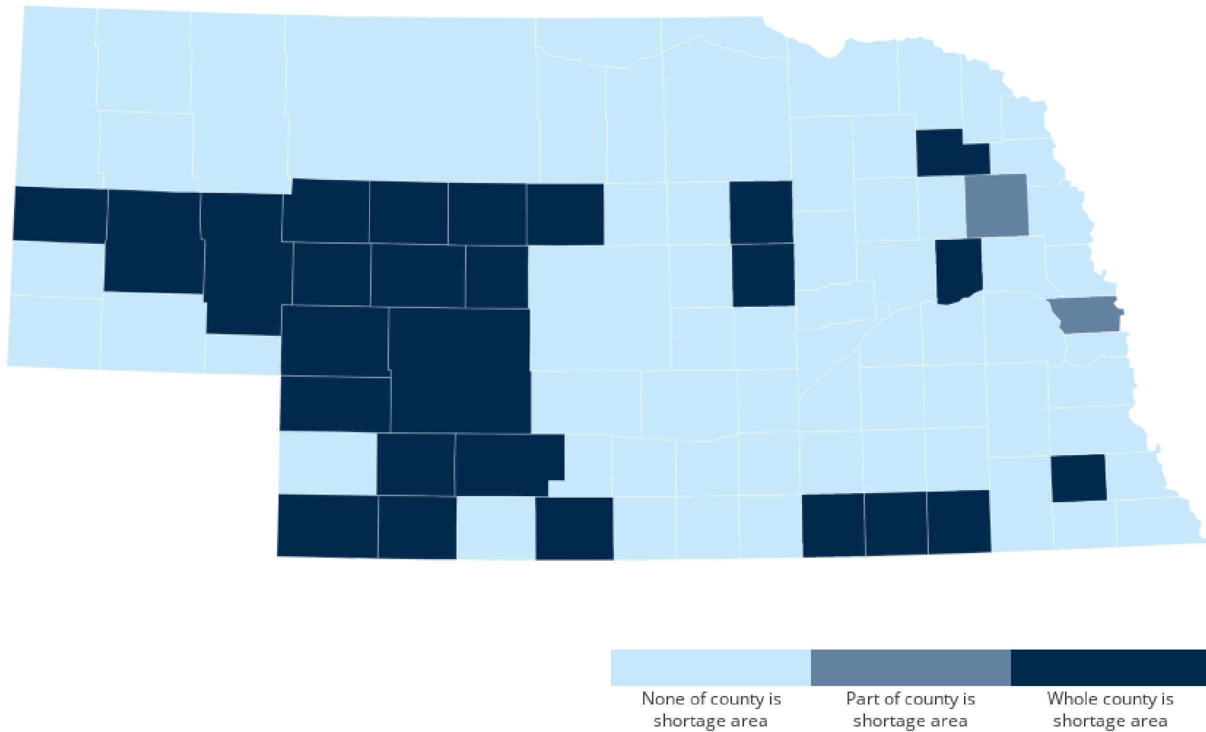
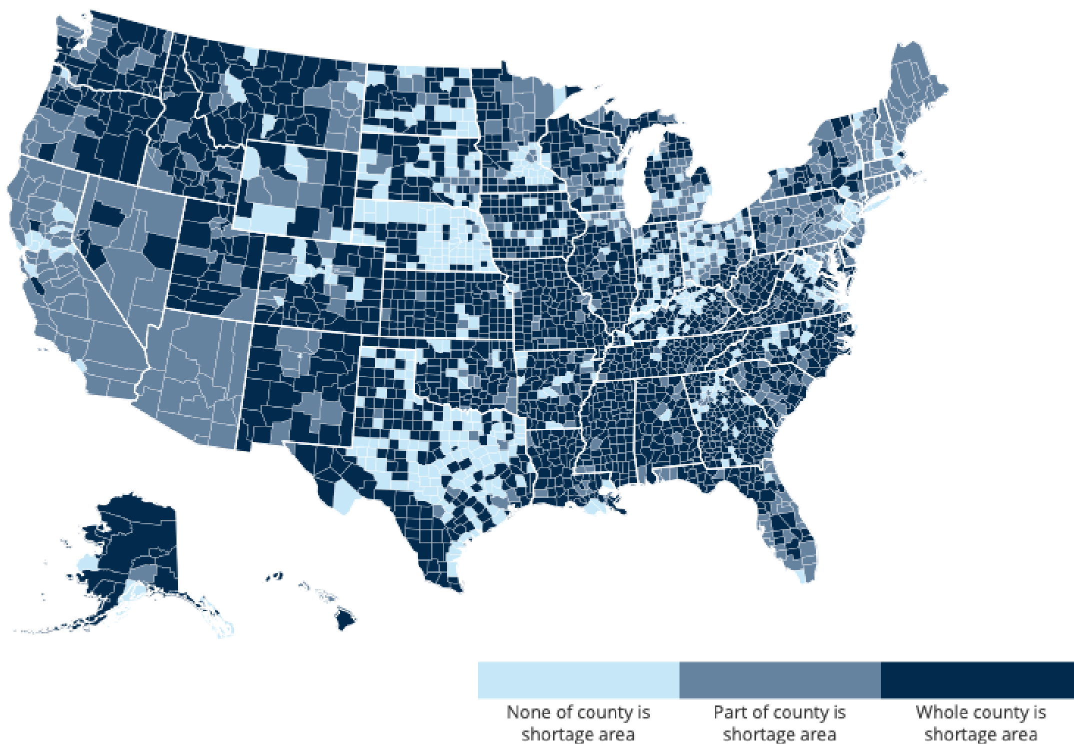


FIGURE 2: U.S. HEALTH PROFESSIONAL SHORTAGE AREAS; DENTAL CARE BY COUNTY, 2019



D. COMMUNITY INTERVENTION THROUGH FLUORIDATION

Public water fluoridation has proven to be one of the most efficient and cost effective ways to combat tooth decay and protect against oral related illnesses, especially in children.[32] Fluoride is a naturally occurring mineral, found in water, soil, and the air, and is added to toothpaste and other dental products. This mineral helps build up and maintain tooth enamel, helping to prevent tooth decay and cavities. For more than 70 years, communities have been adding fluoride to their water systems, helping to reduce the number of cavities in children and adults by nearly 25 percent.[33]

However, rural populations have less access to fluoridated water systems than their urban counterparts because the systems have shown to be cost prohibitive.[34] A study conducted by West Virginia University found that rural communities are much more likely to have inadequately fluoridated drinking water.[35,36] While 72.6 percent of the population in metropolitan counties reported access to fluoridated drinking water, only 63.3 percent of the population in rural counties had access.[37,38] A lack of fluoridated water in a community is often associated with increased cases of dental caries and periodontitis, which can lead to tooth loss and higher risk of other systemic diseases.

For millions of Americans, their rural zip codes limit their ability to get the dental care they need. From high-cost burdens, limitations imposed by Medicaid, provider shortages, and less preventative community health measures, there are disparities which rural residents, providers, and policymakers must address. With innovation, technology, and proactive policy measures, more rural Americans will be able to receive dental care services they need, and come closer to achieving total health.

IV. ADDRESSING THE LIMITATIONS OF THE CURRENT RURAL DENTAL HEALTH DELIVERY MODEL

The disparities in dental health care access in rural counties and communities across the nation, including Nebraska, are dynamic. So are efforts to combat these barriers to dental care and overall health. The state of Nebraska, legislators, providers, public health professionals, colleges, and communities have come together to bring forward solutions to address many of these limitations. Moreover, there are opportunities to replicate current programs in other areas of Nebraska as well as to draw upon the dental health access efforts that have been successfully brought forth in other states.

32 "5 Reasons Why Fluoride in Water Is Good for Communities." American Dental Association, ada.org/en/public-programs/advocating-for-the-public/fluoride-and-fluoridation/5-reasons-why-fluoride-in-water-is-good-for-communities. Accessed August 2019.

33 "Over 70 Years of Community Water Fluoridation." Center for Disease Control and Prevention, March 11, 2019, cdc.gov/fluoridation/basics/70-years.htm. Accessed August 2019.

34 Hendryx, Michael, et al. "Water Fluoridation and Dental Health Indicators in Rural and Urban Areas of the United States." West Virginia Rural Health Research Center, January 2012, ruralhealthresearch.org/mirror/4/478/2011_fluoridation_policy_brief.pdf. Accessed August 2019.

35 "5 Reasons Why Fluoride in Water Is Good for Communities." American Dental Association, ada.org/en/public-programs/advocating-for-the-public/fluoride-and-fluoridation/5-reasons-why-fluoride-in-water-is-good-for-communities. Accessed September 2019.

36 Hoadley, Jack, et al. "Health Insurance Coverage in Small Towns and Rural America: The Role of Medicaid Expansion." Georgetown University Center for Children and Families and the University of North Carolina NC Rural Health Research Program, September 2018, ccf.georgetown.edu/wp-content/uploads/2018/09/FINALHealthInsuranceCoverage_Rural_2018.pdf. Accessed August 2019.

37 "Project Dental Campaign." The Pew Charitable Trusts, pewtrusts.org/en/projects/dental-campaign. Accessed August 2019.

38 "Dental Benefits Coverage in the U.S." Health Policy Institute, American Dental Association, ada.org/~/media/ADA/Science%20and%20Research/HPI/Files/HPIgraphic_1117_3.pdf?la=en. Accessed August 2019.

A. EXPANDING THE ORAL HEALTH CARE WORKFORCE

As noted previously, there are more than 5,200 dental health provider shortage areas in the U.S., with 75 shortage areas located in Nebraska.[39] There are simply not enough dental health professionals to fill the traditional roles of dental assistants, hygienists, and dentists to meet the needs of the communities they are serving. To address issues related to dental health care access, the number of providers must increase.

One solution to increase the number of dental providers has taken the form of innovative legislation to create new, mid-level provider positions and expand the scope of practice for existing providers. The idea of a mid-level provider called a “dental therapist” in the U.S. was first introduced in 2000 as a way to address the disparity in oral health faced by American Indians and Alaska Natives.[40] Subsequently, a handful of states across the country have passed similar legislation permitting the adoption of dental therapist training and practice.

Dental therapists are defined as “mid-level practitioners responsible for providing evaluative, preventative, restorative, and minor surgical dental care within their scope of practice.”[41] The addition of dental therapy licensing expands the dental health team and, in turn, increases access to oral health care, especially for populations that are vulnerable and historically underserved.

As of August 2019, eight states, including Arizona, Connecticut, Maine, Michigan, Minnesota, Nevada, New Mexico, and Vermont, have authorized dental therapy for all dental offices. Three states have granted conditional permission in tribal areas, and nine states have indicated they are actively exploring authorization of dental therapy.[42] Minnesota was the first state to authorize the use of dental therapy in 2009, and has seen incredible success, reporting an increase in patient visits by 27 percent after one year.[43]

B. ADDITIONAL ALTERNATIVES IN LICENSURE

Dental therapy licensing is not the only route states have taken to increase the number of dental health providers and improve access to care for residents. States like Nebraska have implemented alternative approaches to expand dental teams to include mid-level or second-tier dental providers.

On March 23, 2017, Nebraska Legislative Bill 18 passed, “chang[ing] licensure and scope of practice for dental assistants and dental hygienists,” and modernizing the way dental care is administered.[44] The legislation, which took effect in 2018, created a new category of licensed dental assistants and expanded the functions that existing dental assistants and licensed dental hygienists can perform. Legislative Bill 18 effectively doubled the tasks that dental assistants are able to perform, gave licensed dental hygienists more autonomy in their work, and created job opportunities for Nebraskans in the way of a licensed dental assistant position. Table 1 on page 9 outlines the changes enacted by Legislative Bill 18.

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39 “Shortage Designation Scoring Criteria.” Health Resources and Services Administration, Bureau of Health Workforce, bhw.hrsa.gov/shortage-designation/hpsa-process. Accessed October 2019.

40 Nash, David A., and Ron J. Nagel. “A Brief History and Current Status of a Dental Therapy Initiative in the United States.” Journal of Dental Education, vol. 69, no. 8, Aug. 5, 2005, pp. 857-859.

41 “Emerging Professions.” Minnesota Department of Health, dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=SIM_Emerging_Professions. Accessed August 2019.

42 Koppelman, Jane. “States Expand the Use of Dental Therapy.” The Pew Charitable Trusts, Sept. 28, 2016, pewtrusts.org/en/research-and-analysis/articles/2016/09/28/states-expand-the-use-of-dental-therapy. Accessed August 2019.

43 Glans, Matthew. “Research & Commentary: Addressing Idaho’s Dental Health Shortage with Dental Therapy.” The Heartland Institute, Feb. 26, 2019, heartland.org/publications-resources/publications/research--commentary-addressing-idahos-dental-health-shortage-with-dental-therapy. Accessed August 2019.

44 “LB18 - Change licensure and scope of practice for dental assistants and dental hygienists.” Nebraska Legislature, March 29, 2017, nebraskalegislature.gov/bills/view_bill.php?DocumentID=30786. Accessed September 2019.

TABLE 1: NEBRASKA LEGISLATIVE BILL 18 DUTY CHART

Nebraska Legislative Bill (LB) 18			
	Dental assistant	**Licensed dental assistant [new]**	**Licensed dental hygienist**
Education	On the job trained or a graduate of a dental assisting program	High school diploma or equivalent [new]	Graduate from a dental hygiene program
		Graduate of a dental assisting program or 1,500 hours of experience [new]	Pass credentialing, practical, and jurisprudence exams
		Pass credentialing and jurisprudence exams [new]	
Duties	1. Perform coronal polishing	1. Take dental impressions for fixed prosthesis* [new]	1. Teeth cleaning, scaling, and root planning
	2. Take x-rays	2. Take dental impressions and make minor adjustments for removable prosthesis* [new]	2. Polish teeth
	3. Place topical local anethesia [new]	3. Cement prefabricated fixed prosthesis on primary teeth* [new]	3. Preliminary charting, screening
	4. Monitor nitrous oxide with current CPR [new]	4. Monitor and administer nitrous oxide analgesia* [new]	4. Brush biopsies
		5. All procedures authorized for an unlicensed dental assistant	5. Pulp vitality testing
			6. Gingival curettage
			7. Removal of sutures
			8. Application of fluorides and sealants
			9. Impressions of teeth
			10. Application of topical and subgingival agents
			11. X-rays of teeth
			12. Oral health education
			13. Interim Therapeutic Restoration* [new]
			14. Write prescriptions for mouth rinses and fluoride products* [new]
			15. Administer and titrate nitrous oxide* [new]
			16. All duties an unlicensed dental assistant may perform
Eligible for expanded function permits? [new]	No	Yes, with (1) 1,500 hours of experience, (2) course, (3) jurisprudence and credentialing exams [new]	Yes, with (1) 1,500 hours of experience, (2) course, and (3) jurisprudence and credentialing exams [new]
Expanded functions with separate permits [new]	None	(1) Restorative level one simple restorations, (2) restorative level two complex restorations, ~~and (3) complete final cementation of fixed prosthesis**~~ [new]	(1) Restorative level one simple restorations, and (2) restorative level two complex restorations [new]
KEY [new] - This would be added into law by Legislative Bill 18 * This function requires additional education ** A deletion from HHS Committee Amendment Note: Legislative Bill 18 grants the Board of Dentistry authority to approve education and testing of assistants and hygienists.			Legislative Bill 18 also increases the scope of practice for public health dental hygienists: (1) interim therapeutic restoration technique*; (2) writing prescriptions for mouth rinses and fluoride products*; (3) minor denture adjustments to adults* [new]

Reforming the licensure and scope of practice for dental hygienists and assistants increases the number of available providers while also decreasing costs. Licensed dental assistants in Nebraska, like dental therapists in other states, have helped to increase the number of dental health practitioners, and thus have helped to address the shortage of professionals in the field and provide care to those who might otherwise not have access.

C. BRINGING TELEDENTISTRY TO RURAL PLACES

In other areas of health care delivery, telehealth services have helped alleviate barriers to care for rural residents by expanding access to screening and follow-up visits, opening doors to remote specialty care providers, and eliminating the need to travel long distances. Used primarily for general and mental health services, the technology has revolutionized how individuals who are unable to access traditional means of health care can obtain care in a way that is most practical for them.

More recently, dentistry has been added to the health care professions that utilize telehealth technologies. Teledentistry is defined as "the remote provision of dental care, advice, or treatment through the medium of information technology, rather than through direct personal contact with any patient(s) involved."[45] While its use has been limited, teledentistry has proven to have incredible benefits for rural America.

1. EXPANDING TELEDENTISTRY'S REACH THROUGH POLICY

Although teledentistry is a relatively new health care delivery mode, the University of Nebraska Medical Center's College of Dentistry has been a leader and innovator in the practice for more than a decade. The College of Dentistry has used teledentistry both to provide care in dental shortage areas and as a teaching tool between dental students located in rural areas and faculty on campus. As of 2013, seven teledentistry sites were established in rural communities, including Ainsworth, Burwell, Chadron, Columbus, Gering, Macy, and Norfolk.[46] This effort compliments the University of Nebraska Medical Center's Rural Health Opportunities Program, where students are guaranteed admission to their designated University of Nebraska Medical Center program, like dentistry, upon completing their prerequisite degree at a state college. The program is designed to recruit rural students into the health professions, with the intention of such students returning to rural areas to practice.

Moreover, teledentistry is utilized interprofessionally within the Omaha Public Schools system in Nebraska providing dental screenings in their eight School-Based Health Centers and with school nurses within the system.[47] The School-Based Health Centers are operated by the Charles Drew Health Center and One World Community Health Center, both Omaha-based Federally Qualified Health Centers.

Despite this innovative approach to dental care delivery, the University of Nebraska Medical Center is the only known dental provider using teledentistry in the state of Nebraska.[48] Barriers exist to the utilization of teledentistry, including the lack of reimbursement for services for Medicaid patients, as well as its omission from the Nebraska Dentistry Practice Act. Policy revisions would help bring clarity to and likely expand the use of teledentistry services in the state, while simultaneously expanding dental services for rural residents.

A number of states have incorporated provisions for the use of teledentistry into statute. Arizona, California, Colorado, Georgia, Minnesota, Oregon, and Washington have adopted policies to allow for the reimbursement of teledentistry services to Medicaid patients.

45 Khan, Saad Ahmed, and Omar Hanan. "Teledentistry in Practice: Literature Review." Telemedicine and e-Health, vol. 19, no. 7, July 9, 2013, pp. 565–567, doi: 10.1089/tmj.2012.0200. Accessed August 2019.

46 Reinhardt, John, and Kimbery McFarland. "Strategies for Strengthening the Great Plains Oral Health Workforce." Great Plains Studies, Center for Social Sciences, University of Nebraska-Lincoln, 2013, digitalcommons.unl.edu/cgi/viewcontent.cgi?article=2272&context=greatplainsresearch. Accessed August 2019.

47 Trewet-Sloop, Tami, RDH, BS, PHRDH. Personal email interview. Sept. 3, 2019.

48 Ibid.

To effectively implement and integrate teledentistry (and telehealth as a whole) into practice is the necessity of high-speed and dependable broadband service, which many rural areas continue to lack. Nationally, 63 percent of rural residents have broadband service in their homes, compared to 75 percent nationwide.[49] The foundation on which teledentistry lies is reliable internet access, and unfortunately for many rural areas, this puts them at a disadvantage as they are not able to access teledentistry technologies. In 18 of Nebraska's 93 counties, 5 percent or less of the population has access to broadband.[50]

While measures in the state legislature are being considered to expand broadband services, the bottom line is if patients and dental health care providers do not have access to high-speed internet, teledentistry is not a viable option to address the disparities in access to rural dental health care.

Each of these states, with the exception of Georgia, expanded Medicaid. Tennessee statute defines teledentistry and allows for its use for initial and subsequent examinations.[51]

The impacts and outcomes of teledentistry (and broadly telemedicine) vary by community, but can take the form of eliminated transportation costs for traveling health care providers, a decrease in time needed for patients to take off work and the loss of wages that result from not working, improved patient outcomes, and an increase in patients with access to care, among others.[52] Rural dental providers that use teleconsultation can additionally retain revenue when providers at those offices are able to treat patients in a local facility instead of transferring them to an emergency or specialty care facility. Teledentistry provides an invaluable service to those in rural areas. The focus now must be overcoming barriers to implementation so Americans can reap the benefits.

D. EDUCATING THE NEXT GENERATION OF DENTAL HEALTH PROFESSIONALS

Perhaps the most proactive approach to closing the gap in access to dental care for Americans takes place not in a dental office but instead in the classroom. Colleges and universities across the country have worked for decades to counteract the shortage of dental professionals in rural areas by providing students a chance to work in rural, underserved areas through externships or loan reimbursement programs.

Programs to draw rural students to the dental profession exist within Nebraska's college systems. Some programs offer lower cost, accelerated degrees and incentivize working in the oral health field in rural communities. While effective models exist, programs like the Dental Hygiene Associate of Applied Science Degree at Central Community College need to be replicated at other colleges and recognized by

49 Perrin, Andrew. "Digital Gap Between Rural and Nonrural America Persists." Pew Research Center, May 31, 2019, pewresearch.org/fact-tank/2019/05/31/digital-gap-between-rural-and-nonrural-america-persists/. Accessed August 2019.

50 Hladik, Johnathan. "Broadband Is a Basic Service for All Nebraskans." Center for Rural Affairs, Feb. 7, 2019, cfra.org/news/190207/broadband-basic-service-all-nebraskans. Accessed September 2019.

51 "Current State Laws and Reimbursement Policies." Public Health Institute, Center for Connected Health Policy, cchpca.org/telehealth-policy/current-state-laws-and-reimbursement-policies?keyword=teledentistry. Accessed August 2019.

52 "Telehealth Use in Rural Healthcare." Rural Health Information Hub, March 26, 2019, ruralhealthinfo.org/topics/telehealth#financial-impact. Accessed July 2019.

state policymakers as a proactive approach to closing the gap in dental health providers.

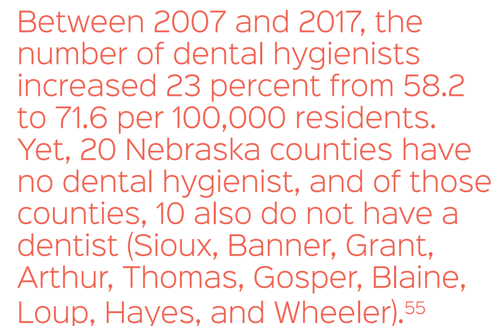
The Central Community College Dental Hygiene Applied Science Degree program was established in 1977. The only program of its kind in Nebraska, it provides students with a faster, less expensive alternative to a traditional Bachelor of Science in Dental Hygiene degree. Students at Central Community College are exposed to the field of dental hygiene through a mix of classroom, laboratory, and clinical assignments while gaining experience through work in the college's dental hygiene clinic. The clinic is open to the public to get the care they need at a discounted price.

The three-year program based in Hastings, Nebraska, provides students with the education and credentials needed to sit for the national and regional exams to become a registered dental hygienist.[53] Fifteen students are admitted to the program annually, and there is a two-year waiting list for admission.

In addition to classroom and clinical work, Central Community College dental hygiene students participate in an outreach program and travel with faculty to schools in surrounding counties to offer free preventative screenings to students each spring. An estimated 4,000 area elementary students in rural schools were screened in 2019. Many of these schools served are located within counties with Dental Health Professional Shortage Areas, and often the children screened would otherwise not have access to quality preventative care. Dental hygiene students provide topical fluoride and sealants, and work to educate elementary students and their parents on effective dental hygiene practices and how to prevent future issues from arising.[54] These hands-on training opportunities in the communities where students call home have become an effective way of demonstrating the need in these locations and have helped attract students back to these areas following the completion of their degree.

Programs like those offered by Central Community College have made strides in closing the gap of dental health professionals in the state of Nebraska.

The work that Central Community College and other institutions across the country are doing is imperative to alleviating the shortage of dental health professionals in many rural areas. However, shortages continue to exist, and there is still much work to be done. Expansion of and support from states for these types of programs and degrees are crucial to ensure Americans are able to have their oral health needs met in a timely and financially feasible manner, no matter where they live.



53 "Dental Hygiene AAS Degree Plan of Study—Full-Time." Central Community College, catalog.cccneb.edu/preview_program.php?catoid=37&poid=12397. Accessed July 2019.

54 Cloet, Wanda, and Deb Schardt. Personal interview. June 18, 2019.

55 Wilson, Fernando A., et al. "The Status of the Helathcare Workforce in the State of Nebraska." University of Nebraska Medical Center, February 2018, unmc.edu/publichealth/hpts/news/The-Status-of-the-Healthcare-Workforce-in-the-State-of-Nebraska-February-2018.pdf. Accessed August 2019.

V. CONCLUSION

A shortage in dental health care providers, financial barriers, the inability or unwillingness of providers to treat Medicaid patients, and limitations to dental health literacy are only a few of the factors keeping individuals in rural communities from accessing and utilizing adequate oral health care.

To improve dental health care delivery in Nebraska and other rural states, one must first recognize that oral and general health cannot be interpreted as separate entities. Instead, they must be acknowledged as aggregate components of overall health and integrated into the broader scope of health care practice and delivery.

The second step is acknowledging that disparities in oral health access in rural communities cannot be solved with one solution. Leveraging the current dental health workforce in a more efficient way, working to create more provider positions, investing in local programs that focus on preventative care, and improving oral literacy in at-risk populations are certainly steps in the right direction. However, there is more work to be done. Tackling the complexities that Medicaid, reimbursement rates, and the incoming expansion population will bring to the oral health field in the coming years will be necessary. And, overall improvement in cost structures and insurance coverage will be an essential part of future efforts to ensure rural Americans have access to affordable and high-quality oral health care.

Improving access to dental health care and the status of oral health in rural America cannot be achieved with one policy or program, but will require lawmakers, health care professionals, and advocates to overcome the current disparities in dental care and health. That is something all rural residents can smile about.

ABOUT THE CENTER FOR RURAL AFFAIRS

Established in 1973, the Center for Rural Affairs is a private, nonprofit organization with a mission to establish strong rural communities, social and economic justice, environmental stewardship, and genuine opportunity for all while engaging people in decisions that affect the quality of their lives and the future of their communities. This institution is an equal opportunity provider and employer.