



# IMPROVING ACCESS TO CARE IN UNDERSERVED RURAL COMMUNITIES

Eighteenth Annual Report to the Secretary of the U.S.  
Department of Health and Human Services and the  
U.S. Congress

Advisory Committee on Training in Primary Care  
Medicine and Dentistry

November 2021

# **Advisory Committee on Training in Primary Care Medicine and Dentistry (ACTPCMD)**

---

## **Improving Access to Care in Underserved Rural Communities**

---

### **Eighteenth Annual Report to the Secretary of the U.S. Department of Health and Human Services and the U.S. Congress**

**November 2021**



The views expressed in this report are solely those of the Advisory Committee on Training in Primary Care Medicine and Dentistry and do not represent the perspectives of the Health Resources and Services Administration nor the United States Government.

## Table of Contents

|  |    |
|--|----|
| Authority .....  | 3  |
| Committee Members.....   | 4  |
| Federal Staff.....   | 6  |
| Acknowledgements.....  | 7  |
| Recommendations.....   | 8  |
| Incorporating Longitudinal Clinical Training in Rural Primary Care.....                  | 8  |
| Integrating Oral and Behavioral Health in Primary Care:.....                             | 8  |
| Enhancing the Capacity of Telehealth.....  | 8  |
| Supporting Interprofessional Team-based Education and Practice in Maternal–Infant Care . | 8  |
| Executive Summary .....  | 10 |
| Strengthening Primary Health Care in the United States .....                             | 10 |
| Impact of the COVID-19 Pandemic .....  | 11 |
| Recommendations—Background .....   | 12 |
| Conclusion .....   | 24 |
| References.....  | 26 |
| Definitions .....  | 33 |

## **Authority**

The Advisory Committee on Training in Primary Care Medicine and Dentistry (ACTPCMD) is a Federal advisory committee under the auspices of the Health Resources and Services Administration (HRSA), an agency of the U.S. Department of Health and Human Services (HHS). HRSA is the primary Federal agency for improving access to health care by strengthening the health care workforce, building healthy communities, and achieving health equity. The ACTPCMD is authorized by sections 222 and 749 of the Public Health Service Act (PHSA) (42 U.S.C. §§ 271a, 749), as amended by section 5303 of the Patient Protection and Affordable Care Act (ACA). The ACTPCMD was established under the authority of section 748 of the 1998 Health Professions Education Partnerships Act. The ACTPCMD provides advice and recommendations on policy and program development to the Secretary of the U.S. Department of Health and Human Services (Secretary) and is responsible for submitting an annual report to the Secretary and to Congress concerning the activities under sections 747 and 748 of the PHSA, as amended. Reports are submitted to the Committee on Health, Education, Labor, and Pensions of the Senate and the Committee on Energy and Commerce of the House of Representatives. In addition, the ACTPCMD develops, publishes, and implements performance measures and longitudinal evaluations, as well as recommends appropriations levels for programs under Part C of Title VII of the PHSA, as amended.

## Committee Members

### Chair

#### **Anita Duhl Glicker, MSW**

Executive Director  
National Interprofessional Initiative on Oral  
Health  
Professor and Associate Dean Emerita  
University of Colorado Anschutz Medical  
Campus  
Aurora, CO

### Vice Chair

#### **Sandra M. Snyder, DO**

Program Director  
Family Medicine Residency  
Cleveland Clinic  
Lakewood, OH

#### **Jane E. Carreiro, DO**

Vice President for Health Affairs  
Dean, College of Osteopathic Medicine  
University of New England  
Biddeford, ME

#### **Nancy W. Dickey, MD**

President Emeritus, Health Science Center  
Executive Director, A&M Rural and  
Community Health Institute  
Professor and Head, Department of Primary  
Care Medicine  
Texas A&M University  
College Station, TX

#### **Jeffery Hicks, DDS**

Professor of Dentistry  
University of Texas Health San Antonio  
University of Texas  
San Antonio, TX

#### **Geoffrey Hoffa, DHSc, PA-C**

Principal  
Geoffrey W. Hoffa, PLLC  
Phoenix, AZ

#### **Michael J. Huckabee, MPAS, PA-C, PhD**

Director, Physician Assistant Program  
Associate Professor  
Senior Associate Consultant-II  
Mayo Clinic School of Health Sciences  
Mayo Clinic  
Rochester, MN

#### **Cara Lichtenstein, MD, MPH**

Associate Professor of Pediatrics,  
The George Washington School of Medicine  
and Health Sciences  
Attending Physician, Children's National  
Hospital  
Washington, DC

#### **Anne E. Musser, DO**

Medical Director  
Alaska Native Tribal Health Consortium  
Community Health Aide Program  
Anchorage, AK

#### **Pamela R. Patton, PA, MSP, DFAAPA**

William M. Hall Associate Professor  
Director of Admissions  
School of Physician Assistant Studies  
University of Florida  
Gainesville, FL

#### **Kim Butler Perry, DDS, MSCS, FACD**

Distinguished NIH Clinical Translational  
Research Scholar  
Associate Professor  
Associate Vice President  
University Strategic Partnerships  
A.T. Still University  
Mesa, AZ  
93rd President, National Dental Association

**F. David Schneider, MD, MSPH**  
Chair, Family and Community Medicine  
University of Texas Southwestern Medical  
Center  
Dallas, TX

**Mark D. Schwartz, MD**  
Professor and Vice Chair  
Department of Population Health  
NYU School of Medicine  
New York, NY

**Jason M. Spangler, MD, MPH**  
Executive Director  
Amgen  
Washington, DC

**Wanda H. Thomas, MD, FAAP**  
Associate Professor  
Department of Pediatrics  
Pediatric Hospitalist  
AHEC Program Director  
Louisiana State University Health  
Shreveport, LA

**Louise T. Veselicky, DDS, MDS**  
Associate Vice President for Academic  
Affairs  
West Virginia Health Sciences Center  
Morgantown, WV

## **Federal Staff**

### **Shane Rogers**

Designated Federal Official  
Division of Medicine and Dentistry  
Bureau of Health Workforce  
Health Resources and Services Administration

### **Jennifer Holtzman, DDS, MPH**

Subject Matter Expert  
Dental Officer  
Bureau of Health Workforce  
Health Resources and Services Administration

## Acknowledgements

The members of the Committee express appreciation to everyone who made presentations at Committee meetings for their time and expertise. Special thanks to: Thomas Tsai, MD, MPH; Alan Morgan, MPA; Howard Straker, PA-C, EdD, MPH; Russell Maier, MD, FAAFP; Charles Moore, MD, FAACP; Clese Erikson, MPAff; and Caswell Evans, DDS, MPH. Each of their presentations played a critical role in the preparation of this report. The Committee also extends their gratitude and appreciation to colleagues and fellow members who contributed to the writing of this report: Anita Glicken, MSW; Sandra Snyder, DO; Jeffrey Hicks, DDS; Michael Huckabee, MPAS, PA-C, PhD; Kim Butler Perry, DDS, MSCS, FACD; and Mark Schwartz, MD. Finally, this report has benefited from the capable assistance of staff from HRSA, Bureau of Health Workforce (BHW): Shane Rogers, Designated Federal Official; and Jennifer Holtzman, DDS, MPH. The Committee deeply appreciates the hard work and dedication of these individuals in producing this report.

Sincerely,

*Anita Glicken*

Anita Duhl Glicken, MSW  
Chair, ACTPCMD



## Recommendations

### **Recommendation 1: Incorporating Longitudinal Clinical Training in Rural Primary Care.**

Congress should increase funding to Title VII, Section 747 and 748, programs to increase the number of longitudinal\*<sup>1</sup> primary care rotations and post-graduate residency programs providing training in underserved rural communities with an emphasis on accessible, comprehensive, equitable, and age-friendly\* care.

#### ***Rationale***

Longitudinal integrated primary care training enables trainees to establish enduring connections and professional and personal relationships, which support workforce retention and rural practice. Providing training opportunities in rural communities increases the likelihood that trainees will continue to practice in these communities following completion of their training.

**Recommendation 2: Integrating Oral and Behavioral Health in Primary Care.** Congress should increase funding to the Title VII, Section 747 and 748, programs to integrate oral and behavioral health into primary care training to support interprofessional team-based training and practice that addresses the needs of medically complex\* patients, including those facing racial and ethnic inequity in underserved rural communities.

#### ***Rationale***

Interprofessional primary care\* training that includes oral and behavioral health can better equip the workforce to meet the needs of rural communities. Integrated oral and behavioral health training increases understanding of the oral-systemic connection and encourages teams to work together to address the needs of complex patients suffering from chronic disease and environmental challenges due to the social determinants of health.

**Recommendation 3: Enhancing Telehealth Capacity.** Congress should increase funding for Title VII, Section 747 and 748, programs to build and enhance telehealth\* capacity of primary care training programs to use clinical telehealth technologies for telemonitoring, remote interprofessional collaborative care, shared patient management, and telementoring in underserved rural communities.

#### ***Rationale***

Telehealth technology has become an important resource, increasing health care access in rural areas. Primary care training that integrates innovative telehealth strategies, including teledentistry, can enable future providers and their patients to overcome barriers to care related to time and distance, and increase opportunities for patient education, consultation, collaboration, and shared care management.

**Recommendation 4: Supporting Interprofessional Team-based Education and Practice in Maternal-Infant Care.** Congress should increase funding for Title VII, Section 747 and 748, programs to support interprofessional team-based education and practice that incorporates oral

---

1. Definitions of terms marked with an \* can be found at the end of the document.

health and a life course\* approach to proactively address disparities in maternal and infant health outcomes in underserved rural communities.

***Rationale***

Rural areas often rely on family medicine physicians working with other primary care clinicians to provide maternal-infant care. Training future providers to collaborate across interprofessional teams using a life course approach prioritizes prevention, enhances protective factors, and helps minimize developmental and structural risk factors to improve long-term maternal and child health outcomes.

## Executive Summary

### **Strengthening Primary Health Care in the United States**

Primary health care serves a common good by improving the health of the populace, as stated in a report issued by the National Academies of Sciences, Engineering, and Medicine (2021). Primary care is foundational to efficient health care delivery and it is the only health care component where an increased supply is associated with better and more equitable population health outcomes. However, it requires substantial investment, along with societal and political support, to counter prevalent incentives toward a more fragmented, proceduralist, and subspecialist-oriented health care system.

Access to high quality primary care services is grossly unequal, with a particular disparity between rural and urban areas of the country. One in five Americans or approximately 60 million people live in a rural areas (U.S. Census Bureau, 2017). Rural communities differ from urban ones in age, income, and health status (Hoffman & Holmes, 2017; Schroeder & Rural Health Research Gateway, 2018). By many measures, rural residents have significantly worse health outcomes than their urban counterparts, including higher rates of chronic conditions such as hypertension, cancer, and diabetes, and higher rates of mortality from heart disease, respiratory disease, cancer, stroke, unintentional injury, and suicide (Kozhimannil et al., 2019; Moy et al., 2017).

To achieve better health outcomes across all areas of the United States, the primary care system requires a sufficient health workforce trained to meet community needs and to work at the top of their skillset and scope of practice within interprofessional teams. However, a major contributing factor to disparities in access is a chronic shortage of health care professionals, including physicians, dentists, physician assistants (PAs), nurses and nurse practitioners, pharmacists, and other primary care clinicians who train, practice, and live in rural areas (Iglehart, 2018). Almost 70% of the HRSA-identified primary medical health professional shortage areas (HPSAs) are located in rural or partially rural areas.

In addition, separate training and practice settings are ingrained into the cultures of medicine, nursing, dentistry, and behavioral health. Interprofessional teams and practices improve health outcomes (IOM, 2001, 2015), however, clinicians remain largely siloed in training and practice, limiting opportunities for joint learning experiences and collaboration.

Increasing access to comprehensive primary care delivered by interprofessional teams would be a significant step toward improving health equity\*, reducing health disparities, and ensuring that care is available and accessible to every individual, family, and community when needed. The recommendations in this 18th report of the ACTPCMD aim to advance health equity through enhanced support of primary care workforce training to address health barriers in rural and other underserved communities.

## Impact of the COVID-19 Pandemic

This report on primary care was developed within the context of an evolving public health crisis that has amplified the pervasive inequities of a siloed health care system. Over the last two years, the COVID-19 pandemic has shined a spotlight on weaknesses and pervasive challenges in the primary care system that have varying impacts on communities and individuals, especially those of color, those living in or near poverty, the homeless, and other minority, or underserved populations. As a result, the pandemic has exacerbated health disparities. In rural communities already suffering from long-standing health and social inequities many rural residents are at increased risk of getting COVID-19 or severe illness (MMWR, 2020) at a time when rural hospitals and practices have experienced an accelerated rate of closure (Kaufman et al., 2016).

The pandemic has been a major disruptive force, transforming the way we work together across our health care system and communities. Our “new normal” has forced us to recognize that in addition to the acute care provided today, we will soon face a tsunami of need for future care due to delayed or missed preventive visits, increasing mental health needs, and a growing population suffering from chronic illness precipitated by sequelae of COVID-19. Health centers, the backbone of the primary care safety net, served roughly 28 million patients in 2020, of which 90% are low income and 63% are racial/ethnic minorities. However, these centers faced almost 2,000 temporary closures as of May 2020 and reported a 43% drop in patient visits overall, limiting access to essential primary care service for disadvantaged populations.

In rural communities, COVID-19 has exacerbated preexisting health inequities including a decrease in life expectancies, workforce shortages, and hospital closures, putting residents at increased risk of getting COVID-19 or severe illness. Community-based public health approaches seek to address some of these issues; however, accessible comprehensive care remains unattainable for much of the population. Sufficient investment in a primary care workforce, collaborating with public and community health, has the potential to mitigate inequities and associated health disparities. To ensure equitable access to care and reduce health disparities in rural and other underserved communities it is vital that HRSA increase Title VII funding to prepare trainees to work in evolving integrated care models, providing team-based primary care focused on prevention, value, and population health.

ACTPCMD recommendations include:

1. Advancing strategies for recruitment and retention of primary care workforce through longitudinal training of clinicians in rural communities.
2. Integrating oral and behavioral health into primary care training to support interprofessional teams to increase access to preventive care, and more effectively meet the needs of medically complex patients.
3. Building and enhancing telehealth capacity in primary care programs to prepare students, trainees, and faculty to use clinical telehealth technologies that extend access.
4. Supporting interprofessional team-based education and practice that incorporates oral and mental health and a life-course approach to proactively address health disparities in maternal and infant health outcomes.

## Recommendations—Background

### **Recommendation 1: Incorporating Longitudinal Clinical Training in Rural Primary Care**

Congress should increase funding to Title VII, Section 747 and 748, programs to increase the number of longitudinal\*<sup>2</sup> primary care rotations and post-graduate residency programs providing training in underserved rural communities with an emphasis on accessible, comprehensive, equitable, and age-friendly\* care.

#### ***Rationale***

Longitudinal integrated primary care training enables trainees to establish enduring connections and professional and personal relationships, which supports workforce retention and rural practice. Providing training opportunities in rural communities increases the likelihood that trainees will continue to practice in these communities following completion of their training.

#### ***Background***

A vital rural community depends on the health of its population and their ability to access primary care. Yet, rural communities are particularly challenged to recruit and retain critical primary healthcare workforce. As of March 2021, 61% of Primary Care Health Professional Shortage Areas (HPSAs) were in rural areas (HRSA,2021). Similarly, 63% of dental HPSAs are in rural areas, where preventive dental care visits are lower than those in urban areas (Cha & Cohen, 2021; HRSA, 2021). Studies indicate that trainees often choose to practice near where they trained (Patterson, 2016).

Although unfunded, the Affordable Care Act (ACA) included a recommendation to fund new rural physician training grants, recognizing that these programs to support rural-focused training, recruitment, and graduate students most likely to practice in underserved rural communities (RTT Collaborative, 2021b). Currently only nine schools of medicine are located in a rural community and forty-two medical schools have a rural program for a select number of students, ranging from four to sixty (RTT Collaborative, 2021). Of the current 729 family medicine residencies, 7% are active rural programs (AAFP, 2021) and less than 5% of the 600 Accreditation Council for Graduate Medical Education (ACGME) programs are in rural communities (ACGME, 2021; Residency Programs List, 2021; RTT Collaborative, 2021a).

While the number of new medical schools has increased, as has the class size of the existing schools, the number of medical students who express an interest in practicing in rural communities has fallen (Shipman, 2019). Studies indicate that students from rural backgrounds are more likely to practice in rural communities, however, less than 5% of new medical students come from rural backgrounds (Shipman, 2019). Rural populations are growing, reversing the trend of population loss (Cromartie et al., 2020), accelerating the need to implement new strategies to recruit and retain a sufficient number of primary care clinicians to address rural population health care needs.

---

<sup>2</sup> Definitions of terms marked with an \* can be found at the end of the document.

Primary care post-graduate experiences improve clinician recruitment to rural communities. Several studies show that rural education and training opportunities increase the likelihood that students and trainees will continue to practice in these communities following graduation (Abid et al., 2020; Farmer et al., 2015; Holst, 2020; Melo et al., 2014; Meyers et al., 2020; Orzanco et al., 2011). Shannon et al., (2016) found that that trainees from rural backgrounds and urban trainees experiencing rural community-based rotations were more likely to indicate an intention to practice in rural communities.

Longitudinal integrated primary care training models, including rural primary care clinical rotations, residency programs, and fellowships, can allow students and trainees to establish enduring connections through professional and personal relationships and community engagement. Rural training programs work to foster connections between providers and the communities they serve, which is critical for a successful rural placement (Jaret, 2020; Wittick et al., 2018). Longitudinal rotations may make it easier for individuals from rural communities to return to their community for a portion of their educational training. In addition, they provide an environment for learners to gain vital experience in managing chronic diseases (diabetes, hypertension, cardiovascular disease) and the unique challenges, needs, and social determinants of health that affect health outcomes of rural residents (Fraher & Brandt, 2019).

Physician-patient concordance can contribute to health outcomes (Shen et al., 2018). Though less racially and ethnically diverse than urban areas, approximately 22% of the rural population is comprised of racial and ethnic minorities (Castillo & Cromartie, 2020). However, less than 0.5% of new medical students are racial/ethnic minorities with rural backgrounds (Shipman et al., 2019). Rural longitudinal primary care experiences that include diversity, inclusion, and bias training may help address these structural challenges to obtaining accessible, comprehensive, equitable, and age-friendly care.

### Exemplars

1. **The University of Colorado Longitudinal Rural Curriculum.** Students in the Rural Program spend the year at dispersed sites in one rural Colorado community or several neighboring towns. Students have extensive opportunities for hands-on experiences and participation in procedures. PA Program rural track students are integrated into team-based rural training experiences. <https://medschool.cuanschutz.edu/education/current-students/curriculum/longitudinal-curriculum/tracks/rural-program>
2. **The Family Medicine Residency of Idaho** trains broad-spectrum family medicine physicians to work in underserved and rural areas of Idaho through a high-quality, affordable care in a collaborative work environment. <https://www.integratedcarenews.com/sites/family-medicine-residency-of-idaho/>
3. **COMPADRE**, a multifaceted program at the UC Davis Health School of Medicine, aims to reduce health disparities by transforming the physician workforce—to be better prepared, more equitably distributed, and more deeply connected to underserved communities. More specifically, the goals of COMPADRE are to: 1) fundamentally change how learners are selected into undergraduate medical education (UME) and graduate medical education

(GME); 2) redesign the UME to GME transition, so learners gain first-hand experience in their future clinical learning environments; 3) better prepare residents to care for populations in under-resourced settings; 4) enhance well-being by nurturing meaningful longitudinal relationships within a thriving learning community; and 5) reduce regional health disparities. <https://www.learncompadre.com/>

4. **A.T. Still University's primary model of providing clinical education for medical, dental, and PA students in urban and rural teaching health centers** offers primary continuity of care to vulnerable populations through a longitudinal primary care teaching health center model for students, trainees, faculty, and other healthcare professionals. [A.T. Still/Rural Teaching for workforce sustainability and improved population health teaching Health Centers.](#)
5. **Expansion of Physician Assistant Training (EPAT) grants from HRSA across 2011-2016** led to increased deployment of PAs at graduation to primary care specialties at a rate that was 2.5 times higher than the national average. The primary care deployment was durable for several years post-graduation. The EPAT grants funded programs that graduated over 140 PA graduates who immediately practiced in medically underserved areas. The funding supported a more racially and ethnically diverse student population and a higher number of students from rural areas than the national average of PA students (Rolls, Lessard, Smith, & Keahey, 2021).

## **Recommendation 2: Integrating Oral and Behavioral Health in Primary Care**

Congress should increase funding to the Title VII, Section 747 and 748, programs to integrate oral and behavioral health into primary care\* training to support interprofessional team-based training and practice that addresses the needs of medically complex\* patients, including those facing racial and ethnic inequities in underserved rural communities.

### ***Rationale***

Interprofessional primary care training that includes oral and behavioral health can better equip the workforce to meet the needs of rural communities. Integrated oral and behavioral health training increases understanding of the oral-systemic connection and encourages teams to work together to address the needs of complex patients suffering from chronic disease and environmental challenges due to the social determinants of health.

### ***Background***

Rural communities are especially in need of increased access to oral and behavioral health care. Nearly one in four rural residents is at least 65 years old and many are medically compromised due to one or more chronic diseases. Goodell and colleagues (2011) showed that mental and chronic medical disorders are risk factors for each other, yet many rural areas have been designated as mental health HPSAs. Similarly, effective oral health care also fails to reach the populations with the highest burden of oral disease, including those in rural America.

Rural adults are more likely to have untreated dental disease, be missing some or all their teeth, and are more likely than their non-rural peers to have received no recent dental care (Braswell & Johnson, 2013; Fish-Parcham et al., 2019). In *Improving Oral Health Care Services in Rural America* (HRSA, 2018) barriers to adequate oral health care included: acute provider shortages, geographic isolation, lack of adequate transportation, higher rate of poverty compared to metro areas, large elderly populations, lack of fluoridated community water, and poor oral health education.

Poor oral health is an independent risk factor for multiple chronic conditions and can aggravate chronic health conditions. Atchison et al. (2018, p.2) conclude, “a siloed dental profession cannot solve people’s oral health problems alone, nor can the medical profession solve general health problems alone.” The lack of collaborative training of physicians and dentists is an important, missed opportunity for meeting the public’s health needs. Skillman et al. (2010) called for increasing the capacity and flexibility of the health workforce, tailoring approaches for rural communities, and creating new roles for providers.

In addition, rural individuals face unique challenges when attempting to address behavioral health and mental health conditions, including seeking care for substance use and opioid use disorders, depression, anxiety, and post-traumatic stress. In rural communities, shortages of mental health providers results in 60% of mental healthcare visits delivered through a primary care provider. Without appropriate integration of mental health services and/or sufficient primary care training, clinicians may not provide the specific treatment necessary for individuals with a mental health condition (National Rural Health Association, 2021).



The National Council for Behavioral Health (2018) found mental health services are insufficient to meet current needs. More than half of American adults have sought or are considering seeking mental health services for themselves or others. Approximately three-quarters of Americans perceive that behavioral health care is difficult to access. The lack of behavioral health care profoundly impacts communities of color and other underserved populations. Research has also shown that lack of culturally and linguistically appropriate care likely contributes to disparities in behavioral health (American Psychiatric Association, 2017).

Interprofessional primary care training that includes oral and behavioral health is necessary to provide effective care for patients with complex needs and chronic conditions. It is more challenging to address other physical health conditions when oral or behavioral health problems go untreated or undertreated. It is essential that oral health and culturally appropriate behavioral health are well integrated into primary care training and practice, to prepare interprofessional teams to meet the health care needs of vulnerable communities. Primary care workforce training requires redefining program admission standards and training program objectives along with reviewing the clinical settings in which training occurs. The current relatively small proportion of federal primary care expenditures limits the opportunity for training programs to be innovative in their approach to addressing the health care needs of the underserved and most vulnerable, particularly in rural areas.

### Exemplars

1. A **3-year, longitudinal oral health program** at the University of Colorado demonstrates that incorporation of an oral health curriculum can lead to lasting knowledge of PAs about basic oral health concepts and increased performance of oral health skills in the clinical year (Bowser et al., 2013). Moreover, PAs educated in oral health competencies are more likely to provide such services to patients, especially in primary medicine or urgent care (Langelier & Surdu, 2021).
2. A **focused interprofessional oral health curriculum** can likely be successfully integrated into various academic settings with a positive effect on learning and improved patient care (Berkowitz et al., 2017). The **Teaching Oral-Systemic Health (TOSH) program** uses oral-systemic health as a clinical exemplar to develop interprofessional competencies. The 2017-2019 data reinforce the credibility of scaling the TOSH model for developing interprofessional competencies with students from different health professions (Haber et al., 2021).
3. **Team-based care** is essential to successful integration in health centers. Additionally, **integrating oral health care into primary medical care** practices results in greater patient satisfaction as patients appreciate the convenience of integrated care (Owen, Hilton, & Thompson, 2019).
4. **Training programs should integrate professions**, including oral care and behavioral health practitioners, which will then improve outcomes. A.T. Still University (ATSU) has a successful program that aligns rural dental school students with primary care (ATSU, 2020).
5. The **Primary Care Collaborative report**, *Innovations in Oral Health and Primary Care Integration* (2021) provides a comprehensive resource citing several exemplars of oral health

integration into primary care education and practice that increase access to care for underserved populations. The report includes a description of **Smiles for Life, a free, online oral health curriculum** endorsed by 22 organizations representing medicine, PAs, nursing, dentistry, dental hygiene, pharmacy, community health centers and more with over 3 million unique site visits and 475,000 courses completed for credit. (<https://www.smilesforlifeoralhealth.org>).

### **Recommendation 3: Enhancing the Capacity of Telehealth**

Congress should increase funding for Title VII, Section 747 and 748, programs to build and enhance telehealth\* capacity of primary care training programs to use clinical telehealth technologies for telemonitoring, remote interprofessional collaborative care, shared patient management, and telementoring in underserved rural communities.

#### ***Rationale***

Telehealth technology has become an important resource, increasing health care access in rural areas. Primary care training that integrates innovative telehealth strategies, including teledentistry, can enable future providers and their patients to overcome barriers to care related to time and distance, and increase opportunities for patient education, consultation, collaboration, and shared care management.

#### ***Background***

The COVID-19 pandemic has exacerbated previous access issues in rural and other underserved communities. Traditional health care encounters between a provider and patient occur face to face in a physical location. During the pandemic, such encounters were often unavailable except for the sickest patients. Patients postponed routine visits, creating a mounting backlog of care and little attention to preventive visits. Further, many health profession schools were forced to close their physical doors and transition to other instruction modalities.

Telehealth has emerged over the past 20 years as an effective solution for addressing patient, provider, and student education needs across distance and time. Historically, telehealth focused on rural medicine (Health Affairs, 2016). However, it has now become an essential component of the response to COVID-19 by meeting many patient care needs at a distance and reducing exposure for providers and staff (Ramaswamy & Seshadri, 2020).

Telehealth is a valuable resource for overcoming distance barriers facilitating communication with patients as well as consultation between interprofessional care team members. Telehealth reduces travel time, cost, and logistic burdens that affect rural and other vulnerable and underserved communities (Bolin et al., 2015). Further, it can extend the reach of primary care and specialist services to remote areas and potentially facilitate interprofessional collaborations and care management. Evidence supports the effectiveness of telehealth for specific uses, including remote patient monitoring, communication, and counseling for patients with chronic conditions; and psychotherapy as part of behavioral health (Totten et al., 2016). By increasing access, telehealth can help improve patient outcomes and enhance chronic disease management (Myers, 2018).

In addition to the above uses, telehealth can also facilitate transfer of information and across the care team and allow preceptors and specialty care to reach remote areas that lack clinical supervisors (Kohli et al., 2021; Kopycka-Kedzierawski, 2018; Mesko, 2017; Schulte et al., 2019; Society of Teachers of Family Medicine, 2020). Telehealth consultations can support high-quality obstetric care for patients in community hospitals without medical specialty services. Virtual collaborations support optimal care for geriatric patients in post-acute, long-term care facilities, and comprehensive medication reviews and electronic health record documentation to

review with patients' primary physicians in interprofessional training programs (ACOG, 2016; Archbald-Pannone et al., 2020; Begley et al., 2019).

In the PA profession, 64% of PAs reported using telemedicine in their practice in June 2020, compared to one in 10 as of February 2020. Researchers found that utilization of telehealth video consultation, and PAs trained to provide pediatric orthopedic care across suburban/rural areas, can increase pediatric orthopedic surgeon access and decrease travel costs while maintaining patient satisfaction (Sinha, 2019). PAs in primary care have higher odds of using telemedicine more frequently, and those familiar with telemedicine were obviously more likely to use it (AAPA, 2020).

COVID-19 has led to emergency shifts in policy and payment which has made it possible to address patient needs across traditional geographic barriers. Patients and primary care providers have grown accustomed to relying on virtual care for convenience and efficiency. Regulatory changes have included HIPAA flexibility, telemedicine waivers through CMS, cost-sharing, and billing and reimbursement changes. Until the COVID-19 pandemic, CMS rules required teaching physicians to be physically present when reviewing services provided by residents. CMS has now adopted an interim rule that allows regulatory flexibilities, including remote review through "virtual means via audio/visual real time communications technology" (Society of Teachers of Family Medicine, 2020). Given that this technology supports preceptors observing procedures, residents, and patients, and allows preceptors to reach remote areas that lack clinical supervisors, and the demonstrations of successful implementation of telementoring, it is recommended that this regulatory flexibility be permanent. Future clinicians will need to be equipped with new knowledge and skills that enables them to deliver care using telehealth technologies effectively and efficiently.

While educators and care providers have responded to public needs by offering telehealth, education and professional associations report a need for increased capacity for formal education and training in how to integrate telehealth into practice (Murphy, 2021). Faculty and trainees who are equipped with the knowledge and skills to apply telehealth applications have the capacity to expand access to quality patient care. Telehealth technology can also facilitate and increase capacity for mentoring health care providers by supporting remote supervision of medical residents.

### Exemplars

1. The **Extension for Community Healthcare Outcomes (ECHO) project** supports specialists' telementoring primary care providers who practice in underserved communities to treat complex diseases. Currently, 920 ECHO programs are operating in 423 global hubs (University of New Mexico, 2021). Examples of ECHO projects include: telementoring for family practitioners, general neurologists, and school nurses treating patients with epilepsy (Aker, 2019); training primary care providers and case managers in best practices in geriatric mental health, resulting in increased knowledge, improved care, and decreased costs (Fisher et al., 2017); connecting specialists with community practice sites where providers have had no experience treating the hepatitis C virus to support effective treatment delivery and increased access to services for Latino patients (Arora et al., 2011); curriculum and training

sessions to support rural primary care providers in implementing or expanding medication-assisted treatment for opioid use disorder (Salvador et al., 2021).

2. The **Cleveland Clinic** (Brateanu et al., 2021) has developed a training program for clinicians providing virtual care. The program assumes fundamental clinical skills and addresses the challenges with the virtual environment.
3. The **University of Nebraska's Teledentistry program** allows dental providers in rural areas to conduct patient consultations through two-way audio/video with dental specialists at the college. The program's hub is in the city of Lincoln, and teledentistry equipment connects it to diverse sites in nine communities around the state, including a hospital and a community health center (Nebraska Teledentistry, 2021).
4. Since fiscal year (FY) 2002, the **Veterans Administration** (VA) has provided veterans with access to mental health services through more than 2,749,000 TeleMental Health encounters. In FY 2017, approximately 8,700 veterans gained access to VA TeleMental Health services using VA Video Connect directly from their homes or other non-VA locations. Currently, TeleMental Health services are delivered by providers from multiple mental health professions to treat nearly all diagnoses. Given improved access to mental health treatment, admissions to acute psychiatric beds in the VA for new patients receiving Clinical Video TeleMental Health decreased by 31%, and bed days of care decreased by 34% in FY 2017 (Veterans Health Administration, 2018).

#### **Recommendation 4: Supporting Interprofessional Team-based Education and Practice in Maternal–Infant Care**

Congress should increase funding for Title VII, Section 747 and 748, programs to support interprofessional team-based education and practice that incorporates oral health and a life course\* approach to proactively address disparities in maternal and infant health outcomes in underserved rural communities.

##### ***Rationale***

Rural areas often rely on family medicine physicians working with other primary care clinicians to provide maternal-infant care. Training future providers to collaborate across interprofessional teams using a life course approach prioritizes prevention, enhances protective factors, and helps minimize developmental and structural risk factors to improve long-term maternal and child health outcomes.

##### ***Background***

Like all communities, rural areas require a full range of healthcare professionals (i.e., physicians, dentists, PAs, nurses, hygienists, and behavioral/mental health practitioners) trained to work collaboratively to meet the community’s health needs across the lifespan. This is an important factor in maternal–infant health outcomes. Residents in rural areas are more likely to have poor maternal–infant outcomes if they are low-income, uninsured, and members of racial or ethnic minorities with suboptimal access to oral health care. (Ha et al., 2014; Northridge et al., 2020). Pregnancy may make women more disposed to periodontal disease and cavities. Oral health is considered an important part of prenatal care as poor oral health during pregnancy can lead to poor health outcomes for the mother and baby (CDC, 2021) with studies suggesting a low, but existing association between periodontitis and adverse pregnancy outcomes (Corbella et al., 2016).

The United States has one of the most technologically advanced healthcare systems globally, yet we have higher maternal morbidity and mortality rates than comparable countries. This problem is even worse in rural communities. Rural residents have a 9% greater probability of maternal morbidity than urban residents (CMS, 2019). Black and American Indian/Native Alaskan women in rural communities experience disproportionately higher maternal mortality rates compared with their White counterparts (CMS, 2019). There is a need for advanced training for maternal health collaborative teams that integrate primary care, obstetrics, and oral healthcare framed in a life course approach to reduce maternal and infant morbidity and mortality in rural communities.

The COVID-19 pandemic continues to threaten rural hospitals due to deferred care. Over the past year, 20 rural hospitals have closed, bringing the total of hospital closures to 136 since 2010. Hospital closures present a snowball effect because the loss of hospital-based obstetric services is associated with longer travel times to maternal care services, increases in out-of-hospital and preterm births, and births in hospitals without obstetric units, leading to poor maternal-infant outcomes (Anderson et al., 2019; CMS, 2019; Kozhimannil et al., 2018).

Historical studies document that the primary health care needs of pregnant women in both urban and rural populations have been addressed by a variety of clinicians, including obstetrician-gynecologists (Ob/Gyns), family medicine physicians, nurse midwives, and PAs working in collaboration with Ob/Gyns or independently (Kozhimannil et al., 2019). Obstetricians are concentrated in urban areas, while rural areas often rely on family medicine physicians working with other primary care clinicians to provide primary maternity health care (prenatal, delivery, and postpartum care). Fewer and fewer primary care clinicians provide maternity care. However, most primary care residencies, including traditional family medicine residencies, do not provide enough volume, exposure to complications, and surgical obstetric training to address the needs of patients in rural America who need maternity care. The lack of prenatal maternal care is associated with premature birth, low birth weight, maternal mortality, and severe maternal morbidity.

A multidisciplinary team approach designed to promote health and prevent disease across the lifespan can impact maternal and child health from preconception through pregnancy, infancy, childhood, adolescence, and adulthood (Association of University Centers on Disabilities, 2011; Jones & Roy, 2017; WHO, 2000). Training interprofessional teams to use a life course approach that recognizes the importance of social, economic, and cultural contexts can further impact patient outcomes (Jones, 2019). Integrating preventive oral and behavioral health care can result in improved access and outcomes for rural mothers and infants over their life span (National Governors Association, 2020) particularly those of underserved racial/ethnic groups with less access to health care services.

Interprofessional collaborative teams are better equipped to recognize maternal risk behaviors and underlying disease such as oral disease, substance use, chronic health conditions, preeclampsia, and postpartum depression, and partner abuse. These teams can increase access to effective, timely and cost-effective maternal-infant care; however, family medicine and other primary care providers need additional training to increase their capacity to identify and mitigate risk factors and adverse childbirth events. Communication can also focus on working to address social determinants of health (such as adequate food availability, safe housing, transportation, etc.), and other structural factors that may help reduce the morbidity and mortality of both mothers and baby.

### Exemplars

1. The **Life Course Initiative**, launched in 2005, is a 15-year family, maternal and child health (FMCH) program initiative based on the Life Course Perspective. The Life Course Initiative utilizes a 12-Point Plan to Close the Black-White Gap in Birth Outcomes as its road map. The Life Course Initiative is currently developing and implementing *Building Economic Security Today (BEST)* (Contra Costa Health Services, 2021a), an asset development pilot project that utilizes innovative strategies to reduce disparities and inequities in health outcomes.
2. The **Community Oral Health Program (COHP)** (Contra Costa Health Services, 2021b) collaborates with schools and community partners to increase access to oral health services by linking children, youth, and families to no- or low-cost dental resources. This program

includes both the Children's Oral Health Program and the Local Community Health Improvement Plan. The program is organized into perinatal oral health, special needs, children's oral health for classrooms, school-based medical, dental, and behavioral health clinics, and mobile clinics that provide life-long care in pediatrics, adult, and geriatric care.



## Conclusion

Many rural areas in the United States are medically underserved. There are just not enough physicians, dentists, PAs, nurses, dentists, behavioral health providers, and other clinicians to meet the needs of people living hundreds of miles from large urban centers. Even in states with higher overall density, towns and communities still struggle to attract a health care workforce (Westfall & Byun, 2019).

The foundation of health care is crumbling, visits to primary care clinicians are declining, and the primary care clinician workforce is decreasing. Yet, increased access to primary care is associated with better population health and more equitable outcomes. Without access to primary care, minor health problems can spiral into a chronic disease, case management becomes difficult and uncoordinated, visits to emergency departments increase, preventive care lags, and the nation's health care spending soars to unsustainable levels.

In addition, health disparities can and do affect many different groups; there is a long-standing history of disparities affecting racial and ethnic minorities in the United States (Wheeler & Bryant, 2017). The 2002 Institute of Medicine report, *Unequal Treatment*, examined racial and ethnic disparities in health care in the United States (Smedley et al., 2003). Consequently, Congress authorized the Agency for Healthcare Research and Quality (AHRQ) to annually report on national and state health care disparities. Despite improvement in selected health care disparities, overall progress has been slow (AHRQ, 2017; Fiscella & Sanders, 2016).

Unequal access to high-quality primary care services, particularly between rural and urban areas of the country, must be met with substantial and sustained public investment of funding and a revision of health care policies to strengthen the primary care workforce and address health disparities. Federal appropriation levels for Title VII programs, the primary federal funding mechanism for the primary care workforce, remain low and have a negative impact on national efforts to increase the primary care workforce and improve access for underserved populations. Federal policies to support and fund training of the primary care workforce must be substantially increased to achieve the national health goals described in this report's recommendations.

The recommendations in this 18th report of the ACTPCMD aim to advance health equity\* through enhanced training of the primary care workforce to address health barriers in underserved communities. The recommendations focus on rural communities and populations who have systematically had limited access to preventive health care and suffer from social and economic barriers leading to persistent inequality. These barriers prevent underserved and disadvantaged populations from accessing high-quality primary health care services (National Academies of Sciences, Engineering, and Medicine, 2021), including endemic challenges created and perpetuated by a siloed health care system that is supported by a fee-for-service system that incentivizes individual treatment of disease by procedural subspecialists and undervalues primary care, preventive care, and population health interventions.

As charged, the recommendations apply to Title VII, sections 747 and 748 programs, however, we acknowledge the critical importance of an expanded primary care team to include physicians, PAs, nurses, dentists, dental hygienists, dental therapists, pharmacists, behavioral health, and

frontline health workers. While this 18th Report is focused on the needs of geographically underserved communities, the Committee recognizes that increased access and enhanced training can improve population health in all underserved communities.

## References

- AAPA (American Academy of Physician Assistants). (2020). PA Practice Survey. Retrieved from <https://www.aapa.org/wp-content/uploads/2020/10/June-2020-Telemedicine-DataBrief-Rev.pdf>.
- Abid Y, Connell CJ, Sijnja B, Verstappen AC, & Poole P (2020). National study of the impact of rural immersion programs on intended location of medical practice in New Zealand. *Rural Remote Health* 20(4), 5785. Retrieved from <https://doi.org/10.22605/RRH5785>.
- ACGME (Accreditation Council for Graduate Medical Education). (2021). Retrieved from <https://www.acgme.org/search/?q=rural%20residency%20programs>.
- ACOG (American College of Obstetricians and Gynecologists). (2016). Health disparities in rural women, Committee Opinion Number 586, February 2014. *Obstet Gynecol* 123(2):382-388. Reaffirmed 2016. Retrieved from [https://journals.lww.com/greenjournal/Fulltext/2014/02000/Committee\\_Opinion\\_No\\_586\\_Health\\_Disparities\\_in.35.aspx](https://journals.lww.com/greenjournal/Fulltext/2014/02000/Committee_Opinion_No_586_Health_Disparities_in.35.aspx).
- AHRQ (Agency for Healthcare Research and Quality). (2017). *2014 National Healthcare Quality and Disparities Report*. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from [www.ahrq.gov/sites/default/files/wysiwyg/research/findings/nhqrdr/2017qdrslides110718.pptx](http://www.ahrq.gov/sites/default/files/wysiwyg/research/findings/nhqrdr/2017qdrslides110718.pptx).
- Aker, J (2019). Foundation's ECHO pilot programs educate school nurses and link primary care providers in rural communities to epilepsy specialists. Epilepsy Foundation applauds the American Medical Association's decision to encourage use of telemedicine programs. Press Release. Retrieved from <https://www.epilepsy.com/release/2019/6/epilepsy-foundation-applauds-american-medical-association%E2%80%99s-decision-encourage-use>.
- AAFP (American Academy of Family Physicians). (2021). 2021 Match results for family medicine. Retrieved from <https://www.aafp.org/students-residents/residency-program-directors/national-resident-matching-program-results.html>
- American Psychiatric Association (2017). Mental health disparities: diverse populations. *Mental Health Fact Sheet*. Retrieved from [https://www.psychiatry.org > File Library > Psychiatrists > Cultural-Competency > Mental-Health-Disparities > Mental-Health-Facts-for-Diverse-Populations.pdf](https://www.psychiatry.org/FileLibrary/Psychiatrists/Cultural-Competency/Mental-Health-Disparities/Mental-Health-Facts-for-Diverse-Populations.pdf)
- Anderson B, Gingery A, McLellan M, Rose R, Schmitz D, & Schou P (2019). *NRHA Policy Paper: Access to Rural Maternity Care*. Retrieved from [https://www.ruralhealthweb.org/NRHA/media/Emerge\\_NRHA/Advocacy/Policy%20documents/01-16-19-NRHA-Policy-Access-to-Rural-Maternity-Care.pdf](https://www.ruralhealthweb.org/NRHA/media/Emerge_NRHA/Advocacy/Policy%20documents/01-16-19-NRHA-Policy-Access-to-Rural-Maternity-Care.pdf).
- Archbald-Pannone LR, Harris DA, Albero K, Steele RL, Pannone AF, & Mutter JB (2020). COVID-19 collaborative model for an academic hospital and long-term care facilities. *J Am Med Dir Assoc* 21(7), 939-942.
- Arora S, Thornton K, Murata G, Deming P, Kalishman S, Dion D, Parish B, Burke T, Pak W, Dunkelberg J, Kistin M, Brown J, Jenkusky S, Komaromy M, & Qualls C (2011). Outcomes of hepatitis C treatment by primary care providers. *N Engl J Med* 364(23). doi:10.1056/NEJMoa1009370.
- Association of University Centers on Disabilities (AUCD). (2011). Life Course MCH Training Resources. Retrieved from <https://www.aucd.org/template/page.cfm?id=768>.

- Atchison, KA, Rozier RG, & Weintraub JA (2018). Integration of oral health and primary care: Communication, coordination, and referral. *NAM Perspectives Discussion Paper*. Washington, DC: National Academy of Medicine. Retrieved from <https://doi.org/10.31478/201810e>.
- ATSU (A.T. Still University). (2020). Retrieved from <https://drive.google.com/file/d/1fYoBlq0bwROpIJCaxoKeZ0p7yfRzjal/view>.
- Begley K, O'Brien K, Packard K, Castillo S, Haddad AR, Johnson K, Coover K, & Pick A (2019). Impact of interprofessional telehealth case activities on students' perceptions of their collaborative care abilities. *Am J Pharm Ed* 83(4):6880. doi: 10.5688/ajpe6880.
- Berkowitz O, Bristotti MF, Gascon L, Henshaw M, & Kaufman LB (2017). The impact of an interprofessional oral health curriculum on trainees. *Physician Assist Educ* 28(1):2-9. doi: 10.1097/JPA.000000000000104. PMID: 28207581.
- Bolin JN, Bellamy G, Ferdinand AO, Kash BA, & Helduser JW (Eds) (2015). *Rural Healthy People 2020*, vol 1. College Station, TX: Texas A&M Health Science Center School of Public Health, Southwest Rural Health Research Center.
- Bowser J, Sivahop J, & Glicken A (2013). Advancing oral health in physician assistant education: evaluation of an innovative interprofessional oral health curriculum. *J Physician Assist Educ* 24(3):27-30.
- Braswell A & Johnson N (2013). *National Rural Health America Policy Brief: Rural American Oral Health Care Needs*. Washington DC: National Rural Health Association.
- Brateanu A; Isaacson JH, Mehta N, Rood M, Shook S, Stoller J, Traboulsi E, Greenwald L, & Pishotti D. (2021) *Training Program for the Clinician Providing Virtual Care*. Retrieved from <https://healthcareedu.ccf.org/login/index.php>.
- Braveman P, Gottlieb L, Francis D, Arkin E, & Acker J (2019). *What Can the Health Care Sector Do to Advance Health Equity?* Princeton, NJ: Robert Wood Johnson Foundation.
- Castillo M & Cromartie J (2020). Racial and ethnic minorities made up about 22% of the rural population in 2018, compared to 43% in urban areas. USDA Economic Research Service. Retrieved from <https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=99538>.
- Cha AE & Cohen RA (2021). Urban–rural differences in dental care use among adults aged 18–64. *NCHS Data Brief* No. 412. Retrieved from <https://www.cdc.gov/nchs/products/databriefs/db412.htm>.
- CDC (Centers for Disease Control and Prevention) (2021) *Pregnancy and Oral Health*. <https://www.cdc.gov/oralhealth/publications/features/pregnancy-and-oral-health.html>
- CMS (Centers for Medicare and Medicare Services). (2019). Improving access to maternal health care in rural communities. *Issue Brief*. Retrieved from: <https://www.cms.gov/About-CMS/Agency-Information/OMH/equity-initiatives/rural-health/09032019-Maternal-Health-Care-in-Rural-Communities.pdf>.
- Contra Costa Health Services (2021a). *Building Economic Security Today (BEST)*. Retrieved from <https://cchealth.org/lifecourse/economic-security.php>.
- Contra Costa Health Services (2021b). *Community Oral Health Program (COHP)*. Retrieved from <https://cchealth.org/dental/#Special>.
- Corbella, S., Taschieri, S., Del Fabbro, M., Francetti, L., Weinstein, R., & Ferrazzi, E. (2016). Adverse pregnancy outcomes and periodontitis: A systematic review and meta-analysis

- exploring potential association. *Quintessence international (Berlin, Germany : 1985)*, 47(3), 193–204. <https://doi.org/10.3290/j.qi.a34980>.
- Cromartie J, Dobis EA, Krumel T, McGranahan D, & Pender, J (2020). Rural America at a Glance, 2020 edition. *Economic Information Bulletin* No. (EIB-221). USDA Economic Research Service. Retrieved from <https://www.ers.usda.gov/topics/rural-economy-population/population-migration>.
- Farmer J, Kenny A, McKinstry C, & Huysmans RD (2015). A scoping review of the association between rural medical education and rural practice location. *Hum Resour Health* 13(1), 1-15.
- Fiscella K & Sanders MR (2016). Racial and ethnic disparities in the quality of health care. *Annu Rev Public Health* 37:375-94. doi: 10.1146/annurev-publhealth-032315-021439.
- Fisher E, Hasselberg M, Conwell Y, Weiss L, Padrón NA, Tiernan E, Karuza J, Donath J, & Pagán, JA (2017). Telementoring primary care clinicians to improve geriatric mental health care. *Population Health Manag* 20 (5), 342-347.
- Fish-Parcham C, Burroughs M, Tranby E, & Brow A (2019). Addressing rural seniors' unmet needs for oral health care. *Health Affairs Blog*, May 6.
- Fraher E & Brandt B (2019). Toward a system where workforce planning and interprofessional practice and education are designed around patients and populations not professions. *J Interprof Care* Jul-Aug;33(4):389-397. doi: 10.1080/13561820.2018.1564252.
- Goodell S, Druss BG, Walker ER, & Mat MJ (2011). Mental disorders and medical comorbidity. *Research Synthesis Report Number 21*. Robert Wood Johnson Foundation.
- Ha JE, Jun JK, Ko HJ, Paik DI, & Bae KH (2014). Association between periodontitis and preeclampsia in never-smokers: a prospective study. *J Clin Periodontology*, 41(9), 869-874.
- Haber J, Nartnett E, Cipollina J, Allen K, Crowe R, Roitman J, Feldman L, Fletcher J, & Ng G, (2021). Attaining interprofessional competencies by connecting oral health to overall health. *J Dent Educ* 85(4), 504-512. doi: 10.1002/jdd.12490. Epub 2020 Nov 23. PMID: 33230834.
- Hartford Foundation, 2021. Age-Friendly Health Systems Initiative. Retrieved from <https://www.johnhartford.org/grants-strategy/current-strategies/age-friendly/age-friendly-health-systems-initiative>.
- Health Affairs (2016). Telehealth parity laws. *Health Policy Brief* August 15. DOI: 10.1377/hpb20160815.244795. Retrieved from <https://www.healthaffairs.org/doi/10.1377/hpb20160815.244795/full>.
- Hoffman A & Holmes M (2017). Regional differences in rural and urban mortality trends. *North Carolina Health Research Program*. Retrieved from [https://www.shepscenter.unc.edu/wp-content/uploads/dlm\\_uploads/2017/08/Regional-Differences-in-Urban-and-Rural-Mortality-Trends.pdf](https://www.shepscenter.unc.edu/wp-content/uploads/dlm_uploads/2017/08/Regional-Differences-in-Urban-and-Rural-Mortality-Trends.pdf).
- Holst J (2020). Increasing rural recruitment and retention through rural exposure during undergraduate training: an integrative review. *Int J Environ Res Public Health* 17(17), 6423.
- HRSA (Health Resources and Services Administration). (2013). Medical school rural tracks in the US. Policy Brief. Retrieved from [https://www.ruralhealth.us/NRHA/media/Emerge\\_NRHA/PDFs/RTPolicyBrief91513final.pdf](https://www.ruralhealth.us/NRHA/media/Emerge_NRHA/PDFs/RTPolicyBrief91513final.pdf).

- HRSA. (2018). *Improving Oral Health Care Services in Rural America*. Retrieved from <https://www.ruralcenter.org/resource-library/improving-oral-health-care-services-in-rural-america>.
- HRSA. (2021). Designated Health Professional Shortage Areas Statistics, 4<sup>th</sup> Quarter Fiscal Year 2021, September 30, 2021, Bureau of Health, US Department of Health & Human Services.
- Iglehart JK (2018). The challenging quest to improve rural health care. *N Engl J Med* 378:473-479.
- IOM (Institute of Medicine). (2001). *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press. doi: 10.17226/10027
- IOM (2015). *Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes*. Washington, DC: National Academies Press. <https://doi.org/10.17226/21726>.
- Jaret P (2020). Attracting the next generation of physicians to rural medicine. *AAMC News*. Retrieved from <https://www.aamc.org/news-insights/attracting-next-generation-physicians-rural-medicine>.
- Johnson G, Byun R, Foster K, Wright F, & Blinkhorn A (2019). A longitudinal workforce analysis of a rural clinical placement program for final year dental students. *Aust Dent J* 64(2):181-192. doi: 10.1111/adj.12691.
- Jones MM & Roy K (2017). Placing health trajectories in family and historical context: a proposed enrichment of the Life Course Health and Development Model. *Matern Child Health J* 21(10), 1853-1860.
- Kohli R, Clemens J, Mann L, Newton M, Glassman P, & Schwarz E (2021). Training dental hygienists to place interim therapeutic restorations in a school-based teledentistry program: Oregon's virtual dental home. *J Public Health Dent* 2021 Jun 17. doi: 10.1111/jphd.12465.
- Kopycka-Kedzierawski DT, McLaren SW, & Billings RJ (2018). Advancement of Teledentistry at the University of Rochester, Eastman Institute For Oral Health. *Health Aff (Millwood)* 37(12):1960-1966. doi: 10.1377/hlthaff.2018.05102.
- Kozhimannil KB, Hung P, & Henning-Smith C (2018). Association between loss of hospital-based obstetric services and birth outcomes in rural counties in the United States. *JAMA* 319:1239–1247. doi:10.1001/jama.2018.1830.
- Kozhimannil KB, Interrante JD, Henning-Smith C, & Admon LK (2019). Rural-urban differences in severe maternal morbidity and mortality in the US, 2007-15. *Health Affairs (Project Hope)* 38(12), 2077-2085. <https://doi.org.ezproxyhhs.nihlibrary.nih.gov/10.1377/hlthaff.2019.00805>.
- Langelier M & Surdu S (2021). Does education in oral health competencies in physician assistant education programs translate to delivery of oral health services in clinical practice? *J Physician Assist Educ* 32(2), 79–86. DOI 10.1097/JPA.0000000000000351.
- Life Course Initiative (n.d.). Retrieved from [https://cchealth.org/lifecourse/pdf/12\\_point\\_plan\\_fact\\_sheet.pdf](https://cchealth.org/lifecourse/pdf/12_point_plan_fact_sheet.pdf).
- Manning E & Gagnon M (2017). The complex patient: a concept clarification. *Nurs Health Sci* 19(1), 13-21.

- Maxwell B (2021). Interprofessional Education: five years of success from HRSA grant awarded to ATSU-ASDOH. *A.T. Still University iConnect News*. Retrieved from <https://iconnect.atsu.edu/ipe-five-years-success-hrsa-grant-atsu-asdoh>.
- Melo J, Kaneshiro B, Kellett L, & Hiraoka M (2014). The impact of a longitudinal curriculum on medical student obstetrics and gynecology clinical training. *Hawai'i J Med Public Health* 73(5):144-147.
- Meskó B, Drobni Z, Béneyi É, Gergely B, & Györffy Z (2017). Digital health is a cultural transformation of traditional healthcare. *Mhealth* 14;3:38. doi: 10.21037/mhealth.2017.08.07.
- Meyers P, Wilkinson E, Petterson S, Patterson DG, Longenecker R, Schmitz D, & Bazemore A (2020). Rural workforce years: quantifying the rural workforce contribution of family medicine residency graduates. *J Grad Med Educ* 12(6):717-726. doi: 10.4300/JGME-D-20-00122.1.
- MMWR. Morbidity and mortality weekly report (2020). COVID-19 Stats: COVID-19 Incidence, by Urban-Rural Classification - United States, January 22-October 31, 2020<sup>s</sup>. 69(46), 1753. <https://doi-org.ezproxyhhs.nihlibrary.nih.gov/10.15585/mmwr.mm6946a6>.
- Murphy B (2021). How the telehealth boom is changing physician training. *AMA Digital*. Retrieved from <https://www.ama-assn.org/practice-management/digital/how-telehealth-boom-changing-physician-training>.
- Myers CR (2018). Using telehealth to remediate rural mental health and healthcare disparities. *Issues in Mental Health Nursing* 40(3), 233-239.
- National Academies of Sciences, Engineering, and Medicine (2021). *Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care*. Washington, DC: The National Academies Press. doi.org/10.17226/25983.
- National Council for Behavioral Health (2018). *Annual Report, 2018*. Retrieved from <https://www.thenationalcouncil.org/about/2018-annual-report-pdf/>.
- National Governors Association (2020). *Maternal and Child Health Update 2020*. Retrieved from <https://www.nga.org/center/publications/maternal-child-health-update-2020/>.
- National Rural Health Association, 2021. Barriers to mental health treatment in rural areas. Retrieved from <https://www.ruralhealthinfo.org/toolkits/mental-health/1/barriers>
- Nebraska Teledentistry, University of Nebraska Medical Center: Lincoln, NE. Retrieved from <https://www.unmc.edu/dentistry/outreach/teledentistry.html>
- Northridge ME, Kumar A, & Kaur R (2020). Disparities in access to oral health care. *Ann Rev Public Health* 41:513-535. doi: 10.1146/annurev-publhealth-040119-094318.
- Orzanco MG, Lovato C, Bates J, Slade S, Grand'Maison P, & Vanasse A (2011). Nature and nurture in the family physician's choice of practice location. *Rural Remote Health* 11(3):1849. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/21919544/>.
- Owen C, Hilton I, & Thompson P (2019). Integration of oral health and primary care practice integrated models survey results: Embedded dental providers. National Network for Oral Health Access (NNOHA). Retrieved from: <https://www.nnoha.org/nnoha-content/uploads/2019/10/NNOHA-2019-Integrated-Models-Survey-Results.pdf>.
- Patterson D, Andrilla A, & Larson E (2016). Graduates of rural-centric family medicine residencies: determinants of rural and urban practice. *WWAMI Rural Health Research Center*. Retrieved from <https://www.ruralhealthresearch.org/publications/1052>.

- Phillips RL & Turner BJ (2012). The next phase of Title VII funding for training primary care physicians for America's health care needs. *Ann Fam Med* 10(2), 163-168.
- Primary Care Collaborative (2021). *Innovations in Oral Health and Primary Care Integration: Alignment with the Shared Principles of Primary Care*. Retrieved from <https://www.pcpcc.org/resource/innovations-oral-health-and-primary-care-integration-alignment-shared-principles>.
- Quinn KJ, Kane KY, Stevermer JJ, Webb WD, Porter JL, Williamson HA Jr, & Hosokawa MC (2011). Influencing residency choice and practice location through a longitudinal rural pipeline program. *Acad Med* 86(11):1397-1406. doi: 10.1097/ACM.0b013e318230653f. PMID: 21952065.
- Ramaswamy S & Seshadri S (2020). Children on the brink: Risks for child protection, sexual abuse, and related mental health problems in the COVID-19 pandemic. *Indian J Psychiatry* 62(Suppl 3):S404-S413. doi: 10.4103/psychiatry.IndianJPsychiatry\_1032\_20.
- Residency Programs List, 2021. Internal medicine residency. Retrieved from <https://www.residencyprogramslist.com/internal-medicine>.
- Rolls, J., Lessard, D., Smith, T., & Keahey, D. (2021). Outcomes of HRSA-Funded Expansion of Physician Assistant Training Grants 2011-2016. *The journal of physician assistant education: the official journal of the Physician Assistant Education Association*, 32(3), 143–149.
- RTT Collaborative (2021a). Accredited rural residency programs. Retrieved from <https://rttcollaborative.net/rural-programs/residency-map/>.
- RTT Collaborative (2021b). Explore rural health professions education. Retrieved from <https://rttcollaborative.net/rural-programs/>.
- Salvador JG, Bhatt S, Sussman A, Jacobsohn V, Maley L, Hardgrave C, & Alkhafaji R (2021). Medication assisted treatment. ECHO Institute Programs, UNM School of Medicine. Retrieved from <https://hsc.unm.edu/echo/institute-programs/mat/>.
- Schulte A, Nadler J, & Majerol M (2019). Narrowing the rural-urban health divide: bringing virtual health to rural communities. *Deloitte Insights*. Retrieved from <https://www2.deloitte.com/us/en/insights/industry/public-sector/virtual-health-telemedicine-rural-areas.html>.
- Shannon CK, Price SS, & Jackson J (2016). Predicting rural practice and service to indigent patients: survey of dental students before and after rural community rotations. *J Dental Educ* 80(10), 1180-1187.
- Shen MJ, Peterson EB, Costas-Muñiz R, Hernandez MH, Jewell ST, Matsoukas K, & Bylund CL (2018). The effects of race and racial concordance on patient-physician communication: a systematic review of the literature. *J Racial Ethn Health Disparities* 5(1):117-140.
- Shipman SA, Wendling A, Jones KC, Kovar-Gough I, Orłowski JM, & Phillips J (2019). The decline in rural medical students: a growing gap in geographic diversity threatens the rural physician workforce. *Health Aff (Millwood)* 38(12):2011-2018. doi: 10.1377/hlthaff.2019.00924.
- Sinha N, Cornell M, Wheatley B, Munley N, & Seeley M (2019). Looking through a different lens: patient satisfaction with telemedicine in delivering pediatric fracture care. *J Am Acad Orthop Surg Glob Res Rev* 3(9): e100. doi: 10.5435/JAAOSGlobal-D-19-00100



- Skillman SM, Doescher MP, Mouradian WE, & Brunson DK (2010). The challenge to delivering oral health services in rural America. *J Public Health Dentistry* 70, S49-S57.
- Smedley BD, Stith AY, & Nelson AR (Eds.) (2003). *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Institute of Medicine, Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. Washington, DC: National Academies Press (US).
- Society of Teachers of Family Medicine (2020). New CMS interim final rule allows for application of primary care exception to telehealth services. Retrieved from [https://www.stfm.org/news/2020-news/5-1-20\\_primarycareexceptiontelehealth/](https://www.stfm.org/news/2020-news/5-1-20_primarycareexceptiontelehealth/).
- Totten AM, Womack DM, Eden KB, McDonagh MS, Griffin JC, Grusing S, & Hersh WR (2016). *Telehealth: Mapping the Evidence for Patient Outcomes from Systematic Reviews*. Technical Brief No. 26. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2015-00009-I.) AHRQ Publication No.16-EHC034-EF. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from <https://effectivehealthcare.ahrq.gov/products/telehealth-expansion/white-paper>.
- University of Nebraska Medical Center (2021). Nebraska Teledentistry. Retrieved from <https://www.unmc.edu/dentistry/outreach/teledentistry.html>.
- University of New Mexico (2021). *Project ECHO*. Retrieved from <https://hsc.unm.edu/echo/>
- US Census Bureau (2017). Retrieved from <https://www.census.gov/library/stories/2017/08/rural-america.html>.
- Veterans Health Administration (2018). TeleMental Health in the Department of Veteran Affairs. Retrieved from [https://www.va.gov/anywheretoanywhere/docs/TeleMental\\_Health\\_factsheet.PDF](https://www.va.gov/anywheretoanywhere/docs/TeleMental_Health_factsheet.PDF).
- Wendling AL, Phillips J, Short W, Fahey C, & Mavis B (2016). Thirty years training rural physicians: outcomes from the Michigan State University College of Human Medicine Rural Physician Program. *Acad Med* 91(1):113-9. doi: 10.1097/ACM.0000000000000885.
- Westfall JM & Byun H (2020). Recruiting, educating, and taking primary care to rural communities. *Ann Fam Med* 18(5):386-387. doi: 10.1370/afm.2601. PMID: 32928751; PMCID: PMC7489973.
- Wheeler SM & Bryant AS (2017). Racial and ethnic disparities in health and health care. *Obstet Gynecol Clin North Am* 44(1):1-11. doi: 10.1016/j.ogc.2016.10.001.
- WHO (World Health Organization) (2000). *The Implications for Training of Embracing a Life Course Approach to Health* (No. WHO/NMH/HPS/00.2).
- Wittick TA, Wittick PK, O'Neill EJ, Davis WJ, Mitchell E KL, Campbell DG, Connelly MA, Fry DC, & D'Amore A (2018). Symbiotic, medical student-initiated community engagement on a rural longitudinal integrated clerkship. *Aust Med Student J* 8 (2), 20-25.

## Definitions

### **Age-Friendly Health Systems**

A concept developed by the Hartford Foundation, this term has recently been adopted by the Institute for Health Improvement. Though developed for the population of older adults, it has the potential to be more inclusive, describing care that is appropriate across the life span, accommodating a patient's specific needs and concerns whether they are 6 months of age or 96 years. Some HRSA NOFOs have incorporated this term.

<http://www.ihl.org/Engage/Initiatives/Age-Friendly-Health-Systems/Pages/default.aspx>;

<https://www.johnhartford.org/grants-strategy/current-strategies/age-friendly/age-friendly-health-systems-initiative>

### **Health Equity**

The term “health equity” in this report refers to the consistent, systematic, fair, just, and impartial treatment of all individuals who have historically been denied this right, including those who belong to underserved communities that have been denied this right, such as Black, Latino, Indigenous and Native American persons, other persons of color, religious minorities, persons with disabilities, lesbian, gay, bisexual, transgender, and queer (LGBTQ) persons, and persons who live in rural areas or are otherwise adversely affected by poverty (Braveman, 2019; HRSA, 2018).

### **Life Course Health and Development Model**

A multidisciplinary approach that considers how underlying biological, behavioral and psychosocial processes operate over the lifespan to affect health. The approach recognizes the importance of early life events in affecting later outcomes as well as the importance of social, economic, and cultural context (Association of University Centers on Disabilities, 2011; World Health Organization, 2000). Recent literature emphasizes the importance of family context and social determinants on health trajectories (Jones et al, 2019).

### **Longitudinal Education**

Includes varied definitions, all describing an alternative to brief block rotations. For the purposes of recommendations in this report, “longitudinal” refers to clinical experiences that allows trainees to engage and develop a meaningful relationship with the community where they train, have multiple clinical encounters with individual patients, and learn to become advocates for the patients and community they serve.

### **Medically Complex**

For the purposes of this report, refers to patients who are affected by at least one chronic health condition. Social determinants of health may also contribute to medical complexity (Manning & Gagnon, 2017; Grant et al., 2011).

**Primary Care**

Primary care in this report refers to care that is comprehensive, person-centered, and relationship-based across the lifespan, based on the needs and preferences of individuals, families, and communities.

**Telehealth**

Per the Health Resources and Services Administration (2020), defines the term as, “the use of electronic information and telecommunications technologies to support and promote long-distance clinical health care, patient and professional health-related education, and public health and health administration.”