HRSA
Health Resources & Services Administration

Innovations in Primary Care Education and Training

Developing Community Partnerships to Improve Population Health

---

Seventeenth Annual Report to the
Secretary of the United States Department of Health and Human Services
and the Congress of the United States

Advisory Committee on Training in Primary Care Medicine and Dentistry

October 2020

Advisory Committee on Training in Primary Care Medicine and Dentistry

---

Innovations in Primary Care Education and Training: Developing Community Partnerships to Improve Population Health

---

Seventeenth Annual Report
to the
Secretary of the United States
Department of Health and Human Services
and the
Congress of the United States

October 2020

HRSA
Health Resources & Services Administration

The views expressed in this document 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 or the United States Government.

TABLE OF CONTENTS

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 Membership

Chair

Thomas E. McWilliams, DO, FACOFP
Senior Advisor
Graduate Medical Education
School of Osteopathic Medicine
A.T. Still University
Alamosa, Colorado

Bruce Blumberg, MD
Clinical Professor of Pediatrics
University of California
San Francisco School of Medicine
Adjunct Clinical Professor of Pediatrics
Stanford University School of Medicine
Kaiser Permanente Southern California
San Mateo, California

Jane E. Carreiro, DO
Vice President for Health Affairs
Dean, College of Osteopathic Medicine
University of New England
Biddeford, Maine

Donald L. Chi, DDS, PhD
Associate Professor
Department of Oral Health Sciences
School of Dentistry, University of Washington
Seattle, Washington

Tara A. Cortes, PhD, RN, FAAN
Executive Director and Professor
Hartford Institute for Geriatric Nursing
New York University College of Nursing
New York, New York

A. Conan Davis, DMD, MPH
Associate Professor and Assistant Dean for Community Collaborations and Public Health
University of Alabama, Birmingham
School of Dentistry and Public Health
Birmingham, Alabama

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, Texas

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

Jeffery Hicks, DDS
Professor of Dentistry
University of Texas Health Sciences Center
University of Texas
San Antonio, Texas

Geoffrey Hoffa, DHSc, PA-C
Principal
Geoffrey W. Hoffa, PLLC
Phoenix, Arizona

Michael J. Huckabee, MPAS, PA-C, PhD
Director, Physician Assistant Program
Associate Professor
Senior Associate Consultant-II
Mayo Clinic School of Health Sciences
Rochester, Minnesota

Antoinette Kahan, RDH, BA, RDA, CBA
Dental Assisting Program Director
Virginia Beach Public Schools
Virginia Beach, Virginia

Cara Lichtenstein, MD, MPH
Associate Residency Program Director and Director – Leadership in Advocacy, the Underserved, and Community Health Track
Children's National Medical Center
Washington, DC

Anne E. Musser, DO
Medical Director of the Community Health Aide Program
Alaska Native Tribal Health Consortium
Anchorage, Alaska

Patricia McKelvey Dieter, MPA, PA-C
Professor in Community and Family Medicine
Chief, Physician Assistant Division
Duke University School of Medicine
Durham, North Carolina

Pamela R. Patton, PA, MSP, DFAAPA
William M. Hall Associate Professor
Director of Admissions
School of Physician Assistant Studies
University of Florida
Gainesville, Florida

Kim Butler Perry, DDS, MSCS
NIH Clinical Translation Research Scholar
Associate Professor
Associate Vice President University Strategic Partnerships
93rd Past President of the National Dental Association
A.T. Still University
Mesa, Arizona

Rita A. Phillips, PhD, BSDH, RDH, CTCP
Professor, Dental Assisting and Hygiene
Wytheville Community College
Wytheville, Virginia

Russell S. Phillips, MD
Director
Center for Primary Care
William Applebaum Professor of Medicine
Boston, Massachusetts

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

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

Sandra M. Snyder, DO
Program Director
Cleveland Clinic Family Medicine Residency
Cleveland Clinic
Lakewood, Ohio

Jason M. 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
Shreveport, Louisiana

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

John Wesley Sealey, DO, FACOS
Director of Medical Education
Detroit Wayne County Health Authority
Detroit, Michigan

Teshina Wilson, DO
Family Medicine Physician
Department of Family Medicine
Kaiser Permanente Northern California
Pinole, California

Al Staropoli
Federal Contractor/Technical Writer
President and CEO
Medical Communications and Marketing
Boca Raton, Florida

Federal Staff

Shane Rogers
Designated Federal Official, ACTPCMD
Public Health Advisor
Division of Medicine and Dentistry
Bureau of Health Workforce
Health Resources and Services Administration
Rockville, Maryland

Paul Jung, USPHS, CAPT
Director
Division of Medicine and Dentistry
Health Resources and Services Administration
Bureau of Health Workforce
Rockville, Maryland

Jennifer Holtzman, DDS, MPH
Dental Officer
Division of Medicine and Dentistry
Health Resources and Services Administration
Bureau of Health Workforce
Rockville, Maryland

Executive Summary

The role of primary care providers in public health is of paramount importance. They diagnose and treat common medical and dental conditions, deliver preventive care, address chronic conditions, and refer patients to specialists.

Despite their importance, the demand for primary care physicians is expected to outstrip future supply. A 2020 report by the American Association of Medical Colleges projects a shortfall of between 21,400 and 55,200 primary care physicians by 2033 (AAMC, 2020). Unfortunately, a significant surge in physicians alone will not solve this shortage.

This is because in the U.S., primary care physicians are not distributed evenly across the country, with fewer physicians providing care in rural and underserved areas (Bodenheimer & Pham, 2010). So how then, can the health care system ensure that more Americans can be provided with both preventive care and effective treatments in the future? That is the principal subject matter of this report.

One solution is to develop and implement innovations in primary care education and training to address future provider shortages. Another approach is to develop community partnerships to improve population health. Through the latter, providers can recognize and address factors that can impact their patients' health outside the walls of their offices—such as food insecurity, safety, and housing—all of which can improve health outcomes for the community as a whole when appropriately addressed (Cockerham et al., 2017). Yet another strategy is to train providers in behavioral change strategies that can help their patients prevent chronic disease in the first place or, for those who already have them, teach them to better manage their chronic disease.

Health disparities in the U.S. due to race and ethnicity have been the subject of many articles and books. The issue of disparities was brought to the forefront in early 2020 when the World Health Organization characterized COVID-19 as a pandemic. In the U.S. alone, cases ran into the millions, and deaths, unfortunately, into the hundreds of thousands. National data resulting from the pandemic shined a spotlight on issues related to race and disparity. Preliminary data showed that African Americans and Latinos were three times more likely to contract COVID-19 than Whites, and almost twice as likely to die from the disease (Wen & Sadeghi, 2020).

An article published in 2020 in the *Journal of the American Medical Association* proposed that the disparities were due, in part, to the disproportionate burden of chronic conditions and comorbidities in in racial/ethnic populations, including diabetes, cardiovascular disease, asthma, obesity, and kidney disease (Hooper et al., 2020)—once again showing the importance of diagnosing and managing chronic disease.

As a result of the pandemic, some state and local governments began to encourage social distancing and limited gatherings. This presented a challenge for some patients who needed to receive medical and dental treatment. As challenges often do, the pandemic created an opportunity for the increased use of telehealth to reduce exposure to populations considered at risk (Aziz et al 2020).

Despite its importance and increased use during the pandemic, formalized telehealth training is still not ubiquitous in American medical education, with only about a quarter of medical schools having integrated telehealth training components in the preclinical phase of their curriculum (Waseh & Dicker, 2019). There is hope, however, that an increased need for the use of telehealth and potential changes in telehealth reimbursements could support increased training, which in turn could further expand its use to serve rural and underserved populations.

Based on these findings and other research, the 17th report of the Advisory Committee on Training in Primary Care Medicine and Dentistry proposes the five recommendations below for the Secretary and Congress. The rationale for each of these recommendations is discussed, more in depth, in the following sections of the report.

ACTPCMD Recommendations

Recommendation 1
Support the incorporation of community-based resources and partnerships into community-based primary care education and training for students, trainees, faculty, and practitioners.

Recommendation 2
Support longitudinal community-based primary care education and training for students, trainees, and faculty.

Recommendation 3
Provide funding to support innovative primary care programs that educate and provide training, incorporating evidence-based behavior change strategies that improve chronic disease prevention and management across oral health and primary care.

Recommendation 4
Support faculty development designed to facilitate the education of students, trainees, and primary care providers using innovative methods in addressing population health and managing chronic disease. Support the education and training of students and trainees in addressing population health and managing chronic disease.

Recommendation 5
Provide funding to support programs that provide innovative education and training, including telehealth. Also provide funding to support programs that provide education and training in telehealth as well as other virtual health technologies.

Background

The role of primary care providers in public health is of paramount importance. They diagnose and treat common medical and dental conditions, deliver preventive care, address chronic conditions, and refer patients to specialists.

Despite their importance, the demand for primary care physicians is expected to outstrip their future supply. A 2020 report by the American Association of Medical Colleges projects a shortfall of between 21,400 and 55,200 primary care physicians by 2033 (AAMC, 2020). Unfortunately, a significant surge in physicians and other providers alone will not solve a nationwide shortage. This is because in the U.S., primary care providers are not distributed evenly across the country, with fewer physicians providing care in rural and other underserved areas (Bodenheimer & Pham, 2010).

Health Professional Shortage Areas (HPSA) are areas, population groups, and facilities experiencing a shortage of health care professionals. HRSA estimates that over 79 million individuals in the U.S. live in a HPSA area with a shortage of primary care providers (HRSA, 2020).

The challenges of provider shortages and maldistribution, among others, has led to the development of alternative educational and training strategies to help ameliorate these problems and increase public health, which is the primary subject of this report.

Definition of Primary Care Provider

> For the purpose of this report, a primary care provider is defined broadly and includes physicians, dentists, dental hygienists, nurses, physician assistants, nurse practitioners, behavioral health professionals, and other similar health care providers.

The Importance of Community-Based Primary Care Education and Training

In 2013, the American Academy of Family Physicians published research showing that 56% of family medicine graduates practice within 100 miles from where they completed their training (American Academy of Family Physicians [AAFP], 2013). Moreover, 39% of them practice within 25 miles of their residency training and 19% stay within 5 miles of their training program (AAFP, 2013).

Given these data, it makes sense to support training models that operate where primary care providers are most needed—such as in rural areas and areas where underserved populations live (AAFP, 2013). One approach that has shown promise is the community-based primary care education model. Using this model, primary care trainees obtain their training by being placed alongside other providers that practice in the community, such as small practices or community clinics.

Unlike the hospital setting, trainees in a community-based milieu are exposed to patients managing illness in a family, social, and community context (Kelly et al., 2014). This type of

training supports meaningful learning experiences and a social context for learning (Kelly et al., 2014). Trainees also gain a continuous insight into the lives and communities they serve and therefore obtain better awareness of the challenges their patients face (Kelly et al., 2014). This allows trainees to better understand factors other than disease that might impact the health of their patients, such as the social determinants of health (living/work conditions, housing adequacy, food insecurity, and other factors) (Claramita et al. 2019).

Community-based educational models also have shown to have a positive effect in dentistry training (Piskorowski et al. 2011). For instance, the University of Michigan School of Dentistry has extended training beyond school walls to expose students to the needs of underserved populations. Since 2000, the school has partnered with more than 27 community clinics to improve oral health (Piskorowski et al. 2011).

Through this program, students spend at least 10 weeks living and working in the community, which helps them gain a better understanding of the patients' unmet needs. As of 2011, a total of 58,652 patients had been treated with students performing 121,769 dental procedures at community clinics (Piskorowski et al. 2011). A subsequent study has shown that community-based dentistry programs lasting more than eight weeks may increase the likelihood of students selecting a community dental career path as their first career choice (Piskorowski et al. 2012).

Longitudinal Community-Based Training Programs

Clinical block rotations typically involve short placements (e.g., 4-8 weeks) through various specialties in either hospital or general practice settings (Thistlehwaite et al., 2013). This generally results in short-term encounters with patients, primarily for acute care. Longitudinal continuity of care programs, in contrast, tend to be significantly longer. Studies show that longitudinal programs can vary in length from half a day per week for six months, to full-time involvement for 12 or more months (Thistlehwaite et al. 2013).

Although not strictly the same, longitudinal care is sometimes referred to as continuity of care. The American Academy of Family Physicians defines continuity of care as "the process by which the patient and his/her physician-led care team are cooperatively involved in ongoing health care management…Continuity of care is rooted in a long-term patient-physician partnership in which the physician knows the patient's history from experience and can integrate new information and decisions from a whole-person perspective efficiently without extensive investigation or record review." (AAFP, n.d.).

Longitudinal programs offer the opportunity for student learning in health promotion and disease prevention and help demonstrate the value of managing chronically-ill patients (Thistlehwaite et al. 2013). These programs help highlight the importance of life perspective, family dynamics, and the patient's social context.

Longitudinal programs are also important because some studies have shown that longitudinal, multifaceted programs are more effective than isolated modules or clerkships in increasing the number of students choosing primary care specialties (Pfarrwaller et al., 2015). An example of a longitudinal community-based training program is the Neighborhood Health Education Learning Program (NeighborhoodHELP) implemented by Florida International University. The program

targets underserved households in Miami Dade County and includes students from various disciplines including nursing, medicine, and social work. It may also include students from the law school to address a client's legal issues, the education school to provide tutoring and career advice, and behavioral staff to provide counseling when needed (Greer et al., 2018).

Through the program, a specialist conducts an assessment of the household's needs and strengths. Following the assessment, a holistic care plan is created to address both social and medical needs by a student team. Students then provide direct services (e.g., health services, helping with food stamp applications) through home visits and a mobile health center. A minimum of three follow-up visits are conducted per household, with students assessing and reflecting on their efforts. Over the past six years, nearly 1,500 students have conducted close to 7,500 home visits (Greer et al., 2018).

Programs such as NeighborhoodHELP and the community initiative by The University of Michigan School of Dentistry emphasize how partnerships between communities and schools can be mutually beneficial and how they can influence providers to practice in areas where a need exists.

Chronic Disease Prevention and Management

Chronic Disease in the United States

The Center for Disease Control and Prevention (CDC) defines a chronic disease as a condition lasting a year or more that requires ongoing medical attention, limits activities of daily living, or both (CDC, 2019a). Examples of common chronic diseases include diabetes, high blood pressure, arthritis, depression, cancer, and asthma.

Chronic diseases are common in the U.S. population, with six in ten American adults having one (CDC, 2019b). In addition to the physical and emotional toll on patients and families, chronic diseases also lead to significant health care costs. Of the $3.5 trillion annual health care expenditures in the U.S., 90% are for people with chronic and mental health conditions (CDC, 2019a).

Many chronic diseases have been found to be linked to behaviors such as substance use (e.g., tobacco and excessive alcohol use), poor nutrition, and lack of exercise (CDC 2019a). Because these behaviors can be modifiable, some chronic diseases are avoidable or better managed through patient education and behavioral change strategies.

In this arena, all health care providers can play an important role. Studies show that 40% of all primary care visits focus on chronic illness (Searight, 2018). Also, because primary care providers and dentists are typically an individual's first point of contact within the health care system, it creates a natural opportunity for patient education.

The Role of Primary Care Providers in Preventing and Managing Chronic Conditions

Primary care providers can significantly impact behaviors that lead to better health outcomes. Studies show that states with higher ratios of primary care physicians to patients have better health outcomes, including lower rates of all causes of mortality (Starfield et al., 2005). States

with higher ratios of providers also have lower smoking rates and less obesity (Starfield et al., 2005). In addition to better health outcomes, the supply of primary care providers is also associated with lower health care costs (Starfield et al., 2005).

Screening for chronic diseases has traditionally been the role of physicians, nurses, and physician assistants—but dentists, social workers, behavioral professionals, and other providers can also play an important role in preventing and managing chronic disease. Oral examinations can help detect various health problems including nutritional deficiencies, immune disorders, microbial infections, and some cancers (Institute of Medicine, 2011). Studies have also found an association between chronic oral infections and stroke, premature births, low birth weight, heart disease, lung disease (U.S. Department of Health and Human Services, 2020).

Dentists and hygienists can therefore play a key role in screening, prevention, and management of chronic disease as well as substance use disorders, similar to the valuable role of oral assessments by non-dental primary care providers. Integrated care delivery models, which bridge dentistry and medicine, can be particularly helpful in improving patient outcomes for diseases such as diabetes (Glurich et al., 2018).

Behavioral health and physical health are also interlinked. Therefore, behavioral professionals—in addition to screening for certain types of chronic mental illness—should consider screening for chronic physical health conditions as well (The Healthier Washington Collaboration Portal, n.d.b). For instance, individuals experiencing mental illness or substance use disorder have a greater risk for developing a chronic health condition (The Healthier Washington Collaboration Portal, n.d.a). In addition, individuals with depression and schizophrenia are susceptible to developing type 2 diabetes (The Healthier Washington Collaboration Portal, n.d.b).

Frequent use of various substances, such as alcohol, heroin, and methamphetamines can lead to increased risk for cardiovascular diseases (The Healthier Washington Collaboration Portal, n.d.b). And studies show that some individuals with mental illness may be less able to manage their chronic disease (The Healthier Washington Collaboration Portal, n.d.b). Therefore, because chronic conditions can span many disciplines, their screening, diagnosis, and management should be a "team sport" involving providers from various disciplines.

Barriers to Counseling Patients on Chronic Disease Prevention

Despite the importance of patient counseling to prevent chronic disease, primary care providers do not always feel comfortable counseling patients. A meta-analysis of 35 studies by Rubio-Valera et al. (2014) found that barriers encountered by primary care providers in offering health promotion and preventive services include a lack of confidence in the provider's communication abilities, high workload levels, and a lack of knowledge about referral resources.

A separate meta-analysis of behavioral change interventions by health care professionals found other barriers in delivering such interventions including: lacking the resources to facilitate behavioral change, lacking confidence in the ability to facilitate positive behavioral changes in the patient, a perceived lack of time to deliver the behavioral change intervention, and lacking behavioral change training (Keyworth, 2020). With respect to the latter, one survey showed that only between 31% and 56% of primary care physicians rated themselves as having "significant

expertise" in counseling related to diet, smoking, weight management, and alcohol use (Searight, 2018).

Conversely, studies show the existence of enablers to delivering behavioral change interventions. These include appropriate training, working in an environment perceived to be conducive to delivering interventions, and having the right skillset to deliver the interventions (Keyworth, 2020).

Interprofessional Education/Training and Chronic Disease Prevention/Management
As previously discussed, the prevention and management of chronic diseases does not fall into the realm of solely one profession. Involving various providers is therefore optimal for ensuring an individual's overall health. However, both education and practice are often isolated by profession in the American health care system. This can be remediated through interprofessional education and training, where two or more professions learn from each other to improve health outcomes (Dolce et al., 2014).

Various initiatives have been developed to support interprofessional education and training. For example, the *Smiles for Life: A National Oral Health Curriculum*, is an online, modular curriculum for integration into existing undergraduate and graduate courses across the health sciences (Dolce et al., 2014). This free curriculum, which is endorsed by 20 national organizations, includes eight 60-minute courses covering core areas of oral health which are relevant to medical clinicians.

In the area of behavioral health, the National Center for Integrated Behavioral Health (NCIBH) at the University of Pennsylvania's Perelman School of Medicine has as its mission to "prepare primary care clinicians with the expertise and leadership for integrated behavioral health care." (University of Pennsylvania Perelman School of Medicine, n.d.). Primary care providers are often the first point of contact for patients and can help identify and respond to mental health and substance use disorders. However, current education programs do not always train clinicians in evidence-based practices in these areas. Supported by HRSA, The NCIBH aims to "Identify and disseminate best practices of scalable inter-professional integrated behavioral health training in primary care … [and] enable implementation of integrated behavioral health training and practice models in primary care…" (University of Pennsylvania Perelman School of Medicine, n.d.). Programs such as these can help train providers to better diagnose and manage certain chronic conditions.

At Harvard University the Center for Integration of Primary Care and Oral Health (CIPCOH) serves as a "national resource to consolidate the evidence base for systems-level oral health integration into primary care training." (Harvard University, n.d.). CIPCOH is a resource of research on oral health integration into primary care training. It also supports the development of community of practice plans to support the integration of oral health into primary care training and delivery (Harvard University, n.d.).

While interprofessional education is not currently the norm in the American health care educational system, initiatives such as these can help to improve and promote interprofessional training to improve health outcomes for chronic and other diseases.

Exemplary Training Programs

Americans in Motion—Healthy Interventions

The Americans in Motion—Healthy Interventions (AIM-HI) is a program developed by the American Academy of Family Physicians. It uses evidence-based strategies to assist primary care providers in the delivery of patient fitness interventions in three domains: physical activity, healthy eating, and emotional well-being. AIM-HI uses three tools: 1) a fitness inventory (to assess level of physical activity, nutrition and emotional well-being, as well as readiness for change), 2) a fitness prescription (to record simple and measurable fitness goals), and 3) a food and activity journal (where patients recorded what they ate, how they felt, and what they did to be active) (McAndrews et al., 2011).

Rather than "lecturing" patients on the importance of physical activity, the program uses motivational interviewing techniques for behavioral change as well as the evidence-based "stages of change" model (pre-contemplation, contemplation, preparation, and action). After an initial assessment is made, the physician helps patients to set small, reasonable goals for change. This is important since small, incremental changes are more likely to be successful than an "all-or-nothing" approach. A study of the AIM-HI program involving 21 family practices and 610 patients found that 17.8% of the patients lost 10 pounds or more from baseline to 10 months (McAndrews et al., 2011). Also, the number of patients self-reporting physical activity of 20 minutes, three times a week increased by 10.1% from baseline to 10 months (McAndrews et al., 2011).

Know the R.I.S.K.

Know the R.I.S.K. is an educational intervention involving 121 residents from various programs, including family medicine and dentistry. The purpose of the intervention is to train residents on screening, brief intervention, and referral to treatment (SBIRT)—a comprehensive and integrated public health approach to the delivery of early intervention and treatment services for substance use disorders (Marshall et al. 2012). This approach has been shown to reduce substance use consumption. The intervention was incorporated as part of the resident's core curriculum and includes the following: a lecture introducing SBIRT, six self-directed training modules, five documented patient interventions, and a 30-minute clinical skills examination (Marshall et al. 2012). Residents received a pre- and post-test to assess changes in measurable outcomes.

Results of the intervention showed an increase in the residents' confidence and readiness in applying the SBIRT approach. Residents also rated themselves readier and more confident in addressing a patient's substance use issues. In addition, residents believed that the training was beneficial for providing care to patients who are at risk for substance use disorders. Overall, residents believed that SBIRT training allowed them to make a difference in their patient's substance use (Marshall et al. 2012).

Programs that incorporate evidence-based behavioral change strategies such as Americans in Motion—Healthy Interventions and Know the R.I.S.K. are important because they can help shape patient behavior to prevent disease or to help better manage chronic disease. This, in turn, can help reduce costs for the health care system as a whole.

Population Health Education and Training

Population Health

The American Academy of Family Physicians defines population health as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group." (AAFP, 2015). The traditional training model for primary care providers focuses on solving a clinical problem presented by a single individual (Wood & Grumbach, 2019). While individual care continues to be of great importance, there is now a shift to also consider the health of *groups* of individuals. Such efforts include helping to promote healthy communities as well as efforts towards keeping patients healthy for as long as possible (Wood & Grumbach, 2019).

In a summary of analyses and policies regarding the relationship between primary care practice and population health, Wood & Grumbach (2019) state that a common element in recommended health care system reforms is the recognition that "individual health is inseparable from the health of the larger community, which ultimately determines the overall health of the nation."

Social Determinants of Health

Research shows that a patient's environment and social needs can have a marked effect on their health. The conditions under which people are "born, grow, live, work, and age" can account for as much as 55% of their health outcomes (AAFP, 2018). These conditions—often called the social determinants of health—can include factors such as poverty, lack of community resources, racism, and income inequality (AAFP, 2018). For example, poorer neighborhoods see higher rates of obesity—likely due to lack of access to safe places to exercise and barriers to access healthy foods (LexisNexis, 2017).

Most importantly, studies show that the effects of social determinants of health can extend to chronic diseases such as cardiovascular disease, Type 2 diabetes, cancers, pulmonary diseases, and other conditions (Cockerham et al., 2017). In fact, social factors can at times initiate the onset of the pathology, thus serving as a *cause* for various chronic diseases (Cockerham et al., 2017).

Social determinants of health also impact oral health. For example, the ability to access oral health care is associated with "gender, age, education level, income, race and ethnicity, access to medical insurance, and geographic location." (U.S. Department of Health and Human Services, 2020). According to the American Academy of Pediatric Dentistry (AAPD), other social determinants of health include household food insecurity, which can make the purchase of healthy foods more difficult (AAPD, 2020).

Given their impact on chronic disease and other important health outcomes, it follows that primary care providers and dentists should address the social and environmental determinants of health in addition to treating the patient's initial clinical complaint (Wood & Grumbach, 2019).

The American Academy of Family Physicians recommends that "family physicians consider the factors beyond the walls of their practice that influence their patients' health … [including] the

social and physical environments in which their patients live and work in order to effectively improve health outcomes." (AAFP, 2015).

In addition to physicians, other health care providers can assist in addressing a patient's social determinants of health. In a recent survey conducted in 14 clinical centers of 258 providers—including physicians, nurses, case managers, social workers, and pharmacists—a total of 84% of the respondents "agreed" or "strongly agreed" that screening for social needs should be a standard part of clinical care. Also, 95% "agreed" or "strongly agreed" that such information could be used to improve the patient's care (Schickedanz et al., 2019). In order to train future clinicians, faculty in various disciplines need appropriate professional development to teach social determinants of health to their students and incorporate into the curriculum.

Population Health Programs and Faculty Development

Although the concept of population health has been around for a while, the emergence of population health as department-level initiatives in academic medical centers is relatively recent (Gourevitch, 2019). One of the ways to address the health of populations is to educate prospective clinicians on the social determinants of health. This presumes the incorporation of social determinants of health in the curricula and the provision of faculty development on the subject matter.

Several perceived barriers have been identified to teaching social determinants of health. These include: general resistance to curriculum change, the content not being relevant to licensing exams, lack of dedicated time for teaching social determinants of health, faculty lack of knowledge and skills regarding social determinants of health, and a lack of faculty development opportunities (Lewis et al., 2020). An electronic survey of 29 American medical schools also identified additional barriers including: lack of expertise in curricular development surrounding social determinants of health and a lack of identified experiential learning opportunities (Lewis et al., 2020).

A literature search did not reveal any significant model programs for faculty development in social determinants of health. Therefore, there is a need to incentivize programs that conduct research on best practices on faculty development in population health for various disciplines including physicians, nurses, physician assistants, social workers, case workers, navigators, pharmacists, dentists, dental hygienists, and behavioral health professionals.

While significant models could not be identified, there have been some efforts in faculty development, such as a one-day retreat for 134 faculty representing 56 training programs and 20 disciplines (Martinez et al, 2020). The training was developed by the Zucker School of Medicine at Hofstra/Northwell and focused on five objectives, to: 1) engage educational leadership in identifying learning variables that affect trainees' exposure to social determinants of health, 2) illustrate the effects of social determinants of health, 3) demonstrate methods used to screen for social determinants of health, 4) describe educational approaches to teaching social determinants of health, and 5) participate in best practices that will provide educational innovations to support graduate medical education in addressing social determinants of health (Martinez et al, 2020). A survey three months post-training revealed that 23% of participants reported making a change to their curriculum or clinical workflows.

Education and Training on the Social Determinants of Health
A 2017 survey of 5,000 active members of the American Academy of Family Physicians showed that providers want to help patients address the social determinants of health they encounter but have been stymied by barriers such as time and staffing (AAFP, 2017). In addition, 75% of those surveyed agreed they should advocate for public policies that address social determinants of health but 56% feel unable to provide solutions to their patients (AAFP, 2017). Furthermore, the time spent with patients to locate sources of food, housing, or to address other social determinants of health is not always reimbursable.

Obtaining a patient's thorough history is a core task in primary care practice, but evidence suggests that providers do not always ask patients about important social factors, such as food insecurity (Wood & Grumbach, 2019). Using structured screening tools for social determinants of health might help some practices to better address these determinants during the patient's initial visit (Wood & Grumbach, 2019).

To address some of these issues, the AAFP has developed The EveryONE Project Toolkit, which can be used by both practitioners and trainees. The toolkit includes a validated screening tool to help providers recognize and respond to social determinants of health. It also includes resources and tools to help physicians plan next steps and address a patient's needs (AAFP, 2018).

The toolkit's Social Needs Screening Tool allows providers to evaluate patients on the following social needs: housing, food, transportation, utilities, child care, employment, education, finances, and personal safety. Following screening, providers can use the AAFP's Neighborhood Navigator tool to identify community resources that can help meet their patients' needs. The Neighborhood Navigator is an online resource that can be used at point of care and lists more than 40,000 social services by zip code, including food, housing, legal aid, employment aid, transportation, and other services. The Neighborhood Navigator also allows providers to connect patients to community resources by logging in a referral.

Implicit Bias, Structural Racism, and Health Outcomes
Attitudes and behaviors by primary care providers can contribute to both health disparities (Hall et al., 2015) and outcomes. Despite the increase in scientific advances and treatments, overall health care outcomes are not the same for all racial/ethnic groups in the U.S. Disparities still exist with respect to mortality, disease incidence/prevalence, quality of care received, and life expectancy (Hall et al., 2015).

The recent COVID-19 pandemic has shined a spotlight on issues related to health disparities. National data from the pandemic showed that African Americans and Latinos were three times more likely to contract COVID-19 than Whites, and almost twice as likely to die from the disease (Wen & Sadeghi, 2020).

A provider's bias can contribute to health disparities. Studies show that prejudicial attitudes (or bias) towards others can be either explicit or implicit. Implicit bias exists outside of conscious

awareness and is difficult to acknowledge/control (Hall et al., 2015). Studies show that health care providers show the same level of implicit bias as the population at large (FitzGerald & Hurst, 2017).

One study showed that some White providers viewed African American patients as "less intelligent, less able to adhere to treatment regimens, and more likely to engage in risky behaviors than their White counterparts." (Hall et al., 2015). The same study found that Hispanic patients were viewed by some providers as "unlikely to accept responsibility for their care and more likely to be noncompliant with treatment recommendations." (Hall et al., 2015). Other studies have shown a link between provider bias and patient health outcomes (Hall et al., 2015).

Educational interventions can reduce bias in students by making them aware of their implicit bias and providing strategies to reduce implicit associations (Zestcott et al., 2016). Research shows that having providers take a bias test along with feedback was a predictor to decreasing implicit bias (Zestcott et al., 2016). Other strategies to control automatic responses in stigmatized patients include "affirming egalitarian goals, seeking common-group identities, perspective talking, and individuation via counter-stereotyping." (Zestcott et al., 2016). If the goal is to provide equal care to a community or population, educational interventions on students to reduce implicit bias should be part of the educational strategy for providers moving forward.

In addition to implicit bias, structural racism can also impact health outcomes. Racism operates at various levels, from the individual to the structural. Structural racism has been defined as the "macrolevel systems, social forces, institutions, ideologies, and processes that interact with one another to generate and reinforce inequities among racial and ethnic groups." (Gee & Ford, 2011). Structural racism is important, because it can have a downstream effect on social determinants of health.

For example, structural determinants include social policies (e.g., housing), public policies (e.g., nutrition), macroeconomic policies, and societal values which, in turn, can impact social class, economic position, education, occupation, and income (Sullivan & Thakur, 2020). These factors can then influence social determinants of health such as housing quality, neighborhood safety/green space, community violence, and other determinants (Sullivan & Thakur, 2020).

In the health care arena, one of the first steps to confront structural racism is acknowledging its existence and taking steps to remediate it through education and practice. Curricula to address structural racism already exist, including the following peer-reviewed, interdisciplinary curricula: *Structural Competency: Curriculum for Medical Students, Residents, and Interprofessional Teams on the Structural Factors that Produce Health Disparities* (Neff et al, 2020) and *Health Equity Rounds: An Interdisciplinary Case Conference to Address Implicit Bias and Structural Racism for Faculty and Trainees* (Perdomo et al., 2019). These curricula include facilitator guidelines, training slides, reading lists, handouts, and evaluation materials and are accessible free of charge through *MedEdPORTAL*, an open-access journal of teaching and learning resources in the health professions published by the Association of American Medical Colleges.

Innovative Educational Programs and Telehealth

Impact of Telehealth

HRSA defines telehealth 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." (HRSA, 2020b). Telehealth technologies can be used to support clinical care at a distance in various disciplines including routine medical care, specialty care, behavioral health, and dentistry.

Various studies have shown the clinical effectiveness of telehealth. A review of 1,300 studies involving interventions for five chronic conditions found that, in 99% of the studies, telehealth interventions were equal or better than face-to-face interventions (Rambur et al., 2019).

A separate review of telehealth used for patients with heart failure, stroke, and chronic obstructive pulmonary disease found reductions in hospital admissions/readmissions, length of stay, and emergency department visits (Dinesen et al., 2016). In teledentistry, a comparative study of 291 children, divided into two groups, found that the teledentistry examinations to screen for early childhood caries were comparable to traditional, visual oral examinations conducted in person (Kopycka-Kedzierawski & Billings, 2013).

In addition, telehealth can help rural patients access care without having to travel long distances. For example, a telehealth program in a single rural Veterans Affairs hospital resulted in a reduction of more than 820,000 travel miles by patients over a period of nine years (Waseh & Dicker, 2019). Other studies have found that telehealth produces significant savings to the health care system. A demonstration project involving chronically ill Medicare patients found that—compared with a control group—patients using telehealth resulted in spending reductions of $312-$542 per person, per quarter (Baker et al., 2011).

HRSA's Office for the Advancement of Telehealth has spearheaded the promotion and support of the use of telehealth technology through various funded projects. These projects have focused on providing health care services to medically underserved populations and rural communities (HRSA, 2018). The projects provide telehealth services in various areas, including medical care, dentistry, and behavioral health (HRSA, 2018).

Telehealth Education and Training

In 2016, the American Medical Association released a statement recognizing that formalized telemedicine training is not offered widely to physicians in training (AMA, 2016). As a result, the organization has developed a policy encouraging accrediting bodies to include core competencies for telemedicine into their programs (AMA, 2016). Similarly, the National Organization of Nurse Practitioner Faculties has released a statement in support of incorporating telehealth in the education of nurse practitioners (NONPF, 2018).

Despite the push to educate providers, formalized telehealth training is still not ubiquitous in American medical education. A recent article showed that only about a quarter of medical

schools had integrated telehealth training components in the preclinical phase of their curriculum, while only half had done so in the clerkship phase (Waseh & Dicker, 2019).

In addition, a large disparity exists in the implementation rates of telehealth curricula throughout the nation (Waseh & Dicker, 2019). For instance, the majority of medical schools in California, Pennsylvania, and Michigan—states which are home to 1 out of 7 medical schools nationwide—have implemented some form of telehealth curricula (Waseh & Dicker, 2019). However, there are various states in the county where medical schools offer no telehealth training as part of their preclinical undergraduate medical curriculum including Nevada, Colorado, New Mexico, North Dakota, Kansas, Oklahoma, Arkansas, Louisiana, Ohio, Wisconsin, Kentucky, Tennessee, and North and South Carolina (Waseh & Dicker, 2019).

This is unfortunate as some of these states could benefit significantly from telehealth training due to the large number of existing rural communities. These findings demonstrate a need for undergraduate medical education to incorporate telemedicine competencies in medical school curricula.

Telehealth and the COVID-19 Pandemic

On March 11, 2020 the World Health Organization characterized COVID-19 as a pandemic. In the U.S. one of the first locations reporting a significant number of cases was New York City, so much so that the governor declared a disaster emergency for the state on March 20, 2020. Shortly thereafter, the state began encouraging social distancing and limited gatherings. This presented a challenge for some patients who needed to receive medical and dental treatment.

On March 17, 2020 the Columbia University Irving Medical Care Center began to integrate telehealth into prenatal care in response to the COVID-19 pandemic (Aziz et al 2020). Providers were trained on the use of telehealth software through video tutorials and a user guide one week prior to adoption (Aziz et al 2020). Patients were also assisted in the installation and use of secure apps in their phones/tablets by staff either in person, via telephone, or by emailed instructions (Aziz et al 2020).

Telehealth eliminated about half of in-person hospital visits for low-risk patients at the Columbia University Irving Medical Care Center (Aziz et al 2020). It also reduced exposure of both pregnant women and providers to COVID-19, while also decreasing the use of personal protective equipment. The latter was especially useful due to reported equipment shortages. In addition, the use of telehealth in dentistry during the pandemic allowed for safe and timely patient triage, carrying out patient consultations, and monitoring treatment progress to help decrease visits to burdened dental offices and hospitals (Ghai, 2020).

The large surge of use of telehealth during the COVID-19 pandemic was due in part to both an increased patient demand for virtual visits to reduce the possibility of exposure to the virus as well as the lifting of some barriers that had limited telehealth expansion in the past (Blue et al., 2020). Both federal and state government response helped facilitate an expanded telehealth implementation.

Starting March 1, 2020, Medicare removed the requirement of limiting telehealth reimbursements for beneficiaries receiving care at designated rural health centers, thereby allowing telehealth use to extend significantly (Aziz et al 2020). This wavier also impacted federal Medicaid and Children's Health Insurance Programs, allowing telehealth visits to be reimbursed at the same rate as in-person visits (Aziz et al 2020). The continuation of waivers such as these after the pandemic could have a significant impact on the increased use of telehealth in the future.

Exemplary Telehealth Program

Finger Lakes Community Health

Finger Lakes Community Health (FLCH) in Penn Yan, New York was established in 1989 and currently serves 25,000 patients annually, including 9,000 migrant workers (Langelier et al., 2016). FLCH is a Federally Qualified Health Center that provides dentistry and teledentistry services both through its clinics and mobile dental programs to agricultural workers at housing sites, Head Start centers, and school sites. FLCH operates in rural areas with few available dental specialists. The dental team at FLCH includes 10 dentists (some full- and others part-time), 7 dental hygienists, and 15 dental assistants (Langelier et al., 2016).

Teledentistry services are offered only to children, most of which have serious dental decay. Each patient is assigned a health worker/patient navigator. The navigators are cognizant of the needs of the community and are trained in oral health. When needed, patients can be seen remotely through the teledentistry program by a pediatric dentist in Rochester. To accomplish this, the patient and family are located at a FLCH clinic where a dental hygienist manages the intraoral camera. The pediatric specialist then appears on the monitor and the examination begins with the hygienist manipulating the camera so the specialist can see views of various teeth (Langelier et al., 2016).

To date, more than 534 children have received a teledentistry consultation and 94% have completed their dental treatment plan (Langelier et al., 2016). Prior to the teledentistry program, the waiting time for a child to obtain surgical services at Rochester was 9 months, while now it is only 3 to 4 weeks (Langelier et al., 2016). Because of the program, the practice of medicine and dentistry has changed at FLCH with more frequent communication between primary care providers, general dentists, and specialists, which ultimately benefits the patient (Langelier et al., 2016).

Summary

While a shortage of primary care providers may be inevitable in the future, a resilient health care system—along with innovations in primary care education and training—can help create strategies to address such shortages and improve the health of Americans.

Research shows that providers tend to practice where they trained, and longitudinal community-based training models can be a useful strategy to both meet the needs of the community and increase the number of providers where shortages exist.

Training providers on the use of evidence-based strategies to prevent and manage chronic disease is another way to move towards a healthier population. Also, by training providers, faculty, and staff on the social determinants of health, implicit bias, and structural racism as well as fostering partnerships with community resources, it can help providers to consider factors beyond their office walls that impact their patients' health.

During the past two decades, there has been an explosion of technology and communications devices for the general public. Nonetheless, provider education is still catching up on training providers on the use of telehealth systems. Events such as the COVID-19 pandemic have propelled the use of telehealth as a means to service patients who would like to limit their risk of infection while consulting a doctor. This may further incentivize use and reimbursement of such technologies, which can also be used to service patients in areas where shortages of providers exist.

List of Acronyms and Abbreviations

AAFP	American Academy of Family Physicians
ACTPCMD	Advisory Committee on Training in Primary Care Medicine and Dentistry
AMA	American Medical Association
CDC	Center for Disease Control and Prevention
COVID-19	Coronavirus Disease
HHS	U.S. Department of Health and Human Services
HPSA	Health Professional Shortage Areas
HRSA	Health Resources and Services Administration
SBIRT	Screening, Brief Intervention, and Referral to Treatment

References

Association of American Medical Colleges. (2020). The complexities of physician supply and demand: Projections from 2018 to 2033. https://www.aamc.org/system/files/2020-06/stratcomm-aamc-physician-workforce-projections-june-2020.pdf

American Academy of Family Physicians (n.d.). Continuity of care, definition of. https://www.aafp.org/about/policies/all/definition-care.html

American Academy of Family Physicians (2013). New family physicians tend to settle close to training sites. https://www.aafp.org/news/education-professional-development/20131120rgcfmgrads.html

American Academy of Family Physicians. (2015). Population health. https://www.aafp.org/about/policies/all/population-health.html

American Academy of Family Physicians. (2017). Social determinants of health (SdoH): Family physicians' role. https://www.aafp.org/dam/AAFP/documents/patient_care/everyone_project/sdoh-survey-results.pdf

American Academy of Family Physicians. (2018). Addressing social determinants of health in primary care. https://www.aafp.org/dam/AAFP/documents/patient_care/everyone_project/team-based-approach.pdf

American Academy of Pediatric Dentistry. (2020). Policy on Social Determinants of Children's Oral Health and Health Disparities. www.aapd.org/research/oral-health-policies--recommendations/social_determinents/#

American Medical Association (2016). AMA encourages telemedicine training for students, residents. https://www.ama-assn.org/press-center/press-releases/ama-encourages-telemedicine-training-medical-students-residents

Aziz, A., Zork, N., Aubey, J. J., Baptiste, C. D., D'Alton, M. E., Emeruwa, U. N., Fuchs, K. M., Goffman, D., Gyamfi-Bannerman, C., Haythe, J. H., LaSala, A. P., Madden, N., Miller, E. C., Miller, R. S., Monk, C., Moroz, L., Ona, S., Ring, L. E., Sheen, J. J., Spiegel, E. S., … Friedman, A. M. (2020). Telehealth for High-Risk Pregnancies in the Setting of the COVID-19 Pandemic. *American Journal of Perinatology*, *37*(8), 800–808.

Baker, L. C., Johnson, S. J., Macaulay, D., & Birnbaum, H. (2011). Integrated telehealth and care management program for Medicare beneficiaries with chronic disease linked to savings. *Health Affairs*, *30*(9), 1689-1697.

Bodenheimer, T. S., & Smith, M. D. (2013). Primary care: Proposed solutions to the physician shortage without training more physicians. *Health Affairs*, *32*(11), 1881-1886.

Centers for Disease Control and Prevention. (2019a). About chronic diseases. https://www.cdc.gov/chronicdisease/about/index.htm

Centers for Disease Control and Prevention. (2019b). Chronic diseases in America. https://www.cdc.gov/chronicdisease/resources/infographic/chronic-diseases.htm

Claramita, M., Setiawati, E. P., Kristina, T. N., Emilia, O., & van der Vleuten, C. (2019). Community-based educational design for undergraduate medical education: a grounded theory study. *BMC medical education*, *19*(1), 258. https://doi.org/10.1186/s12909-019-1643-6

Cockerham, W. C., Hamby, B. W., & Oates, G. R. (2017). The social determinants of chronic disease. *American Journal of Preventive Medicine*, *52*(1S1), S5–S12.

Dinesen, B., Nonnecke, B., Lindeman, D., Toft, E., Kidholm, K., Jethwani, K., Young, H. M., Spindler, H., Oestergaard, C. U., Southard, J. A., Gutierrez, M., Anderson, N., Albert, N. M., Han, J. J., & Nesbitt, T. (2016). Personalized telehealth in the future: A global research agenda. *Journal of Medical Internet Research*, *18*(3), e53.

Dolce, M. C., Aghazadeh-Sanai, N., Mohammed, S., & Fulmer, T. T. (2014). Integrating oral health into the interdisciplinary health sciences curriculum. *Dental clinics of North America*, *58*(4), 829–843.

FitzGerald, C., & Hurst, S. (2017). Implicit bias in healthcare professionals: a systematic review. *BMC Medical Ethics*, *18*(1), 19.

Gee, G. C., & Ford, C. L. (2011). Structural racism and health inequities: old issues, new directions. *Du Bois review: Social Science Research on Race*, *8*(1), 115–132.

Ghai S. (2020). Teledentistry during COVID-19 pandemic. *Diabetes & metabolic syndrome*, *14*(5), 933–935. Advance online publication.

Glurich, I., Schwei, K. M., Lindberg, S., Shimpi, N., & Acharya, A. (2018). Integrating Medical-Dental Care for Diabetic Patients: Qualitative Assessment of Provider Perspectives. *Health promotion practice*, *19*(4), 531–541.

Gourevitch, M. N., Curtis, L. H., Durkin, M. S., Fagerlin, A., Gelijns, A. C., Platt, R., ... & Tierney, W. M. (2019). The emergence of population health in US academic medicine: A qualitative assessment. *JAMA Network Open*, *2*(4), e192200-e192200.

Greer, P. J., Jr, Brown, D. R., Brewster, L. G., Lage, O. G., Esposito, K. F., Whisenant, E. B., Anderson, F. W., Castellanos, N. K., Stefano, T. A., & Rock, J. A. (2018). Socially Accountable Medical Education: An Innovative Approach at Florida International University Herbert Wertheim College of Medicine. *Academic Medicine: Journal of the Association of American Medical Colleges*, *93*(1), 60–65.

Hall, W. J., Chapman, M. V., Lee, K. M., Merino, Y. M., Thomas, T. W., Payne, B. K., Eng, E., Day, S. H., & Coyne-Beasley, T. (2015). Implicit racial/ethnic bias among health care professionals and its influence on health care outcomes: A systematic review. *American journal of Public Health*, *105*(12), e60–e76.

Harvard University. (n.d.). Center for Integration of Primary Care and Oral Health. https://cipcoh.hsdm.harvard.edu/about

Health Resources and Services Administration [HRSA]. (n.d). Postdoctoral Training in General, Pediatric, and Public Health Dentistry. https://www.hrsa.gov/grants/find-funding/hrsa-20-005

Health Resources and Services Administration. (2018). Profiles of OAT Grantees 2018.

https://www.hrsa.gov/sites/default/files/hrsa/ruralhealth/resources/telehealth/2018Directory.pdf

Health Resources and Services Administration (2018b). Improving Oral Health Care Services in Rural America. National Advisory Committee on Rural Health and Human Services. https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/rural/publications/2018-Oral-Health-Policy-Brief.pdf

Health Resources and Services Administration (2020a). Designated Health Professional Shortage Areas Statistics. Third Quarter of Fiscal Year 2020. https://data.hrsa.gov/Default/GenerateHPSAQuarterlyReport

Health Resources and Services Administration. (2020b). Telehealth programs.

https://www.hrsa.gov/rural-health/telehealth

The Healthier Washington Collaboration Portal (n.d.a). Promoting chronic disease management: A guide for behavioral health care teams. https://waportal.org/resources/promoting-chronic-disease-management-guide-behavioral-health-care-teams

The Healthier Washington Collaboration Portal (n.d.b). Relationship between behavioral health and chronic diseases.

https://waportal.org/resources/relationship-between-behavioral-health-and-chronic-diseases

Herrera, C. N., Brochier, A., Pellicer, M., Garg, A., & Drainoni, M. L. (2019). Implementing social determinants of health screening at community health centers: Clinician and staff perspectives. *Journal of Primary Care & Community Health*, *10*, 2150132719887260.

Hooper, M. W., Nápoles, A. M., & Pérez-Stable, E. J. (2020). COVID-19 and Racial/Ethnic Disparities. *JAMA*, *323*(4).

Institute of Medicine. (2011). *Advancing Oral Health in America*. Washington, DC: The National Academies Press.

Kelly, L., Walters, L., & Rosenthal, D. (2014). Community-based medical education: is success a result of meaningful personal learning experiences?. *Education for Health (Abingdon, England)*, *27*(1), 47–50.

Keyworth, C., Epton, T., Goldthorpe, J., Calam, R., & Armitage, C. J. (2020). Delivering Opportunistic Behavior Change Interventions: a Systematic Review of Systematic Reviews. *Prevention Science : The Official Journal of the Society for Prevention Research*, *21*(3), 319–331.

Kopycka-Kedzierawski, D. T., & Billings, R. J. (2013). Comparative effectiveness study to assess two examination modalities used to detect dental caries in preschool urban children. *Telemedicine Journal and E-health: The Official Journal of the American Telemedicine Association*, *19*(11), 834–840.

Langelier M., Rodat C., & Moore J. (2016). Case studies of 6 teledentistry programs: Strategies to increase access to general and specialty dental services. Oral Health Workforce Research Center, Center for Health Workforce Studies, School of Public Health, SUNY Albany. www.chwsny.org/wp-

content/uploads/2017/01/OHWRC_Case_Studies_of_6_Teledentistry_Programs_2016.pdf

Lewis, J. H., Lage, O. G., Grant, B. K., Rajasekaran, S. K., Gemeda, M., Like, R. C., Santen, S., & Dekhtyar, M. (2020). Addressing the social determinants of health in undergraduate medical education curricula: A Survey Report. *Advances in Medical Education and Practice*, *11*, 369–377.

LexisNexis. (2017). The top six myths about social determinants of health. White Paper. https://risk.lexisnexis.com/insights-resources/white-paper/myths-about-social-determinants-of-health-data

Marshall, V. J., McLaurin-Jones, T. L., Kalu, N., Kwagyan, J., Scott, D. M., Cain, G., Greene, W., Adenuga, B., & Taylor, R. E. (2012). Screening, brief intervention, and referral to treatment: public health training for primary care. *American journal of public health*, *102*(8), e30–e36.

Martinez, J., Fornari, A., VanHuse, V., Fried, E., Uwemedimo, O. T., Kim, E. J., Conigliaro, J., & Yacht, A. C. (2020). A faculty development graduate medical education retreat to teach and address social determinants of health. *Journal of Medical Education and Curricular Development*, *7*, 2382120520915495.

McAndrews, J.A., McMullen, S. & Wilson, S.L. (March/April 2011). 4 strategies for promoting healthy lifestyles in your practice. *Family Practice Management. www.aafp.org/fpm*

National Center for Chronic Disease Prevention and Health Promotion. (2019). Chronic diseases in America. https://www.cdc.gov/chronicdisease/resources/infographic/chronic-diseases.htm

National Organization of Nurse Practitioner Faculties (2018). NONPF supports telehealth in nurse practitioner education 2018. https://cdn.ymaws.com/www.nonpf.org/resource/resmgr/2018_Slate/Telehealth_Paper_2018.pdf

Neff, J., Holmes, S. M., Knight, K. R., Strong, S., Thompson-Lastad, A., McGuinness, C., Duncan, L., Saxena, N., Harvey, M. J., Langford, A., Carey-Simms, K. L., Minahan, S. N., Satterwhite, S., Ruppel, C., Lee, S., Walkover, L., De Avila, J., Lewis, B., Matthews, J., & Nelson, N. (2020). Structural competency: Curriculum for medical students, residents, and interprofessional teams on the structural factors that produce health disparities. *MedEdPORTAL: The Journal of Teaching and Learning Resources*, *16*, 10888.

https://www.mededportal.org/doi/10.15766/mep_2374-8265.10888

Perdomo, J., Tolliver, D., Hsu, H., He, Y., Nash, K. A., Donatelli, S., Mateo, C., Akagbosu, C., Alizadeh, F., Power-Hays, A., Rainer, T., Zheng, D. J., Kistin, C. J., Vinci, R. J., & Michelson, C. D. (2019). Health equity rounds: An interdisciplinary case conference to address implicit bias and structural racism for faculty and trainees. *MedEdPORTAL: The Journal of Teaching and Learning Resources*, *15*, 10858. https://www.mededportal.org/doi/10.15766/mep_2374-8265.10858

Pew Research Center. (2019a). Internet/broadband fact sheet. https://www.pewresearch.org/internet/fact-sheet/internet-broadband/

Pew Research Center (2019b). Who owns cellphones and smartphones. https://www.pewresearch.org/internet/fact-sheet/mobile/

Pfarrwaller, E., Sommer, J., Chung, C., Maisonneuve, H., Nendaz, M., Perron, N. J., & Haller, D. M. (2015). Impact of interventions to increase the proportion of medical students choosing a primary care career: A systematic review. *Journal of General Internal Medicine*, *30*(9), 1349-1358.

Piskorowski, W. A., Fitzgerald, M., Mastey, J., & Krell, R. E. (2011). Development of a sustainable community-based dental education program. *Journal of Dental Education*, *75*(8), 1038–1043.

Rambur, B., Palumbo, M. V., & Nurkanovic, M. (2019). Prevalence of Telehealth in Nursing: Implications for Regulation and Education in the Era of Value-Based Care. *Policy, Politics & Nursing Practice*, *20*(2), 64–73.

Rubio-Valera, M., Pons-Vigués, M., Martínez-Andrés, M., Moreno-Peral, P., Berenguera, A., & Fernández, A. (2014). Barriers and facilitators for the implementation of primary prevention and health promotion activities in primary care: A synthesis through meta-ethnography. *PloS One*, *9*(2), e89554. doi:10.1371/journal.pone.0089554

Schickedanz, A., Hamity, C., Rogers, A., Sharp, A. L., & Jackson, A. (2019). Clinician experiences and attitudes regarding screening for social determinants of health in a large integrated health system. *Medical Care*, *57* (Suppl 6 2), S197–S201.

Searight H. R. (2018). Counseling Patients in Primary Care: Evidence-Based Strategies. *American Family Physician*, *98*(12), 719–728.

Starfield, B., Shi, L., & Macinko, J. (2005). Contribution of primary care to health systems and health. *The Milbank Quarterly*, *83*(3), 457–502.

Sullivan, K., & Thakur, N. (2020). Structural and social determinants of health in asthma in developed economies: A scoping review of literature published between 2014 and 2019. *Current Allergy and Asthma Reports*, *20*(2), 5.

Thistlethwaite, J. E., Bartle, E., Chong, A. A., Dick, M. L., King, D., Mahoney, S., Papinczak, T., & Tucker, G. (2013). A review of longitudinal community and hospital placements in medical education: BEME Guide No. 26. *Medical Teacher*, *35*(8), e1340–e1364.

University of Pennsylvania Perelman School of Medicine. (n.d.) National Center for Integrated Behavioral Health. https://www.ncibh.org

U.S. Department of Health and Human Services. (2000). *Oral Health in America: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health.

U.S. Department of Health and Human Services. (2020). Healthy People 2020. Oral Health. www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Oral-Health/determinants

Waseh, S., & Dicker, A. P. (2019). Telemedicine Training in Undergraduate Medical Education: Mixed-Methods Review. *JMIR Medical Education*, *5*(1), e12515

Wen, L. S., & Sadeghi, N. B. (2020). Addressing racial health disparities in the COVID-19 pandemic: Immediate and long-term policy solutions. Health Affairs. https://www.healthaffairs.org/do/10.1377/hblog20200716.620294/full/

Wood, J. & Grumbach, K. (2019). The role of primary care in population and community health: Pragmatic approaches to integration. In Michener, J.L., Castrucci, B.S., Bradley, D.W., Hunter, E.L., Thomas, C.W…. & Corcoran, E. (Eds.) *The Practical Playbook II: Building Multisector Partnerships that Work.* New York, NY: Oxford University Press.

Zestcott, C. A., Blair, I. V., & Stone, J. (2016). Examining the presence, consequences, and reduction of implicit bias in health care: A narrative review. *Group Processes & Intergroup Relations: GPIR*, *19*(4), 528–542.