

The Case for Oral Health Care for Prisoners: Presenting the Evidence and Calling for Justice

24

Marguerite J. Ro, Mary E. Northridge, Jareese K. Stroud, and Henrie M. Treadwell

Introduction

With the burgeoning expansion of and notable advances in dental technology, cosmetic dentistry, and social media, oral health as represented by "perfect teeth" has become a marker of status and privilege across cultures, particularly in the United States. On the other hand, missing teeth have become a symbol of low social position, a marker of exposure to violence, and an indicator of inadequate resources, even among older adults. According to Northridge et al. (2020), "Poor oral health serves as the national symbol of social inequality," and nowhere is this more evident than among those behind bars. Thus, the poor oral health of incarcerated populations may be viewed as the accumulated consequence of severe inequities in the distribution of power, income, wealth, and benefits, including lack of access to quality general and oral health care, nutritional deficiencies resulting from poverty and the high cost of healthy food, and discrimination faced by populations (i.e., men of color) who are disproportionately represented in the correctional system. The full burden of poor oral health borne by incarcerated populations is unknown, given the lack of national data on the oral health status of incarcerated populations (Makrides & Shulman, 2019).

Embracing a whole-person approach, the editors of this volume duly acknowledge the importance of oral health and health care to the overall safety and well-being of incarcerated populations. By including this chapter, they have heeded the advice of former Surgeon General David Satcher in his landmark report, *Oral Health in America*, to reconnect the mouth to the rest of the body (U.S. Department

M. J. Ro (⊠)

Public Health—Seattle & King County,

Seattle, WA, USA

e-mail: marguerite.ro@kingcounty.gov

M. E. Northridge

NYU Langone Health, Brooklyn, NY, USA

J. K. Stroud

Satcher Health Leadership Institute, Morehouse School of Medicine, Atlanta, GA, USA

H. M. Treadwell

Department of Community Health & Preventive Medicine and Satcher Health Leadership Institute, Morehouse School of Medicine, Atlanta, GA, USA

of Health and Human Services, 2000). Oral health is important to the physical, emotional, psychological, and socioeconomic well-being of individuals and populations, with determinants at the individual, interpersonal, community, and societal levels. Despite the growing body of scientific evidence linking oral health to overall health, coupled with the longstanding documentation of social disparities in oral health status, insufficient attention to oral health as a priority in public policies and programs continues unabated. *Healthy People 2020* (U.S. Department of Health and Human Services, n.d.) rightly drew attention to incarceration as a key issue in the Social and Community Context domain, but oral health was not mentioned.

When compared to the general population, men and women with a history of incarceration are in worse mental and physical health. Data from the Bureau of Justice Statistics found that, in 2005, more than half of all prison and jail inmates had mental health problems. Studies have shown that when compared to the general population, jail and prison inmates of both genders are more likely to have high blood pressure, asthma, cancer, arthritis, and infectious disease, such as tuberculosis, hepatitis C, and HIV.

To shine light on an otherwise invisible population, in October 2005, two of us (H.M.T. and M.E.N.) collaborated on editing a special issue of the *American Journal of Public Health* devoted to prisons and health. When a formal call for papers and personal solicitations failed to yield any papers on oral health in the prison population, we teamed up with our colleague, Allan J. Formicola, D.D.S., former dean of the Columbia University School of Dental and Oral Surgery (now College of Dental Medicine), to fill this gap through researching, writing, and editing a front piece to the issue titled, "Improving the Oral Health of Prisoners to Improve Overall Health and Well-Being" (Treadwell & Formicola, 2005). Findings included that finances and staffing are the major obstacles to the provision of oral health care in prisons.

More recently, to call further attention to these issues, Treadwell and Evans (2019) in *Oral Health in America: Removing the Stain of Disparity* called attention to persisting oral health inequities experienced by distinct population groups, such as children, older adults, incarcerated people, those with disabilities, as well as populations with certain health conditions. They call for "discarding traditional paradigms serving only a privileged few in favor of those paradigms that guarantee unfettered inclusion, as well as culturally competent and expedient, cost-effective quality care for all in this nation." Identifying oral health disparities as an equity and social justice issue requires inclusive restructuring of policy practice that will lead to oral health for all.

Unmet Dental Needs of Incarcerated Populations

There is scant data on the health of the 1.5 million individuals institutionalized in the U.S. prison system. Blacks, Hispanics, low-income individuals are among those who are over-represented in this population; groups who in the general non-institutionalized populations experience disparities in oral health outcomes and who experience inequitable access to care. For instance, African Americans represent only 13% of the total U.S. male population but comprise nearly 33% of the U.S. prison population (Bronson & Carson, 2019). The rate of incarceration of African Americans is nearly six times that of Whites (1549 per 100,000 Black adults compared to 272 per 100,000 White adults). Hispanics are also disproportionately represented among the incarcerated (23%) compared to within the general population (18%). The rate of incarceration of Hispanics is three times that of Whites (823 per 100,000 Hispanic adults compared to 272 per 100,000 White adults). While American Indian/Alaskan Natives are not included in national data, local data suggest that they too are over-represented among incarcerated populations. For instance, in 2017, the Montana Department of Corrections reported that American Indian males comprised 20% of male inmates and 34% of females compared to 7.2% of males and 7.4% of females in the general population (Montana Department of Corrections,

2017). Overall, men are disproportionately represented among the incarcerated (93%) compared to the general (49%) population (Census, 2019).

In a recent review of the oral health needs of incarcerated populations, Makrides and Shulman (2019) state that "high rates of chronic disease and unmet dental needs are common." However, given the lack of national, state, or local data on the oral health status of incarcerated populations, the full extent of the problem has yet to uncovered. What data do exist are mostly studies from decades before. Yet there is no evidence, data, or shifts in environmental factors that would suggest that oral health conditions have shifted for the better in recent decades.

Similar to other underserved and overlooked groups (i.e., low-income and racial/ethnic groups), adults who are incarcerated in federal and state prison systems are more likely to have extensive caries and periodontal disease, be missing teeth at every age, and endure a higher percentage of unmet dental needs than employed U.S. adults (Mixson et al., 1990; Salive et al., 1989). Clare (1998) conducted a survey of dental decay, moderate periodontal pocket depth, and urgent treatment needs in a sample of adult inmates and found more unmet dental needs in the prison sample compared to those reported among participants in Phase One of the Third National Health and Nutrition Examination Survey (NHANES III). Clare (1998) hypothesized that a possible cause for the differences in results between the adult inmates and the general adult U.S. population may be a higher representation of lower socioeconomic groups in the prison populations.

Due to the complex social environment that surrounds individuals at-risk of criminal legal involvement, it should be no surprise that inmates have poor oral health. As part of the W.K. Kellogg funded, Community Voices: Healthcare for the Underserved, work on addressing inequities in prison health, Treadwell et al. (2016) conducted a study that assessed the access to oral health care of a sample of 98 female inmates in Georgia's prison system. Prior to incarceration, female inmates reported that they did not have a regular dental provider (83%), lacked insurance coverage (66%), and had their last dental visit more than a year ago because they did not have money for service or treatment (64%).

Studies conducted at the state level provide further evidence of the poor oral health status of inmates. Ormes et al. (1997) examined a representative sample of 251 male inmates in the Michigan Department of Corrections. Results were that inmates aged 18–34 had a mean Decayed Missing Filled Teeth Index (DMFT) of 11.52 compared to a mean DMFT of 19.25 for inmates aged 35–44 and 24.70 for inmates aged 45 and older. Differences were also found in the number of decayed and filled teeth and the DMFT composite index with respect to the number of years a male inmate was incarcerated. When these results were compared to those of combined age categories in the NHANES and the Midwest Regional findings of the U.S. Employed Adults survey, the Ormes et al. (1997) inmate survey identified more decayed teeth than the general population surveys, but fewer missing and filled teeth.

Badner and Margolin (1994) investigated the oral health status and dental experience of 183 mostly African-American women detained by the New York City Department of Corrections at Riker's Island Correctional Facility. Almost one-third of the detainees complained of oral pain. Only 41.1% and 67.9% had received dental treatment within the past 12 and 24 months, respectively. One-third of the last treatments were for tooth extraction. The DMFT, time between appointments, need for emergency care, and utilization of extractions all indicated that New York female detainees have: (1) a large amount of unmet dental need, (2) a past dental history consisting of emergency dental care, and (3) limited utilization of preventive and restorative dental services (Badner & Margolin, 1994).

More recent data indicate that inmates continue to suffer from oral disease. Nowotny's analysis of the 2004 Bureau of Justice Statistics Survey of State Inmates in Correctional Facilities, a nationally representative sample of persons incarcerated in state prisons, revealed that 60.8% of inmates self-reported having a dental problem during their incarceration. Boyer et al. (2002) examined a representative sample of new inmates to Iowa prisons. They found that Iowa inmates, male and female

combined, had 8.4 times the amount of untreated decay compared to U.S. non-institutionalized population, but similar numbers of missing teeth.

Mack and Collins (2013) conducted reviews of oral health needs of inmates housed in the Georgia prison system at three time points in 2011. Consistently, they found that approximately 50% of inmates presented with minimal routine dental health needs, about a third presented with moderate cavities and/or gum disease, and 14%–15% presented with extensive gum disease and/or widespread decay. Less than 0.04% of inmates presented with an urgent need for dental services, and 0.01% with life-threatening disease, extreme pain, or infection.

A compounding issue (that arose in the 2000s and continues today) among incarcerated populations is "meth mouth" which refers to a pattern of oral signs and symptoms of methamphetamine abuse, thought to include rampant caries and tooth fracture, leading to multiple tooth loss and edentulism (i.e., toothlessness) (Curtis, 2006). Murphy et al. (2016) in a study examining a matched NHANES cohort showed that methamphetamine "users have severe oral health deficits compared to the general population: they are 3.5 times more likely to experience painful toothaches, 6.6 times to experience difficulty eating, and 8.6 times to be self-conscious due to dental appearance." The issue of meth mouth among incarcerated populations drew the attention of Sen. Max Baucus and Rep Brian Baird who introduced the *MethMouth Correctional Costs and Reentry Support Act* (S. 1907/H.R. 3187) which, if passed, would have supported the collection of data about the oral health of federal inmates and dental care provided in federal correctional facilities and would have provided grants to states to support oral health for prisoners during incarceration and upon release.

Importantly, the impact of poor oral health is not time limited and follows individuals prior, during, and post-incarceration. Poor oral health conditions that remain unaddressed follow inmates after release that can range from severe pain to missing teeth, and can result in low esteem with ramifications for successful re-entry.

A Broken Oral Healthcare System for the Incarcerated

Equitable access to quality oral health care should be a fundamental component of a comprehensive system to provide whole person care that promotes the health of all individuals regardless of social status or condition. This is, in fact, far from the present case. Regardless of location—rural or urban, within the United States or outside of its borders—impoverished communities are everywhere distinguished by crisis-oriented rather than preventive oral health care (Allukian & Horowitz, 2006). Despite dental care being listed as an essential health service by the National Commission on Correctional Health Care (Treadwell & Formicola, 2005), this has not resulted in equitable care for inmates. A major barrier to equity is in the manner that the U.S. dental system operates both external and internal to the correctional healthcare system. The U.S. dental system is financed and organized as a separate system from medical care and behavioral health care—making it virtually impossible to provide comprehensive whole-person care.

In 2017, the Pew Charitable Trusts and Vera Institute of Justice conducted two 50-state surveys to examine healthcare spending in prisons. They found that "Departments of correction collectively spent \$8.1 billion on prison health care services for incarcerated individuals in fiscal year 2015—probably about a fifth of overall prison expenditures." They also found huge variation in healthcare spending per inmate ranging from \$2173 in Louisiana to \$19,796 in California. The percent of spending towards dental care was not provided, but if dental care expenditures follow national healthcare spending patterns, then the amount is paltry at best. Only 4% of national healthcare expenditures is for dental services. For instance, in 2004, the North Dakota State Penitentiary spent \$150,000 for dental work and supplies (Healthcare Mergers, Acquisitions, & Ventures Week, 2004). This is almost

three times the reported amount it spent in 2000 for dental care and supplies (\$56,000), but likely still meager compared with the unmet dental needs of prisoners in this facility (Healthcare Mergers, Acquisitions, & Ventures Week, 2004).

In 2012, 45 states participated in the National Survey of Prison Health Care. The survey captured how states provided dental care and oral surgery services. The majority (82%) provided dental care services both on-site and off-site. Oral surgery is provided primarily on-site by two-thirds of states (Maruschak et al., 2016).

Forty-five of 50 states and the District of Columbia (88% response rate) replied to a 1996 survey from the Department of Corrections (DOCs) that sought to examine the characteristics of dental care provided to state prisoners. Results indicated that there was substantial variation in the way that oral health care was provided to state inmate populations. For instance, 73% of respondents reported that they had dental directors who coordinated dental care in their state prisons, 72% described their DOCs as providing emergency dental care and some routine dental care, 52% required inmates to make a copayment for dental services, and 23% indicated that their states were providing dental care through managed care (Makrides & Schulman, 2002). Not unexpectedly, finances and staffing are major obstacles to the adequate provision of oral health care in prisons.

Although inmates have a constitutional right to health care, co-pays serve as a barrier to care in many states. In the 2019 state legislative sessions, California (AB 45) and Illinois (HB 2045) passed bills eliminating medical and dental co-pays at jails and prisons in the state. In doing so, California and Illinois joined Missouri, Montana, Nebraska, New Mexico, New York, Oregon, Vermont, and Wyoming states that have eliminated copays in jails and prisons (Bishari, 2019). The Texas legislature (HR 812), while not fully eliminating healthcare services fee, significantly reduced the healthcare service fee and put a \$100 limit on the fees that an inmate could be charged in a fiscal year.

In terms of patient experience, the Marshall Project reported that as a result of having few dental clinicians, inmates experienced long waits for routine cleanings. They went on to report that "In March 2017, an inspector general report revealed that one of four inmates at a federal prison in California was on a waitlist for dental care; some waited for as long eight years." Increasing there is anecdotal evidence that prison dentists are pulling teeth rather than providing restorative treatment. Whether the decision to pull teeth is due to limited resources, state procedures that guide dental care, or otherwise should be further investigated (Eldridge, 2018).

In Parsons v Ryan, the rebuttal expert report of Dr. Jay Shulman (2014) illustrates the poor quality of care experienced by some inmates in the Arizona Department of Corrections Dental Program. The poor care consists of inadequate clinical triage, exceeding long wait times to be seen by a dentist, inadequate staffing, and avoidable extractions. Dr. Shulman, in his expert testimony, attributes the poor care to "inadequate policies and practices regarding staffing, triaging, treatment time frames (or lack thereof), tooth extraction, preparation for dentures, and contractor monitoring create a system that places all inmates at a substantial risk of serious dental injury, such as preventable pain, advanced tooth decay, and unnecessary loss of teeth." (p. 10)

Wait Times. Ms. Wells [plaintiff] requested a filling (on tooth #13) as a result of her intake exam in 2009, but the routine care wait was 257 days—at which time the appointment was postponed a further 96 days by medical issues. Delay for medical issues is appropriate and unavoidable, but the original wait, at over 8 months, is itself unacceptable.

Avoidable Extractions/Prisoners' Dilemma. Ms. Wells [plantiff] was twice offered extractions of teeth that were not diagnosed as needing an extraction, and both were ultimately filled [Shulman Report at 25]. The first incident occurred 6 weeks after receiving the filling on #13, when she submitted an HNR regarding pain in that tooth and #18 and was seen on a pain evaluation. Dr. Dovgan and I agree that nothing in the chart entry suggested a clinical reason for extraction of either tooth.27 ... If the dentist did in fact merely offer to extract teeth with no identifiable issues, this is itself below the standard of care (Shulman, 2014).28

Clearly, the system and how care is provided further perpetuates oral health inequity as experienced by inmates. State policies and laws, accreditation policies and reviews, should be reviewed and assessed to determine to what extent disparities are further perpetuated or remediated as a result of existing policies and practices.

Moreover, in the current federal and state efforts to transform and improve the health system, the disconnect between oral health and physical and behavioral health must be bridged. As states and regions seek to transform how their health systems are organized and financed, they have the opportunity to transform oral health systems and include oral health care in integrated systems. It is particularly opportune for states and localities working on diversion for those at-risk of being involved in criminal legal systems or transitional care for individuals re-entering from prisons or jails. Efforts aimed at giving individuals an equitable opportunity to reach their full potential must also include access to quality oral health services as part of whole-person care.

Addressing Oral Health Disparities and Increasing Workforce Diversity

Achieving access to quality oral health care necessitates a workforce that is culturally sensitive and linguistically appropriate. Diversifying the workforce remains an imperative challenge for the health professions. The Sullivan Commission (2004) report titled *Missing Persons: Minorities in the Health Professions* demonstrated the considerable under-representation of African Americans, Hispanic Americans, and American Indians (AI/ANs) within the health professions. In 2016, data from the American Dental Association show that compared to the general population, Black/African Americans (4.3% Black dentists to 12.4%) and Hispanics (5.3–17.8%) dentists continue to be under-represented. Data on AI/ANs were not included in the ADA report. Mertz et al. (2017) reported that only 0.2% of the 190,800 active dentists in the United States in 2012 were AI/AN, compared to the portion of AI/AN (1.7%) in the United States. Evidence of the direct link between poorer health outcomes for racial and ethnic minorities and the shortage of racial and ethnic minorities in the healthcare professions was compiled by the Institute of Medicine (2002) in its landmark report, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*.

Mitchell and Lassiter (2006) reviewed the literature concerning healthcare disparities and work-force diversity issues within the oral health field and synthesized recommendations intended to address the disproportionality within the workforce, with a focus on the role of academic dental institutions (ADIs). "First and foremost, ADIs need to develop a culture conducive to change and the implementation of diversity issues" (Mitchell & Lassiter, 2006, p. 2095). They further explained that developing such a culture will require consistent support the leadership within ADIs, including a formal declaration of each institution's commitment to diversity, cultural competency, and the elimination of oral healthcare disparities (Mitchell & Lassiter, 2006).

By 2045, people of color will make up the majority of the U.S. population. As of 2020, children of color under 18 make up the majority of the under 18 population. The need for ADIs to enroll and support more applicants from underserved racial and ethnic groups is crucial to the elimination of disparities in oral health care. In response to this impending crisis, 15 dental educators undertook a feasibility study with funding from the W. K. Kellogg Foundation which resulted in the publication of the report, *Bridging the Gap*:

Partnerships between Dental Schools and Colleges to Produce a Workforce to Fully Serve America's Diverse Communities (Community Voices: Healthcare for the Underserved Study Committee, 2006). Findings suggest that "a collaborative model between colleges and dental schools can become a valuable way to enroll students of color but ... the establishment of such programs would most likely depend on a demonstrated need for (1) new practitioners in a particular locale, and (2) an interested state legislature seeking to solve a dental workforce problem" (Community Voices: Healthcare for the Underserved Study Committee, 2006, p. 7).

It is no wonder, then, given the striking economic and racial disparities in the application of incarceration and the dearth of dentists of color in the oral healthcare workforce (Community Voices: Healthcare for the Underserved Study Committee, 2006), that inmates suffer from poor oral health and have unmet oral healthcare needs.

Opportunities to Create an Equitable System

Having a willing, ready, and well-trained dental workforce will be essential to achieving oral health equity. Expanding community-based dental externships to prisons presents an opportunity to develop a dental workforce ready to serve incarcerated individuals. In addition, expanding the use of dental hygienists, dental assistants, and dental therapists may be a cost-effective manner to increase access to oral health services within correctional systems.

In a recent survey of U.S. dental schools, Candamo et al. (2018) found that two-thirds of responding dental schools¹ include correctional health as part of their didactic curricula; approximately a quarter (27%) offered students a correctional health rotation most often in the format of a community-based dental externship. Of those that offered a correctional health rotation, only half of those were mandatory. The common length of the rotation was 5 days, though at least one school offered a rotation lasting 6–8 weeks. Schools estimated that an average of a third of their student bodies participated in the correctional health rotations.

State dental schools in North Carolina and Florida have programs in which students or residents are rotated through prison facilities (Treadwell & Formicola, 2005). The University of Texas Medical Branch, the Texas Tech University Health Sciences Center, the University of Southern California, and Ohio State University all sponsor programs in which oral health care is provided to incarcerated populations. Additionally, the Bureau of Prisons (BOP) offers an externship for dental students in their final year of study. Recipients attend dental school as normal, but are commissioned in the U.S. Commissioned Corps of the U.S. Public Health Service. After graduation, they are promoted in the ranks PHS and practice dentistry at a BOP job site for twice the length of the externship. More such programs could help alleviate the shortage of dentists and hygienists in the prison system.

One new innovative model located in Boston is the *Crimson Care Collaborative*, a student-faculty collaborative that has developed a partnership with the Suffolk County Jails to provide a weekly student-faculty collaborative jail-based clinic. Dental students work as part of a health team that includes medical and mental health providers and students to provide care and health education. Specific to oral health, dental students work under the direction of attending jail dentist to conduct an oral health history and an oral health screening, and to implement a treatment plan. Patients needing additional care post-release are provided dental appointments at an academic dental center during the discharge process (Simon et al., 2017). Through this program, students gain an awareness of the complex social determinants of needs faced by incarcerated populations. They also gain an experience with a model of compassionate evidence-based oral health care and an integrated team-based approach to whole-person care.

Similar to efforts to expand access to oral health services for other underserved populations, the use of dental therapists should be explored. Dental therapists are mid-level providers who work under the supervision of a dentist to provide routine preventive and restorative care. Dental therapists are trained to prepare and fill cavities using a hand drill and perform nonsurgical extractions. Dental therapists currently practice in Minnesota and among tribes in Alaska, Washington, and Oregon.

¹Surveys were sent to all 66 U.S. dental schools. Responses were received by 41 schools, but only 30 fully completed the survey.

Vermont, Maine, and Arizona have authorized the use of dental therapists (Koppelman & Singer-Cohen, 2019).

Expansion of loan forgiveness programs might also encourage dental school graduates to work in prisons. For instance, the National Health Services Corps is a federally funded program that offers a loan repayment program for dental students in return for placement and service in underprivileged areas.

In terms of treatment, silver diamine fluoride (SDF) when applied arrests and prevents caries for less than a dollar per treatment. SDF has multiple benefits given its cost, its non-surgical application which can be done in minutes, and its ability to halt and prevent further decay. In other words, "a simple, inexpensive and effective way of preventing caries initiation and progression" (Oliveira et al., 2018). The adoption of silver diamine fluoride may be particularly beneficial for populations and communities that are underserved and under-resourced, such as low-income children, older adults, and inmates (Northridge et al., 2020).

Calling for Justice

The number of U.S. prison inmates² is equivalent to the number of residents in San Antonio, TX, and more than San Diego, CA. Nearly 95% of those incarcerated will return back to their communities (Hughes & Wilson, 2002), with over 641,000 individuals released over the course of a year (Carson & Anderson, 2016). Just as it would be unimaginable to turn our heads away from the residents of an entire U.S. major metropolitan city, we should not be ignoring or disregarding those who are incarcerated. Yet the oral health status of inmates in the prison system is not routinely incorporated into data and reports that summarize the state of the nation's health, making the incarcerated an invisible population. Hence, the need for volumes such as this, which are shining light on the inequities of our nation.

Prison oral health care rests at the intersection of two complex systems: the prison system and the healthcare system. Significant improvements will require policymakers to reform the extremely bureaucratic systems and advocate for adequate resources to address those most in need before, during, and after any involvement with the criminal justice system. Dental providers can help lead the way by expanding access through the use of hygienists and dental health aide therapists, and by using therapies such as silver diamine fluoride. Academic dental institutions need to create the pipeline of providers that reflect the growing diversity of the nation and who are suited and prepared to care for those with the greatest need. The responsibility for oral health rests with us all. If good oral health care is provided to prisoners, the benefits will extend to their families, their communities, and the nation as a whole. We can and must do better as a society to ensure oral health equity for all.

Recommendations

In closing, we have built upon a core set of recommendations from the report titled, *Confronting Confinement: A Report of the Commission on Safety and Abuse in America's Prisons* (Gibbons & Katzanbach, 2006) with the vision of an equitable and just system to assure the oral health care of imprisoned populations. The recommendations that follow are high-level recommendations, and ultimately will require partnering with oral healthcare providers from the community and departments of

²There are another 700,000 individuals incarcerated in jails (Kann, 2019).

corrections which take into account the perspectives and experiences of individuals who are or have formally been incarcerated.

- Create partnerships between correctional staff and dental providers around a shared vision of oral
 health for incarcerated populations. Having a shared vision among corrections administrators and
 officers with oral health providers that is informed by inmate experiences and perspectives is critical to building a system that can effectively address oral health needs of incarcerated individuals.
 This includes accounting for possible past negative experiences with care, histories of chronic
 disease and substance use, and trauma experienced by prisoners. A comprehensive vision should
 include continuity of oral health care upon release.
- 2. Assess and monitor the oral health of incarcerated populations. Individuals should be screened and have their oral health monitored while incarcerated. Assessment should include tracking the utilization and quality of oral health services provided in correctional facilities. Data from monitoring systems should be analyzed by race/ethnicity and gender to identify potential disparities.
- 3. Address systemic bureaucratic inefficiencies in correctional settings. Given the limited resources and the high demand of dental services in the incarcerated population, there are efficiencies to be gained by addressing the systematic bureaucracies and inefficiencies that delay timely delivery of services (Ditslear, Personal communication, 2019).
- 4. Remove financial barriers to oral health care for prisoners. This includes ending copayments for oral health care. State legislatures should revoke existing laws that authorize prisoner copayments for oral health care. Congress should change the Medicaid rules so that correctional facilities can receive federal funds to help cover the costs of providing oral health care to eligible prisoners. Until Congress acts, states should ensure that benefits are available to people immediately on release.
- 5. Academic dental institutions should partner with correctional facilities to provide practice opportunities for dental students. Students can gain practical experience while also gaining an awareness of the complex social determinants of needs faced by incarcerated populations.

Acknowledgments We thank the W. K. Kellogg Foundation and Community Voices: Healthcare for the Underserved, a division within the Satcher Health Leadership Institute at Morehouse School of Medicine, for its vision and commitment to this work.

References

Allukian, M., & Horowitz, A. M. (2006). Oral health. In B. S. Levy & V. W. Sidel (Eds.), Social injustice and public health (pp. 357–377). Oxford University Press.

Badner, V., & Margolin, R. (1994). Oral health status among women inmates at Rikers Island Correctional Facility. *Journal of Correctional Health Care*, 1, 55–72.

Bishari, N. S. (2019, September 18). California prisoners freed from medical, dental copays by bill. SFWeekly. Retrieved December 8, 2019 from https://www.sfweekly.com/news/california-prisoners-freed-from-medical-dental-copays-by-bill/

Boyer, E. M., Nielsen-Thompson, N. J., & Hill, T. J. (2002). A comparison of dental caries and tooth loss for Iowa prisoners with other prison populations and dentate US adults. *Journal of Dental Hygiene*, 76(2), 141–150.

Bronson, J., & Carson, E. A. (2019). *Prisoners in 2017*. U.S. Department of Justice, Bureau of Justice Assistance. Retrieved November 26, 2019 from https://www.bjs.gov/content/pub/pdf/p17.pdf.

Candamo, F., Tobey, M., & Simon, L. (2018). Teaching dental students about incarceration and correctional dentistry: Results from a National Survey. *Journal of Dental Education*, 82(3), 299–305.

Carson, E.A., & Anderson, E. (2016). *Prisoners in 2015*. U.S. Department of Justice, Bureau of Justice Assistance. Retrieved December 8, 2019 from https://bjs.gov/content/pub/pdf/p15.pdf.

Clare, J. H. (1998). Survey, comparison, and analysis of caries, periodontal pocket depth, and urgent treatment needs in a sample of adult felon admissions, 1996. *Journal of Correctional Health Care*, 5, 89–101.

- Community Voices: Healthcare for the Underserved Study Committee. (2006). *Bridging the gap: Partnerships between dental schools and colleges to produce a workforce to fully serve America's diverse communities*. Retrieved August 25, 2006 from http://www.communityvoices.org/Uploads/DENTAL_PUBLICATION_00108_00139.pdf.
- Curtis, E. K. (2006). Meth mouth: A review of methamphetamine abuse and its oral manifestations. *General Dentistry*, 54, 125–129.
- Eldridge, T. E., (2018). Another hurdle for former inmates: their teeth. The Marshall Project. Retrieved from https://www.themarshallproject.org/2018/06/28/another-hurdle-for-former-inmates-their-teeth.
- Gibbons, J. J., & Katzanbach, N. D. B. (2006). Confronting confinement: A report of the Commission on Safety and Abuse in America's Prisons. Vera Institute of Justice.
- Healthcare Mergers, Acquisitions & Ventures Week. (2004). *Correctional healthcare: Methamphetamine use takes major toll on inmates' dental health*. Retrieved August 30, 2006, from http://www.newsrx.com/article.php?articleID=134847.
- Hughes, T., & Wilson, J.W. (2002). Reentry trends in the United States. U.S. Department of Justice, Bureau of Justice Assistance. Retrieved December 8, 2019 from https://www.bjs.gov/content/pub/pdf/reentry.pdf.
- Institute of Medicine. (2002). Unequal treatment: Confronting racial and ethnic dis- parities in health care. National Academy Press.
- Kann, D. (2019). 5 facts behind America's high incarceration rate. CNN. Retrieved Dec 8, 2019 from https://www.cnn.com/2018/06/28/us/mass-incarceration-five-key-facts/index.html.
- Koppelman, J., & Singer-Cohen. (2019). A workforce strategy for reducing oral health disparities: Dental therapy. In *Oral health in America: Removing the stain of disparity* (pp. 135–144). American Public Health Association.
- Mack, K. J & Collins, M. (2013) Access to Oral Health in the Georgia Prison System. *The Journal of Dental Hygiene*, 87(5), 271–274.
- Makrides, J., & Schulman, J. (2002). Dental health care of prison populations. *Journal of Correctional Health Care*, 9, 291–303.
- Makrides, N. S., & Shulman, J. D. (2019). The oral health needs of the incarcerated population: Steps toward equal access. In *Oral health in America: Removing the stain of disparity* (pp. 53–56). American Public Health Association.
- Maruschak, L., Chari, K. A., Simon, A. E., & DeFrances, C. J. (2016). National survey of prison health care: Selected findings. *National Health Statistics Reports*, 96, 1–23.
- Mertz, E., Wides, C., & Gates, P. (2017). The American Indian and Alaska Native dentist workforce in the United States. *Journal of Public Health Dentistry*, 77(2), 125–135.
- Mitchell, D. A., & Lassiter, S. L. (2006). Addressing health care disparities and increasing workforce diversity: The next step for the dental, medical and public health professions. *American Journal of Public Health*, 96, 2093–2097.
- Mixson, J., Eplee, H., Feil, P., Jones, J., & Rico, M. (1990). Oral health status of a federal prison population. *Journal of Public Health Dentistry*, 50, 257–261.
- Montana Department of Corrections. (2017). *Biennial report*. Retrieved December 10, 2019 from https://cor.mt.gov/Portals/104/Resources/Reports/2017BiennialReport.pdf.
- Murphy, D. A., Harrell, L., Fintzy, R., Belin, T. R., Gutierrez, A., Vitero, S. J., & Shetty, V. (2016). A comparison of methamphetamine users to a matched NHANES cohort: Propensity score analyses for oral health care and dental service need. *The Journal of Behavioral Health Services & Research*, 43(4), 676–690.
- Northridge, M. E., Kumar, A., & Kaur, R. (2020). Disparities in access to oral health care. *Annual Review of Public Health*, 41, X. https://doi.org/10.1146/annurev-publhealth-040119-094318
- Oliveira, B. H., Cunha-Cruz, J., Rajendra, A., & Niederman, R. (2018). Controlling caries in exposed root surfaces with silver diamine fluoride: A systematic review with meta-analysis. *The Journal of the American Dental Association*, 149(8), 671–679.
- Ormes, W. S., Carlyon, D., Thompson, W. F., & Brim, M. (1997). The measurement of dental disease in a correctional setting and its importance to functional service delivery. *Journal of Correctional Health Care*, 4, 105–119.
- Salive, M. E., Carolla, J. M., & Brewer, T. F. (1989). Dental health of male inmates in a state prison system. *Journal of Public Health Dentistry*, 49, 83–86.
- Shulman, J. D. (2014). Rebuttal Expert Report of Jay D. Shulman, DMD, MA, MPH Regarding Dental Care at the Arizona Department of Corrections. Retrieved December 3, 2019 from http://prisonlaw.com/wp-content/uploads/2015/12/14.01.31-Shulman-dental-rebuttal-report.pdf.
- Simon, L., Sue, K., Williams, R., Beckmann, D., Tobey, M., & Cohen, M. (2017). Dental student–Delivered care at a student–Faculty collaborative clinic in a correctional facility.
- Sullivan Commission. (2004). Missing persons: Minorities in the health profession. A report of the Sullivan Commission on diversity in the healthcare workforce. Retrieved May 30, 2006, from http://www.aacn.nche.edu/Media/pdf/SullivanReport.pdf.
- Treadwell, H. M., & Evans, C. A. (2019). *Oral health in America: Removing the stain of disparity*. American Public Health Association.

- Treadwell, H. M., & Formicola, A. J. (2005). Improving the oral health of prisoners to improve overall health and well-being. *American Journal of Public Health*, 95, 1677–1678.
- Treadwell, H. M., Blanks, S. H., Mahaffey, C. C., & Graves, W. C. (2016). Implications for improving Oral health care among female prisoners in Georgia's correctional system. *American Dental Hygienists' Association*, 90(5), 323–327.
- U.S. Census Bureau. (2019). *The black alone population in the United States: 2018*. Retrieved December 3, 2019, from https://www.census.gov/data/tables/2018/demo/race/ppl-ba18.html.
- U.S. Department of Health and Human Services. (2000). *Oral health in America: A report of the surgeon general*. National Institute of Dental and Craniofacial Research, National Institutes of Health.
- U.S. Department of Health and Human Services. (n.d.). *Healthy people 2020*. Office of Disease Prevention and Health Promotion. Retrieved Dec 3, 2019 from https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health/interventions-resources/incarceration.