Annual Review of Public Health

The Indian Health Service and American Indian/Alaska Native Health Outcomes

Gina Kruse,[1,2] Victor A. Lopez-Carmen,[2]
Anpotowin Jensen,[3] Lakotah Hardie,[1]
and Thomas D. Sequist[2,4,5]

[1] Department of Medicine, Massachusetts General Hospital, Boston, Massachusetts, USA; email: gkruse@mgh.harvard.edu

[2] Harvard Medical School, Boston, Massachusetts, USA

[3] School of Engineering, Stanford University, Stanford, California, USA

[4] Department of Medicine, Brigham and Women's Hospital, Boston, Massachusetts, USA

[5] Department of Quality and Patient Experience, Massachusetts General Brigham, Somerville, Massachusetts, USA

Annu. Rev. Public Health 2022. 43:559–76

First published as a Review in Advance on January 26, 2022

The *Annual Review of Public Health* is online at publhealth.annualreviews.org

https://doi.org/10.1146/annurev-publhealth-052620-103633

Keywords

Indian Health Service, history, AI/AN health

Abstract

The Indian Health Service (IHS) has made huge strides in narrowing health disparities between American Indian and Alaska Native (AI/AN) populations and other racial and ethnic groups. Yet, health disparities experienced by AI/AN people persist, with deep historical roots combined with present-day challenges. Here we review the history of the IHS from colonization to the present-day system, highlight persistent disparities in AI/AN health and health care, and discuss six key present-day challenges: inadequate funding, limited human resources, challenges associated with transitioning services from federal to Tribal control through contracting and compacting, evolving federal and state programs, the need for culturally sensitive services, and the promise and challenges of health technology.

INTRODUCTION

The trust responsibility of the US government to provide health services for AI/AN people who are enrolled members of a federally recognized Tribe is based on numerous treaties, laws, and Supreme Court decisions. The Indian Health Service (IHS), a federal health program for American Indian and Alaska Native (AI/AN) groups, has served as the primary mechanism by which to fulfill the legal responsibility of the US government, based on treaty obligation, to provide quality health services to AI/AN populations (46).

Our objective is to describe the evolution of the IHS over time, give context for its legal basis, examine how the history of the system has affected health services and health outcomes for the AI/AN populations it cares for, and highlight key papers in the peer-reviewed literature that have examined current challenges and promising solutions to improve health outcomes for AI/AN people receiving care within the IHS.

METHODS

We conducted a narrative review of the history and present-day challenges of the IHS. We included literature if its focus fell within the scope of the following primary research questions: (*a*) How has the IHS evolved over time, (*b*) how has the IHS affected health outcomes for AI/AN populations, and (*c*) what challenges does the IHS currently face? Our review included only English language publications that were electronically available. First, we searched PubMed using the MeSH term "Indian Health Service." This search produced 576 peer-reviewed references on November 13, 2020. We screened these references to identify articles focused on IHS history, systems-level challenges, and health and health care outcomes related to health system–level factors. The abstract/executive summaries and full texts for the selected articles were screened by three authors for content and to identify additional relevant citations, including gray literature, primarily from US government publications and data. From this search, we identified six key present-day challenges. For each of these six challenges, we then selected examples of each challenge from the peer-reviewed literature.

HISTORY

We present the history of the IHS in four segments: colonization, the US Department of War era, the Department of the Interior era, and the present-day IHS. Although many descriptions of IHS history begin with the US Department of War era, we posit that structural racism exemplified by colonization is important to understanding the changes in the IHS over time and the persistent inequities among AI/AN people. We highlight key events in the history of the IHS in **Table 1**.

COLONIZATION

For thousands of years, millions of Indigenous Peoples have lived as diverse Nations unto themselves in the lands now known as the Americas. About 600 years ago, colonization of Indigenous Peoples of the Americas began. Motivated largely by the accumulation of land and resources, European powers and eventually the United States sanctioned massacres, forced removals, and the decimation of traditional food systems to weaken AI/AN Nations that stood in the way of westward expansion. Up to 100,000 AI/AN people from the eastern United States are estimated to have been forcibly relocated to lands west of the Mississippi River during the nineteenth century (85). Colonization introduced highly infectious diseases, including smallpox, to AI/AN Nations, which further reduced their populations to a fraction of their precontact numbers. Nevertheless,

Table 1 Key events in IHS history

Date	Key events
1824	Establishment of the BIA
1834	Codification of the Trade and Intercourse Act, which authorized fines for illegal distribution of alcohol to AI/AN
1849	Relocation of the BIA from the War Department to the DOI
1867	Creation of an Indian Peace Commission in 1867 to establish peace with certain "hostile Indian tribes"
1887	Passage of the General Allotment Act (often described as the beginning of the assimilation period of Indian policy)
1921	Passage of the Snyder Act, which authorized discretionary funded health services for AI/AN via a health division within the BIA
1928	Publication of the Meriam Report/Survey, which described serious morbidity among AI/AN and insufficient health care services
1934	Passage of the Indian Reorganization Act, which emphasized Tribal sovereignty, federal trust responsibility, and economic self-sufficiency
1954	Passage of the Transfer Act, which transferred the health care of AI/AN to the Department of Health, Education, and Welfare (now the HHS) under the administration of what is now the IHS
1959	Passage of the Indian Sanitation Facilities Construction Act, which amended the Transfer Act and established measures for safe water and sewage disposal
1975	Passage of the Indian Self-Determination and Education Assistance Act, which set the stage for individual Tribes to engage in contracts and compacts to assume administration of BIA/IHS services
1976	Passage of the Indian Health Care Improvement Act, which appropriated funds for the IHS until 2001 and Urban Indian Health programs (Title V)
1978	Passage of the Indian Child Welfare Act, which helped to ensure that AI/AN youth can grow and mature within their kinship and culture
1986	Passage of the Omnibus Drug Act, which reauthorized residential substance use treatment programs via the IHS
1992	Amendment of the IHCIA, which made the IHS director an appointee of the president; also the last full reauthorization before the ACA
1997	Establishment of the Special Diabetes Program for Indians to drive innovation in diabetes care and prevention
2003	Implementation by the IHS of an electronic health record across many of its health centers as part of a national initiative
2008	Request by the IHS for an increase in funding for TOHP in its 2008 budget, citing as justification the evidence from the Korenbrot study on decreased hospitalizations with greater funding
2010	Permanent reauthorization of the IHCIA as part of the ACA in March 2010, although it was due for reauthorization in 2000

Abbreviations: ACA, Affordable Care Act; AI/AN, American Indians/Alaska Natives; BIA, Bureau of Indian Affairs; DOI, Department of the Interior; HHS, Health and Human Services; IHCIA, Indian Health Care Improvement Act; IHS, Indian Health Service; TOHP, Tribally operated health programs.

many AI/AN Nations fought back. For nearly 150 years, the United States has had a wartime relationship with AI/AN populations. Although it can feel as though these conflicts occurred in the distant past, the last recorded battle between an AI/AN Nation and the United States was in the twentieth century (in 1918) between the Yaqui Tribe and the US Cavalry (101).

The US government's brutal policies of AI/AN removal produced trauma and loss, inducing dependency on the system that oppressed AI/AN Nations in the first place. Faced with the loss of traditional food supplies, famine, military pressure, and disease, many Tribes signed treaties with the government in exchange for assurance of resources to sustain their communities. Such treaties stipulated that if Tribes gave up parts of their territory and, in many cases, relocated to reservation lands, then Tribes would be provided forms of health care, education, and sustenance in perpetuity. Between 1778 and 1868, at least 367 treaties with Tribes were ratified by the US Senate and signed by US presidents (99). Most treaties guaranteed the provision of general protection and care as well as funding toward health or made even more specific promises of direct health care delivery (99). For example, in 1854, a treaty between the Ottoe and Missouri Indians stipulated payment to "Indians" for "medical purposes" (84). In 1848 and 1851, the Fort Laramie Treaties made between the US government and Sioux Tribes declared assurance of the protection of and care for citizens of those Nations. Another treaty of Fort Laramie, in 1868, included $3000 to "furnish annually to the Indians" a resident physician on the reservation (Prucha 2000 as cited in Reference 84, p. 1542). Although the IHS was not established until 1955, these treaties play a significant role in the health care systems we have today.

DEPARTMENT OF WAR ERA OF INDIAN HEALTH CARE

The US Constitution gave Congress the power to regulate commerce with "foreign Nations, and among the several States, and Indian Tribes" (U.S. Const. art. I, §8). To support the implementation of the growing number of treaties, in 1824 the Bureau of Indian Affairs (BIA), the first federal agency with the mandate to oversee formal relations with Tribes, as described in the Constitution, was established. The BIA was situated under the US War Department. Although managing both commerce and war with Tribes was an early priority, the US government also began taking a more active interest in AI/AN public health starting in the early nineteenth century, targeting the health conditions on reservations where interaction among AI/AN people, settlers, and military personnel was common.

In the beginning, the BIA provided primarily smallpox vaccines and care for injuries to AI/AN groups who were interned on federal reservations near military forts. The BIA's authorizing act also targeted alcohol commerce with Indian Tribes. It stated that "no ardent spirits (alcohol) shall be hereafter introduced, under any pretense, into the Indian country" (52, p. 38). This act was likely the first public health policy measure at the federal level with the purpose of improving AI/AN health through economic regulation. In another landmark federal public health measure targeted at alcohol reduction, the Trade and Intercourse Act of 1834 authorized fines for the distribution of alcohol to AI/AN people.

In the second half of the nineteenth century, official US policy affecting AI/AN populations began to shift away from war and toward assimilation. For the next century, the US government forcibly removed thousands of AI/AN children from their lands, homes, and reservations and placed them into federally run boarding schools where children were punished for speaking their languages or practicing their cultures. Although assimilation policies were arguably no less brutal in their approach, they required a different government apparatus for implementation.

DEPARTMENT OF THE INTERIOR ERA OF INDIAN HEALTH CARE

In 1849, the BIA was moved from the Department of War to the Department of the Interior. Here, federal-level public health intervention to mitigate infectious diseases remained a priority (65). By 1880, the Department of the Interior employed 77 physicians and managed 4 hospitals, yet large disparities in infectious disease mortality and malnutrition remained (77). In 1910, Robert Valentine, Commissioner of Indian Affairs at the BIA, noted the severe health disparities facing AI/AN Tribes and called for serious intervention to mitigate these health threats through treatment, prevention, and education (84).

Policy response moved slowly. It was not until 1921 that Congress formally authorized health services for AI/AN populations with the passage of the Snyder Act (Pub. L. 67-85). This act resulted in the establishment of a health division within the BIA, with a formalized budget for implementation. Three key components of the Snyder Act continue to impact the IHS today. First, funding for AI/AN health care services under the Snyder Act was discretionary rather than entitlement based, meaning the BIA's health division would operate under unstable funding, debated and agreed to each year by Congress. Second, the Snyder Act authorized health care for AI/AN groups regardless of their location or residence, which set a precedent of eligibility for AI/AN people living in metropolitan areas. Third, the Snyder Act emphasized the importance of public, preventive, and environmental health aspects of health care that would become cornerstones of AI/AN health care delivery in the United States.

Despite the significant increase in funding that came with the Snyder Act, federal reports on AI/AN health, such as the Meriam Report in 1928, continued to describe serious morbidity and mortality and insufficient health services to meet Tribes' needs. The Meriam Report detailed horrific conditions on reservations in particular: "They live in such abject squalor that it is no wonder their resistance is low. In winter they use green wood for heating; they never have enough blankets. . . . They are undernourished" (96).

As health care needs remained high, AI/AN sovereignty began to enter the policy discourse as a potential means to address the heterogeneous health needs specific to hundreds of different Tribes. The Indian Reorganization Act of 1934 emphasized Tribal sovereignty, self-determination, and economic self-sufficiency. The act characterized, for the first time, a federal trust responsibility of the US government to financially promote the health of Indigenous Nations with an understanding that their sovereignty, distinct political status, and varied cultures, languages, and geographies required investment at the community level. Over time, the federal trust responsibility entailed with more clarity a legal financial obligation of the US government to provide health services to AI/AN Tribes while recognizing their treaty rights and self-determination.

PRESENT-DAY INDIAN HEALTH SERVICE

In 1954, President Dwight Eisenhower approved the Indian Healthcare Transfer Act, which transferred the responsibility for AI/AN health care from the BIA to the US Public Health Service (USPHS). It authorized the USPHS to maintain and operate health care facilities caring for AI/AN people (94). In 1955, after implementation of the Transfer Act, the IHS was officially established (77). The newly established IHS could prioritize resource distribution and medical expertise among AI/AN communities and fulfill treaty obligations to Tribes across the country.

By 1959, amendments were needed on the Transfer Act to implement environmental policies and protection for standards related to safe water and proper sewage disposal. Thus, in 1959, the Indian Sanitation Facilities Construction Act was established to resolve the pertinent environmental issues related to health. This act granted the IHS permission to build facilities and procure land for managing water and sanitation (93).

From the 1950s to the 1970s, around the same time that the IHS was established, policies promoting relocation and assimilation continued. The Indian Relocation Act of 1956 (Pub. L. 959) was part of several activities promoting assimilation of AI/AN people. It offered incentives such as vocational training and relocation costs to AI/AN people who were willing to leave reservations for urban settings. The US government's long and brutal history of removing children from their homes and Tribes via the boarding school era did not end with the closure of boarding schools in the late 1960s. Many AI/AN youth across the United States were still being forcibly removed from their culture and their homes through foster care services and state intervention. These removals, disguised as child protection cases, caused hundreds of AI/AN children to get lost in the state system (**https://www.bia.gov/bia/ois/dhs/icwa**). In 1978, the Indian Child Welfare

Act (ICWA) prevented the federal government from continuing to take children away from their homes. However, the impact of this trauma continues to affect the health of families and children (25, 37). Suicide rates are higher among AI/AN groups compared with whites overall, the largest difference being among youth, with three times the rate of death by suicide among those under age 25 (17, 53, 70).

The American Indian Movement, which began in 1968, pressured President Richard Nixon to include policies focused on self-determination and decentralization. The goal was to support AI/AN Tribes to become independent while honoring decades old treaties by continuing to provide support and protection. This support came to fruition through the 1975 Self Determination and Education Assistance Act (Pub. L. 93–638), which allowed programs and the control of funding to be allocated by Tribes apart from federal control (77). This act was the beginning of a transition from a fully federally operated system to the mix of federal and Tribally operated health programs (TOHP) and services that exist today.

In 1976, nearly 20 years after the formation of the IHS, the Indian Health Care Improvement Act created the Urban Indian Health Program, which was a substantial step in addressing AI/AN health across the country. The relocation program resulted in many AI/AN people moving into cities as part of a goal to assimilate. However, the difficulties of being away from their culture and their traditional land caused negative health impacts. Urban-dwelling AI/AN people remain at risk of falling through the cracks between Medicaid and limited access to the IHS (71, 98).

Following the 1975 Indian Self-Determination and Education Assistance Act and the Indian Health Care Improvement Act (IHCIA), annual funding increased from $217 million in 1974 to $398 million in 1988 (46). Yet, these increases have not kept pace with health care funding elsewhere in the United States, leading to vast disparities in funding of AI/AN health care compared with other federal programs. From 1980 to 2002, per capita Medicare expenditures grew by 7.8% per year or $5,200 total during that period, whereas IHS per capita appropriations grew by 4.8% per year or $1,121 (100). Measures of mortality during this time period showed that, while disparities in mortality between AI/AN and white individuals had been declining for much of the twentieth century, beginning in the mid-1980s, the disparity began to increase (47, 64). Two factors are highlighted as contributing to this increase. The first is diabetes, as deaths from diabetes almost doubled between 1973 and 1997 (47). The second is substance use, with unintentional injuries and alcohol use disproportionately affecting AI/AN populations and alcohol-related deaths measuring four times the age-adjusted death rate in the general US population (64). The latter prompted the passing of the 1986 Omnibus Drug Act, which created substance use treatment programs across the IHS (84).

The 1990s brought the introduction of Tribal compacting, which allowed Tribes more autonomy and flexibility to meet the unique needs of their populations than contracting. Tribal contracting through Pub. L. 93–638 required that Tribes administer and operate programs and services at the same level as the IHS would otherwise provide. In contrast, compacting allows Tribal Organizations to assume control over programs and services (91). As Warne & Frizell (99) describe it, with contracting, "any program, function, service, or activity of the IHS can be assumed by the tribe. . .to provide services as outlined in the IHS line item budget or a given service unit (clinic or hospital)" (p. S264), whereas a compact "is essentially a block grant for a total budget amount, and the Tribes have greater flexibility in reprogramming resources to meet local needs" (p. S264). The result of these options is that Tribes can choose to receive direct health care services administered by the federal IHS, to assume responsibility for health care services through contract or compact with the IHS, or to fund their own programs and services. The IHCIA was supposed to be reauthorized as early as the 2000s, but it was not until the Affordable Care Act (ACA) of 2010 that the IHCIA was permanently authorized.

The present-day IHS system manages public health and health care services for more than two million Americans who self-identify as AI/AN. The organizational structure of the IHS consists of federal headquarters, area offices, and service units composed of hospitals, health centers, and clinics (4). Within this structure, the IHS provides care through a network of ambulatory health centers and hospitals that is supported by a shared electronic health record (EHR) system (76). In the current structure, the federal government, Tribal governments, and urban Indian groups all have input into IHS operations in a structure that has been described as "very complex" (4, p. 299).

Although the IHS is often compared with other federal programs such as the Federal Employees Health Benefits or Medicare, these comparisons are challenging given the mission of the IHS, which is broader than a federal health insurer's mission. For AI/AN populations in rural or remote settings, simply administering a federal insurance program like Medicare would not meet the needs of populations living in Tribal lands where health care facilities are not accessible. The public health mission, which includes diverse efforts from pandemic response to water fluorination, is also far different than the mission of these comparators. Also distinct from other federal programs is the mix of federal IHS programs and the various TOHP that engage in compacting. In 2016, 350 of 567 federally recognized Tribes participated in compacting, and nearly 40% of the IHS budget went to health care through compacting (91).

This history of the IHS informs many of the present-day challenges. At the center of these challenges are the persistent disparities in health and health care. In the next segment, we summarize these persistent disparities and then highlight the peer-reviewed literature for six key challenges and successes of the present-day IHS: inadequate funding, human resource constraints, challenges of transitioning services from federal to Tribal control through contracting and compacting, evolving federal and state programs, the need for culturally sensitive services, and the promise and challenges of health technology.

PERSISTENT DISPARITIES IN HEALTH AND HEALTH CARE

At the center of present-day challenges for the IHS is the persistence of health disparities for AI/AN people. In the United States, AI/AN groups continue to have higher uninsured rates, poorer access to health care, and poorer health outcomes compared with other racial or ethnic groups (8, 106). The life expectancy of AI/AN individuals remains more than 5 years shorter than that of the general US population (73 years versus 78.5 years) (92). A study of death certificate data highlighted the continued impacts of mental health and substance use disorders, with premature deaths increasing each year among AI/AN groups from 1999 to 2014, largely due to liver disease, suicides, and injuries (78). In terms of health care use and access, avoidable hospitalizations are 72% higher for AI/AN men compared with other Americans living in the same counties and 52% higher for AI/AN women (40). AI/AN people suffer disproportionately from colon and lung cancer, with incidence rates nearly 20% higher compared with whites (55, 102).

Key to addressing the persistent health disparities among AI/AN persons is being able to measure and monitor health care and health outcomes in this population. Although disparities in health outcomes have been demonstrated over time among AI/AN communities, interpretation of these findings has been limited by misclassification of ancestry, which is often associated with underreporting of death and disease among AI/AN populations (18, 23, 36, 63, 81–83). This misclassification has been partially overcome by linking IHS records with health registries, such as cancer registries and the National Death Index, to allow for adjustment for misclassification (36, 63).

Another challenge in measuring AI/AN health outcomes is that health disparities and quality of care vary between regions (48, 54). Looking at health outcomes among AI/AN populations in aggregate can mask regional-level differences, including some of the most striking disparities (102). For example, mortality rates for AI/AN individuals in 1999–2009 vary from 558 per 100,000 in the East region to 995 per 100,000 in the Northern Plains, and socioeconomic differences account for only part of this variation (48). This variability between regions requires interventions that meet the needs of diverse local populations.

Great progress has been made in decreasing these disparities since the modern-day IHS was formed in 1955 (46, 90). A longitudinal analysis of ambulatory quality of care in the IHS from 2002 to 2006 demonstrated improvement in clinical performance for adult immunizations, blood pressure, and cholesterol control among people with diabetes and cardiovascular disease (75). Yet, despite this progress, the health gap between AI/AN groups and other race and ethnic groups has not closed. In a population dealing with profound historical trauma and loss, the IHS is under-resourced to respond to the resulting burden of mental health and substance use disorders (6, 10, 11, 25, 88, 89). Systems-level barriers to delivering high-quality care were measured in a 2007 survey of providers in the IHS. Providers reported barriers to accessing high-quality specialists, nonemergent hospital-level care, diagnostic imaging, and mental health services (75).

CURRENT CHALLENGES AND SUCCESSES

A survey of 39 AI/AN health programs in 10 states was conducted by Noren et al. (61) in 1996. The challenges reported in their paper still largely apply today: (*a*) the need for overcoming problems resulting from inadequate funding; (*b*) recruitment and retention of professional staff; (*c*) conversion to Tribal compacting or contracting of clinical services and relationships between local clinical programs and IHS administration; (*d*) changes in the federal and state programs, specifically Medicaid and Medicare; and (*e*) the need for culturally sensitive services (61). Here we focus on these five factors plus a sixth: opportunities and challenges of health technology.

The Need for Overcoming Problems Resulting from Inadequate Funding

The discretionary funding model established by the Snyder Act persists today and contrasts with entitlement health care funds like Medicare. This unique model makes it difficult to study the impacts of underfunding of the IHS. One study used the Federal Employees Health Benefits Program as a benchmark to measure the impacts of variable funding levels on TOHP—those engaged in contracts and compacts to administer services. In 2009, Korenbrot et al. (39) studied TOHP in California and found that lower rates of funding in TOHP relative to the Federal Employees Health Benefits Program was associated with higher rates of hospitalization for ambulatory sensitive conditions. They observed a 9–11% increase in the rate of hospitalizations for ambulatory sensitive conditions for each 10% increase in the disparity between health care funding for federal employees and funding for the TOHP (39).

More recently, new investments may start to narrow the gap between AI/AN funding and funding of other federal health programs. Some of the largest investments in the IHS have come in response to the coronavirus 2019 pandemic relief policies. The Coronavirus Aid, Relief, and Economic Security Act provided critical relief for AI/AN populations, with more than $1 billion in relief allocated to the IHS in 2020 (34). The pandemic-related American Rescue Plan is also supporting the IHS to spend $600 million for vaccine distribution, $1 billion for coronavirus infection mitigation services, $2 billion for lost reimbursements in Tribal health systems, $84 million for the Urban Indian Health Programs, $140 million for health information technology (IT), and $500 million for overall health services (103).

Adequacy of Human Resources Including Recruitment and Retention of Professional Staff

In addition to financial resources, a lack of human resources staff is a central challenge within the IHS. A 2018 report by the US Government Accountability Office found an average vacancy rate of 25% among providers across 8 IHS geographic regions (95). A survey among Navajo Nation providers revealed that 58% of respondents intended to leave the Navajo-area IHS (38). The factors impacting human resources are complex and interconnected, including the rural and remote nature of many IHS sites as well as leadership structures, infrastructure, compensation, and housing (95). In 2017, the IHS described a total of 36 out of 102 facilities as isolated hardship sites, meaning these sites present significant physical challenges to individuals within them, including high rates of crime or violence, isolation, pollution, scarcity of goods at local markets, or harsh climate (59, 95). In addition, many IHS sites list a lack of amenities, such as access to school systems, and limited employment opportunities as barriers for those seeking to relocate families (95). Challenges to retention and recruitment of professional staff also exist within IHS power structures. Noren et al. (61) note that those staff that demonstrate commitment to the community are often promoted into administrative positions, thus maintaining clinical vacancies.

The high rate of vacancies in the IHS has real and lasting impacts on AI/AN health outcomes and health care access. Not only do vacancies lead to a lack of continuity in care, but also in some locations IHS facilities have been forced to limit services due to staffing issues. As one example of the impact of these vacancies, *Chlamydia* lab tests in South Dakota had to be sent out to another facility owing to limited laboratory personnel, delaying results and therefore treatments by up to a week (95). These limitations place strain on individual providers; a 2011 study found that 59% of 740 IHS primary care physicians felt that they were managing too high a degree of patient complexity of conditions without specialty consultation (75).

Solutions attempting to address recruitment and retention of staff exist in varying stages of implementation. Many sites within the IHS have recognized issues surrounding housing access and now offer on-site housing for employees and non-Tribal members (95). The IHS has made significant efforts in recruitment by offering educational rotations for medical students and residents to attract future providers. In 2006, a study from IHS sites in the US Southwest found that almost one-half (45%) of IHS physicians had at one time completed a rotation within the IHS before employment, and most (87%) reported the experience as a significant motivator to return after training (13, 97). Additional efforts have been focused on developing educational pipelines to foster AI/AN youth with interests in health care fields. Data have repeatedly shown that AI/AN graduates are twice as likely as their white peers to pursue careers in underserved areas (1, 69). Aligned with these data, in a 2012 survey of IHS providers regarding EHR use, 11% self-identified as AI/AN, compared with just 0.3% of active physicians who identified as AI/AN overall in the United States (45). AI/AN students who are interested in a career in medicine or other biomedical fields continue to face many barriers (73). In 2019, only 109 US medical school students (0.2%) and 274 medical school faculty (0.2%) were AI/AN (2). A few programs have shown promise in increasing the pipeline of AI/AN representation in biomedical fields (72, 73). Academic partnerships offer promise as a method to open up the pipeline by creating opportunities for students to train and gain experience in facilities serving AI/AN populations (33). Federal grants have also supported the recruitment and retention of AI/AN students in fields such as psychology (87).

Further efforts have focused on new care delivery models to address the staff shortages, including restructuring clinical roles and adopting telehealth platforms to improve access to subspecialty care and patient education (28, 44). Successful examples of these efforts include a teleophthalmology program for monitoring diabetic retinopathy, which has helped image approximately 25% of all IHS patients with diabetes (19). While many of these solutions represent federal-level interventions, IHS sites and their Tribal members represent a vast and diverse population with unique attributes that limit the effectiveness of an overarching federal approach in addressing site-specific concerns. To this end, delivery models and staff recruitment and retention efforts must be considered within each unique context.

Tribal Compacting and Contracting of Services

The ability of federally recognized AI/AN Tribes to lead TOHP by contracting with the IHS was established by the 1975 Indian Self-Determination and Education Assistance Act, and compacting was made possible by a 1992 amendment to the act (91). By 2015, more than 50% of mental health programs and 80% of substance use treatment programs that serve AI/AN populations were TOHP (67). Although clinical data have not shown differences in quality of care, a survey conducted by an AI/AN health advocacy group found that a majority of Tribes receiving care from TOHP reported better care under Tribal contracting compared with federal IHS management (4, 68). The literature describing challenges associated with compacting and contracting of services often relate to funding constraints. Decentralization of IHS activities for Tribal compacting or contracting of clinical services loses economies of scale, making it likely that individual Tribes pay more to attract providers (46). Context is likely to play a key role in what Tribes choose to do; for example, more isolated Tribes with limited provider supply may be challenged to improve access, and these Tribes may be less inclined to contract care (80).

Impact of Changes in Federal and State Programs

Other federal and state programs impact the IHS and AI/AN health outcomes. In 2013, only 23% of AI/AN people reported the IHS as a source of health coverage, but 98% of AI/AN individuals aged 65 and older and 75% of AI/AN people under age 65 had some form of health insurance coverage (9). Thus, many IHS-eligible individuals have other private or public insurance. To further highlight the role of non-IHS health coverage, an article describing the South Central Foundation of Alaska noted that only 45% of their funding to care for a population of ∼45,000 AN people comes from the IHS; another 45% comes from Medicare, Medicaid, or commercial insurance; and ∼10% of their work is supported by grant funds (27).

Besides insurance and health plans outside of the IHS, Section 330 Community Health Center funding is a potential resource to support TOHP and Urban Indian Health centers (99). A 2004 paper reviewed federal requirements to access Section 330 funding and conducted a survey of the Arizona AI/AN health care community on this topic. They identified several barriers to participating in this funding program, which included a lack of funding information at the local level, complexity of the application process, lack of an immediately available facility that can provide services within the required timeframes after the start of the funding award, and the requirement to serve low-income individuals other than AI/AN people in facilities that have been serving exclusively AI/AN people (3).

The ACA led to several changes for AI/AN populations. First, as noted above, the passage of the ACA in 2010 included the permanent reauthorization of the IHCIA (67). The ACA's expansion of funding for community health centers offered an opportunity to increase resources available to IHS facilities (99). The ACA included significant infrastructure funding, funding for recruitment and retention of clinicians, and increased Medicaid coverage for AI/AN individuals. This increase was not associated with a decrease in IHS coverage, suggesting that it was primarily supplemental and may bring Medicaid resources to IHS services (21). Given that the insurance-based expansions included in the ACA are a departure from the service-based provisions of the IHS, this supplementary relationship holds promise to increase Medicaid resources while continuing core IHS services (80). Warne & Frizzell (99) note that while Tribes may view insurance programs administered by the Center for Medicare and Medicaid Services (CMS) as separate from the treaty responsibility to ensure health care access, the CMS is part of the federal government and a party to those treaties and should be viewed as a component of the trust responsibility. As with many IHS outcomes, regional variation was observed in the ACA-induced expansion in Medicaid coverage among AI/AN populations, with some regions not seeing any expansion in public insurance coverage (22).

Another health system with potential impacts on the IHS is the Veterans Health Administration (VHA). In contrast with Medicaid, according to administrative data from 2002 and 2003, most AI/AN veterans used either the VHA only (28%) or the IHS only (46%) (43). Only 25% of individuals eligible for both health systems used care in both systems (43). When individuals do seek care from both systems, it is driven by institutional resources, and a study of patient and provider perspectives notes that there is room for improvement in care coordination between systems (42).

The Need for Culturally Sensitive Services

It is not surprising that disparities in satisfaction with quality of care and communications with providers have been documented among AI/AN populations compared with among white individuals. AI/AN individuals report 78% greater odds of being dissatisfied with the quality of care they receive and report 70% greater odds of poor communications with providers compared with white individuals (106). Among AI/AN women, perceived discrimination by providers has been negatively associated with the receipt of breast cancer screening (79). A qualitative study of mammography among AI/AN women revealed perceived stigma and a need for culturally sensitive services, which impacted screening decisions (60). These disparities are likely to be attributable, at least in part, to an outstanding need for culturally sensitive services for AI/AN populations.

Key to delivering culturally sensitive care is an understanding that AI/AN groups face social challenges such as poverty, lack of infrastructure, and racism, all of which manifest differently in each community. A look at other Indigenous communities highlights that health services must consider health-related social needs as they relate to Indigenous Peoples, as well as to their communities' cultural and historical contexts (31, 41), and must be grounded in sociocultural specificities (7). Research has highlighted the importance of Indigenous People preserving connections with their extended families and cultural networks and of considering the trauma of forced family removal and assimilation in intervention strategies (51). Services and interventions should include cultural teachings and involve traditional knowledge where appropriate (16, 49).

The ideals of culturally sensitive care are challenged by underfunding of the IHS, the complexity of addressing urban and reservation health needs, and the diverse contexts of US Tribes. Given the complex challenges that each AI/AN community faces, it is almost impossible to ensure culturally sensitive care without specific context about the community being served. Ensuring culturally sensitive care becomes a challenge when considering (*a*) the scarcity of AI/AN health care providers who have an intimate understanding of AI/AN cultural and social contexts and (*b*) the fact that curricula specific to AI/AN health are sparse in clinical education.

Even with these significant challenges, examples of success in the delivery of culturally sensitive, community-engaged health care programs with the IHS do exist. The Special Diabetes Program for Indians (SDPI), funded by a 1997 Congressional allocation, is one example of culturally sensitive, locally administered chronic disease care (50, 104). The SDPI and associated Healthy Heart Demonstration Project show the impact of effective collaboration with Tribal communities, and integration of Tribal traditions in diabetes management, to improve diabetes outcomes, cardiovascular outcomes, and engagement with care (35, 56). The SDPI has been widely adopted, with 301 programs in 35 states, including all 12 IHS areas (**https://www.ihs.gov/sdpi/reports-to-congress/**). Coinciding with the establishment of this program, diabetes prevalence among AI/AN adults has seen a steady decline since 2013 (14).

The Community Health Representative (CHR) programs are another positive example of a culturally sensitive, community-engaged health-promoting program. CHRs represent some of the longest running community health worker programs in the United States. CHR programs have demonstrated improved engagement with care and health outcomes for a variety of health conditions, including diabetes management, mental health, maternal and child health, cancer prevention, and pandemic response (12, 20, 24, 29, 66, 86). There are also examples of the effectiveness of culturally sensitive services within mental health care (26, 62). These successes suggest that by investing in community-level care for other health issues and by engaging with Tribes in a manner that ensures contextual and culturally sensitive services, further health gains could be achieved.

Opportunities and Challenges in Health Technology

The IHS was an early adopter of an EHR system by implementing the Resource and Patient Management System (RPMS), which was based on the Veterans Affairs health IT platform, in the 1980s. In 2003, the IHS began a national initiative to implement EHRs in all federally operated IHS clinics by 2008 (30). The RPMS is the cornerstone of clinical information systems, which enable the assessment of IHS systems-level performance (76). A clinical reporting system using RPMS data and a set of defined quality measures was started in 2000 (15). With this system, performance could be compared and quality improvement activities could be directed to those who needed them most in the IHS system (74).

A survey conducted between 2003 and 2005 of IHS primary care providers in clinics that implemented the RPMS demonstrated that technical limitations and clinical productivity loss were barriers to EHR implementation. Most providers (87%) responding to the survey reported a belief that IT could improve quality of care through access to online information sources, telemedicine, and electronic consultation (76). Providers in this survey also described the potential benefits of EHR use, including the ability to provide culturally appropriate patient education material, access to information about Tribal affiliation, and language proficiency (76). Part of realizing the full potential of the EHR is the meaningful engagement of providers with the EHR system. A 2012 survey of IHS providers revealed that only 14% of respondents reported using all features in a list of 10 meaningful use criteria (45). Barriers to the use of EHR features reported in 2012 included inadequate training, technical support, and computer skills; needed features; productivity loss; privacy concerns; and negative effects on the quality of the patient–provider relationship (45). In its early years, the RPMS was able to identify individuals who used IHS services and who had a diagnosis of diabetes mellitus with an accuracy comparable to other health care systems (105). Since then, the RPMS has been used to evaluate population health programs such as interventions to promote fecal immunochemical testing (29), reminders to screen for *Chlamydia* (32), and prevention of chronic kidney disease among individuals with diabetes (57, 58).

As an early adopter of EHR services, the IHS is now considering modernization. In a qualitative study of IHS health IT stakeholders, key motivators for modernization are the potential for greater satisfaction with usability, increased financial returns or reduced costs, and enhanced potential for improving quality and safety (5).

CONCLUSION

Since its formation, the IHS has worked to fulfill the US government's treaty obligations to AI/AN populations. Much of the narrowing of health disparities between AI/AN populations and other racial and ethnic groups in the United States is attributable to the activities of the IHS. However, health disparities for AI/AN people persist, influenced by the history of trauma and racism, chronic underfunding and insufficient human resources, and ongoing needs for methods to support Tribal control of programs and services and for culturally sensitive services, given the diversity of settings and populations they serve. Future directions should leverage successes such as community-engaged approaches like the CHR programs, culturally tailored services like the SDPI, and technology using the RPMS and advances in telehealth. And finally stakeholders at all levels must continue to develop solutions to adequately fund and build the capacities of diverse Tribes to create community-level solutions to overcome health disparities with programs strengthened by cultural values and traditions.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

LITERATURE CITED

1. AAMC (Assoc. Am. Med. Coll.). 2018. *Reshaping the journey: American Indians and Alaska Natives in medicine*. Rep., AAMC, Washington, DC. **https://store.aamc.org/downloadable/download/sample/sample_id/243/**
2. AAMC (Assoc. Am. Med. Coll.) 2019. *Diversity in medicine: facts and figures*. Exec. Summ., AAMC, Washington, DC. **https://www.aamc.org/data-reports/workforce/report/diversity-medicine-facts-and-figures-2019**
3. Allison M, Rivers PA, Fottler MD. 2004. Can community health center funding enhance health services for Native American Tribes and organizations? *J. Health Care Poor Underserved* 15:193–205
4. Allison MT, Rivers PA, Fottler MD. 2007. Future public health delivery models for Native American Tribes. *Public Health* 121:296–307
5. Amlung J, Huth H, Cullen T, Sequist T. 2020. Modernizing health information technology: lessons from healthcare delivery systems. *JAMIA Open* 3:369–77
6. Armenta BE, Whitbeck LB, Habecker PN. 2016. The historical loss scale: longitudinal measurement equivalence and prospective links to anxiety among North American indigenous adolescents. *Cult. Divers. Ethn. Minor. Psychol.* 22:1–10
7. Auclair G, Sappa M. 2012. Mental health in Inuit youth from Nunavik: clinical considerations on a transcultural, interdisciplinary, community-oriented approach. *J. Can. Acad. Child Adolesc. Psychiatry* 21:124–26
8. Bhaskar R, O'Hara BJ. 2017. Indian Health Service coverage among American Indians and Alaska Natives in federal Tribal areas. *J. Health Care Poor Underserved* 28:1361–75
9. Boccuti C, Swoope C, Artiga S. 2014. *The role of Medicare and the Indian Health Service for American Indians and Alaska Natives: health, access and coverage*. Rep., Kaiser Fam. Found., Menlo Park, CA. **https://files.kff.org/attachment/report-the-role-of-medicare-and-the-indian-health-service-for-american-indians-and-alaska-natives-health-access-and-coverage**
10. Brave Heart MYH. 2003. The historical trauma response among natives and its relationship with substance abuse: a Lakota illustration. *J. Psychoactive Drugs* 35:7–13
11. Brave Heart MYH, Chase J, Elkins J, Altschul DB. 2011. Historical trauma among Indigenous Peoples of the Americas: concepts, research, and clinical considerations. *J. Psychoactive Drugs* 43:282–90

12. Brown C, Lalla A, Curley C, King C, Muskett O, et al. 2020. Community-clinic linkages: qualitative provider perspectives on partnering with community health representatives in Navajo Nation. *BMJ Open* 10:e031794
13. Brown SR, Birnbaum B. 2005. Student and resident education and rural practice in the Southwest Indian Health Service: a physician survey. *Fam. Med.* 37:701–5
14. Bullock A, Sheff K, Hora I, Burrows NR, Benoit SR, et al. 2020. Prevalence of diagnosed diabetes in American Indian and Alaska Native adults, 2006–2017. *BMJ Open Diabetes Res. Care* 8:e001218
15. Carroll M, Cullen T, Ferguson S, Hogge N, Horton M, Kokesh J. 2011. Innovation in Indian healthcare: using health information technology to achieve health equity for American Indian and Alaska Native populations. *Perspect. Health Inf. Manag.* 8:1d
16. Clark TC, Johnson EA, Kekus M, Newman J, Patel PS, et al. 2014. Facilitating access to effective and appropriate care for youth with mild to moderate mental health concerns in New Zealand. *J. Child Adolesc. Psychiatr. Nurs.* 27:190–200
17. Espey DK, Jim MA, Cobb N, Bartholomew M, Becker T, et al. 2014. Leading causes of death and all-cause mortality in American Indians and Alaska Natives. *Am. J. Public Health* 104(Suppl. 3):S303–11
18. Espey DK, Wiggins CL, Jim MA, Miller BA, Johnson CJ, Becker TM. 2008. Methods for improving cancer surveillance data in American Indian and Alaska Native populations. *Cancer* 113:1120–30
19. Fonda SJ, Bursell S-E, Lewis DG, Clary D, Shahon D, Horton MB. 2020. The Indian Health Service primary care-based teleophthalmology program for diabetic eye disease surveillance and management. *Telemed. J. e-Health* 26:1466–74
20. Franz C, Atwood S, Orav EJ, Curley C, Brown C, et al. 2020. Community-based outreach associated with increased health utilization among Navajo individuals living with diabetes: a matched cohort study. *BMC Health Serv. Res.* 20:460
21. Frean M, Shelder S, Rosenthal MB, Sequist TD, Sommers BD. 2016. Health reform and coverage changes among Native Americans. *JAMA Intern. Med.* 176:858–60
22. Frerichs L, Bell R, Lich KH, Reuland D, Warne D. 2019. Regional differences in coverage among American Indians and Alaska Natives before and after the ACA. *Health Aff.* 38:1542–49
23. Frost F, Tollestrup K, Ross A, Sabotta E, Kimball E. 1994. Correctness of racial coding of American Indians and Alaska Natives on the Washington State death certificate. *Am. J. Prev. Med.* 10:290–94
24. Gampa V, Smith C, Muskett O, King C, Sehn H, et al. 2017. Cultural elements underlying the community health representative—client relationship on Navajo Nation. *BMC Health Serv. Res.* 17:19
25. Gone JP, Trimble JE. 2012. American Indian and Alaska Native mental health: diverse perspectives on enduring disparities. *Annu. Rev. Clin. Psychol.* 8:131–60
26. Goodkind JR, Ross-Toledo K, John S, Hall JL, Ross L, et al. 2010. Promoting healing and restoring trust: policy recommendations for improving behavioral health care for American Indian/Alaska Native adolescents. *Am. J. Community Psychol.* 46:386–94
27. Gottlieb K. 2007. The family wellness warriors initiative. *Alaska Med.* 49:49–54
28. Hanson JD, Weber TL, Shrestha U, Bares VJ, Seiber M, Ingersoll K. 2020. Acceptability of an eHealth intervention to prevent alcohol-exposed pregnancy among American Indian/Alaska Native teens. *Alcoholism Clin. Exp. Res.* 44:196–202
29. Haverkamp D, English K, Jacobs-Wingo J, Tjemsland A, Espey D. 2020. Effectiveness of interventions to increase colorectal cancer screening among American Indians and Alaska Natives. *Prev. Chron. Dis.* 17:200049
30. Hays H. 2003. The IHS electronic health record project. *IHS Prim. Care Provid.* 28:233–36
31. Hinton R, Kavanagh DJ, Barclay L, Chenhall R, Nagel T. 2015. Developing a best practice pathway to support improvements in Indigenous Australians' mental health and well-being: a qualitative study. *BMJ Open* 5:e007938
32. Hughes MS, Apostolou A, Reilley B, Leston J, McCollum J, Iralu J. 2021. Electronic health record reminders for chlamydia screening in an American Indian population. *Public Health Rep.* 136:320–26
33. Incze MA, Tobey ML, Sequist TD. 2020. Investing in the health of American Indians and Alaska Natives. *JAMA Intern. Med.* 180:633–34

34. Indian Health Serv. 2020. *IHS receives more than $1 billion for coronavirus response*. Press Release, April 3. **https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/IHSPressRelease_IHS_CARES_Act_Funding_Release_04032020.pdf**
35. Jiang L, Johnson A, Pratte K, Beals J, Bullock A, et al. 2018. Long-term outcomes of lifestyle intervention to prevent diabetes in American Indian and Alaska Native communities: the Special Diabetes Program for Indians diabetes prevention program. *Diabetes Care* 41:1462–70
36. Jim MA, Arias E, Seneca DS, Hoopes MJ, Jim CC, et al. 2014. Racial misclassification of American Indians and Alaska Natives by Indian Health Service contract health service delivery area. *Am. J. Public Health* 104(Suppl. 3):S295–302
37. John-Henderson NA, Oosterhoff B, Kampf TD, Hall B, Johnson LR, et al. 2021. Historical loss: implications for health of American Indians in the Blackfeet community. *Ann. Behav. Med.* **https://doi.org/10.1093/abm/kaab032**. In press
38. Kim C. 2000. Recruitment and retention in the Navajo Area Indian Health Service. *West J. Med.* 173:240–43
39. Korenbrot C, Kao C, Crouch JA. 2009. Funding of Tribal health programs linked to lower rates of hospitalization for conditions sensitive to ambulatory care. *Med. Care* 47:88–96
40. Korenbrot CC, Ehlers S, Crouch JA. 2003. Disparities in hospitalizations of rural American Indians. *Med. Care* 41:626–36
41. Kowanko IC, Stewart T, Power C, Fraser R, Love I, Bromley T. 2009. An Aboriginal family and community healing program in metropolitan Adelaide: description and evaluation. *Aust. Indig. Health Bull.* 9(4):1–12
42. Kramer BJ, Vivrette RL, Satter DE, Jouldjian S, McDonald LR. 2009. Dual use of Veterans Health Administration and Indian Health Service: healthcare provider and patient perspectives. *J. Gen. Intern. Med.* 24:758–64
43. Kramer BJ, Wang M, Jouldjian S, Lee ML, Finke B, Saliba D. 2009. Veterans Health Administration and Indian Health Service: healthcare utilization by Indian Health Service enrollees. *Med. Care* 47:670–76
44. Kruse CS, Bouffard S, Dougherty M, Parro JS. 2016. Telemedicine use in rural Native American communities in the era of the ACA: a systematic literature review. *J. Med. Syst.* 40:145
45. Kruse GR, Hays H, Orav EJ, Palan M, Sequist TD. 2017. Meaningful use of the Indian Health Service electronic health record. *Health Serv. Res.* 52:1349–63
46. Kunitz SJ. 1996. The history and politics of US health care policy for American Indians and Alaskan Natives. *Am. J. Public Health* 86:1464–73
47. Kunitz SJ. 2008. Ethics in public health research: changing patterns of mortality among American Indians. *Am. J. Public Health* 98:404–11
48. Kunitz SJ, Veazie M, Henderson JA. 2014. Historical trends and regional differences in all-cause and amenable mortality among American Indians and Alaska Natives since 1950. *Am. J. Public Health* 104(Suppl. 3):S268–77
49. Lucero NM, Bussey M. 2012. A collaborative and trauma-informed practice model for urban Indian child welfare. *Child Welfare* 91:89–112
50. Lucero J, Roubideaux YD. 2022. Advancing diabetes prevention and control in American Indians and Alaska Natives. *Annu. Rev. Public Health* 43:461–75
51. Malone JL, Stanley D. 2013. Community-based mental health initiatives in a First Nations health centre: reflections of a transdisciplinary team. *Pimatisiwin* 11:433–39
52. Martin JE. 2003. "The greatest evil": interpretations of Indian prohibition laws, 1832–1953. *Great Plains Q.* 23:35–53
53. McLeigh JD. 2010. What are the policy issues related to the mental health of Native Americans? *Am. J. Orthopsychiatry* 80:177–82
54. Melkonian SC, Henley SJ, Senkomago V, Thomas CC, Jim MA, et al. 2020. Cancers associated with human papillomavirus in American Indian and Alaska Native populations—United States, 2013–2017. *MMWR* 69:1283–87
55. Melkonian SC, Jim MA, Haverkamp D, Wiggins CL, McCollum J, et al. 2019. Disparities in cancer incidence and trends among American Indians and Alaska Natives in the United States, 2010–2015. *Cancer Epidemiol. Biomarkers Prev.* 28:1604–11

56. Moore K, Jiang L, Manson SM, Beals J, Henderson W, et al. 2014. Case management to reduce cardiovascular disease risk in American Indians and Alaska Natives with diabetes: results from the Special Diabetes Program for Indians Healthy Heart Demonstration Project. *Am. J. Public Health* 104:e158–64
57. Narva A. 2018. Population health for CKD and diabetes: lessons from the Indian Health service. *Am. J. Kidney Dis.* 71:407–11
58. Narva AS. 2008. Reducing the burden of chronic kidney disease among American Indians. *Adv. Chronic Kidney Dis.* 15:168–73
59. NCAI (Natl. Congr. Am. Indians). 2017. *Tribal infrastructure: investing in Indian country for a stronger America*. Rep., NCAI, Washington, DC. **https://www.ncai.org/NCAI-InfrastructureReport-FINAL.pdf**
60. Ndikum-Moffor FM, Braiuca S, Daley CM, Gajewski BJ, Engelman KK. 2013. Assessment of mammography experiences and satisfaction among American Indian/Alaska Native women. *Women's Health Issues* 23:e395–402
61. Noren J, Kindig D, Sprenger A. 1998. Challenges to Native American health care. *Public Health Rep.* 113:22–33
62. Payne HE, Steele M, Bingham JL, Sloan CD. 2018. Identifying and reducing disparities in mental health outcomes among American Indians and Alaskan Natives using public health, mental healthcare and legal perspectives. *Adm. Policy Ment. Health* 45:5–14
63. Rhoades DA. 2005. Racial misclassification and disparities in cardiovascular disease among American Indians and Alaska Natives. *Circulation* 111:1250–56
64. Rhoades ER, Hammond J, Welty TK, Handler AO, Amler RW. 1987. The Indian burden of illness and future health interventions. *Public Health Rep.* 102:361–68
65. Rhoades ER, Rhoades DA. 2014. The public health foundation of health services for American Indians & Alaska Natives. *Am. J. Public Health* 104(Suppl. 3):S278–85
66. Rosenthal EL, Menking P, Begay M-G. 2020. Fighting the COVID-19 merciless monster: lives on the line—community health representatives' roles in the pandemic battle on the Navajo Nation. *J. Ambul. Care Manag.* 43:301–5
67. Ross RE, Garfield LD, Brown DS, Raghavan R. 2015. The Affordable Care Act and implications for health care services for American Indian and Alaska Native individuals. *J. Health Care Poor Underserved* 26:1081–88
68. Roubideaux Y. 2005. Beyond Red Lake—the persistent crisis in American Indian health care. *N. Engl. J. Med.* 353:1881–83
69. Saha S, Shipman S. 2006. *The rationale for diversity in health professions: a review of the evidence*. Rep., US Dep. Health Hum. Serv., Health Resour. Serv. Adm., Bur. Health Profess., Hyattsville, MD
70. Sancar F, Abbasi J, Bucher K. 2018. Mortality among American Indians and Alaska Natives. *JAMA* 319:112
71. Satter DE, Wallace SP, Le TM, Zubiate A. 2002. *Improving health insurance coverage for American Indian Children and Families under Healthy Families (SCHIP)*. Rep., Univ. Calif. Los Angel. Cent. Health Policy Res., Los Angeles. **http://healthpolicy.ucla.edu/publications/Documents/PDF/Improving%20Health%20Insurance%20Coverage%20for%20American%20Indian%20Children%20and%20Families%20under%20Healthy%20Families%20(SCHIP).pdf**
72. Sequist TD. 2005. Paving the way—providing opportunities for Native American students. *N. Engl. J. Med.* 353:1884–86
73. Sequist TD. 2007. Health careers for Native American students: challenges and opportunities for enrichment program design. *J. Interprof. Care* 21(Suppl. 2):20–30
74. Sequist TD, Cullen T, Ayanian JZ. 2005. Information technology as a tool to improve the quality of American Indian health care. *Am. J. Public Health* 95:2173–79
75. Sequist TD, Cullen T, Bernard K, Shaykevich S, Orav EJ, Ayanian JZ. 2011. Trends in quality of care and barriers to improvement in the Indian Health Service. *J. Gen. Intern. Med.* 26:480–86
76. Sequist TD, Cullen T, Hays H, Taualii MM, Simon SR, Bates DW. 2007. Implementation and use of an electronic health record within the Indian Health Service. *J. Am. Med. Inform. Assoc.* 14:191–97

77. Shelton BL. 2004. *Legal and historical roots of health care for American Indians and Alaska Natives in the United States*. Issue Brief, Henry J. Kaiser Family Found., Menlo Park, CA. **https://www.kff.org/wp-content/uploads/2013/01/legal-and-historical-roots-of-health-care-for-american-indians-and-alaska-natives-in-the-united-states.pdf**
78. Shiels MS, Chernyavskiy P, Anderson WF, Best AF, Haozous EA, et al. 2017. Trends in premature mortality in the USA by sex, race, and ethnicity from 1999 to 2014: an analysis of death certificate data. *Lancet* 389:1043–54
79. Simonds VW, Colditz GA, Rudd RE, Sequist TD. 2011. Cancer screening among Native Americans in California. *Ethn Dis*. 21:202–9
80. Skinner D. 2016. The politics of Native American Health Care and the Affordable Care Act. *J. Health Polit. Policy Law* 41:41–71
81. Stehr-Green P, Bettles J, Robertson LD. 2002. Effect of racial/ethnic misclassification of American Indians and Alaskan Natives on Washington State death certificates, 1989–1997. *Am. J. Public Health* 92:443–44
82. Sugarman JR, Lawson L. 1993. The effect of racial misclassification on estimates of end-stage renal disease among American Indians and Alaska Natives in the Pacific Northwest, 1988 through 1990. *Am. J. Kidney Dis.* 21:383–86
83. Sugarman JR, Soderberg R, Gordon JE, Rivara FP. 1993. Racial misclassification of American Indians: its effect on injury rates in Oregon, 1989 through 1990. *Am. J. Public Health* 83:681–84
84. Thierry J, Brenneman G, Rhoades E, Chilton L. 2009. History, law, and policy as a foundation for health care delivery for American Indian and Alaska Native children. *Pediatr. Clin. North Am.* 56:1539–59
85. Thornton R. 1984. Cherokee population losses during the Trail of Tears: a new perspective and a new estimate. *Ethnohistory* 31(4):289–300
86. Trevisi L, Orav JE, Atwood S, Brown C, Curley C, et al. 2019. Integrating community health representatives with health care systems: clinical outcomes among individuals with diabetes in Navajo Nation. *Int. J. Equity Health* 18:183
87. Trimble JE, Clearing-Sky M. 2009. An historical profile of American Indians and Alaska Natives in psychology. *Cult. Divers. Ethn. Minor. Psychol.* 15:338–51
88. Tucker RP, Wingate LR, O'Keefe VM. 2016. Historical loss thinking and symptoms of depression are influenced by ethnic experience in American Indian college students. *Cult. Divers. Ethn. Minor. Psychol.* 22:350–58
89. Tucker RP, Wingate LR, O'Keefe VM, Hollingsworth DW, Cole AB. 2016. An examination of historical loss thinking frequency and rumination on suicide ideation in American Indian young adults. *Suicide Life Threat Behav*. 46:213–22
90. US Dep. Health Hum. Serv., Indian Health Serv. 2015. *Trends in Indian health 2014 edition.* Rep., US Dep. Health Hum. Serv., Indian Health Serv., Rockville, MD. **https://www.ihs.gov/sites/dps/themes/responsive2017/display_objects/documents/Trends2014Book508.pdf**
91. US Dep. Health Hum. Serv., Indian Health Serv. 2016. *Tribal self-governance*. Fact Sheet, US Dep. Health Hum. Serv., Indian Health Serv., Rockville, MD. **https://www.ihs.gov/newsroom/factsheets/tribalselfgovernance/**
92. US Dep. Health Hum. Serv., Indian Health Serv. 2019. *Indian health disparities*. Fact Sheet, US Dep. Health Hum. Serv., Indian Health Serv., Rockville, MD. **https://www.ihs.gov/newsroom/factsheets/disparities/**
93. US Dep. Health Hum. Serv., Indian Health Serv. 2021. Indian Sanitation Facilities Act of July 31, 1959 (Public Law 86–121). *Legislation*. **https://www.ihs.gov/aboutihs/legislation/**
94. US Dep. Health Hum. Serv., Indian Health Serv. 2021. Legislation. *Indian Health Service*. **https://www.ihs.gov/aboutihs/legislation/**
95. US GAO (Gov. Account. Off.). 2018. *Indian Health Service: agency faces ongoing challenges filling provider vacancies.* Rep., US GAO, Washington, DC. **https://www.gao.gov/assets/gao-18-580.pdf**
96. US Natl. Libr. Med. 1998. *The Meriam Commission and health care reform (1926–1945)*. *History of Medicine*. **https://www.nlm.nih.gov/exhibition/if_you_knew/ifyouknew_07.html**
97. Vogt HB, Jerde OM. 1994. Pine Ridge Indian Health Service primary care resident rotation: an update. *S. D. J. Med.* 47:125–27

98. Warne D. 2009. The state of Indigenous America series: ten Indian health policy challenges for the new administration in 2009. *Wicazo Sa Rev*. 24:7–23
99. Warne D, Frizzell LB. 2014. American Indian health policy: historical trends and contemporary issues. *Am. J. Public Health* 104(Suppl. 3):S263–67
100. Westmoreland TM, Watson KR. 2006. Redeeming hollow promises: the case for mandatory spending on health care for American Indians and Alaska Natives. *Am. J. Public Health* 96:600–5
101. Wharfield CHB. 1963. A fight with the Yaquis at Bear Valley, 1918. *Arizoniana* 4:1–8
102. White MC, Espey DK, Swan J, Wiggins CL, Eheman C, Kaur JS. 2014. Disparities in cancer mortality and incidence among American Indians and Alaska Natives in the United States. *Am. J. Public Health* 104(Suppl. 3):S377–87
103. White House. 2021. *Fact Sheet: Biden Administration invests $4 billion in American Rescue Plan funding to Combat COVID-19 in Indian country*. Press Release, April 16. **https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/16/fact-sheet-biden-administration-invests-4-billion-in-american-rescue-plan-funding-to-combat-covid-19-in-indian-country/**
104. Wilson C, Gilliland S, Cullen T, Moore K, Roubideaux Y, et al. 2005. Diabetes outcomes in the Indian health system during the era of the Special Diabetes Program for Indians and the Government Performance and Results Act. *Am. J. Public Health* 95:1518–22
105. Wilson C, Susan L, Lynch A, Saria R, Peterson D. 2001. Patients with diagnosed diabetes mellitus can be accurately identified in an Indian Health Service patient registration database. *Public Health Rep*. 116:45–50
106. Zuckerman S, Haley J, Roubideaux Y, Lillie-Blanton M. 2004. Health service access, use, and insurance coverage among American Indians/Alaska Natives and whites: What role does the Indian Health Service play? *Am. J. Public Health* 94:53–59