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Diabetes Disparities: A Comparative Analysis of Indigenous Populations (Pima and Cherokee Tribes) in the United States and Ethnic Minority Groups (Manchu and Miao) in China

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Abstract

This paper argues that Type 2 diabetes disparities in Native American communities and Chinese ethnic minority communities are produced by structural inequality, specifically being reshaped by shifting political policy and cultural disruption. Through a comparative analysis of the Pima and Cherokee tribes in the United States and the Miao and Manchu populations in China, this study examines how forced assimilation, relocation, and market-driven modernization have destabilized traditional food systems and constrained access to consistent healthcare. Although these communities exist within differing political and economic environments, they face similar struggles when institutions prioritize socioeconomic development over local continuity. By challenging narratives that individualize blame, this research reframes diabetes partially as an illness shaped by the conditions under which people are made to live. Finally, the paper draws implications for intervention: solutions must address root causes by working alongside affected communities to rebuild trust, by providing them with food sovereignty and suitable healthcare support system.

Key words: Type 2 diabetes mellitus (T2DM), forced assimilation, Food Distribution Program on Indian Reservations (FDPIR), Pima (Akimel O'odham), Cherokee Nation, Miao, Manchu, blood quantum level, screening uptake, traditional healing.

Intro

Type 2 diabetes mellitus (T2DM) accounts for 90–95% of diabetes cases worldwide. It also contributes significantly to health burdens and premature death. The prevalence and health loss associated with Type 2 Diabetes Mellitus (T2DM) have consistently increased from 1990 to 2021, particularly in low-resource settings (He et al., 2024). As the disease burden varies across sociodemographic contexts, tracking these patterns is crucial for monitoring in addition to equitable resource allocation and designing interventions targeting high-risk communities.

To address and explore the central question, the study compares two distinct groups: Native American communities in the United States, focusing on the Pima and Cherokee peoples; and ethnic minorities in China, focusing on the Miao and Manchu populations.

Despite being under different political and economic environment, both groups have undergone profound social transformations over the past century. These transformations encompassed forced assimilation policies, compulsory relocation, and market-driven modernization, and have eroded traditional customs while shifting the healthcare accessibility. This fundamentally altered their dietary patterns. These shifts are crucial because they reshaped the material and social conditions of daily life, determining the types of food and resources available to people while influencing their perceptions of and responses to disease.

From this perspective, the roots of health disparities in diabetes lie not only in inherent cultural deficiencies or individual group failures, but should rather be seen as manifestations of structural violence, where health inequalities stem from institutional and systemic forces, not choices or behaviors of minority groups.

Historical Context

This study examines the Pima and Cherokee tribes of Arizona as case studies, as they possess relatively well-documented histories within Native American communities, despite their differing experiences during colonization and modernization (U.S. Commission on Civil Rights, 2004). Historically, Native American communities endured a series of external interventions that altered their land ownership and governance structures (U.S. Congress, 1887). These measures often aimed to assimilate Indigenous peoples into mainstream culture while undermining tribal sovereignty and traditional community organizational systems (U.S. Congress, 1887). Although the federal government established corresponding service systems, chronic underfunding and fragmented jurisdictional authority have left many communities facing persistent gaps in housing, education, employment, and healthcare (U.S. Commission on Civil Rights, 2004). These historical legacies persist today unevenly across regions and tribes (U.S. Commission on Civil Rights, 2004). They not only shape communities' access to public services but, more significantly, profoundly influence these communities' trust in external institutions (Hodge, 1989).

In China, the Miao and Manchu populations offer contrasting perspectives on how ethnic minorities navigate national integration. The Miao predominantly reside in southwestern provinces like Guizhou, are largely rural, and remain economically marginalized (Encyclopaedia Britannica, n.d.). The Manchu, who held ruling positions during the Qing Dynasty, are now highly dispersed and urbanized, primarily concentrated in Northeast China (Encyclopaedia Britannica, 2025). Despite divergent historical trajectories, both groups have undergone state-driven transformations. Since the mid-twentieth century, a series of state projects, including agricultural collectivization, market reforms, infrastructure expansion, migration policies, and poverty alleviation initiatives, have accelerated administrative integration and cultural standardization (World Bank, 2022). These transformations reshaped local governance patterns and livelihoods while pushing marginalized communities more tightly into the network of state institutions (World Bank, 2022).

Correspondingly, the healthcare delivery system has continuously evolved through these reforms. From the era of “barefoot doctors” stationing primary care workers in rural areas to the subsequent expansion of medical insurance coverage, the forms of healthcare provision have undergone significant changes (Yip et al., 2019). However, in many ethnic minority and remote regions, the quality and continuity of medical services remain uneven (World Bank, 2022). Cultural traditions coexist with biomedicine, and ritual and spiritual healing often run parallel to formal medical care, particularly in communities with strong local identities or where access to biomedicine is hindered by cost or distance (Yang & McTavish, 2024).

In both contexts, assimilation and modernization are not isolated events. They reconfigure territorial and power structures, redistributing opportunities and vulnerabilities within the nation-state, often concentrating disadvantages within the spaces where ethnic minority communities live and work (U.S. Commission on Civil Rights, 2004; World Bank, 2022). This paper situates diabetes health disparities within this broader socio-historical framework: these health outcomes reflect how the state integrates ethnic minority populations into local institutions and regulates their access to health resources (U.S. Commission on Civil Rights, 2004; World Bank, 2022). It is precisely these arrangements that determine which services they can access and which institutions they trust, thereby shaping patterns of chronic disease risk (Hodge, 1989; U.S. Commission on Civil Rights, 2004). By comparing the Pima and Cherokee peoples in the United States with the Miao and Manchu peoples in China, this study reveals how modernization and forced assimilation reshape food systems and healthcare accessibility across the globe (U.S. Congress, 1887; World Bank, 2022). It further argues that the primary driver of diabetes incidence disparities is structural inequality instead of inherent cultural or biological traits of ethnic groups (U.S. Commission on Civil Rights, 2004).

Methodology

This research uses a comparative case study design with two components. First, it analyzes historical records, federal policy documents (FDPIR), and epidemiological studies (OGTT data from China) to map major drivers of diabetes disparities.

Second, it incorporates a semi-structured interview conducted with Myia Ferguson (Puyallup, Modoc, and Cherokee heritage) on January 30, 2026. Ferguson’s testimony grounds abstract policy analysis in lived experience, showing how blood quantum requirements, poverty, and medical distrust authentically operate in daily life. Her mixed tribal background offers insight across different Indigenous contexts, and her willingness to discuss difficult family histories adds depth that published literature often lacks.

While one interview cannot represent all Native American experiences, it demonstrates how historical policies gets reflected into present-day health outcomes and validates the harm structural violence brings through concrete, traceable means.

II. Case Study 1: Native American Communities in the U.S.

A. Historical Assimilation and Dietary Transitions

(1) Forced relocation and its disruption of the traditional foodways

Centuries of colonization profoundly reshaped the dietary structures of Native Americans. Forced relocations and land policies often coincided with the collapse of traditional food systems, abruptly severing access to traditional hunting, fishing, and gathering sites and weakening food sovereignty (National Library of Medicine, n.d.). Prior to these external interventions, Indigenous communities across North America had developed diverse food systems deeply adapted to local ecosystems. For instance, many Indigenous agricultural traditions relied on the "Three Sisters" system of corn, beans, and squash grown together as a mutually sustaining method of cultivation (U.S. Department of Agriculture, n.d.). In southern Arizona, the Pima (Akimel O'odham) historically relied on drought-adapted foods such as tepary beans and mesquite-based foods alongside other desert plants and seasonal harvesting patterns (Civil Eats, 2008).

However, beginning in the late nineteenth century, land dispossession and assimilation policies progressively severed tribal communities from their traditional food sources. The General Allotment Act of 1887 (Dawes Act) authorized the division of tribally held reservation land into individual allotments, undermining communal land bases and reshaping Indigenous livelihoods (National Archives, 2022). These policies, and the broader land loss that followed, made it harder for many communities to maintain subsistence practices tied to place, including cultivation, hunting, and gathering routes (National Library of Medicine, n.d.).

As these structural ruptures accumulated, the nutritional composition of Indigenous diets underwent significant alteration, which in turn yielded profound metabolic consequences. As communities became more dependent on externally supplied foods and highly processed commodities, refined carbohydrates and saturated fats increasingly displaced fiber-rich traditional staples (Knowler et al., 1990). When high-calorie processed foods combined with reduced everyday physical activity, weight gain became more prevalent, and long-term research on the Pima population documented strong links between obesity patterns and diabetes risk over time (Knowler et al., 1990). Economic marginalization further compounded this process because many reservation food environments face limited access to adequately stocked stores, long travel distances, transportation barriers, and higher prices for healthier foods (O'Connell et al., 2011; Satterfield et al., 2020).

Beyond nutritional composition alone, the loss of food sovereignty also functions as a structural driver of metabolic disease. More broadly, Indigenous health disparities reflect how historical and ongoing colonial conditions become embodied through land loss, disrupted lifeways, and constrained access to healthy environments (Walters et al., 2011).

(2) Food Distribution Program on Indian Reservations (FDPIR) and the Institutionalization of Nutritional Dependency

The shift from traditional diets to processed foods was actively promoted through federal food assistance programs, particularly the Food Distribution Program on Indian Reservations (FDPIR). Launched in the 1970s and first authorized under the Food Stamp Act of 1977, the program provides USDA Foods to income-eligible households on reservations and to eligible Native households in approved areas near reservations and in Oklahoma. (U.S. Department of Agriculture [USDA], 2014; USDA, Food and Nutrition Service, 2025a) The monthly food packages distributed have historically relied heavily on shelf-stable commodity items and standardized staples, a pattern that Native food policy analysts argue prioritized administrative and logistical feasibility over cultural fit and long-term health outcomes. (Maillacheruvu, 2022; USDA, Food and Nutrition Service, 2008) Typically, these packages were often limited in fresh produce options relative to traditional diets, and the overall package profile has been assessed by USDA in terms of alignment with dietary standards. (USDA, Food and Nutrition Service, 2008; USDA, Food and Nutrition Service, 2025b)

The nutritional composition of FDPIR commodity foods starkly contrasts with traditional Indigenous diets. Traditionally, tepary beans provided fiber-rich protein and are described in agricultural guidance as a low-glycemic food that can support more stable blood sugar responses, whereas commodity staples commonly include refined grain products such as white flour.

(USDA, Natural Resources Conservation Service, n.d.) Traditionally, legume pods and foraged wild greens supplied diverse micronutrients, while commodity food packages have often emphasized processed, sodium-dense meats and shelf-stable items. (Maillacheruvu, 2022; USDA, Food and Nutrition Service, 2008) Traditional food acquisition also required substantial physical labor through cultivation, hunting, and gathering, whereas dependence on packaged and externally supplied foods reduces the built-in activity associated with food production and procurement. (Maillacheruvu, 2022) This substitution matters metabolically because long-running epidemiologic work in the Pima population emphasizes the importance of environmental and lifestyle change alongside diet in the rise of type 2 diabetes risk. (Knowler et al., 1990)

Geographic and infrastructural factors shaped the program's impact across communities. For the Pima people living in the Sonoran Desert, the expansion of reliance on externally supplied foods occurred alongside severe constraints on traditional agriculture after upstream diversions reduced downstream river flows in the 1800s, undermining irrigation-based farming. (DeJong, 2004; Gila River Indian Community, n.d.) With traditional agriculture increasingly difficult to sustain, the growing dependence on commodity foods and other processed staples intensified dietary change, while physically demanding subsistence and irrigation work diminished over time. (DeJong, 2004; Knowler et al., 1990) Longitudinal research among the Pima directly links changing diet patterns and reduced physical activity with obesity and diabetes trends across decades. (Knowler et al., 1990)

The Cherokee experience with commodity food dependence varied based on geographic and economic context. After forced removal in 1838–1839, Cherokee communities rebuilt in what became Indian Territory, and agricultural knowledge persisted even as federal Indian policy and later economic pressures reshaped food systems. (National Park Service, 2023; Cherokee Nation, 2025) Traditional dietary practices also remained culturally important, including longstanding reliance on “Three Sisters” agriculture and gathered foods documented in Cherokee public education and cultural resources. (Visit Cherokee, n.d.) Over time, however, structural incentives often favored dependence on standardized food supplies when land access, time, and economic opportunity constrained subsistence production. (Maillacheruvu, 2022)

Unifying these divergent experiences is the slow seep of federal food policy and the broader political economy of reservation food access. Analysts of Native food insecurity emphasize that federal policies of dispossession and reservation-era economic constraint shaped modern food environments and increased dependence on external food systems. (Maillacheruvu, 2022) In addition, USDA research on food access in tribal areas documents persistent structural barriers (distance, limited retail options, and affordability constraints) that make healthy food access more difficult in many tribal communities. (Kaufman et al., 2014) These constraints mean that even when traditional food knowledge persists across generations, communities may lack the land, water, infrastructure, and economic conditions needed to practice it at scale. (DeJong, 2004; Kaufman et al., 2014)

Thus, FDPIR can be analyzed as more than nutritional assistance; it can also be read as a policy pathway through which administrative systems shape diet under conditions of constrained choice. (Maillacheruvu, 2022) USDA’s own evaluations of the FDPIR food package assess nutritional quality relative to federal dietary standards, while critical public policy analyses highlight the tension between standardized program delivery and the cultural and health needs of tribal communities. (Maillacheruvu, 2022; USDA, Food and Nutrition Service, 2008)

The shift from traditional diets to commodity foods destroyed what Ferguson calls “First Foods” — ceremonial staples like blue corn, berries, and meat served in organized communal settings during teepee ceremonies. These foods carry spiritual and social meaning that shelf-stable, sodium-dense commodity items cannot replicate. Ferguson described how “before we start the ceremonies, we have our first cultural food...you normally just scoop it and eat it. And you just eat it as it is, and you can eat as much as you want” (M. Ferguson, personal communication, February 7, 2026). This communal tradition embeds nutrition within cultural practice. Federal programs, on the other hand, prioritize logistical efficiency over cultural fit, severing the disconnection between food (in its raw form) and collective identity.

B. Structural Inequality and Healthcare Access

(1) Institutional and Environmental Factors in Native Diabetes Disparities

The previous section analyzed how federal policies laid the groundwork for diabetes health disparities through commodity food programs. Addressing this established epidemic demands healthcare infrastructure and access to medical care, areas where Indigenous communities face severe structural barriers. The diabetes crisis facing the Pima and Cherokee peoples are caused by multiple compounding forces: metabolic vulnerabilities caused by drastic dietary shifts, chronic systemic underinvestment in healthcare services, and deep-seated medical mistrust rooted in historical trauma. Medical anthropologist Paul Farmer terms this phenomenon "structural violence": organized social arrangements that systematically harm specific populations while obscuring institutional accountability (Farmer, 2004).

Consider the funding realities. The Indian Health Service (IHS), established in 1955 to fulfill federal treaty obligations for healthcare (Indian Health Service, n.d.), spends approximately $4,078 per capita, which is less than half of Medicare's per capita expenditure ($10,692) and only one-third of the Veterans Health Administration's spending (Dieleman et al., 2020; Indian Health Service, n.d.). This funding gap reflects longstanding systemic neglect. For the Gila River Pima community, where type 2 diabetes affects over 50% of adults aged 35 and older, these shortages translate into concrete healthcare gaps: ophthalmology services face lengthy scheduling delays, hindering critical screening for diabetic retinopathy; diabetes education programs rely on traveling staff, making sustained patient relationships difficult to establish (Knowler et al., 1990). Clinics operate chronically overloaded. Even when patients actively seek treatment, preventive care and early intervention remain challenging (Warne & Frizzell, 2014).

The Cherokee Tribe presents a somewhat different picture, though the structural challenges persist. Through the 1990s Self-Determination Compact, the Cherokee gained operational autonomy over their healthcare system and established one of the most advanced Indigenous healthcare systems in the region—a model that demonstrates what tribal self-governance can achieve (Cherokee Nation, 2021). Yet administrative autonomy cannot overcome funding constraints (Warne & Frizzell, 2014). The system must serve approximately 400,000 citizens across 14 rural counties in northeast Oklahoma while grappling with a 25% physician vacancy rate that has remained largely unchanged over the past decade despite sustained recruitment efforts (Kocherlakota, 2020). This provider shortage leads to fragmented care: patients often see different doctors at each visit, undermining the continuity essential for managing chronic conditions (U.S. Government Accountability Office, 2018). Navigating the complex coordination procedures between federal, state, and tribal programs forces patients through bureaucratic jurisdictional boundaries just to receive continuous treatment (U.S. Government Accountability Office, 2018). Then result becomes predictable: although the tribal investment is significant, the healthcare system operates at full capacity year-round, and diabetes prevention and management efforts remain reactive rather than proactive (Warne & Frizzell, 2014).

These funding and infrastructure deficiencies compound with deep-seated distrust of healthcare rooted in historical institutional harm. For Indigenous communities, medicine has often functioned as a catalyst for assimilation and violence rather than healing: children died from preventable diseases due to inadequate medical care in residential schools (U.S. Department of the Interior, 2022); forced sterilization programs targeting Indigenous women persisted into the 1970s (Stern, 2020); unethical medical research treated informed consent as optional (Hodge, 2012). This history remains immediate. Many contemporary elders lived through it, and it continues to shape healthcare engagement (Warne & Frizzell, 2014). In the Pima community, despite diabetes reaching epidemic levels even among adolescents, screening rates fall short of what the crisis demands (Walters et al., 2011). Patients often delay seeking care until symptoms worsen, arriving at initial diagnosis already experiencing advanced complications like retinopathy, nephropathy, and neuropathy (Walls et al., 2006). High staff turnover deepens this distrust, especially when clinic personnel rotate every few months or years, meaningful doctor-patient relationships cannot form (U.S. Government Accountability Office, 2018). Patients continually encounter new physicians unfamiliar with their medical histories and cultural backgrounds (U.S. Government Accountability Office, 2018).

The Cherokee context reveals how institutional trust remains fragile even with tribal autonomy and substantial healthcare infrastructure investments. Administrative complexity from overlapping federal, state, and tribal program jurisdictions undermines healthcare continuity: Which services fall under IHS coverage? Which require state Medicaid? Which need tribal funding supplements? This fragmented information creates gaps in preventive care and interrupts follow-ups, reducing long-term treatment adherence (U.S. Government Accountability Office, 2018). When administrative barriers intersect with historical trauma, they further the perception that biomedical system was never designed to effectively serve Indigenous communities (Warne & Frizzell, 2014).

The diabetes disparity among the Pima and Cherokee peoples thus reflects a mutually reinforcing structural system where underinvestment in healthcare, geographic isolation, administrative fragmentation, and institutional distrust interlock (Farmer, 2004; Warne & Frizzell, 2014). Funding shortages limit clinical capacity. Staff shortages and high turnover prevent the patient-provider relationships essential for chronic disease management (U.S. Government Accountability Office, 2018). Administrative complexities create barriers to care for patients, disproportionately burdening vulnerable populations (U.S. Government Accountability Office, 2018). Historical trauma reduces engagement with the healthcare system, delaying diagnoses and worsen preventable complications (Hodge, 2012; U.S. Department of the Interior, 2022).

These forces function altogether within the framework of societal violence and policy failure, driving health deterioration while obscuring institutional accountability (Farmer, 2004). Clinical interventions alone cannot address diabetes disparities in Indigenous communities. Institutional reforms prove essential: increasing funding for IHS and tribal health systems to parity with other federal programs (Dieleman et al., 2020); streamlining administrative oversight to ensure continuity of care (U.S. Government Accountability Office, 2018); rebuilding institutional trust through culturally responsive healthcare models that honor Indigenous knowledge and are attentive towards community sovereignty (Warne & Frizzell, 2014).

Beyond IHS funding gaps, blood quantum creates a more insidious barrier. Ferguson described how tribal healthcare and legal services remain inaccessible to those who fail to meet ancestry percentage thresholds (known as the Blood Quantum Level): "If you do not meet the blood quantum level, then it's impossible to gain the health benefits for certain tribes." (M. Ferguson, personal communication, February 7, 2026). Individuals with Indigenous heritage and cultural identity get excluded from support systems designed to offset poverty and marginalization. This legal rule of erasure functions as structural violence, determining who receives protection based on bureaucratic bloodline calculations rather than actual need or metabolic risk.

(2) Racism and microaggressions in healthcare settings and their impact on health-seeking behavior

Factors mentioned in the previous section (underfunded healthcare facilities, disrupted food systems, and geographic isolation) create diabetes health disparities. But there's another aspect to it, which is the doctor-patient relationship. Medical services may exist on paper, yet racial discrimination and microaggressions in clinical settings actively push patients away, rendering those services ineffective.

Indigenous American patients encounter what researchers call "racial microaggressions" during medical visits. Each incident appears minor when viewed individually. When viewed cumulatively, though, the harm runs deep. Communication often feels perfunctory. Healthcare providers frequently presume that patients struggle with substance abuse or fail to follow treatment plans on top of indigenous health knowledge gets dismissed as irrelevant (Walls et al., 2015, p. 233). The healthcare system carries a fraught history in these communities, serving as an instrument of assimilation and violence. Forced sterilizations occurred. Unethical medical experiments were conducted. The past continues shaping present-day clinical interactions, particularly around chronic disease management like diabetes care. A national study found that when Indigenous patients experience microaggressions in healthcare settings, their diabetes self-management deteriorates, distress levels rise, and blood sugar control worsens (Sittner et al., 2018). The damage compounds itself. Negative clinic experiences discourage people from seeking screenings or attending follow-ups. Diagnoses come later. Complications progress silently.

Among the Pima, over half of adults aged 35 and older live with type 2 diabetes. The consequences of delayed care prove devastating. Compared to non-Indigenous patients, Pima individuals at initial diagnosis show significantly higher rates of advanced complications in retinopathy, kidney damage, neuropathy. Many appear to avoid the healthcare system entirely until symptoms become intolerable (Walls et al., 2015, p. 231). Cherokee patients face parallel challenges. They benefit from one of the nation's most developed tribal healthcare systems, yet concerns persist about whether biomedical providers genuinely understand or respect traditional healing practices. This make us start to wonder: Who possesses medical authority? Will Indigenous knowledge be categorically dismissed, or meaningfully integrated into care?

These interpersonal barriers extend beyond individual encounters to generate systemic dysfunction. Egede's framework identifies racism as a "root determinant of diabetes risk," operating simultaneously across multiple levels (Egede et al., 2023, pp. 668–669). Interpersonal microaggressions elevate stress and cortisol, both established risk factors for insulin resistance. Institutional racism determines which communities access preventive resources and which remain trapped in healthcare deserts. Indigenous communities already contend with inadequate medical funding and food insecurity. Hostile or dismissive clinical environments perpetuate a destructive cycle where structural neglect produces poor health outcomes, which reinforce stereotypes about Indigenous health behaviors, thereby justifying continued neglect.

Disrupting this cycle requires accountability. Indigenous communities must exercise genuine control over their healthcare delivery. Traditional healing practices need authentic integration into biomedical settings rather than superficial acknowledgment. The healthcare system must earn trust through sustained respect, not presume it flows automatically from institutional status. Evidence supports this approach. Culturally grounded diabetes prevention programs that incorporate Indigenous traditional knowledge demonstrate lasting improvements: enhanced glycemic control, greater health literacy, healthier behavioral patterns. These gains persist up to two years post-intervention (Cargo et al., 2003). Traditional medicine reconnects people with ancestral knowledge and belief systems, providing a source of empowerment. This directly counters the sense of powerlessness generated by historical trauma and persisting structural barriers (Johnson et al., 2022, pp. 53-59).

The diabetes disparities observed in Pima and Cherokee communities reflect deliberate policy choices. They constitute measurable outcomes of centuries of systematic deprivation. Ironically, both material and interpersonal harm originate from institutions ostensibly designed to provide care.

C. Cultural Continuity and Health Beliefs

(1) Spiritual resilience through the lens of traditional healing

For the Cherokee and Pima communities, traditional healing practices represent far more than alternative medical approaches after centuries of forced assimilation and institutionalized medical neglect. They constitute acts of cultural survival and resistance against a biomedical establishment that positioned itself as inherently superior. Federal policies disrupted Indigenous food systems and governance structures, yet healing traditions persisted as repositories of communal identity. Understanding these practices requires recognizing that Indigenous conceptions of health differ fundamentally from the Western biomedical paradigm.

Consider the Cherokee weaving tradition, which spiritualizes health by weaving it into daily existence, blurring boundaries between the material and spiritual realms. The finger-weaving technique used to create sock bands and decorative items has historically been part of their daily identity and ritual life, demonstrating how cultural meaning flows through material practices rather than existing in separate categories of “health” or “spirit” (Museum of the Cherokee People, n.d.). The Cherokee rivervine basketry tradition similarly roots itself in reciprocal relationships with the lands and waterways from which materials are gathered, reinforcing a worldview where daily practices link closely to spiritual equilibrium (NCpedia, n.d.). Historian Theda Perdue said: “The Cherokee did not separate spiritual and physical realms but regarded them as one, and they practiced their religion in a host of private daily observances as well as in public ceremonies” (Perdue, as cited in *Cherokee Spiritual Beliefs*, n.d.). This holistic view centers on the entire network of relationships connecting individuals, communities, the environment, and the spiritual world.

Cherokee healing rituals centered on water ceremonies, particularly the practice of “going to the water,” where rivers held longevity significance (Lefler, n.d., p. 163). These ceremonies served multiple purposes: physical purification through year-round river bathing, spiritual cleansing before and after major life events, establishing connections with cosmic forces believed to govern health and balance. Anthropologist Peter Nabokov observed: “For the Cherokee who bathed in his body, who drank from him and invoked his curative powers, the Long Man always helped them out” (Nabokov, as cited in *Cherokee Spiritual Beliefs*, n.d.). Such practices embed health maintenance within daily spiritual observances rather than relegating it to crisis intervention in clinical settings, representing an approach to wellness that diverges sharply from the passive, pathology-centered model dominant in Western medicine.

Traditional Cherokee healing also relies heavily on herbal medicine administered by shamans or medicine men possessing expertise passed down through generations. Cherokee healing practices blend ritual with medicinal plants, with much sacred knowledge recorded in the Cherokee syllabary. Certain formulas remain oral traditions and secrets, shared only among tribal healers ("Cherokee Healing," n.d.). The spiritual dimension of herbs distinguishes them from mere botanical pharmacology, as healers listen to the spirit of the plant to determine what ailments it can cure. For every four plants found, only one is gathered to maintain ecological balance and express respect for nature's wisdom ("Maintaining Balance," n.d.). This epistemology positions humans as participants in reciprocal relationships, demanding gratitude through restraint, spirit through harmony. Within Cherokee communities, women particularly assume roles as healers and herbalists, serving as first responders to physical and spiritual ailments while possessing extensive knowledge of local plants and their generationally transmitted medicinal properties ("The Role of Women," n.d.).

These healing traditions have endured despite centuries of suppression, demonstrating the cultural resilience of Indigenous communities. Federal assimilation policies explicitly targeted Indigenous spiritual practices, yet these practices adapted and survived. In contemporary Cherokee communities, many still seek guidance and healing from shamans, integrating traditional practices into modern challenges, while some shamans collaborate with healthcare providers to offer holistic wellness approaches ("The Role of the Shaman," n.d.). This continuity reflects active resistance—communities chose to preserve healing traditions precisely because they embodied the values and knowledge federal policies sought to eradicate.

For the Pima people, traditional healing operates through equally profound yet ecologically distinct practices adapted to the Sonoran Desert environment. Pima medicine encompasses extensive knowledge of desert plants' therapeutic properties. Three-toothed larrea (known as greasewood) treats fevers, flu, colds, stomach discomfort, arthritis, and fungal infections, regarded by desert peoples as "No. 1 medicine in the medicine chest." Carob is harvested to make intestinal cleansing tea, while its sap from September to October treats sore throats and stomach inflammation. Brittle daisy reduces fever. Devil's claw addresses arthritis and joint pain (Vaszily, n.d.). Like other southwestern indigenous groups (the Hopi, Navajo, and Apache), the Pima developed a healing system where plant medicines function within broader ritual and spiritual backgrounds. These practices reflect healers' knowledge of which plants grow in specific desert microclimates, when to harvest them seasonally, how to use them without depleting populations. This knowledge accumulated through millennia of careful observation and was passed down orally through generations.

Similar to Cherokee practices, Pima healing emphasizes restoring balance and harmony. Illness signifies a disruption in the relationships connecting individuals, communities, the land, and spiritual forces, requiring holistic interventions to address the imbalance. This worldview reveals how humans exist embedded within the desert ecosystem: plants are understood as possessing wisdom and agency, offering their medicinal power within a reciprocal relationship demanding respect and sustainable harvesting practices. By the late nineteenth century, the Pima food system and water rights suffered catastrophic disruption when white settlers diverted upstream water sources and dismantled the irrigation networks sustaining Pima agriculture for centuries. This made maintaining these healing practices increasingly difficult. Access to traditional gathering grounds became drastically more challenging. As communities were confined to shrinking reservations, the ecological knowledge embedded in seasonal movements across the desert landscape became impracticable. Despite these structural shocks, oral traditions and ritual knowledge persisted, transmitted through families and communities even as the material conditions for fully practicing traditional medicine became constrained. They maintained healing knowledge inseparable from preserving Pima identity in the face of forces seeking cultural erasure. Through persistent action, they resisted.

In addition, Ferguson provides an essential correction to the biomedical view of traditional medicine. In her tradition, health is a process of “getting well”, with a physical and spiritual purging of “nastiness” (Ferguson, 2026). She describes the use of “holy little children” (medicinal fungi) as a form of “internal therapy” that addresses the voids created by historical trauma. This holistic rejuvenation is the antithesis of the clinical model; it treats the soul as a prerequisite for healing the metabolic body.

(2) The Paradox of Cultural Continuity: Traditional Healing and Biomedical Engagement

With biomedical diabetes screening and management, tensions that may inadvertently lead to delays in diagnosis and treatment. This paradox stems from the failure of biomedical institutions to align with Indigenous knowledge and healthcare preferences. When biomedicine positions itself as the only legitimate form of medical knowledge while devaluing or pathologizing traditional practices, it forces communities to choose between cultural identity and access to formal healthcare. This coercive dichotomy yields quantifiable consequences for chronic disease management.

The epistemological divergence between traditional healing and biomedicine creates potential barriers to early diabetes screening. Traditional Cherokee and Pima healing practices emphasize maintaining equilibrium and addressing the spiritual roots of illness through ritual interventions and long-term herbal medicine use. Cherokee medicine posits that physical suffering is caused by spiritual impairment, prioritizing the purification and well-being of the soul before addressing bodily symptoms (Frazier et al., 2013). This method does readily align with biomedical screening processes that emphasize asymptomatic detection, numerical thresholds like fasting blood glucose levels or HbA1c percentages, and pharmacological interventions. For individuals whose health worldview centers on spiritual equilibrium, the necessity of routine blood glucose screening may seem less compelling, especially when symptoms remain absent. Within traditional healing paradigms, people seek treatment when experiencing symptoms of illness or spiritual imbalance rather than based on risk assessments derived from laboratory values.

Furthermore, racism and cultural insensitivity within biomedical settings exacerbate Indigenous communities' tendency to trust traditional healers who understand cultural contexts and respect Indigenous knowledge systems. When Indigenous patients encounter healthcare providers who hold stereotypes about them or demonstrate ignorance of their traditional healing practices, they rationally conclude that the biomedical system is neither designed for them nor trustworthy. Research indicates that American Indian patients who experience microaggressions in healthcare settings exhibit significantly poorer diabetes self-care behaviors, leading to greater diabetes-related distress and poorer glycemic control (Sittner et al., 2018; Walls et al., 2015). This creates a two-way dynamic: negative clinical experiences make patients less willing to engage in screening and preventive care. At the same time, reliance on cultural traditional healing practices may delay their seeking care from biomedical institutions, often resulting in diabetes progression to symptomatic stages by the time they do seek care.

This dynamic explains what we observe: Native American patients are often diagnosed with type 2 diabetes at a later stage than non-Native populations. Among the Pima, where prevalence exceeds 50%, many individuals avoid biomedical treatment until complications arise such as vision-impairing retinopathy, kidney disease causing edema or uremic symptoms, or painful neuropathy leading to foot ulcers. By the time patients finally seek biomedical care, opportunities for early intervention have been missed. Similarly, within Cherokee communities, despite access to a tribally operated healthcare system, screening uptake remains uneven partly because the biomedical system has historically failed to integrate or even acknowledge traditional therapeutic frameworks central to the health beliefs of many community members.

Developing solutions require integrated healthcare models that respect Indigenous knowledge systems while providing evidence-based diabetes prevention and management. Abandoning traditional treatments would constitute further cultural violence. Promising pathways are emerging. Some tribal healthcare systems now employ both traditional healers and biomedical providers, creating pathways that allow patients to access both services without forced choice. Others integrate traditional practices directly into diabetes programs: for example, conversation circles that blend cultural narratives with diabetes education, food programs reviving ancestral crops like lentils with diabetes-protective properties, and incorporating health discussions within ceremonial contexts to normalize screening as part of community wellness. The Indian Health Service document Traditional Healing acknowledges: “many Native communities view health holistically, integrating body, mind, spirit, and community; traditional healers treat more than just symptoms" (Koithan & Farrell, 2010, p. 477). When the biomedical system ceases positioning itself as opposed to traditional healing, screening acceptance increases because patients no longer perceive biomedicine as a culturally hostile force.

Research on talking circles demonstrates the potential of this integrative pathway. In an intervention study with Indigenous women, talking circles combined cultural narratives with diabetes education, allowing participants to discuss health within familiar ceremonial contexts rather than clinical settings (Kambuga & Arcelay-Rojas, 2023). This approach increased participants' willingness to undergo screening precisely because it considered biomedical information within their familiar Indigenous cultural setting, without requiring cultural assimilation as a prerequisite for accessing healthcare. Similarly, programs training Indigenous community health workers to serve as bridges between traditional and biomedical systems have demonstrated success in improving early diagnosis rates. These workers understand both knowledge systems and can explain how biomedical screening complements traditional healing, positioning regular blood glucose monitoring as one tool to maintain the balance emphasized by traditional practices.

Thus, the persistence of traditional healing within Indigenous communities should be understood as a resource underutilized by biomedical institutions. The rigidity of biomedicine and its historical failure to engage respectfully with non-Western cognitive systems creates the problem, which does come from Indigenous health beliefs themselves. Low diabetes screening uptake happens because the biomedical system has disregarded Indigenous healing practices, failing to consider the myriad possibilities for developing collaborative models. The incompatibility is between biomedicine's inflexibility and preventive care, though traditional healing remains compatible with prevention.

Addressing diabetes health disparities thus requires societal recognition that traditional healing constitutes legitimate knowledge worthy of respect and integration. Only through such acknowledgment can screening programs reach communities where cultural identity is linked to health and where deeply justified skepticism toward historically harmful biomedical institutions persists due to centuries of medical violence.

III. Case Study 2: Ethnic Minority Communities in China

A. Modernization and State-Driven Assimilation

In China, modernization has unfolded as a decades-long national project involving administrative integration of peripheral regions. By 2023, China's urbanization rate reached 66.16%, marking a massive shift from rural subsistence economies to urban wage labor and market dependence (National Bureau of Statistics of China, 2024). This pace of transformation is unprecedented in history. China completed in 30 years what took Western nations over a century to achieve (Gong et al., 2012).

This matters because urbanization reshapes people's daily lives in fundamental ways. It changes what food they can access; it transforms how meals are prepared; and it alters the nature of physical labor. More importantly, it determines how healthcare systems are established. As rural households shifted from farming to wage employment, subsistence practices that once regulated metabolism through physical activity vanished. Food acquisition transformed from cultivation or gathering to market purchase. Traditional ecological knowledge became difficult to sustain when work hours were spent in factories rather than fields. People could no longer easily know which crops thrive locally, which plants treat specific ailments, or how seasonal rhythms affect dietary habits.

For ethnic minorities, economic transformation has overlapped with cultural assimilation. State integration often designed institutions favoring majority groups. Schools taught in Mandarin while neglecting minority languages. Clinic staff and biomedical practitioners sometimes dismissed traditional medicine as superstition. Development policies prioritized cash crops and wage labor over subsistence farming. This was particularly evident during the Cultural Revolution, culturally viewed as a form of modernization, when ethnic regions endured violent campaigns targeting their collective identities. In Inner Mongolia, the fabricated "Inner Mongolia People's Revolutionary Party" case resulted in tens of thousands of deaths and 340,000 arrests. Mongolian scholar Yanghai described this as a "collective memory" comparable to genocide (Southern Mongolia Human Rights Information Center, 2021). In Tibet, thousands of monasteries were destroyed. In Xinjiang, conflicts between the Production and Construction Corps and Uyghur communities sowed seeds of enduring tension. From a sociological perspective, what matters goes beyond the violence itself. Han Chinese immigrants consistently aligned with state power against ethnic minorities, forming a unified ethnic front that deepened exclusion of minority groups (Southern Mongolia Human Rights Information Center, 2021).

For ethnic minorities, "modernization" is often caused by systemic reorganization happening alongside state integration. Education and public service systems typically operate according to national standards. This makes it easier for minority languages and daily practices to be absorbed into the mainstream culture rather and not recognized as equally “sustainable” forms of knowledge and ways of life. Taking the Manchu people as an example, official ethnic profiles emphasize that throughout history, the Manchu have been “broadly similar to the Han.” They existed within close interaction with the culture of the Central Plains and gradually underwent “assimilation.” More crucially, the Manchu population is now widely dispersed, “scattered across... large and medium-sized cities” (Heilongjiang Provincial People's Government, 2025). This spatial and social network connectivity binds daily rhythms and health behaviors more tightly to urban markets and state service systems. In contrast, the Miao ethnic group is geographically concentrated in the mountainous regions of southwest China, such as Guizhou. Cultural life among the Miao often relies more heavily on localized community ties and ritual customs. When these social forms are incorporated into larger market and mobility systems, tension often emerges. Culture persists while the conditions for its practice are rewritten (Tibet Autonomous Region Ethnic Affairs Commission, 2019; Guizhou People's Congress, 2020).

When examining these contrasting scenarios through the lens of health and diabetes incidence, the double-edged nature of modernization becomes apparent. On one hand, the expansion of transportation and healthcare systems enhances access to diagnosis and treatment. On the other hand, as labor and time are redistributed through wage work and population migration, traditional dietary habits and activity levels become more susceptible to being replaced by energy-dense commercialized foods and sedentary occupations. Compounded by disruptions in family caregiving and altered life rhythms stemming from “dispersed urbanization” among the Manchu and “mountain migration and left-behind populations” among the Miao, metabolic risks quietly escalate. This creates the situation where increased risk coincides with rising or delayed diagnosis. The incidence and detection rates of Type 2 diabetes reflect complex modernization effects that resist simple labels of purely beneficial or purely harmful (Heilongjiang Provincial People's Government, 2025; Tibet Autonomous Region Ethnic Affairs Commission, 2019).

B. Ethnic Variability in Diabetes Prevalence and Diagnosis

- **Miao: How Spiritual Healing Shapes Diabetes Diagnosis and Management**

In Miao communities, modernization signifies far more than a simple change in lifestyle. It has fostered a dual understanding of illness and therapeutic practices. One track centers on hospitals and biomedicine. The other remains rooted in indigenous healing traditions, where the unification of soul and body through ancestral spirits and ritual order remains central. Chen (2024), drawing on ethnographic data from Miao villages in Guizhou, notes that Miao interpretations of illness often attribute suffering to "imbalances in the relationship between soul and body," specifically external impurities or disturbances from the spirit realm. Shamans and ritual specialists serve as healers and mediators, helping families reconstruct meaning and order amidst uncertainty and hardship (Chen, 2024).

For chronic conditions like Type 2 diabetes, this creates complex effects. Ritualistic treatments and local knowledge systems offer psychological comfort, often serving as the primary and familiar coping resources for most people. They help patients endure the pressures of long-term illness and prompt certain lifestyle adjustments, particularly drawing on cultural resources that modernization cannot readily replace. Yet when families entrust their understanding of causes and cures to ritual systems, illness becomes interpreted as a spiritual event rather than a metabolic disorder requiring ongoing monitoring and long-term follow-up. This shift in interpretation carries real risks. Screening gets delayed. Follow-up gets interrupted. Cases go undiagnosed. The problem intensifies when modern healthcare is perceived as costly and inaccessible. Hospitals increasingly become last resorts, while ritual practices are viewed as preferred and accessible routine options (Chen, 2024).

Disparities in diabetes burden among the Miao may therefore reflect something other than variations in actual prevalence rates; They potentially reflect limited opportunities for diagnosis and ongoing management. Modernization has introduced new health risks through market forces and tourism economies, yet it has failed to establish chronic disease management channels that can engage with indigenous knowledge systems. The result is paradoxical. Diseases may be treatable, yet chronic conditions often go without systematic management. This increases the likelihood of undiagnosed and inadequately managed cases, creating the appearance of lower than expected prevalence rates or causing data to fluctuate unpredictably.

- **Manchu: Does the “Lower Reported Prevalence” accurately reflect their undiagnosed proportion?**

Among the Manchu population in Northeast China, ethnic differences in diabetes cannot be simply attributed to biological conclusions of “lower true prevalence.”, but should also consider from a sociological perspective as the combined result of statistical presentation and resource accessibility. Feng et al. (2012) conducted standardized diagnoses using oral glucose tolerance tests (OGTT) on Han, Manchu, and Korean adults in Mudanjiang, finding a lower diabetes prevalence among Manchus (8.39%) compared to Han Chinese (12.10%). In the multivariate model, “Han ethnicity” was significantly associated with increased diabetes risk, while “Manchu ethnicity” showed relatively lower risk. However, the study revealed a more policy-relevant reality: an extremely high proportion of undiagnosed diabetes cases existed, reaching 88.46% among ethnic minorities, particularly prominent among Manchu diabetes patients (Feng et al., 2012).

This coexistence of low prevalence and high undiagnosed rates shows that the “lower prevalence” observed among the Manchu population likely reflects disparities in access to healthcare documentation rather than difference in risk. When studies rely solely on self-reported diagnoses and medical histories, the true metabolic burden among the Manchu population is likely underestimated, creating an unreliable statistical illusion of “better health conditions.”

This diagnostic gap is not an isolated phenomenon. It can be explained through the interlinked barriers to healthcare system accessibility and communication challenges. Feng et al. (2012) emphasized that despite using uniform laboratory standards for indicators like blood glucose and lipids, they still observed abnormally high undiagnosed rates among ethnic minorities. They consequently recommended strengthening screening efforts and raising awareness (Feng et al., 2012).

At the systems level, higher undiagnosed rates among ethnic minorities are often linked to barriers in doctor-patient communication. When medical facilities default to the “majority ethnic language” as the standard communication tool, ethnic minorities’ reliance on health services becomes more prone to friction and disengagement. Related research indicates that within

China's broader context, language barriers impact healthcare utilization and quality, which in turn correlating with widening health disparities (Zhang et al., 2022).

For the Manchu population, modernization's impact extends beyond altering dietary habits or stress exposure to influence metabolic risks. It reshapes the social implications of "prevalence" by determining who gains easier access to healthcare systems and who receives more sustained chronic disease support. When undiagnosed rates remain persistently high, "lower prevalence" cannot be seen as "lower disease burden." Instead, it likely indicates persistent gaps in the public health system's ability to identify and manage this population, thereby exacerbating inequalities faced by ethnic minorities (Feng et al., 2012).

Ethnic differences in diabetes among the Manchu should therefore be understood through two layers. The first layer involves changes in metabolic risk factors influenced by modernization. The second layer concerns how systemic oversights determine who is seen and who is overlooked. These oversights include screening coverage and diagnostic documentation within the healthcare system. This is particularly critical given the high undiagnosed rates among ethnic minorities revealed by research. Cross-ethnic disease comparisons must therefore incorporate "undiagnosed cases" into case analysis or reform healthcare systems to capture more cases. Otherwise, systemic issues and disparities in health accessibility may be misinterpreted as inherent lower risk among certain ethnic groups, obscuring true intervention priorities and the underlying inequalities.

C. Healthcare Barriers and Health Behaviors: Why Disparities Manifest in Diagnosis First, not Illness?

- **Miao: How Mountainous Terrain, Healthcare Accessibility, and "Interpretive Systems" Shape Low Diagnosis Rates and Poor Continuity of Care for Chronic Diseases**

For the Miao ethnic group, disparities in diabetes often manifest primarily as differences in diagnosis rates and access to ongoing management rather than accurately reflecting the actual burden of the disease. Miao communities are predominantly concentrated in the mountainous regions of southwest China, such as Qiandongnan and Qiannan in Guizhou Province. Scattered villages, rugged terrain, and high transportation costs collectively form fundamental barriers to chronic disease management (Qiannan Buyi and Miao Autonomous Prefecture, n.d.). Diabetes identification relies on repeated measurements and long-term follow-up, including retesting of fasting blood glucose or glycated hemoglobin and medication adjustments. However, within a healthcare landscape characterized by fragmented service provision, where village clinics and township hospitals have limited capacity, county-level medical resources are relatively concentrated, and travel costs are high, chronic diseases are more likely to be treated as "seek care only when symptomatic" events rather than through proactive monitoring (Chang et al., 2010). Consequently, the healthcare system's detection and follow-up chain for diabetes is more prone to disruption at the grassroots level, leading to statistically lower reported or detected rates. This does not necessarily imply lower metabolic risk (Yang et al., 2010).

Crucially, medical pluralism is prevalent in Miao communities, where biomedical diagnoses coexist with local healing practices and ritual systems. Ethnographic research indicates that in certain Miao contexts, disease explanations often intertwine with frameworks involving spiritual entities or imbalances in order (Feng, 2024). Ritual specialists or shamans primarily fulfill functions of meaning restoration and rebuilding familial order. While this system provides crucial psychological and social support for chronic pain, it may also redefine chronic conditions from asymptomatic risks to events requiring relational and order restoration. This shifts the urgency away from regular screening and long-term follow-up. When modern healthcare is perceived as inaccessible due to cost and geographic distance, families are more likely to view hospitals as a last resort, prioritizing local treatments as more accessible and familiar. This naturally increases the likelihood of delayed initial diagnosis and interrupted follow-up. Research on healthcare choices among the Miao ethnic group and its migrant populations similarly emphasizes that when individuals navigate different contexts, healthcare decisions often involve complex trade-offs between cost and accessibility. Such choices should not be simplistically dismissed as superstition or labeled unscientific.

- **Manchu: “Visibility Gaps” and How Urbanization and High Mobility Undermine Documentation**

Compared to the Miao ethnic group, the Manchu are often positioned as more urbanized and closer to the mainstream system. This readily leads to the intuitive inference that the Manchu face a lower risk of diabetes or require less special attention. However, the OGTT study from Northeast China cited in Section B reminds us that the Manchu difference cannot be simplified as biologically lower incidence rate. Under standardized laboratory testing, the study from Mudanjiang found a diabetes prevalence rate of 8.39% among the Manchu and 12.10% among the Han. Yet simultaneously, the overall undiagnosed diabetes rate among ethnic minorities reached 88.46%, with the Manchu group being particularly prominent. The significance of looking at these two sets of data side by side lies in their direct revelation that the apparent lower prevalence is likely a statistical illusion caused by lower diagnosis rates or weaker detection capabilities. If research or policy relies solely on self-reported medical history and past medical records, the true metabolic burden among the Manchu population is likely to be underestimated (Y. Feng et al., 2012b).

To fully understand this, “modernization” must be seen as a bidirectional process. It alters the risk factors for metabolic diseases, including dietary habits, work routines, stress, and sleep. It also changes the pathways through which individual cases enter the statistical system. The Manchu population, characterized by more dispersed settlement and tighter ties to urban labor markets, theoretically possesses greater access to healthcare resources. However, the phenomenon of abnormally high undiagnosed rates indicates that resource availability does not guarantee screening implementation, nor does screening necessarily lead to timely diagnosis.

Diabetes screening and ongoing management rely on a highly institutionalized chain of links. This includes community health check mobilization, workplace screening, follow-up by family doctor teams, chronic disease record establishment, and re-examination reminders. The effectiveness of these steps depends on whether individuals can consistently engage with a primary care unit to maintain ongoing monitoring. Extensive research indicates that utilization of China’s basic public health services, particularly chronic disease management, does not automatically increase with urbanization or resource density in residential areas. Highly mobile populations, those with unstable work schedules, and individuals residing and working across districts are more prone to management chain breaks, reducing the likelihood of successful case registration and regular monitoring (Yang, 2024).

This also explains the high undiagnosed rate among the Manchu population is fundamentally a visibility gap. Early-stage diabetes often lacks obvious symptoms. If people are too occupied for check-ups, consistently skipping follow-ups, and only seeking care when discomfort arises, by the time they first enter the healthcare system, they are more likely to have already missed the optimal detection window.

For the Manchu population, these barriers should not be misinterpreted as stemming from lack of education or language barriers. The deeper implication is that when a group is culturally presumed to be highly integrated and requiring no special mobilization, it becomes more likely to remain invisible within the institutional mobilization of public health screening and follow-up. This invisibility makes chronic disease screening more reliant on individual initiative, which is continuously suppressed by the pace of urban life and high opportunity costs. The issues emphasized earlier can thus be more precisely understood as problems of communication reach and continuity in follow-up reminders.

The barriers within the Manchu context are more likely manifested in three aspects. First, weakened mobilization and attention, meaning they are not prioritized as key coverage targets. Second, high population mobility and unstable time schedules leading to reduced follow-up compliance. Third, a mismatch between the reliance on primary healthcare units for chronic disease management and the demands of urban lifestyles. Together, these factors contribute to statistically low prevalence rates that do not equate to high levels of actual metabolic risk.

IV. Comparative Analysis

By comparing the cases of the Pima, Cherokee, Miao, and Manchu peoples side by side, we see that health disparities in diabetes are not solely the result of marginalization. They are simultaneously shaped through differing systemic pathways that share a common logic. This shared logic involves state power transformed the lives of ethnic minorities in ways that undermine metabolic health. Previous sections documented this process across distinct contexts. Both the U.S. federal commodity program and China's urbanization-driven dietary shifts disrupted traditional food systems, yet they operated through different timelines and with different degrees of visibility. These processes both determine disease prevalence and dictate when diabetes manifests. They also determine whether communities gain access to healthcare that respects their epistemologies.

A. Two Pathways of Dietary Disruption

Core Comparison: Food Distribution Program on Indian Reservations (FDPIR) in the U.S. vs. China's urbanization process

In the United States, the FDPIR program establishes a direct nutritional dependency by making bulk food the primary food source for many indigenous families through direct government distribution (U.S. Department of Agriculture, Food and Nutrition Service, 2025; Center on Budget and Policy Priorities, 2022). China's modernization process operates differently. It resembles an indirect substitution mechanism. As rural populations migrate to cities and integrate into wage labor systems, their daily schedules and consumption habits undergo fundamental transformation (Zhai et al., 2014; Popkin, 2014; Sun, 2021). The types of food perceived as easily accessible shift, though this change is caused by the drastic shift of daily life (Popkin, 2014; Cyr-Scully et al., 2022).

These two pathways yield strikingly similar outcomes. Both undermine food sovereignty and traditional dietary practices to varying degrees (Center on Budget and Policy Priorities, 2022; Popkin, 2014). Yet their operational logic essentially differs, reflecting two distinct institutional pathways.

The FDPIR program is characterized by clearly defined responsibilities and a traceable supply chain (U.S. Department of Agriculture, Food and Nutrition Service, 2025). The monthly distribution of policy commodities like white flour and canned meat enables the state to shape nutritional intake. Resulting dietary outcomes, such as high refined carbohydrate and saturated fat intake coupled with insufficient fresh produce consumption, can be directly attributed to specific policy and administrative decisions (Center on Budget and Policy Priorities, 2022). These decisions often prioritize logistical efficiency and cost control over cultural appropriateness and nutritional balance. In other words, accountability can theoretically be clearly identified.

China’s urbanization, on the other hand, has transformed diets through a different route. Market integration and infrastructure development pulled rural populations into urban employment networks, gradually rendering traditional subsistence agriculture economically unsustainable (Zhai et al., 2014; Popkin, 2014). As migrant work became the majority, fast-paced lifestyles and tight schedules made processed foods, high-energy snacks, takeout, and restaurant dining more convenient, gradually replacing traditional cooking methods using home-grown vegetables and whole grains (Popkin, 2014; Sun, 2021; Ding, 2025). This shift occurred within economic backdrop rather than through state distribution. Consequently, responsibility became dispersed between market forces and development policies. Individual choices began to be constrained by wage labor conditions, particularly those choices that appeared voluntary yet were shaped by limited options (Ding, 2025; Sun, 2021).

This contrast helps us understand how forced assimilation and modernization drive dietary change through different ways in distinct national contexts. It also explains why similar metabolic consequences, here rising diabetes prevalence, emerge from entirely different origins, necessitating distinct intervention strategies and accountability approaches (Popkin, 2014; Zhai et al., 2014).

B. Trust Deficit and Visibility Gap

Access to healthcare is never simply about how far you live from a clinic or whether you have insurance. What matters more is whether the system recognizes you as someone who needs care and is willing to design services around your lived reality.

When comparing different groups, it is made clear that different forms of institutional failure create different kinds of missed diagnoses.

For the Pima and Cherokee peoples, the greatest barrier is often deep-seated historical distrust of healthcare systems. In the collective memory of many Indigenous communities, healthcare systems serve as more than places of healing. They have also functioned as instruments of violence and assimilation. Forced sterilizations, medical neglect during the boarding school era, research conducted without consent are all documented, traceable harms (U.S. Government Accountability Office, 1976; Newland, 2024; Pacheco et al., 2013; U.S. National Library of Medicine, 2021). Delaying screening and avoiding biomedical care becomes a rational form of self-protection. The result is that many only enter the healthcare system when symptoms become severe, often receiving their first diagnosis after complications like retinopathy or nephropathy have already developed, rather than at an early, manageable stage (Koopman et al., 2006; Lin, 2006). Here, underdiagnosis stems from an active avoidance shaped by historical weight.

The challenges faced by the Manchu people reflect a different logic: one of passive invisibility. Often perceived as already assimilated and dispersed across urban areas, the Manchu are frequently excluded from public health mobilization efforts or targeted chronic disease screening programs (Koopman et al., 2006; Lin, 2006). Society fails to recognize them as a group requiring special attention, leading to the downplaying of their risks at both statistical and policy levels. Compounded by higher mobility and unstable work schedules in urban life, continuity of care becomes fragmented. Frequent movement across different administrative jurisdictions makes it easy to miss follow-up appointments. Here, underdiagnosis resembles a form of neglect disguised by integration.

The Miao ethnic group faces a more complex, layered challenge. Geographical isolation in the mountainous southwest limits access to county-level or higher diagnostic facilities. Costs and transportation collectively raise barriers to care (Wei et al., 2017). Simultaneously, the biomedical system's rejection of shamanic healing creates cognitive friction. When ritual experts serve as primary interpreters of illness causes and treatments, while hospitals are experientially perceived as expensive, distant, or only visited as a last resort, chronic risks like diabetes get recoded as different kinds of events (Chen, 2024). Diabetes shifts from being understood as a symptomless metabolic risk requiring prevention to being perceived as a spiritual or social issue demanding relational repair or meaning-making. Consequently, screening and follow-up become conceptually difficult to prioritize in daily life. Here, underdiagnosis stems from the simultaneous occurrence of inaccessibility and cultural negation (Chen, 2024; Wei et al., 2017).

These three pathways converge into a single point. Systemic inequality determines who is more exposed to diabetes risk and who is more likely to be seen within the healthcare system. In other words, disease disparities occur mainly within the institutional gaze.

C. The "Double Dilemma" of Traditional Medicine in Diabetes Management

Traditional healing becomes a practical survival strategy. It helps individuals and families reclaim meaning and order in the face of illness while preserving cultural continuity. Yet precisely because diabetes is a chronic disease highly dependent on asymptomatic detection with long-term follow-up and metabolic control, this relational, holistic healing logic creates friction with biomedical management models (American Diabetes Association, 2026).

First, the Cherokee water ceremonies and herbal medicine, the Pima desert botanical knowledge, and the Miao soul-body framework centered on shamans and rituals, though differing in form, share a crucial premise: health is about maintaining equilibrium in relationships between individuals and the land, family, community, and spiritual forces (Frazier et al., 2013; Rea, 1997;

Chen, 2024; Koithan & Farrell, 2010). Within this worldview, illness is often understood as the consequence of disrupted relational order, signaling a need for restoration. Consequently, for many, undergoing regular blood sugar screenings before noticeable physical discomfort arises is often perceived as less urgent (American Diabetes Association, 2026; Koithan & Farrell, 2010). Screenings capture an invisible risk, whereas traditional healing excels at addressing an already manifested imbalance. This reflects two knowledge systems possessing different temporal sensibilities about when action is required. Biomedicine demands continuous monitoring even in asymptomatic phases; traditional healing emphasizes responding to manifest imbalances through ritual and relational restoration (American Diabetes Association, 2026; Koithan & Farrell, 2010; Chen, 2024).

Second, this tension becomes a dilemma because the biomedical system often presents itself in an exclusive manner. It positions itself as the only legitimate knowledge, simplistically labels traditional practices as superstition, and demands patients meet standardized compliance metrics (indicators, follow-ups, medication adherence) while rarely acknowledging their need for dignity and cultural safety (Walls et al., 2015; Wylie et al., 2018; Jacklin et al., 2017). When individuals repeatedly encounter microaggressions or pressure to justify themselves within clinical settings, their trust in and adherence to the healthcare system fades. Yet diabetes demands precisely such long-term compliance. Thus, traditional healing becomes a refuge within an adversarial environment, offering respect and understanding. It simultaneously risks reinterpreting diabetes as an event requiring restoration of relational order, thereby diminishing the priority of long-term screening and follow-up. This reframing is particularly evident among Miao families: when illness is primarily understood within ritualistic context, hospital visits are often delayed and follow-ups more easily interrupted. For the Cherokee and Pima peoples, the issue manifests more as distrust stemming from the overlap of clinical experiences and historical memories, making stable self-care and ongoing management more difficult (Jacklin et al., 2017; Walls et al., 2015).

However, these tensions are resolvable. The key lies in whether institutions are willing to juxtapose the two systems. Existing practices demonstrate that when screening and diabetes education are embedded within cultural frameworks, acceptance significantly increases. Examples include reconnecting nutritional preservation to collective memory through traditional food revival projects like the Tepary bean (DeBruyn et al., 2020; Wesner, 2014; AIHD, n.d.), or enabling traditional healers and biomedical providers to work in parallel within tribal healthcare systems. Their common thread is treating culture as a mobilizable resource for chronic disease management (DeBruyn et al., 2020; Struthers et al., 2003).

Thus, the deeper implication revealed is that traditional healing represents both cultural resilience against assimilation and exclusion, and a variable within diabetes governance(Koithan & Farrell, 2010; Gall et al., 2021; Chen, 2024). The issue lies in the rigid, exclusionary nature of the biomedical system creating a false dichotomy, forcing communities to choose between cultural identity and early intervention (Walls et al., 2015; Jacklin et al., 2017; Wylie et al., 2018). What truly needs changing is whether the system can provide a sustainable chronic disease management pathway that does not require cultural assimilation as a prerequisite (Rhoades, 2009; DeBruyn et al., 2020).

D. Unequal Burden Within Communities

Even within the same community, diabetes risk and access to diagnosis are not distributed equally. Often, the burden falls disproportionately on women, older adults, and those living in the most remote areas, as those with fewer resources and choices are more likely to experience "concentrated harm" from chronic diseases.

(1) Gender: Care work amplifies risk and complicates management

Gender disparities warrant particular scrutiny in tribal communities. Within Cherokee communities, women have historically served as the primary caregivers for families and communities. They hold knowledge of plant medicines, acting as healers and herbalists, and serve as the first responders to physical and mental health crises (Dinkins, n.d.; Koithan & Farrell, 2010). This role endows them with knowledge and responsibility. Yet within the big picture of contemporary chronic disease, it could also be seen as an additional burden. Women often shoulder more caregiving labor and emotional labor, facing higher stress exposure (Soon et al., 2022; King et al., 2021). The link between chronic stress and insulin resistance is well-documented in medical research (Yan et al., 2016; Yaribeygi et al., 2021; Joseph & Golden, 2016). Caring for family members compresses the time available for exercise and regular meals, making preventive self-care a luxury in reality (Soon et al., 2022; King et al., 2021).

Certain historical events, such as forced sterilization, may inflict more direct and enduring physical and psychological harm on women, potentially affecting subsequent generations through family dynamics and nurturing environments (U.S. Government Accountability Office, 1976; U.S. National Library of Medicine, 2021). However, it must be emphasized that gender-disaggregated diabetes data within tribal contexts remains limited (Small-Rodriguez & Akee, 2021; Huyser et al., 2019). Therefore, it is more appropriate to treat this as a highly plausible mechanistic hypothesis rather than making overconfident statistical assertions.

(2) Older Generations Bear Trauma and Distrust, Younger Generations Face New Risks

Generational differences are equally pronounced. Elders who directly experienced policies like residential schools and forced relocation often carry deeper historical trauma, which significantly shapes their perceptions of the healthcare system. Growing distrust along with avoidance of screenings all reduce the likelihood of early diagnosis (Bear, 2017; Newland, 2024; Pacheco et al., 2013).

The younger generation faces a different risk profile. They may be more familiar with biomedical setting and more willing to engage with the hospital system. At the same time, they are also more deeply entangled in modern lifestyles, characterized by increased sedentary wage labor and weakened cultural ties to traditional dietary practices (Attard et al., 2012; World Health Organization, 2014). Older generations are more likely to fall behind in the diagnostic chain. Younger generations face accelerated exposure to lifestyle risks. (Attard et al., 2012; Bear, 2017).

(3) Geography determining diagnostic opportunities

Geographic stratification is strikingly evident across different cases. The Pima community in the Sonoran Desert, after upstream water diversion disrupted irrigation systems, effectively became a food desert. Fresh produce became scarce, expensive, unreliable, directly altering daily dietary patterns (DeJong, 2004; The Evergreen State College, n.d.). In contrast, the Cherokee community in Oklahoma, benefiting from relatively better agricultural viability and transportation infrastructure, is more likely to maintain diverse food sources. Some households still grow vegetables and maintain kitchen gardens, while others rely almost entirely on commodity distributions (Cherokee Nation, 2025a, 2025b, 2026).

The same logic applies to Miao communities. The disparity between remote mountain villages and county or small-town residents in Guizhou extends beyond greater distance. It leads to reduced access to medical care (Dai, Zhou, & Mei, 2014; Zhang et al., 2024; Shan et al., 2024). For chronic conditions like diabetes requiring long-term monitoring, geographical isolation renders management nearly impossible to sustain (Dai et al., 2015; Zhang et al., 2024).

Therefore, what matters more is how structural violence further stratifies within the same community, concentrating risks and diagnostic barriers on those simultaneously marginalized by gender, generation, and geography. (Farmer, 2004; Walters et al., 2010).

V. Implications for Policy and Health Equity

Information above reveals that disparities in diabetes are often caused by systemic flaws. Thus, policies that merely focus on “more publicity and more screening” address only symptoms. What is truly needed is to repair the systemic links that lead to risk accumulation, including delayed diagnosis and interrupted care.

I. Core Insight: Shifting from “Changing Individuals” to “Streamlining Pathways”

Comparing these groups reveals that disparities are largely outcomes of systemic arrangements. Whether an individual receives early detection and management largely depends on the food environment and societal rhythms they inhabit.

For Native Americans, the solution requires confronting two fundamental issues. First, historically unjust food distribution systems that shaped today's dietary patterns; second, chronic shortages and negligence towards their traditional culture.

For China's ethnic minorities, the challenge extends beyond insufficient health awareness. Rapid urbanization and population mobility disrupt traditional rhythms of life, leaving people without the time or means to maintain health management. Simultaneously, certain groups, perceived as already assimilated, are often overlooked in routine public health mobilization efforts.

Thus, the essence of equity lies in building healthcare systems that actually work for people's real circumstances. This means creating screening and follow-up programs flexible enough to accommodate unstable work schedules and high mobility, and ensuring that public health outreach reaches groups who have been incorrectly assumed to need no special attention.

II. Adjusting Goals: Beyond Merely Reducing Numbers, Achieving Equitable Diagnosis

The "prevalence rates" we commonly observe actually blend three factors: actual incidence, testing capacity, and system documentation. Low prevalence in certain groups may not indicate their genuine health condition, but more so the unattentiveness of the system due to high undetected rate.

This is dangerous because resource allocation often follows the data. Groups that “appear healthy” on paper receive less attention and investment, falling into a vicious cycle: the less visible they are, the less resources are allocated; the less resources are allocated, the less visible they become.

Therefore, authentic evaluations require us to ask: Who has consistently been missed in screenings? Who receives diagnoses too late? Who is lost to follow-up? We need more proactive sampling to uncover “invisible” patients and test whether the system truly achieves fairness and efficiency.

III. Targeted Solutions: Fix Where It Breaks

Different groups face different barriers, because one size does not fit all. The effective approach is to identify where in the chain from risk to long-term management is the weakest link.

- For the Pima and Cherokee tribes: The breakpoint lies in **trust.** Historical trauma and negative healthcare experiences make it difficult for the medical system to gain trust. The key to repair lies in establishing accessible and community-engaged healthcare services. Rebuilding relationships requires sustained sincerity and professional respect.

- For the Miao ethnic group: The breaking point is “connectivity”. Inconvenient transportation and limited capacity are hard constraints; differing cultural understandings of disease make modern medicine’s “asymptomatic screening” seem non-urgent. Effective strategies involve “integration” and “collaboration”: embedding screening into familiar community activities and fostering communication between primary care providers and traditional healers to work in ways the Miao people understand and accept.

- For the Manchu: The disconnect lies in “continuity” and ‘coverage’. High mobility makes sustained management difficult, while administrative “one-size-fits-all” approaches may leave them overlooked in screening efforts. What’s needed here are “portable” and “seamless” services: such as health records accessible across regions and stable referral mechanisms that place screening entry points in places they frequent.

All communities are facing the same disease, diabetes, but the root cause lies in the system, and the solution must target the system’s “pressure points.”

IV. Without Cultural Safety, Long-Term Management Is Unattainable

Managing diabetes is a decades-long endeavor. What keeps people committed is both knowledge and the sense of being understood and respected.

When modern healthcare systems dismiss these traditions outright, they force people into a painful choice between “cultural identity” and “following medical advice.” The result is often patients quietly leaving and never coming back.

A more pragmatic approach is to make cultural safety a standard feature of healthcare services, allowing patients to share their practices without pressure; training healthcare providers to listen to and understand this information as vital medical history; and tailoring health education and to local language and cultural perspectives. This is the technical foundation we need to make long-term management possible.

V. Dietary Issues

Dietary shifts in these cases are mostly shaped by the interplay of living environments and economic constraints. When fast-paced lives force reliance on convenience foods, expecting individuals to change through personal education alone is unrealistic.

Therefore, nutrition policy must move beyond lecturing toward creating supportive environments:

- For Indigenous communities, this means supporting the restoration and maintenance of traditional, healthy food systems and securing related land and water rights.
- For China's migrant workers, it may involve promoting healthy food options in workplaces or adjusting work schedules to allow time for medical-care.

VI. Limitations and Methodological Constraints

This research is subject to several limitations. Because the paper is a comparative, process-focused analysis spanning two national contexts and four minority groups, the findings should be interpreted as explanations rather than definitive causal proof across all subpopulations.

The primary limitations involve data availability and disaggregation gaps in minority diabetes research, constraints on primary fieldwork and representative interviewing, and mechanism claims that remain inferential, especially the proposed link between ritual healing frameworks and reduced biomedical screening engagement.

First, data quality and visibility bias constrain causal certainty. Many diabetes indicators available for Native American and Chinese minority communities are not consistently disaggregated at the subgroup level, by tribe or ethnicity, remoteness, or migration status, and often fail to separate diagnosed prevalence from undiagnosed burden. Because this paper argues that systemic visibility and screening capacity impact reported prevalence, the same limitation that motivates the argument also restricts its precision. If a group is under-screened, quantitative estimates may understate true burden and blur whether differences reflect actual incidence or detection.

Second, the study is limited by restricted primary data collection. Without multi-site fieldwork or broad community-level interviewing, the paper cannot directly verify how individuals narrate illness, how trust changes over time, or how clinical microaggressions negatively affect screening behavior in daily life. Any interview evidence drawn from individuals with relatively singular tribal identities cannot represent the diversity of lived experience across tribes or within-group regional variation. This limits generalizability and makes it inappropriate to treat individual narratives as population-level phenomenon.

Third, several proposed pathways should be treated as educated hypotheses rather than confirmed facts. The claim that shamanic or ritual interpretive systems may reduce perceived urgency for asymptomatic screening is particularly inferential. Similar outcomes, late diagnosis, interrupted follow-up, could arise from confounders such as distance, cost, wage-labor time constraints, administrative fragmentation, or discrimination, independent of ritual practice.

Future research should combine longitudinal designs tracking screening uptake and follow-up continuity with community-based participatory research (CBPR) to ensure culturally safe measurement and ethical, reliable data governance. Mixed-method approaches linking local interviews and clinic-level records through subgroup-disaggregated surveillance would allow researchers to test whether interpretive healing traditions predict delayed screening after controlling for access barriers, strengthening or revising the mechanisms proposed here.

VII. Conclusion

The comparative evidence presented here puts emphasis on a definitive shift in our understanding of metabolic health that disparities are manufactured, not inherent. Across disparate geographies and political backgrounds, the elevated diabetes burdens observed among Pima, Cherokee, Miao, and Manchu populations are the direct consequence of institutional arrangements that concentrate metabolic risk while obstructing access to culturally safe care. Whether through the FDPIR's legacy of commodity foods in the United States or the urbanization-driven dietary shifts in China, state-sponsored process have functioned with a striking commonality, which is severing communities from traditional food systems and restricting individual choice to narrow, institutionalized options.

This analysis suggests that historical traumas including perceived assimilation and geographical isolation are the results of state power determining whose knowledge systems are prioritized and whose bodies must bear the cost of development.

Recognizing these disparities as products of structural violence reorients the objective of public health intervention. We must move away from the flawed logic of "correcting" minority behaviors and toward the repair of institutional pathways that could create unequal risk. When biomedical systems demand cultural assimilation as a prerequisite for treatment, they perpetuate the very marginalization that drives poor outcomes. Traditional healing practices persist today because they offer what biomedicine frequently lacks but the minority groups value: meaning and cultural continuity. The central tension is whether institutions possess the humility to abandon the false binary between cultural identity and metabolic health.

Ultimately, achieving health equity requires a radical redesign of chronic disease interventions. This necessitates the creation of flexible screening for mobile populations and the pursuit of food sovereignty through land and water rights. Most critically, it demands a reassessment of “low prevalence” labels in underscreened groups, which often mask diagnostic failure rather than reflecting true health.

Future research must now pivot from documenting these gaps to testing solutions. Utilizing community-based participatory designs that center Indigenous epistemologies is the only way to identify which reforms actually reduce diagnostic delays and improve long-term outcomes. The question is no longer whether structural inequality drives these disparities;the evidence is conclusive. The question is whether our society have the political will to dismantle the arrangements that continue to concentrate harm on those with the fewest resources to resist.

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