



Cross-Sectional Analysis of Transgender Individuals Undergoing Endocrine Affirmative Care in the Texas Panhandle

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Abstract

Background: Over the past decade, the number of individuals seeking affirmative transgender care has risen worldwide. Most research has originated from urban centers. Considerably less is known about health and psychosocial needs that transgender persons encounter in rural areas.

Objective: We sought to characterize individuals with gender dysphoria seeking endocrine gender-affirming care at a single university center located in a predominately rural locale.

Methods: A retrospective cross-sectional chart review and analysis was conducted of individuals seeking gender-affirming healthcare between 2009 and 2023. A total of 102 records were retrieved and evaluated using a 32-item checklist.

Results: The number of individuals seeking gender affirming healthcare over the 14-year timespan has increased ($p < 0.001$), especially in the last three years. The average age at presentation was 22.2 (95% CI 20.6-23.9) years with a range of 9-69 years. 40.2% identified as transfemale and 59.8% as transmale. Many patients travel over 100 miles each way for care. 75.5% were white/Caucasian and 12.7% expressed interest in fertility preservation. A family history of gender dysphoria was reported in 9 patients (8.8%). No detransitioners have been identified.

Conclusions: The number of individuals seeking transgender care in this relatively rural area of Texas continues to grow. Regional healthcare providers should understand specific needs and barriers to medical and psychological care associated with this historically underserved and marginalized population.

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Abbreviations: Transgender (TG), gender dysphoria (GD), Texas Tech University Health Sciences Center School of Medicine at Amarillo, Texas (TTUHSC-Amarillo), World Professional Association of Transgender Health (WPATH), American Society for Reproductive Medicine (ASRM), Lesbian, gay, bisexual, transgender (LGBT), Total laparoscopic hysterectomy with bilateral salpingo-oophorectomy (TLH-BSO), Gonadotropin releasing hormone analog (GnRHa), Pre-exposure prophylaxis (PreP).

Background

The transgender (TG) community represents a unique and diverse segment of our society, and the number of individuals seeking care worldwide is increasing steadily.¹ It is estimated that over 1.6 million adults in the U.S. identify as TG, with nearly 93,000 of those residing in the state of Texas.² While this is a relatively small number, it may be an underestimation.³ Research continues to identify significant barriers to competent and affirming healthcare in non-urban and rural locales.⁴ In addition, medical school and postgraduate training in TG medicine remains critically deficient.⁵

TG individuals, whose gender identity differs from the sex assigned to them at birth, have historically confronted various obstacles to healthcare. Societal discrimination and a lack of knowledge and acceptance by the medical community have led to healthcare disparities.^{1,6,7} Most research concerning TG persons is derived from metropolitan populations, and considerably less attention has been focused on challenges faced by TG individuals living in non-urban and rural settings. The Texas Panhandle, characterized by its predominantly rural and conservative landscape and distant from major metropolitan areas, presents a unique setting for examining healthcare needs and obstacles faced by those with gender dysphoria (GD) and TG identity.

To better understand the unique medical

and psychosocial needs of the TG community in the Texas Panhandle, we collected and analyzed retrospective epidemiologic and demographic data from the TG population presenting or referred to a single university center for endocrine care located in the Panhandle. By collecting this data, we hope to better understand barriers to care and develop educational resources for TG individuals living in this remote locale.

Materials and Methods

An electronic medical records search was performed from 2009 (when electronic records were introduced to this medical school) until December 2023 using the terms “transgender”, “transsexual”, and “gender dysphoria”. All patients included in this analysis attended the reproductive medicine clinic at Texas Tech University Health Sciences Center at Amarillo (TTUHSC-Amarillo) for endocrine gender-affirming care. This clinic has adopted the World Professional Association of Transgender Health (WPATH) guidelines for transgender care which recommends that all individuals initially undergo formal psychological assessment to verify the diagnosis of GD and to assess readiness for gender-affirming endocrine therapy.⁸ The assessment must be performed by a licensed mental health professional (psychiatrist, psychologist, or social worker) and a signed letter provided to the program certifying the diagnosis of GD. Furthermore, the mental health professional must state that the patient has a reasonable understanding of his/her condition and competent to consent to hormone therapy. In the case of minors, both parents must consent (unless one parent has full legal custody) and the minor must give ascent. In 2023, Texas law (Texas Senate Bill 14) prohibited use of gonadal releasing hormone antagonists for pubertal suppression and gender-affirming endocrine and surgical care to minors with GD, and these patients were referred to clinics outside of Texas for continued care. Similar laws are in effect in other states.⁹

All patients must sign a detailed informed consent before hormonal treatment is initiated.

Nine adults initially presented for care after initiating hormone therapy with another healthcare provider but without psychological assessment, and they were admitted to the program on a case-by-case basis. In 2016, a discussion of fertility preservation was added to the permits for adults and minors in accordance with recommendations from the American Society for Reproductive Medicine (ASRM) and WPATH.^{10,11}

A total of 102 records were retrieved and reviewed. One of the co-authors reviewed each chart and completed a 32-item checklist including demographic information, social data, family history, and physical and mental health conditions obtained at initial consultation or during a follow up visit. Any disputes were resolved by one of the senior authors (RPK or DM) who had contact with all patients. Distance travelled to TTUHSC-Amarillo was determined by zip code.

Statistical analysis: Data was entered into an Excel spreadsheet and statistical assessments were performed using MedCalc Statistical Software, v22.014, Ostend, Belgium. Distribution of continuous data was determined by the Shapiro-Wilk test. Continuous variables were backtransformed after logarithmic transformation if the distribution was non-parametric. Independent samples Student's t-test was used to compare continuous data between two groups when the F-test determined equal variances. Welch's test was used when variances by the F-test were unequal. Chi-square or Fisher's Exact tests were used to compare categorical data between two groups. Trends in the age of presentation were assessed by univariate linear regression. Statistical differences were assumed if $p < 0.05$.

IRB approval: The study was approved by the Institutional Review Board of TTUHSC-Amarillo (IRB-FY2024-19).

Results

The number of patients presenting for care has steadily increased between 2010 and 2023 ($p < 0.0001$). Sixty of 102 (58.8%) of the

patients presented to the clinic for the first time in 2022 or 2023 (Figure 1). A total of 61 (59.8%) identified as transmale and 41 (40.2%) as transfemale. Distance travelled to the clinic was at least 30 miles (47 km) each way for 39 (38.2%) of the clinic participants. Detailed cross-sectional data is found in Table 1.

Chronological age at first presentation was 22.2 (95% CI 20.6-23.9) years with a range from 9-69. The age when hormone therapy (or gonadal suppression in pubescent patients) was initiated was 23.2 (95% CI 21.3-25.1) years with a range of 9-69 (Figure 2). The delay in some cases between first presentation and starting treatment was due to a multitude of issues including inability to pay for medications, distance to the clinic, waiting to receive therapist letters, and complicated family dynamics. The age at which treatment has been initiated has remained stable over the study interval ($p = 0.38$, Figure 2).

Among children and teens (age < 18), three (2.9%) underwent gonadotropin suppression with depot-leuprolide or depot-medroxyprogesterone prior to beginning affirmative hormone therapy. Depot-medroxyprogesterone was administered to one transmale for pubertal suppression whose family could not afford gonadotropin releasing hormone analog (GnRHa) therapy. GnRHa drugs demonstrate superior suppression of the hypothalamic-pituitary-gonadal axis compared to progestins but are more expensive.¹²

"White" or "Caucasian" was the most common ethnic group treated (75.5%) and Hispanics represented 17.6% of the clinic population (Figure 3). A total of 70 patients (68.6%) had private health insurance, 21 (20.6%) had a governmental program, and 11 (10.8%) were private pay. The distribution of payor types was similar among all four ethnic groups represented ($p = 0.81$).

During the course of treatment in the clinic, 25 (24.5%) of TG individuals have undergone some form of gender-affirming surgery. Among transmen, laparoscopic hysterectomy and bilateral salpingo-

oöphorectomies (TLH-BSO) was performed in 15 (24.6%) and mastectomies (“top surgery”) in the same percentage. Incidentally, these are usually performed as two separate surgeries. Except for TLH-BSO, these procedures were performed at outside institutions. Three transmen have undergone metoidoplasty and one had completed phalloplasty. Among transwomen, 7 of 41 (17.1%) underwent at least one form of transfeminizing surgery (breast implants, tracheal shaving, or orchiectomies and vaginoplasty).

A pre-existing medical comorbidity (hypertension, diabetes, etc.) was encountered in 36 (35.3%). In the assessment of side-effects and complications, one transmale (age 45) experienced deep venous thrombosis five years after initiation of androgen therapy and was treated with standard anticoagulation with continuation of testosterone therapy. Another transmale was treated for clitoral priapism which has not since recurred.¹³ By far, the most common complaint or complication was mastalgia in transfemales. Tobacco use was confirmed in 20 (19.6%). Neuropsychiatric disorders were common in our population and fully detailed in a companion manuscript.

A total of 19 patients were married at presentation prior to gender-affirming hormone therapy. Seven were divorced. No patient was positive for human immunodeficiency virus (HIV) and HIV pre-exposure prophylaxis (PrEP) was utilized by four (3.9%).

A desire for fertility preservation by oocyte or sperm cryopreservation was voiced by 13 (12.7%). To our knowledge, we have had no detransitioners (post-treatment regret with renunciation of TG identity).

Nine patients (8.8%) shared a family history of GD in a sibling or close family member. This includes a set of identical triplets and two sibling pairs.¹⁴

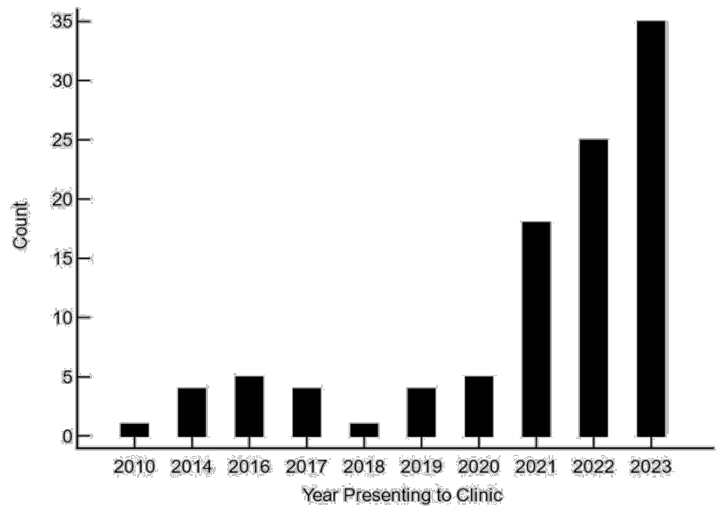


Figure 1. Year of initial presentation ($p < 0.0001$ by Shapiro-Wilk test).

Group	Characteristic	Yes (%)	No (%)
All Patients n=102	Initial therapist assessment	92 (90.2%)	10 (9.8%)
	Tobacco use	20 (19.6%)	82 (80.4%)
	Married (prior or current)	19 (18.6%)	83 (81.4%)
	Divorced	7 (6.9%)	95 (93.1%)
	HIV	0 (0%)	102 (100%)
	HIV PreP use	4 (3.9%)	98 (96.1%)
	Fertility preservation desired	13 (12.7%)	89 (87.3%)
	Detransition	0 (0%)	102 (100%)
	Family member with gender dysphoria	9 (8.8%)	93 (91.2%)
	Gender affirming surgery	25 (24.5%)	77 (75.5%)
	Pedi/Adolescent gonadotropin suppression	3 (2.9%)	99 (97.9%)
	Side effects/complications of HT (excluding polycythemia in transmen)	10 (9.8%)	92 (90.2%)
	At least one chronic medical condition	36 (35.3%)	66 (64.7%)
	Travels over 30 miles (47 km) each way to clinic	39 (38.2%)	63 (61.8%)
Transwomen n=41	Any affirming surgery	7 (17.1%)	34 (82.9%)
Transmen n=61	Hysterectomy/BSO	15 (24.6%)	46(75.4%)
	Need for menstrual suppression with progestins	21 (33.8%)	41 (66.2%)
	Gender-affirming mastectomies	15 (24.6%)	46 (75.4%)
	Polycythemia (Hct>50%)	11 (18.0%)	50 (82.0%)

Table 1. Binomial characteristics of the study population.

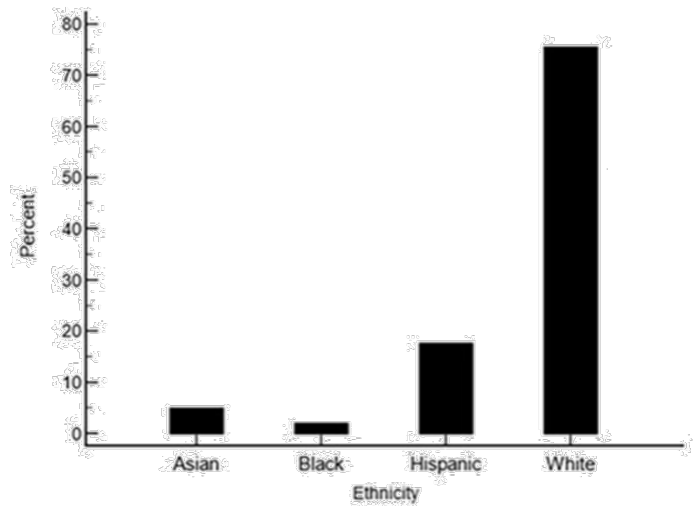
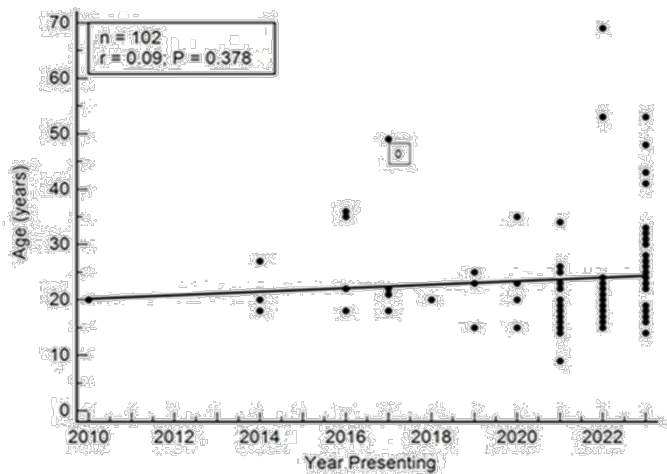
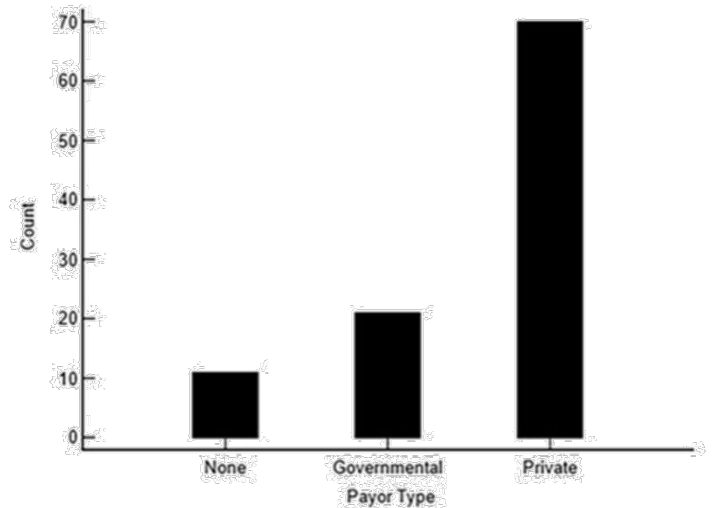
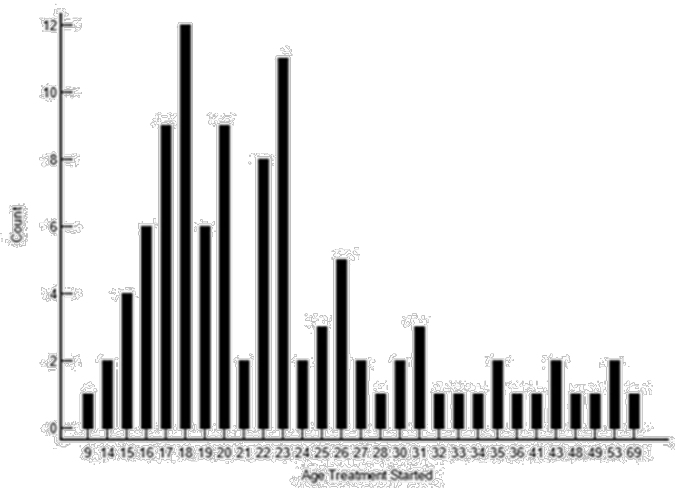


Figure 2. The top figure depicts age at which gonadal suppression or affirming hormone therapy was initiated ($p < 0.0001$ by Shapiro-Wilk test). The bottom figure is a univariate analysis of age of presentation by year ($r = 0.09$, $p = 0.38$).

Figure 3. Self-reported ethnic identification and payor types among the transgender population.

Discussion

In recently published cross-sectional studies, approximately 0.5% (1:200) of adults identify as TG (or along the TG spectrum), and the incidence is even greater in high school adolescents (1.8% or 1:55).^{3,15} In addition to removing transgenderism from the list of pathological disorders by the American Psychiatric Association in 2013, social media may well be a factor in the higher incidence among teenagers.¹⁶ Admittedly, demographic research on incidence of the transgender identity is difficult given the diversity of transgender expression, screening issues, and social stigma.^{3,17,18} Nevertheless, the population of TG individuals is growing and so are the resources needed to take care for them.

Compared to cis-gender counterparts, the TG and gender-diverse community have historically encountered barriers in the pursuit of approbative and specialized health care.¹⁹ Anxiety and perceived discrimination remain common impediments to TG persons seeking medical care, but whether transphobia is more prevalent in rural geographical locations around the world is unclear.^{20,21} The concerns of the TG community should be heard, cataloged, and addressed so that medical care may be welcoming to all. The gender-diverse community tends to be more uncomfortable in the traditional medical office setting because of perceived transphobia, caretaker discomfort, and lack of knowledge in TG health.²²

In our clinic population, 59.8% of those seeking hormone therapy for gender reassignment identified as transmale versus 40.2% transfemale. This ratio (roughly 3:2) is higher than reported in most cross-sectional databases which show a greater number of individuals with GD seeking transfeminine therapy compare to masculinizing treatments.^{3,23-26} A decade ago, 6.8 per 100,000 people were believed to identify as transfemale and 2.6 per 100,000 as transmale, a ratio of 2.6:1.²⁶ In more recent surveys in the US, Europe, and Asia, the ratio now seems to be approaching unity.^{18,24,27-29} Methodological issues remain a substantial challenge in studies

of sexuality and gender identity.¹⁸

The population seeking endocrine care at this institution is relatively young with a mean age of 22.3 at presentation. This is fairly consistent with other literature reports.^{15,30} Our experience is consistent is the preponderance of demographic data supporting the onset of GD occurring before adulthood.³¹ Of interest, we have noted an increase in older adults presenting in the past 3 years, including one 69 year old. All have stated fear of reconciling with their sense of gender identify due to societal and family disapproval and rejection by the medical community. Unique issues associated with hormone treatment in elderly TG individuals is another area of limited knowledge.³²

“White/Caucasian” ethnicity was self-identified in 75.5% of our clinic transgender population which is higher than the general Panhandle Caucasian population of 53.6%.³³ Payor types, however, were similar among the four ethnic groups represented in our study. Whether the disproportionate number of Caucasian patients in our clinic population indicates better access or confidence in the health system is unknown. Fear of discrimination has been reported to be higher in non-white transgender persons. Greater family and societal acceptance of transgender identify among Caucasians might also explain this discrepancy.^{34,35}

TG persons in the US population are disproportionately affected by HIV. The estimated prevalence of HIV is 0.39% in the US general population with a substantially higher number of transwomen (42.0%) and transmen (3.2%) affected.³⁶ None of our patients are known to be HIV positive, although all testing in the clinic is voluntary. An inquiry into HIV status and history of any sexually transmitted disease is collected at the first visit. HIV prophylaxis (PreP) is discussed with all adult patients, and four patients (3 transmen and 1 transwoman) have initiated PreP. The absence of HIV may reflect our non-urban population although TG individuals with HIV may be receiving endocrine treatment elsewhere or not

at all.

A total of 9 patients (8.8%) stated that a first degree relative also identified as transgender or gender fluid. A genetic influence on transgender identity has been suggested by monozygotic and dizygotic twin studies although the *in utero* environment and postnatal environment clearly play a role in the sense of identity.^{37,38} Such data is obviously challenging to parse. Gomez-Gil, et al, found concordance for GD in siblings of a transgender proband in one per 211 families in a Spanish population, further suggesting a familial influence.³⁹ This and other studies accentuate the intricate roles of genetics and environment on neural development and behavioral expression. In our population, we had a set of identical triplets and two sets of siblings presenting for endocrine care at this institution. We acknowledge that the number of patients treated with a close family member with GD is far higher in our population than reported in the literature and likely coincidental. A detailed discussion of the determinants of GD is beyond the scope of this cross-sectional analysis.

The desire for fertility preservation was of interest to 12.7% of our patient population. This rate is lower than in some published reports in which 18-54% have expressed interest in biological parenting.⁴⁰ Our numbers may be artificially low since this data was not recorded until 2016. Unfortunately, few transgender persons receive reproductive counseling prior to hormonal or surgical therapy due to lack of awareness or patient perception of physician bias.⁴¹ All transgender persons should be informed of reproductive options prior to initiating hormone therapy or gonadectomy.^{11,42} In our young reproductive-age population, the cost of fertility preservation was repeatedly named as the biggest impediment to pursuing oocyte or semen cryopreservation. Technology comes with a cost, and fertility preservation, particularly oocyte cryopreservation, is expensive and rarely covered by insurers. Additionally, discrimination in housing and job markets place TG persons at greater risk for poverty.³

Studies of TG people have identified distance to caretakers as a barrier to the care.^{43,44} To access care at TTUHSC-Amarillo, some of the patients travel over 100 miles (161 km) roundtrip to attend the clinic. Some live outside the Texas Panhandle in three nearby states. Invariably, the reason given for long distance travel is for access to knowledgeable and affirming transgender care. Given that WPATH recommends that patients undergoing hormone therapy follow up every 3 months during the first year of treatment, travel distances, time expenditures, and pecuniary concerns represent major obstacles and a significant burden on the patient. To remedy this, we have performed some follow up visits by telemedicine with laboratory assessment provided by local hospitals. Our growing TG population in the Texas Panhandle accentuates a critical need for education of rural physicians on TG and LGBT health in general. Telemedicine continues to grow in popularity in the US among the TG population although safety issues and outcomes require further study.⁴⁵

We did not identify any detransitioners in our population. It is conceivable that an individual who no longer had a TG identity simply stopped coming to clinic without notifying us. On the other hand, pretreatment psychological evaluation, required in all new candidates before endocrine treatment at this institution, has been established to better identify those meeting diagnostic criteria for GD and thereby minimize misdiagnosis and subsequent detransitioning.^{8,46} Detransitioners represent another understudied group, and unfortunately, many who have come forward have faced ridicule by the LGBT community.⁴⁷ Limited data from around the world suggests the detransition rate between 0.2-9.8%. Unfortunately, these small studies are prone to methodological errors and multiple confounders.^{46,48} With the recent surge in requests for TG care, it may be many more years before researchers have a better understanding of factors associated with detransitioning and the frequency in which it occurs.⁴⁶ Like all patients, detransitioners require compassionate care.

A strength of this study is the inclusion of 100% of the individuals referred for transgender endocrine therapy over a 14-year span. By following WPATH guidelines for entry into our program, we had fairly extensive health history on most individuals accepted for endocrine therapy as well as pretreatment psychological assessment.

A weakness of this study is the lack of inclusion of all TG patients in the region. Many TG persons are treated by primary care physicians or endocrinologists. Beginning in 2023, any TG patient less than 18 years of age was not allowed to be treated medically or surgically in the state of Texas. This has undoubtedly prevented access to care for children and adolescents with GD. The psychological harm in interrupting gonadal suppressive therapy and hormone therapy remains to be examined in detail. Finally, some individuals identify as fluid or non-binary. In this study, we chose binomial statistical approach for those who were treated with gender-affirming hormone therapy based on readiness evaluations by psychotherapists.

In conclusion, our regional study of TG persons in a largely rural part of West Texas found fairly similar demographic trends as other large and mostly urban population studies. The disproportionate number of individuals seeking transmasculine therapy for male gender identity was the largest difference from published studies. The rate of familial GD among our patient population is an outlier.

Identifying specific population characteristics, demographics, and needs is one of the first steps that must be taken to improving healthcare delivery. We hope to expand regional knowledge of transgender health, diminish travel distances, and lower barriers to care that impede access for this population.

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