“Psychiatric diagnoses in non-binary compared to binary transgender adults: a retrospective analysis of medical records at an urban health system.”

Kasey (Kase) Cragg

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Genya Shimkin

Michelle Garrison

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University of Washington

Abstract

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Kasey (Kase) Cragg

Chair of the Supervisory Committee:

Genya Shimkin

Department of Family Medicine

Transgender and Non-Binary (TGNB) people across the lifespan have increased risk of mood and anxiety disorders compared to cisgender (non-transgender) people; previous research has typically grouped non-binary and binary transgender adults as one, despite recorded differences in experience between the two populations. We used a retrospective cohort study design to analyze de-identified summary-level data taken from electronic medical records of a TGNB adult patient sample. Our aim was to compare the odds of mood disorder diagnosis in non-binary versus binary transgender adults, and to see whether these odds differed when each group is stratified across the demographic variables of age, sex assigned at birth, race, and insurance payer. Non-binary patients had significantly higher odds of a mood disorder diagnosis when stratified across almost all demographic variables. This study provides emerging evidence for key differences in prevalence of psychopathology in non-binary compared to binary transgender adults, which can inform changes to medical practice as well as the need for disaggregation of this population within future research.

Introduction

Within the past decade, greater attention has been paid to mental illness and trauma related disparities across different communities and identities. Extensive research exists documenting prevalence of psychopathology among certain subsets of the population, but there is a lack of data that examines the adult transgender and gender non-binary (TGNB) population, a group speculated to experience significant mental health burden. *Transgender* is a term for those people whose gender identity (one's internal sense of being male, female, both or neither) differs from the sex they were assigned at birth (James et al, 2016). It is estimated that approximately 0.6% of adults above the age of 18, or about 1.4 million people, identify as transgender in the United States (Testa, Jimenez, & Rankin, 2013). The term 'transgender' can also refer to gender nonconforming or non-binary people whose expression through clothing, behaviors, and attitudes does not adhere to common gender roles and expectations in society; non-binary people may express themselves as masculine and/or feminine, and may use a variety of terms to describe themselves (ex. Pangender, bigender, agender, neutrois, etc.) (American Psychological Association, 2015; Jones et al, 2019). The 2015 U.S. Transgender Survey found that of their 22,000 patients, more than one third (35%) of respondents identified as non-binary; a recent study estimated that approximately 1.2 million adults in the US identify as non-binary (James et al 2016; Wilson & Meyer, 2021). Transgender and non-binary people may or may not pursue medical transition such as Hormone Replacement Therapy (HRT, testosterone, estrogen) and surgery, and/or social transition, including changing one's name and sex marker on federal documents, to feel greater congruence between their gender identity and how others perceive them. In order to pursue steps of medical transition, many physicians and insurance companies require TGNB patients to have a diagnosis of Gender

Identity Disorder (Gender Dysphoria) documented in their medical history (Dewey & Gesbeck, 2017).

Research shows that relative to cisgender (non-transgender) individuals, TGNB individuals experience heightened levels of depression, anxiety, substance use, suicidality, and poor mental and overall self-rated health (James et al 2016; Flentje, Heck, & Sorensen, J, 2014; Hanna et al 2019). Several studies have addressed the fact that compared to the cisgender population, TGNB individuals experience higher rates of mental illness and substance use, yet typically the reason given for an association is the dysphoria experienced by the transgender individual themselves, without acknowledgement of the interpersonal, systemic, and intersectional, factors at play (Flentje, Heck, & Sorensen, J, 2014; Meyer, 2003; Hanna et al 2019). By living an experience outside of what is considered normative, TGNB people report more frequent gender-identity-based discrimination and harassment from cisgender people, as they navigate transition and finding authenticity (James et al 2016; Testa, Jimenez, & Rankin, 2013; Valentine & Shipherd, 2018; Kachen et al, 2022). One of the most pervasive locations of this harassment is in healthcare, where TGNB people routinely experience barriers to care, discriminatory treatment from healthcare workers, and refusal of care outright (Valentine & Shipherd, 2018; Tordoff et al 2021). Historically and at present, TGNB people who are Black, Indigenous, or another Person of Color (BIPOC), disabled, fat, poor, neurodivergent, and intersections of these identities experience compounding barriers to access in employment, housing, and in health care access by extension, which leads to a greater prevalence of psychopathology among transgender and non-binary people compared to their cisgender counterparts.

One way to begin to address the mental health disparities experienced by TGNB patients is to look at their medical history with psychopathology since beginning transition. Wanta, Niforatos, Durbak, Viguera, & Altinay (2019) completed a cross-sectional analysis of psychiatric diagnosis prevalence comparing a cohort of transgender adults to a control population of cisgender individuals, and found that transgender patients had statistically significantly higher prevalence of all psychiatric diagnoses, with the most common listed diagnoses of Major Depressive Disorder and Generalized Anxiety Disorder (Wanta et al, 2019). The authors noted that a main limitation of this study is the erasure of non-binary individuals through lack of coding within the medical record system to capture their identity (Wanta et al, 2019). There remains little research that examines the presence or absence of psychopathology among other different intersections of TGNB people, such as those who are racialized, lowincome, or of distinct age groups.

Transgender and non-binary gender identity are not captured in the United States Census and not often captured in medical records or routine demographic research. As a result, there is an overall lack of quality quantitative and qualitative data capturing transgender people and their experiences with mental illness, despite the known prevalence within the community (Valentine & Shipherd, 2018; Hanna et al 2019; Valente et al, 2020). Tordoff et al (2021) argues that in order to capture quality data on TGNB individuals, the systems used to gather Sexual Orientation and Gender Identity (SOGI) information must adapt to reflect changes in language, including ending the use of aggregated data: if 'non-binary' is even available as a response option, many researchers lump this group together with 'binary transgender' individuals in order to reach power requirements, but this eliminates the possibility to understand nuance within the transgender population (Tordoff et al, 2021). Only recently have medical records

systems adapted to contain the word 'non-binary' as a gender option, historically leaving those who identify as such to choose 'other' or 'none of the above' (Progovac et al, 2018) As much of this research is completed by cisgender investigators who lack transgender insight on their research team, the limitations of using aggregated identity data are not often discussed, and the transgender community is treated as a monolith. Within the research that does compare non-binary or genderqueer people to a binary transgender population, results are mixed: nonbinary people report better health and less depressive symptoms in some samples, and greater prevalence of substance use or traumatic experience in others (Scandurra et al, 2019; Wanta et al; Progovac et al; Valente et al, 2020).

Another limitation of most gender-expansive research is the constant comparison of transgender and non-binary individuals to a cisgender population. This asserts that being 'cisgender' is a 'norm' to which transgender identities should be compared and removes the ability to examine the differing experiences between subpopulations of transgender people. For example, 'transmasculine' is a term used among some non-binary individuals assigned female at birth to describe aspects of their gender transition, which may lead to different lived experiences compared to transgender men (D'Angelo et al 2021; Jones et al 2019; Lefevor, 2019; Reisner & Hughto, 2019). Another prominent example is the impact of intersectional identities, such as the difference in treatment of Black transgender women versus White transgender women (Noonan et al 2018; Valente et al, 2020).

To date, a medical record review that specifically addresses the potential for differences in prevalence of mental health diagnosis within the transgender population (binary vs. nonbinary) has not been completed. The goal of this study is to examine the differences in rates of the most prevalent mental health diagnoses between non-binary (gender non-conforming,

genderqueer, etc.) and binary (transgender men and women) transgender-identified adult patients at a large academic medical system. This study will examine the prevalence of these diagnostic ICD-10 codes across four demographic variables: race/ethnicity, age, insurance payor as a proxy for income status, and sex assigned at birth. The second goal of analysis will be to examine the most common co-morbidities between these diagnoses (i.e., which diagnosis groups co-occur with one another among transgender and non-binary adults). We hope to explore the mental health disease burden of TGNB people of color, of younger and older ages, of low income, and different sexes assigned at birth, to acknowledge gaps in care and improve health outcomes for a historically marginalized population.

Theoretical Model

Throughout the empirical research, symptoms and diagnoses of anxiety disorders are found to be high among all those whose gender identity does not match their assigned sex at birth, an experience that could be in part due to the experiences of marginalization and discrimination reported by TGNB people (Millet, Longworth, & Arcelus, 2017; Valente et al, 2020). This research is most often linked theoretically to the Minority Stress and Gender Minority Stress Models. The Minority Stress Model builds upon previous research on social sources of stress among Black and Latinx individuals to examine the effects of discrimination on health among gender and sexual minorities (Parra & Hastings, 2018). Here, the word 'minority' is not used to describe prevalence of a certain identity; rather, it describes how the identity is socially positioned within society to lead to differential, privileged treatment for people without that identity (Meyer, 2003). The model posits that the health disparities experienced by sexual minorities (gay, lesbian, and bisexual people) can be explained in large part due to a hostile society rooted in homophobia, wherein harassment, victimization, and both individual and

systemic discrimination impact access to care and resources (Meyer, 2003). The combination of distal stressors (direct daily experiences of discrimination and/or micro-aggressions) and proximate factors (societal attitudes, political events, internalized phobia) create a pervasive sense of insecurity, which is then embodied as mental and physical disorders (Meyer, 2015; Kachen et al, 2022). The concept of Minority Stress differs from other quotidian stressors in that it requires a high degree of mental effort on behalf of the individual to adapt to having a stigmatized identity, and it is persistent despite civil rights progress of the past few decades; the alertness required to defend or advocate for oneself at any moment results in hypervigilance, and therefore the chronic stress (Meyer 2003).

Since creation of the model, other authors adapted the concept of minority stress to specifically address TGNB people—although some aspects of discrimination are similar between transgender people and sexual minorities, TGNB people experience structural barriers to affirmation of their identity, including 1) being unable to access legal documents or health insurance due to discrepancies in records of their sex assigned at birth or name, 2) inability to comfortably access public restrooms, and 3) non-affirmation of their identity, such as a transgender woman being called 'sir.' (Testa et al, 2015; Kachen et al, 2022; Lefevor et al, 2019). The negative impact of minority stress results in greater embodied stress, leading to deteriorated mental health. Much of the current body of research on transgender health supports the new Gender Minority Stress Model in that it documents the presence of both psychological illness and barriers to treatment seeking among transgender people (James et al, 2016; Grant et al, 2011; Shepherd, Green & Abramovitz, 2010; Kachen et al 2022). Several studies report a greater number of physical health concerns and psychiatric diagnoses among

TGNB people compared to cisgender peers, both of which are attributed to the toxic effects of minority stress (Flentje, Heck, & Sorensen, 2014; Shepherd, Green, & Abramovitz, 2010). Common among all of these authors is a call for updates to Electronic Health Records (EHR) to avoid using incorrect names or pronouns for patients while they transition genders (Redfern & Sinclair, 2014; Jasuja et al, 2020).

Methods

Data Source

Epic is a cloud-based EHR software used by many hospitals and major health systems. Within Epic, SlicerDicer is a self-service reporting tool that allows healthcare providers and other internal personnel ready access to Epic clinical data customizable at the patient population level for data exploration. Data is uploaded every 24 hours after it is de-identified. The final product gives the user cross-tabbed summary data of the desired characteristics rather than individual-level patient records. Physicians may choose to create a 'registry' of patients who meet certain criteria to identify meaningful characteristics about that registry. Epic SlicerDicer also provides population-level demographic information allowing for researchers to learn the demographic breakdown of people on their pre-defined registry, including age, sex assigned at birth, race, ethnicity, and insurance status. From June 2021 to April 2022, we conducted a retrospective secondary data analysis of Epic SlicerDicer records from a large urban academic health system in the Pacific Northwest to identify TGNB patients with a history of a psychiatric diagnosis.

Inclusion Criteria

To identify all TGNB patients, we relied on a SlicerDicer registry of TGNB adults who either 1) indicated in their EHR that they identify as TGNB or 2) had a previous diagnosis of gender dysphoria, formerly gender identity disorder (International Classification of Disease (ICD) Code F64.9), a prerequisite for most insurance policies to accessing gender-affirming care.

Patients in this version of the Epic system may choose the following options for Gender Identity: Male, Female, Transgender Male (FTM), Transgender Female (MTF), Genderqueer, Other, None of the Above, and Choose Not to Disclose.

The purpose of this study is to examine within-group differences of the transgender population, which is only possible if information about gender identity is listed. For this reason, patients who are on the TGNB Registry yet indicated 'choose not to disclose' for their gender were excluded from the analysis. The category 'none of the above' is self-populated if no option is selected. In this case, a significant number of patients on the predefined TGNB registry fell under 'none of the above', enough to consider the potential that this group includes transgender patients who recently informed their provider about their gender identity; in other words, they were recently added to the TGNB registry and have not yet updated their information. Demographic data on the None of the Above population was included as a category to be as an example of "emerging data": individuals who are in the TGNB patient group and will likely move into either the non-binary or binary categories over time. The group of 2887 people on the registry with 'none of the above' listed for gender identity is included for descriptive purposes but excluded from further analyses due to lack of meaningful information

about the characteristics of this population. A final sample of 3893 non-binary and binary adults were left for the remaining analyses.

This study reviewed records from 01/01/2017 to 01/01/2020. The choice of timing for medical record inclusion is twofold. First, the Department of Health and Human Services rule that allowed for collection of SOGI information in EHR systems did not take effect until 2015, and many large medical systems required an additional 1-2 years to train clinicians and staff on the importance of data collection in addressing health disparities. To allow for this training period and based on recommendations from the health system on their SOGI data collection progress, we set the beginning year for inclusion at 2017. Second, at the time of study initiation, it was unclear how the onset of the COVID-19 pandemic and related restrictions have and will impact diagnosis of mental disorders within the transgender and non-binary community. Since the onset of the pandemic, there has been more research to acknowledge the deepening of mental health disparities among TGNB people (Jarrett et al, 2021). Still, to exclude anxiety/trauma experiences that could be directly related to the pandemic, the length of medical record inclusion is limited up until U.S. acknowledgement of COVID-19 in January 2020.

Criteria for the final sample included all ‘active’ patients on the SlicerDicer TGNB registry (either by diagnosis of gender identity disorder or self-disclosure of some non-cisgender identity to provider). ‘Active’ patients in Epic are those who have attended at least one appointment or procedure during the specified time period, in this case between 01/01/2017 to 01/01/2020, and who have at minimum some pieces of identifying information in the system, such as their birthdate. The system displays patients aged one to 100, grouped by four equal ranges of 25 years, and prompts the user to adjust or remove these age ranges as necessary.

Variables

1. Gender Identity

Patients who indicated their identity 'Male', 'Female' 'Transgender Male (FTM) or Transgender Female 'MTF' were grouped as the 'Binary' transgender population, and patients who indicated 'Genderqueer' or 'Other' were grouped as 'non-Binary.' For the purposes of this study, the "non-binary" group label is an umbrella term for genderqueer and all other adults who did not identify with any of the other options that indicate a 'binary' gender (man, woman, MTF); it is of note that individuals who appear on the TGNB registry that listed 'Other' may use a variety of different terms to define their gender (e.g. agender, bigender, trans-femme, etc.).

2. Diagnosis Categories

Within Epic SlicerDicer, when searching for a specific condition or ICD code, users may choose to "Show the top 10" most prevalent diagnosis or ICD codes for a predetermined population. Among this system's TGNB registry, of the top ten most prevalent diagnoses, three of them are mental health conditions: Generalized Anxiety Disorder, Major Depressive Disorder-single episode, and Post-Traumatic Stress Disorder. While these three ICD codes are the most frequently used, they represent three distinct sections of the mental disorders section in the ICD-10 codebook: Major Depressive Disorders (single episode) [F32], Other Anxiety Disorders [F41], and Reaction to Severe Stress and adjustment disorders [F43]. Because medical providers can have certain preferences to use one diagnosis over the other and the ICD-10 manual allows for highly specific coding (for example, the code F32.2 is a diagnosis of 'Major depressive disorder, single episode, severe without psychotic features'), patients with very similar symptom presentations could receive a different ICD-10 diagnosis depending on which provider they meet. To connect patients with similar symptoms, acknowledge the use of

different diagnostic codes between providers, and capture the breadth of psychopathology within the trans and gender non-conforming patient communities, patients with the same base code (i.e. F41 vs F43) were grouped together for comparison. The decision to group patients by base code is rooted in prior research using medical records review that groups diagnoses as a means to organize large groups of patient data to assess for risk factors (Kostylova, Swaine, Feldman, 2005; McClish et al, 1997; Axmon et al, 2018). Appendix A contains a table listing each mental illness diagnosis and their corresponding group name. Major Depressive Disorder (F33) was also included as a group based on its relevance and possible co-occurrence with the other disorders.

To assess the influence of Gender Identity and Gender Dysphoria on the development of mental disorders, those who have a diagnosis of gender dysphoria, or a former diagnosis of gender identity disorder were grouped for comparison (base code F64); whether someone did/did not have a gender dysphoria-related diagnosis on file was treated like other demographic variables. Appendix A also contains a list of each diagnosis grouped under 'gender identity/dysphoria diagnosis.'

3. Demographics

We used the population-level demographic function in Epic SlicerDicer to examine age, sex assigned at birth, race, Hispanic/Latino ethnicity, and insurance payer of TGNB-registry patients who do and do not have a diagnosis within one of the four diagnostic groups. Because SlicerDicer data is only viewable in aggregate form and cannot reveal individual patient information, demographic variables were viewable by setting terms to define each category. Age groups were set to less than 18 years old, age 18-35, age 36-65, and aged 66 and above. Sex assigned at birth, race, ethnicity, and insurance payer all contained the option for the

participant to select ‘other/refused,’ or leave the option blank and let it default to ‘none of the above’; patients in the ‘none of the above’ category are in Table 1 yet excluded from further analysis due to lack of meaningful information about their identities. ‘Hispanic/Latino’ or ‘NonHispanic Latino’ were the options for Ethnicity. Patients could choose one of the following to identify their race: White, Asian, Black, American Indian/Alaska Native, or Native Hawaiian/Other Pacific Islander. Those who identify as bi-racial or multi-racial could select one option, other/refused, or let it default to ‘none of the above’. To separate by insurance payer, we used the ‘show the top 10’ function of SlicerDicer to reveal the most common payer options among TGNB patients; from this, we created a dichotomous variable of ‘insurance status’ to compare low-income Medicaid patients to those suspected to be non-low-income–this included a combination of self-pay, private insurance, and Medicare patients. Because Medicare is not based on income, individuals within this population could fall under either category; in this case, Medicare patients were grouped under the ‘non-low-income’ patient group based on their low representation within cells of the sample (n<10) that did not impact the effect size significantly when added or removed from the sample. For later analyses (Tables 2-4), Race and Age were re-written as dichotomous variables for comparison to Sex Assigned at Birth, Insurance Payer, and presence of a Gender Identity/Dysphoria disorder. Age was dichotomization as 18-35 and 36-65, while those who indicated ‘Asian, Black, American Indian/Alaska Native or Native Hawaiian/Other Pacific Islander’ were grouped under the label ‘BIPOC’ and those who indicated ‘White’ were labeled ‘Non-BIPOC’; the BIPOC group was combined due to low cell numbers within individual racial groups.

Data Analysis

The analyses were conducted in STATA 16. Descriptive statistics were used to describe the demographics of the sample of transgender adults. Between-group chi^2 tests of significance were used to determine if there were any significant demographic or clinical differences between the non-binary, binary, and 'none of the above' groups.

To estimate the association of binary vs. non-binary gender (independent variable) and mood disorder diagnoses (dependent variable) across different population strata (age, racial identity, sex assigned at birth, Medicaid status, Gender Identity/Dysphoria disorder diagnosis) using the summary data available, we used statistical packages within STATA designed for meta-analysis. Of note, presence of a gender dysphoria disorder is not typically a 'demographic' characteristic yet is included among others in this analysis because it is a defining characteristic among this patient population.

In addition to examining the overall odds of any mood disorder diagnosis, exploratory analyses were also conducted to examine the odds of specific diagnostic categories of mood disorders (Depressive Episode, Major Depressive Disorder, Anxiety Disorder, Reaction to Severe Stress), using the same methods and overall model structure. Finally, meta regression was used to test for potential effect modification between pairs of two demographics as predictor variables (ex. age and sex at birth, BIPOC identity and sex at birth, etc.) in the association between gender identity and any mood disorder. The alpha level was set at $p < 0.05$.

IRB submitted in November 2021 determined further consent and IRB approval from patients was not needed due to the lack of identifying variables or risk to subjects.

Results

Descriptive Analysis

Table 1 highlights the sample demographics. In the final sample of 3893 transgender adults, 52.6% identified as 'non-binary' and 47.4% as binary. A majority of the sample were aged 18-35 (62.3%), had a non-Hispanic ethnicity (77.4%), and/or White racial identity (73.2%). For insurance payer, 55.7% of the sample were non-Medicaid status, compared to 14.3% on Medicaid and 30.1% Other/Refused. For Clinical Characteristics, a third (33.7%) of the sample had at least one diagnosis from the listed categories ('mood disorder group'). Only 14.4% of the sample had a diagnosis of gender identity disorder or Dysphoria in their chart. One third of individuals had at least one diagnosed mood disorder; anxiety disorders represented the largest group among TGNB adults in this sample (23.4%), followed by major depressive disorders (19.8%), depressive episodes (11.2%), and disorders based on reaction to severe stress (10%).

Comparison on Demographic Variables and Within Diagnosis Groups

Table 2 presents the association of being non-binary compared to binary with odds of having any of the mood disorder diagnoses, stratified across population characteristics, and **Figure 1** depicts these odds ratios as a forest plot. Overall, Non-binary transgender adults had 1.42 times the odds of having a mood disorder compared to binary transgender adults (95% CI: 1.23-1.61). There were significantly increased odds of mood disorder diagnoses in non-binary vs. Binary transgender adults in both those age 36-65 (OR=1.54, 95%CI = 1.20-1.98), and in those 18-35 (OR =1.23, 95%CI = 1.05-1.44). Non-binary patients Assigned Male at Birth had 1.5 times the odds of a mood disorder compared to binary transgender women (95%CI = 1.181.91), compared to Non-binary people Assigned Female at Birth who had 1.22 times the odds of a mood disorder compared to binary trans men (95%CI = 1.01-1.47). There were significantly

higher odds of a mood disorder diagnoses in non-binary compared to binary adults across the strata of Race, Medicaid status, and presence of a Gender dysphoria diagnosis, with higher odds of a mood disorder diagnosis among non-binary White (non-BIPOC) patients (OR = 1.33, 95%CI = 1.05-1.68), non-Medicaid patients (OR = 1.51, 95%CI = 1.20-1.81), and those without a gender dysphoria diagnosis (OR = 2.20, 95%CI = 1.89-2.57).

Table 3 examines within-group differences for patients of the same psychiatric diagnosis group, stratified across the demographic variables.

1. Depressive Episode: Overall, non-binary individuals had 1.12 times the odds of a depressive episode diagnosis compared to binary transgender individuals (95%CI = 1.03-1.39). Non-binary individuals with a gender dysphoria diagnosis had 1.47 the odds of also having depressive episode diagnosis compared to binary transgender individuals (95%CI = 1.022.13), while non-binary patients without a gender dysphoria diagnosis had 1.69 times the odds of also having depressive episode diagnosis compared to binary transgender individuals (95%CI = 1.41-2.03).
2. Major Depressive Disorder: Although the overall odds of major depressive disorder between non-binary and binary transgender people was not statistically significant, the odds ratio of 1.2 (95% CI 1.00-1.44) suggests a trending towards significance (p=0.05). There were no significant differences in the odds of major depressive disorder between non-binary and binary transgender people across strata of previously identified population characteristics.
3. Anxiety Disorder: Overall, non-binary individuals had 1.55 times the odds of an anxiety disorder diagnosis compared to binary transgender individuals (95%CI = 1.35-1.79). Differences across strata for each of the demographic variables were significant among those with anxiety, with non-binary patients having increased odds over binary patients in

each case. There were significantly increased odds of an anxiety disorder among non-binary vs. binary patients in both those age 36-65 (OR=1.51, 95%CI = 1.15-1.99) and in those age 18-35 (OR=1.42, 95%CI = 1.19-1.69). Non-binary patients assigned male at birth had increased odds of an anxiety disorder (OR=1.62, 95%CI = 1.03-1.54) compared to those assigned female at birth (OR=1.26, 95%CI = 1.24-2.13). BIPOC non-binary patients were 1.63 times more likely to have an anxiety disorder diagnosis compared to binary transgender patients (95%CI = 1.15-2.31), while White (non-BIPOC) non-binary people were 1.5 times more likely to have an anxiety disorder diagnosis compared to binary transgender patients (95%CI = 1.28-1.76). Medicaid and Non-Medicaid non-binary patients had 1.6 times the odds of an anxiety disorder diagnosis compared to binary transgender participants (95%CI = 1.14-2.24 and 95%CI = 1.37-2.01). There were significantly increased odds of an anxiety disorder diagnosis in non-binary compared to binary patients among both patients without a gender dysphoria diagnosis (OR=2.54, 95%CI = 1.03-2.17) and those with a diagnosis (OR=1.49, 95%CI = 2.13-3.03).

4. Reaction to Severe Stress: Overall, non-binary individuals had 1.36 times the odds of a reaction to severe stress diagnosis compared to binary transgender individuals (95%CI = 1.11-1.66). Differences by Age, Race, and Payer were each significant. Of patients individuals aged 18-36, non-binary individuals were 1.25 times more likely than binary individuals to have a diagnosis based on reaction to severe stress (95%CI 0.97-1.62); of patients aged 36-65, non-binary individuals were 1.51 times more likely than binary individuals to have a diagnosis based on reaction to severe stress (95%CI 1.07-2.13). BIPOC non-binary transgender people were 1.08 times more likely to have a reaction to severe stress diagnosis compared to binary transgender patients (95%CI 0.70-1.67); non-BIPOC non-

binary people were 1.39 times more likely to have a reaction to severe stress diagnosis compared to binary transgender patients (95%CI 1.10-1.75).

Table 4 presents the likelihood of a mood disorder diagnosis based on two interacting demographic variables. Due to the low prevalence of TGNB adults that have a diagnosis of Gender Identity Disorder/Dysphoria, when this variable was combined with the other demographic variables (age, sex at birth, race, payer), it led to small cell sizes (n<10) that overinflated the odds ratio and significance of the p-value when we ran the analysis. For this reason, interaction effects with Gender Identity Disorder were removed. In the interaction between Age and Insurance Payer, effect sizes were greatest among older non-binary patients on Medicaid, who had 1.95 times the odds of a mood disorder diagnosis compared to binary patients (95%CI 0.98-3.88). In the relationship between Race and Age, effect modification was the greatest among younger (18-35), BIPOC, non-binary adults, who had 1.48 times the odds of a mood disorder diagnosis compared to binary patients (95%CI 1.02-2.15). In the relationship between Race and Medicaid status, effect modification was the greatest among non-binary BIPOC individuals not on Medicaid, with 2.34 times the odds of a mood disorder diagnosis compared to binary transgender individuals (95%CI 1.51-3.61). In the relationship between Race and Gender Identity/Dysphoria Diagnosis, effect modification was the greatest among non-binary BIPOC individuals with a Gender Dysphoria Diagnosis, with 3.65 times the odds of a mood disorder diagnosis compared to binary transgender individuals (95%CI 1.16-11.50). In the relationship between Medicaid status and Sex assigned at birth, effect modification was the greatest among non-Medicaid, non-binary individuals assigned Male at birth, who had 1.6 times the odds of a mood disorder diagnosis compared to binary transgender women (95%CI 1.14-2.23).

Discussion

Over a third of both binary and non-binary patients had a diagnosis of a mood disorder, with non-binary adults being slightly more likely to have a diagnosis. This finding reflects the reality of mental health disparities within the U.S. TGNB population at large and adds nuance about the presence of psychiatric disorders among non-binary people that the literature has yet to address in depth. Non-binary transgender adults in this sample had consistently higher odds of a mood disorder compared to their binary transgender peers when stratified across the demographic characteristics and prior diagnosis of gender dysphoria. Achieving these findings within medical record data underscores the importance of disaggregation by identity when treating or researching the transgender and gender non-binary communities, as their different life experiences and transition goals are associated with distinctive health outcomes. Of all the distinct groups of mood disorders, almost a quarter (23.4%) of the entire sample had an anxiety disorder diagnosis. Clinicians working with binary or non-binary transgender patients could interpret this result as reason to increase screening for anxiety to address concerns before they reach a clinical level.

Most patients in the sample regardless of mood disorder did not have a gender identity/dysphoria diagnosis listed, and the odds of mood disorders overall and odds of depressive episode and anxiety disorder diagnoses were higher among non-binary people without a gender identity/dysphoria diagnosis. Obtaining a gender identity/dysphoria diagnosis is an early step in the process for TGNB folks accessing gender-affirming care, yet only 23% of 'binary' transgender patients, those believed to be most likely to access gender-affirming medical care, had this diagnosis listed. The abundance of folks without Gender Dysphoria in their chart could represent a lack of screening or discussion of gender identity disorders in

healthcare, namely among those with pre-existing anxiety or depressive episode diagnosis. This sample provides evidence that diagnosis of a gender identity disorder is not a common precursor to mental illness diagnosis, which contradicts the belief among many cisgender individuals that the transgender identity itself is a mental disorder. Many trans folks do not agree or identify with the diagnostic code for gender identity disorder/dysphoria since their dysphoria is based in social treatment of their presentation or identity, not in a medical disorder, and see the diagnosis of gender dysphoria as a gatekeeper for accessing care. The stress of obtaining this diagnosis and social discomfort around accessing care as a transgender person may cause certain TGNB folks to feel less comfortable disclosing aspects of their dysphoria with a provider. Whether under-diagnosis or genuinely separated from the medical description of dysphoria, this sample contrasts the belief that most transgender individuals, binary or non-binary, have gender dysphoria for which they're actively seeking medical intervention.

The demographic characteristics of the majority, non-Hispanic White with private or self-pay as an insurance option, match some of the regional demographics where this data was collected and represent those with most resources to access care, receive a diagnosis, and/or ability to update MyChart to provide these details. For odds of any mood disorder, White nonbinary patients had higher odds than BIPOC patients, and non-Medicaid patients had greater odds than Medicaid patients. White and non-Medicaid patients also had higher odds of a Reaction to Severe Stress diagnosis relative to their comparison groups. Again, this could be because these groups are significantly overrepresented in the sample. Because income, and therefore Medicaid eligibility, can fluctuate throughout a given year unlike the other demographic variables used, it may ultimately not be a useful proxy for socioeconomic status,

in a way that would be reflected within one's psychiatric diagnoses. While this may not have provided consistent results here, prior research would suggest that low-income TGNB people (who may/may not be connected to Medicaid) are less likely to engage in care, which would explain why there are so many non-Medicaid patients overall (Stanton, 2020).

It is of note that among BIPOC and Medicaid patients, the odds of any mood disorder and odds of Reaction to Severe Stress diagnosis were equally distributed among non-binary and binary patients: For both analyses, the 95% confidence interval (95%CI = 0.66-1.93 and 0.831.70, respectively) indicates that being a person of color (BIPOC) and Medicaid status are not factors in the relationship between gender identity and mood disorder diagnosis for these groups. Here, differences based on gender identity only appear among those perceived to have more privilege (i.e. white and not on Medicaid), and one's BIPOC identity or Medicaid status creates a more equalizing experience of mental pathology among all TG & NB patients. Trauma and the effects of the severe stress appear to affect members of the TGNB community equally, despite certain those with identities having greater access to formal diagnosis. Furthermore, BIPOC non-binary adults had increased odds of an anxiety disorder diagnosis compared to the White/non-BIPOC group, meaning that while stress reaction diagnoses are equally distributed between binary and non-binary BIPOC adults, those who exist as non-binary may embody stress as pathological anxiety as opposed a post-traumatic stress disorder.

Odds of overall mood disorder diagnosis and odds of an anxiety disorder specifically were higher among non-binary patients Assigned Male at Birth. This finding is expected, as gender-diverse Individuals who are assigned male at birth more often experience harassment and violence for diverting from masculine social norms, especially among those whose appearance is, by choice, not in line with the cisgender-heterosexual conceptualization of a

typical ‘man’ or ‘woman.’ Odds of overall mood disorder diagnosis and odds of anxiety disorder were also higher among older adults, age 35-65. Society only becomes more inclusive and accepting to gender-diverse people with the passage of time, so it is understandable that those who have lived through more oppressive decades of U.S. history would experience higher odds of mood disorder or anxiety diagnosis.

For the intersecting demographic factors (Table 4), the places where the levels of effect moderation were the greatest revealed certain intersections of identity whose odds of mood disorder diagnosis may be in line with the idea of additive stress, as in the Gender Minority Stress Theory. The greatest effect size among older adults on Medicaid may be indicative of this population experiencing greater comorbid conditions due to aging that may contribute to or exacerbate pre-existing mental health conditions; having fewer financial resources and navigating the public insurance system could contribute to the development of hopelessness, helplessness, and ultimately psychopathology. Younger BIPOC adults had the greatest effect size for its group, which is notable considering this is the only location where the younger age group (18-35) had a greater effect than the older. Young folks of color who are non-binary and gender-diverse may experience additive stress due to discrimination based on their age, race, and gender identity, which could include maltreatment from within their own racial group in the form of transphobia. While these dynamics are not fully clear from the data, it is possible that this group of 18–35-year-old BIPOC folks are more effected by current the U.S. political and social climate surrounding BIPOC transgender individuals, where violence and homicide towards this community increases with each passing year with little to no legislative protections.

In the relationship between Race and Sex assigned at birth, although the p-value is less than 0.05, the width of 3 of the confidence intervals containing the value of 1 suggests that the interaction between BIPOC/non-BIPOC identity and sex assigned at birth is not a factor in the

relationship between transgender identity and mood disorder. Again, the equal distribution of mood disorder among BIPOC non-binary and binary transgender patients of either sex assigned at birth could be an indicator that the effects of stress are comparable in each group. In the interaction with Medicaid status, the highest effect was found among BIPOC adults not on Medicaid, and those Assigned Male at Birth not on Medicaid. Despite these being the highest odds, in both cases, the odds of mood disorder didn't differ between non-binary and binary patients on Medicaid. As stated earlier, this finding is likely due to the high prevalence of patients not on Medicaid in the sample and provides information that among BIPOC patients on Medicaid and among AMAB patients on Medicaid, the odds of mood disorder are equally distributed among non-binary and binary patients. Again, while Medicaid status did not end up being as strong a predictor of mood disorder as originally thought, knowing that patients on Medicaid of all identities experience mood disorders could provide instruction on how to better screen this community for symptoms.

The odds of major depressive disorder diagnosis did not significantly differ between non-binary and binary transgender patients. This diagnostic group was included based on relation to the others, yet it is distinct in that it is more often labeled a genetic (or hereditary) condition, while episodic depression, anxiety, and severe stress reactions are all typically tied to a triggering event or set of life conditions. Because gender minority stress is based on external stressors, it is possible that TGNB folks do not disproportionately experience major depressive disorder.

Strengths & Limitations

A strength of this study is the large sample size relative to comparable studies that look at health differences between non-binary and binary transgender individuals (Scandurra et al,

2019). Although data cleaning was necessary, the number of non-binary patients in this sample and the levels of differences found between members of opposed demographic groups provide immense nuance to the body of evidence that exists about non-binary transgender people that may have been otherwise limited by sample size. Members of the research and advisory team for this project either identified as TGNB or had experience analyzing data with this community, and thus all involved made a concerted effort to ensure the data was organized in a way that respected our shared understanding of identity and intersectionality with the TGNB community. While it was necessary to make certain assumptions given the data that was available, the presence of lived experience with both gender dysphoria and mental illness on the research team meant that every decision made was done with immense care for the people whose stories are represented by these numbers.

This data was originally gathered for a use other than research purposes, and while it can provide direct insight into patient population disparities, the demographic information in a patient's medical record was not intended to provide social determinants of health data; without incentive for providers or patients to input this data, a high number of missing values can result, as evidenced in this sample (Haatef et al, 2019). Furthermore, without access to individual-level patient records, it was impossible to adjust for confounding to the degree that would be preferred. We were limited in what limited amount analyses could be accomplished with summary, population-level data that must fit cleanly into predetermined categories. Because this analysis could not account for multiple comparisons (for example, the multiplicative effect of the intersection of age and gender identity on mood disorder diagnosis), some of the significant associations may be due to chance alone. As these comparisons were

intended to generate hypotheses, these methodological limitations would need to be addressed in future studies addressing a similar question.

With regards to diagnosis, it is similarly important to recognize that this data only provides us with the prevalence of diagnosis by providers, not the actual prevalence of these conditions in the population–information that may lend a provider to diagnose one patient with a mood disorder over another may be missing, especially among TGNB people who have a history of low health care utilization and negative health care encounters. For this reason, certain authors have warned against grouping patients by diagnostic category in research with concerns that it limits power (Cadieux et al, 2017). Usage of a screening tool such as the PHQ-9 or GAD-7 could provide greater quantitative evidence of the symptom presentation behind these diagnoses; use of these measures wasn't possible within EpicSlicer but may be worth developing as another tool within Epic to get even more information about mental health among TGNB people. Diagnostic data in this format is also largely cross-sectional, so it could also be useful to conduct a longitudinal study with this cohort of TGNB adults to assess the prevalence of mood disorder in this population over time.

Response options to demographic variables are also limited to what's currently available in this system, while the options do expand as system versions update over time. The 'Non-Binary' population group was inferred from other response options based on reasonable estimation, but the results from this study would be even more compelling if patients were given the option to select 'non-binary' as an option instead of 'genderqueer' or 'other.' Inclusion of 'None of the Above' as a data column in Table 1 reveals this medical record system's gaps in data collection for the TGNB population: 49% of the whole sample of adults on the TGNB registry did not have their sex assigned at birth listed, and of those who did not list a

gender identity ('None of the Above'), 96.1% did not have their sex assigned at birth listed. Additionally, the ability to select only one racial option erases the identities of multi-racial people in the sample. Specifically, Hispanic/Latino ethnicity was not included as a demographic factor in the analysis based on the complexity of Latino identity: the inability to reflect multiracial identity accurately in this dataset makes it impossible to account for important racial and cultural differences, such as the experiences of those who live as White and Latino compared to Black or Brown and Latino. It may be valuable to repeat this study with similar methodology after another update of the Epic system and additional time and training to fill in gaps in demographic details.

Conclusion

There was a significantly higher odds of a mood disorder among non-binary transgender adults in our sample compared to binary adults even when stratified across various demographic variables. This finding was most consistent when it came to the presence of anxiety disorders. Our findings indicate that the high prevalence of mental health conditions documented among the entire TGNB population may be even higher among specifically nonbinary people, with special attention to anxiety conditions. Physicians working with non-binary transgender patients should screen for all mood disorder conditions, especially anxiety, knowing that this population may not currently be receiving adequate care based on more targeted outreach to binary transgender populations. Future research using tools within electronic medical record systems like Epic SlicerDicer should account for changes over time to the system that could affect response options, such as the ability to identify as multi-racial and explicitly 'non-binary', noting the limits of current response options in terms of analyzing patient demographics. It was beyond the purview of this study to do cross-analyses between

diagnostic groups to assess for the prevalence of co-morbid conditions between non-binary and binary patients; future research should consider the presence of co-morbid conditions as another version of when disability, or minority stress, is multiplicative, like the impact of intersectional identities. This study is among the first of its kind to consider the potential for differences between non-binary transgender and binary transgender people and opens the possibility for an even deeper understanding of the ways in which the intersection of gender diversity and socially defined identities can impact mental health outcomes.

Table 1 - Population Characteristics

Characteristic	*Non-Binary (N=2046)*	*Binary (N=1847)*	*None of the Above (N=2887)*	*Total (N=6780)*	*p*
Sex Assigned at Birth					
Female	1383(67.6%)	673(36.4%)	75 (2.6%)	2131 (31.4%)	**<0.001**
Male	428 (20.9%)	857 (46.4%)	39 (1.4%)	132 (19.5%)	
Other/Refused	235 (11.5%)	317 (17.2%)	2773 (96.1%)	3325 (49.0%)	
Age (years)					
<18	73 (3.6%)	69 (3.7%)	346 (12.0%)	488 (7.2%)	**<0.001**
18-35	1488 (72.7%)	1040(56.3%)	1693 (58.6%)	4221 (62.3%)	
36-65	443 (21.7%)	564 (30.5%)	651 (22.5%)	1658 (24.4%)	
65+	40 (2.0%)	174(9.4%)	197(6.8%)	411 (6.1%)	
Race					
American Indian/Alaska Native	72 (3.5%)	53 (2.9%)	68 (2.4%)	193 (2.8%)	**<0.001**
Asian	214 (10.5%)	138 (7.5%)	198 (6.9%)	550 (8.1%)	
Black	100 (4.9%)	108 (5.8%)	161 (5.6%)	369 (5.4%)	
Hawaiian/Pacific Islander	25 (1.2 %)	21 (1.1%)	28 (0.97%)	74 (1.1%)	
White	1603 (78.3%)	1417 (76.7%)	1941 (67.2%)	4961 (73.2%)	

Other/Refused	32 (1.6%)	110 (6.0%)	491 (17.0%)	633 (9.3%)	
Ethnicity					
Hispanic or Latino	211 (10.3%)	174 (9.4%)	186 (6.4%)	571 (8.4%)	**<0.001**
Non-Hispanic or Latino	1688 (82.5%)	1477(80.0%)	2084 (72.2%)	5249 (77.4%)	
Other/Refused	147 (7.2%)	196 (10.6%)	617 (21.3%)	960 (14.2%)	
Insurance Payer					
Medicaid	308 (15.0%)	310 (16.8%)	350 (12.1%)	968(14.3%)	**<0.001**
Non-Medicaid	1281 (62.6)	1100(59.6%)	1393 (48.2%)	3774 (55.7%)	
Other/Refused	457 (22.3%)	437 (23.7%)	1144 (39.6%)	2038 (30.1%)	
Clinical Characteristics					
Gender Dysphoria					
With Diagnosis	153 (7.5%)	436 (23.6%)	389 (13.5%)	978 (14.4%)	**<0.001**
Without	1893 (92.5%)	1411(76.4%)	2498 (86.5%)	5802 (85.6%)	
Any Mood Disorder	892 (43.6%)	652 (35.3%)	742(25.7%)	2286 (33.7%)	**<0.001**
Depressive Episode	509(24.9%)	400 (21.7%)	436 (15.1%)	756 (11.2%)	**<0.001**
Major Depressive Disorder	311 (15.2%)	240 (13.0%)	205 (7.1%)	1345 (19.8%)	**<0.001**
Anxiety Disorder	652 (31.9%)	428 (23.2%)	505 (17.5%)	1585 (23.4%)	**<0.001**
Reaction to Severe Stress	267 (13.0%)	184 (10.0%)	224 (7.8%)	675 (10.0%)	**<0.001**

Table 2: Association of binary vs non-binary with odds of any mood disorder diagnosis, stratified by population characteristics

Variables of Interest		*OR*	*95% CI*	*P value for effect modification for test across population strata*
Overall		1.42	1.24-1.61	**<0.001**
Age	18-35	1.23	1.05-1.44	
	36-65	1.54	1.20-1.98	**0.008**
Sex	AFAB	1.22	1.01-1.47	
	AMAB	1.50	1.18-1.91	**0.006**

Race	BIPOC	1.04	0.66-1.63	
	Non-BIPOC	1.33	1.05-1.68	**0.032**
Payer	Medicaid	1.19	0.83-1.70	
	Non-Medicaid	1.51	1.20-1.81	**0.001**
Dysphoria	Yes Diagnosis	1.71	1.07-2.73	
	No Diagnosis	2.20	1.89-2.57	**<0.001**

Figure 1– Forest Plot of Values in Table 2

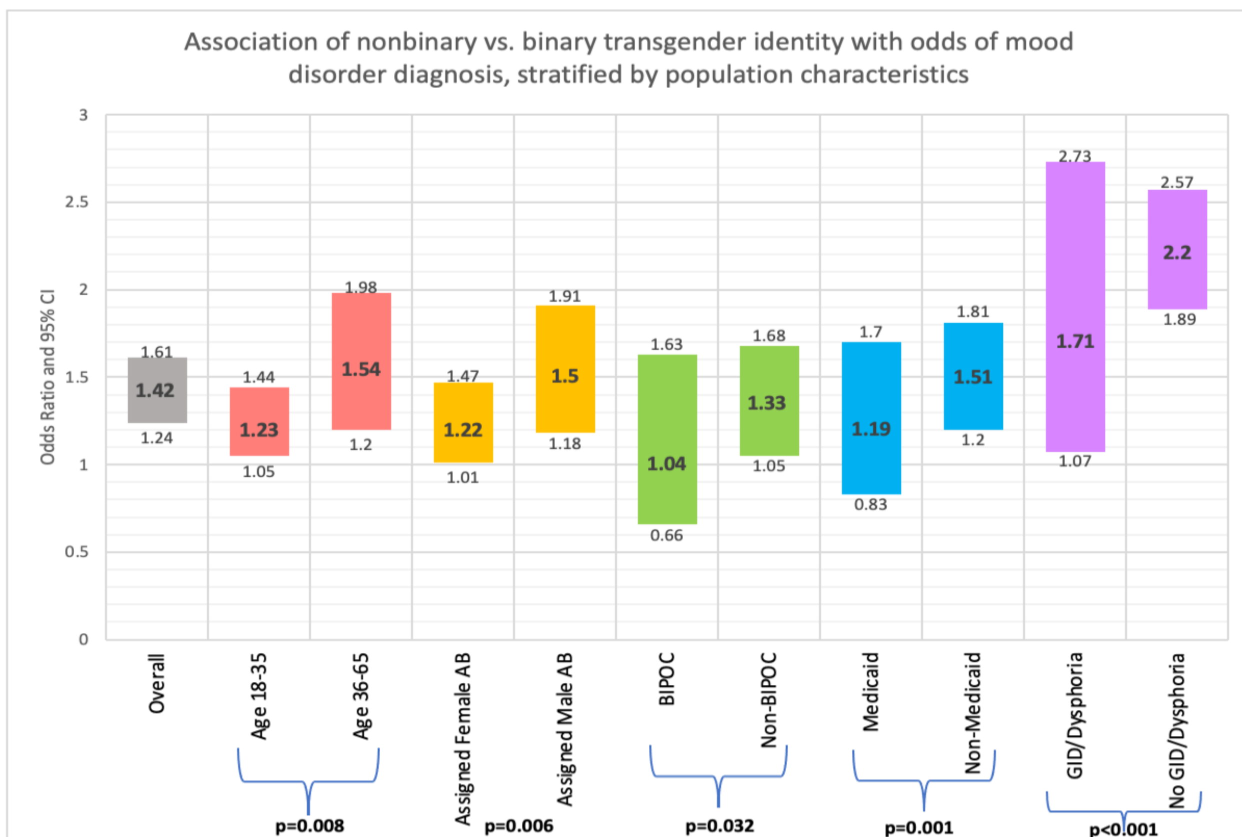

Table 3 - Association of binary vs non-binary with odds of individual mood disorder diagnoses, stratified by population characteristics

Diagnosis Groups x Variables of Interest		*OR**	*95% CI*	*P value for effect modification for test across population strata*
Depressive Episode		1.12	1.03-1.39	**0.02**
Age	18-35	1.05	0.88-1.26	

	36-65	1.11	0.84-1.48	0.40
Sex	AFAB	1.08	0.89-1.35	
	AMAB	1.50	1.18-1.91	0.09
Race	BIPOC	1.15	0.81-1.64	
	Non-BIPOC	1.17	0.99-1.38	**0.005**
Payer	Medicaid	0.98	0.70-1.38	
	Non-Medicaid	1.31	1.07-1.62	0.27
Dysphoria	Yes Diagnosis	1.47	1.02-2.13	
	No Diagnosis	1.69	1.41-2.03	**<0.001**
Major Depressive Disorder		1.2	1.00-1.44	0.05
Age	18-35	0.99	0.80-1.24	
	36-65	1.58	1.12-2.23	0.37
Sex	AFAB	1.33	1.02-1.75	
	AMAB	1.08	0.76-1.51	0.06
Race	BIPOC	2.19	1.36-3.56	
	Non-BIPOC	1.08	0.88-1.31	0.26
Payer	Medicaid	0.98	0.67-1.42	
	Non-Medicaid	1.15	0.91-1.46	0.37
Dysphoria	Yes Diagnosis	1.19	0.81-1.77	
	No Diagnosis	1.83	1.45-2.31	0.05
Anxiety Disorder		1.55	1.35-1.79	**<0.001**
Age	18-35	1.42	1.19-1.69	
	36-65	1.51	1.15-1.99	**<0.001**
Sex	AFAB	1.26	1.03-1.54	
	AMAB	1.62	1.24-2.13	**0.007**
Race	BIPOC	1.63	1.15-2.31	
	Non-BIPOC	1.50	1.28-1.76	**<0.001**
Payer	Medicaid	1.60	1.14-2.24	
	Non-Medicaid	1.66	1.37-2.01	**<0.001**
Dysphoria	Yes Diagnosis	1.49	1.03-2.17	
	No Diagnosis	2.54	2.13-3.03	**0.009**
Table 3 (continued): Reaction to Severe Stress		1.36	1.11-1.66	**0.003**
Age	18-35	1.25	0.97-1.62	
	36-65	1.51	1.07-2.13	**0.006**

Sex	AFAB	1.42	1.06-1.91	
	AMAB	1.51	0.71-1.57	0.11
Race	BIPOC	1.08	0.70-1.67	
	Non-BIPOC	1.39	1.10-1.75	**0.008**
Payer	Medicaid	1.31	0.88-1.96	
	Non-Medicaid	1.51	1.14-1.99	**0.002**
Dysphoria	Yes Diagnosis	1.27	0.85-1.91	
	No Diagnosis	2.44	1.85-3.22	0.07

Table 4 - Interactions between Variables, Odds of Mood Disorder

Variables of Interest	*OR**	*95% CI*	*p*
Age 18-35, AMAB	1.43	1.04-1.96	
Age 18-35, AFAB	1.00	0.80-1.26	
Age 36-65, AMAB	1.17	0.76-1.80	
Age 36-65, AFAB	1.56	1.06-2.35	0.06
Age 18-35, Medicaid	1.02	0.66-1.63	
Age 18-35, non-Medicaid	1.33	1.05-1.68	
Age 36-65, Medicaid	1.95	0.98-3.88	
Age 36-65, non-Medicaid	1.41	1.01-1.98	**0.001**
BIPOC, 18-35	1.48	1.02-2.15	
BIPOC, 36-65	1.14	0.60-2.15	
Non-BIPOC, 18-35	1.15	0.96-1.38	
Non-BIPOC, 36-65	1.44	1.09-1.90	**0.004**
BIPOC, AMAB	1.50	0.87-2.56	
BIPOC, AFAB	1.43	0.90-2.29	
Non-BIPOC, AMAB	1.42	1.08-1.89	
Non-BIPOC, AFAB	1.19	0.96-1.46	**0.001**

BIPOC, Medicaid	1.56	0.73-3.34	
BIPOC, non-Medicaid	2.34	1.51-3.61	
Non-BIPOC, Medicaid	0.78	0.51-1.20	
Non-BIPOC, Non-Medicaid	1.40	1.14-1.72	**<0.001**
Medicaid, AMAB	0.96	0.49-1.92	
Medicaid, AFAB	1.31	0.77-2.24	
Non-Medicaid, AMAB	1.60	1.14-2.23	
Non-Medicaid, AFAB	1.40	1.08-1.82	**0.0003**

Appendix A

ICD Base Code	Group Name	Diagnoses coded under group name (most common among TGNB in bold)
F32	Depressive Episode	F32.0 **Major depressive disorder, single episode, mild** F32.1 Major depressive disorder, single episode, moderate F32.2 Major depressive disorder, single episode, severe without psychotic features F32.3 Major depressive disorder, single episode, severe with psychotic features F32.4 Major depressive disorder, single episode, in partial remission F32.5 Major depressive disorder, single episode, in full remission F32.8 Other depressive episodes · F32.81 Premenstrual dysphoric disorder · F32.89 Other specified depressive episodes F32.9 Major depressive disorder, single episode, unspecified F32.A Depression, unspecified
F33	Major Depressive Disorder	F33.0 Major depressive disorder, recurrent, mild F33.1 Major depressive disorder, recurrent, moderate F33.2 Major depressive disorder, recurrent severe without psychotic features F33.3 Major depressive disorder, recurrent, severe with psychotic symptoms F33.4 Major depressive disorder, recurrent, in remission ● F33.40 …… unspecified ● F33.41 Major depressive disorder, recurrent, in partial remission ● F33.42 Major depressive disorder, recurrent, in full remission F33.8 Other recurrent depressive disorders

F41	Other Anxiety Disorders	F41.0 Panic disorder [episodic paroxysmal anxiety] F41.1 **Generalized anxiety disorder** F41.3 Other mixed anxiety disorders F41.8 Other specified anxiety disorders F41.9 Anxiety disorder, unspecified
F43	Reaction to severe stress, and adjustment disorders	F43.0 Acute stress reaction F43.1 **Post-traumatic stress disorder (PTSD)** • F43.10 Post-traumatic stress disorder, unspecified • F43.11 Post-traumatic stress disorder, acute • F43.12 Post-traumatic stress disorder, chronic F43.2 Adjustment disorders • F43.20 Adjustment disorder, unspecified • F43.21 Adjustment disorder with depressed mood • F43.22 Adjustment disorder with anxiety • F43.23 Adjustment disorder with mixed anxiety and depressed mood • F43.24 Adjustment disorder with disturbance of conduct • F43.25 Adjustment disorder with mixed disturbance of emotions and conduct • F43.29 Adjustment disorder with other symptoms

References:

James, S. E., Herman, J. L., Rankin, S., Keisling, M., Mottet, L., & Anafi, M. (2016). *The Report of the 2015 U.S. Transgender Survey*. Washington, DC: National Center for Transgender Equality.

Testa, R., Jimenez, C., & Rankin, S. (2013). *Risk and Resilience During Transgender Identity Development: The Effects of Awareness and Engagement with Other Transgender People on Affect*. Journal of Gay & Lesbian Mental Health, 18(1), 31-46.

Wilson, B. & Meyer, I. (2021). Non-binary LGBTQ Adults in the United States. *UCLA School of Law Williams Institute* [Brief]. Accessed Dec 15, 2021, at https://williamsinstitute.law.ucla.edu/wphttps://williamsinstitute.law.ucla.edu/wp-content/uploads/Nonbinary-LGBTQ-Adults-Jun-2021.pdfcontent/uploads/Non-binary-LGBTQ-Adults-Jun-2021.pdf

Valentine, S., & Shipherd, J. (2018). A systematic review of social stress and mental health among transgender and gender non-conforming people in the United States. Clinical Psychology Review, 66, 2438.

Tordoff DM, Minalga B, Gross BB, Martin A, Caracciolo B, Barbee LA, Balkus JE, Khosropour CM. (2021) Erasure and health equity implications of using binary male/female categories in sexual health research and HIV/STI surveillance: recommendations for transgender-inclusive data collection and reporting. *Sexually Transmitted Diseases*. Published-Ahead-of-Print. doi: 10.1097/OLQ.0000000000001533

Flentje, A., Heck, N., & Sorensen, J. (2014). Characteristics of transgender individuals entering substance abuse treatment. *Addictive Behavior*, 39(5), 969–75.

Meyer, I. (2003). Prejudice, Social Stress, and Mental Health in Lesbian, Gay, and Bisexual Populations: Conceptual Issues and Research Evidence. *Psychological Bulletin,* 129(5): 674–697.

Wanta, J., Niforatos, J., Durbak, E., Viguera, A., & Altinay, M. (2019). Mental Health Diagnoses Among Transgender Patients in the Clinical Setting: An All-Payer Electronic Health Record Study. *Transgender Health* 4, no. 1: 313–15. https://doi.org/10.1089/trgh.2019.0029.

Millet, N., Longworth, J. & Arcelus, J. (2017) Prevalence of anxiety symptoms and disorders in the transgender population: A systematic review of the literature, *International Journal of Transgenderism*, 18:1, 27-38, DOI: 10.1080/15532739.2016.1258353

Center for American Progress (2015, October 7). New HHS Rules Require Sexual Orientation and Gender Identity Data Collection in Electronic Health Records Program [Press release]. Retrieved from https://www.americanprogress.org/press/statement-new-hhs-rules-require-sexual-orientation-andhttps://www.americanprogress.org/press/statement-new-hhs-rules-require-sexual-orientation-and-gender-identity-data-collection-in-electronic-health-records-program/gender-identity-data-collection-in-electronic-health-records-program/

Parra, Luis A., and Paul D. Hastings. (2018) "Integrating the Neurobiology of Minority Stress with an Intersectionality Framework for LGBTQ-Latinx Populations." *New Directions for Child and Adolescent Development* 2018, no. 161: 91–108. https://doi.org/10.1002/cad.20244.

Testa, R., Habarth, J., Peta, J., Balsam, K., & Bockting, W. (2015). Development of the Gender Minority Stress and Resilience Measure. Psychology of Sexual Orientation and Gender Diversity, 2 (1), 65-77.

Grant, J., Mottet, L., Tanis, J., Harrison, J., Herman, J., and Keisling, M. (2011). Injustice at Every Turn: A Report of the National Transgender Discrimination Survey. Washington: National Center for Transgender Equality and National Gay and Lesbian Task Force.

Shepherd, J., Green, K., & Abramovitz, S. (2010). Transgender Clients: Identifying and Minimizing Barriers to Mental Health Treatment. Journal of Gay & Lesbian Mental Health, 14:94–108

Redfern, J. & Sinclair, B. (2014). Improving health care encounters and communication with transgender patients, Journal of Communication in Healthcare, 7:1, 25-40, DOI: 10.1179/1753807614Y.0000000045

Noonan, E., Sawning, S., Combs, R., Weingartner, L., Martin, L., Jones, V. & Holthouser, A. (2018) Engaging the Transgender Community to Improve Medical Education and Prioritize Healthcare Initiatives, Teaching and Learning in Medicine, 30:2, 119-132, DOI: 10.1080/10401334.2017.1365718

Jarrett BA, Peitzmeier SM, Restar A, Adamson T, Howell S, et al. (2021) Gender-affirming care, mental health, and economic stability in the time of COVID-19: A multi-national, cross-sectional study of transgender and non-binary people. PLOS ONE 16(7): e0254215. https://doi.org/10.1371/journal.pone.0254215

Dewey, J. and Gesbeck, M. (2017) "(Dys) Functional Diagnosing: Mental Health Diagnosis, Medicalization, and the Making of Transgender Patients." Humanity & Society 41, no. 1: 37–72. https://doi.org/10.1177/0160597615604651.

Jasuja, G., de Groot, A., Quinn, E., Ameli, O., Hughto, J., Dunbar, M., Deutsch, M. (2020). "Beyond Gender Identity Disorder Diagnoses Codes: An Examination of Additional Methods to Identify Transgender Individuals in Administrative Databases." Medical Care 58, no. 10: 903–11. https://doi.org/10.1097/MLR.0000000000001362.

Jones, B., Bouman, W., Haycraft, E., and Arcelus, J. (2019) "Mental Health and Quality of Life in Non-Binary Transgender Adults: A Case Control Study." The International Journal of Transgenderism 20, no. 2–3: 251–62. https://doi.org/10.1080/15532739.2019.1630346.

D'Angelo, A., Argenio, K., Westmoreland, D., Appenroth, M., and Grov, C. (2021). "Health and Access to Gender-Affirming Care During COVID-19: Experiences of Transmasculine Individuals and Men Assigned Female Sex at Birth." American Journal of Men's Health 15, no. 6: 15579883211062680. https://doi.org/10.1177/15579883211062681

Lefevor, G., Boyd-Rogers, C., Sprague, B., and Janis, R. (2019) "Health Disparities between Genderqueer, Transgender, and Cisgender Individuals: An Extension of Minority Stress Theory." Journal of Counseling Psychology 66, no. 4: 385–95. https://doi.org/10.1037/cou0000339

2015 American Psychological Association 0003-066X/15/$12.00 Vol. 70, No. 9, 832– 864 http://dx.doi.org/10.1037/a0039906

Kachen, A., Pharr, J., Chien, L-C., and Flatt, J. (2022). "Creating a Minority Stress Index to Examine Mental Health Impacts of Discrimination Among Transgender and Gender Non-binary Adults." *LGBT Health* 9, no. 1: 63–71. https://doi.org/10.1089/lgbt.2021.0088.

Hatef, E., Rouhizadeh, M., Tia, I., Lasser, E., Hill-Briggs, F., Marsteller, J., and Kharrazi, H. (2019) "Assessing the Availability of Data on Social and Behavioral Determinants in Structured and Unstructured Electronic Health Records: A Retrospective Analysis of a Multilevel Health Care System." *JMIR Medical Informatics* 7, no. 3: e13802. https://doi.org/10.2196/13802.
Cadieux, G., Tamblyn, R., Buckeridge, D., and Dendukuri, N (2017). "Validation of Diagnostic Groups Based on Health Care Utilization Data Should Adjust for Sampling Strategy." *Medical Care* 55, no. 8: e59–67. https://doi.org/10.1097/MLR.0000000000000324.

Kostylova, A., Swaine, B., and Feldman, D. (2005) "Concordance between Childhood Injury Diagnoses from Two Sources: An Injury Surveillance System and a Physician Billing Claims Database." *Injury Prevention: Journal of the International Society for Child and Adolescent Injury Prevention* 11, no. 3: 186–90. https://doi.org/10.1136/ip.2004.006585.

McClish, D., Penberthy, L., Whittemore, M., Newschaffer, C., Woolard, C., Desch, C., and Retchin, S. (1997) "Ability of Medicare Claims Data and Cancer Registries to Identify Cancer Cases and Treatment." *American Journal of Epidemiology* 145, no. 3: 227–33. https://doi.org/10.1093/oxfordjournals.aje.a009095.

Axmon, A., Björne, P., Nylander, L., and Ahlström, G. (2018) “Psychiatric Diagnoses in Older People with Intellectual Disability in Comparison with the General Population: A Register Study.” *Epidemiology and Psychiatric Sciences* 27, no. 5: 479–91. https://doi.org/10.1017/S2045796017000051.

Progovac, A., Cook, B., Mullin, B., McDowell, A., Sanchez, M., Wang, Y., Creedon, T., and Schuster, M. (2018) “Identifying Gender Minority Patients’ Health And Health Care Needs In Administrative Claims Data.” *Health Affairs* 37, no. 3: 413-420,420A-420H. http://dx.doi.org/10.1377/hlthaff.2017.1295.

Valente, P., Schrimshaw, E., Dolezal, C., LeBlanc, A., Singh, A., and Bockting, W. (2020) “Stigmatization, Resilience, and Mental Health Among a Diverse Community Sample of Transgender and Gender Nonbinary Individuals in the U.S.” *Archives of Sexual Behavior* 49, no. 7: 2649–60. https://doi.org/10.1007/s10508-020-01761-4.

Stanton, A., Batchelder, A., Kirakosian, N., Scholl, J., King, D., Grasso, C., Potter, J., Mayer, K., and O’Cleirigh, C. (2021) “Differences in Mental Health Symptom Severity and Care Engagement among Transgender and Gender Diverse Individuals: Findings from a Large Community Health Center.” *PLOS ONE* 16, no. 1: e0245872. https://doi.org/10.1371/journal.pone.0245872.

Reisner, S., and Hughto, J. (2019). “Comparing the Health of Non-Binary and Binary Transgender Adults in a Statewide Non-Probability Sample.” *PLOS ONE* 14, no. 8 (August 27, 2019): e0221583. https://doi.org/10.1371/journal.pone.0221583.