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## ABSTRACT

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# Economic Outcomes for Transgender People and Other Gender Minorities in the United States: First Estimates from a Nationally Representative Sample\*

We provide the literature's first estimates of economic outcomes for transgender people and other gender minorities in the United States using nationally representative data from the Household Pulse Survey. We find that transgender women – individuals who were assigned male at birth but who identify as female – are significantly less likely to be employed, have higher poverty rates, are more likely to have public health insurance, and report greater food insecurity compared to otherwise similar cisgender men. Differences between non-cisgender individuals who were assigned female at birth and cisgender women are smaller. Non-cisgender Black individuals fare significantly worse than non-cisgender white individuals, regardless of sex assigned at birth. Our results demonstrate the precarious economic position of gender minority populations in America.

**JEL Classification:** J1

**Keywords:** transgender, gender minority, economic outcomes, Household Pulse Survey

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## **1. Introduction**

Scholarship in economics on sexual minorities (e.g., lesbians, gay men, and bisexual individuals) has grown significantly since Badgett’s seminal 1995 paper documenting wage penalties for gay men (for a brief overview, see Badgett et al. 2021). Yet far less is known about economic experiences of gender minorities and gender diverse populations such as people who are transgender and/or nonbinary.<sup>1</sup> Transgender individuals are people whose gender identity and/or gender expression or behavior differ from their sex assigned at birth or differ from gender-cultural norms attached to their sex assigned at birth.<sup>2</sup> Cisgender individuals identify with their sex assigned at birth. Nonbinary individuals are people whose gender identity is neither exclusively male nor exclusively female. Carpenter et al. (2020) outline numerous possible channels through which gender minority status could be related

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<sup>1</sup> Sexual orientation and gender identity are distinct concepts; all individuals have one or more sexual orientations and one or more gender identities. Sexual minorities include individuals who are attracted to and/or have sex with individuals of the same sex; these individuals are generally referred to as lesbians, gay men, and bisexual individuals. Gender identity refers to one’s sense of being male, female, both, or neither. Gender minorities are individuals whose current gender does not match their sex assigned at birth. Gender minorities can have any sexual orientation, and indeed most surveys, including the Household Pulse, show that most gender minorities identify as heterosexual. Similarly, sexual minorities can have any gender identity, and the vast majority of sexual minorities identify as cisgender. Our paper is primarily about gender identity and gender minority status, though we control for sexual orientation and sexual minority status in our empirical models.

<sup>2</sup> Transgender and gender non-conforming individuals may include transsexuals, androgynous people, cross-dressers, genderqueers, and other gender non-conforming people who identify as transgender. Some, but not all, of these individuals may desire to undergo medical and/or legal sex changes. Transgender individuals whose gender identity does not match their sex assigned at birth and who desire to change from one sex to another are sometimes referred to as ‘MTF’ (for individuals who transition from male to female) or ‘FTM’ (for individuals who transition from female to male). There is a wide variance in the use of these labels; for example, ‘MTF’ can be used by individuals who are assigned male at birth and identify as a woman but have not taken steps to change their gender expression.

to economic outcomes, including: labor market discrimination, differential health profiles, and differential willingness to identify as gender minorities in surveys.

Understanding the economic position of transgender and gender diverse people in the United States is important for several reasons. First, gender minorities are a sizable and increasing share of the population. Gallup data from 2021 indicate that 2.1 percent of Generation Z individuals (those born between 1997 and 2012) identify as transgender (Jones 2002). Flores et al. (2016) estimate that there are about 1.4 million transgender adults in the United States, and a recent population-based study estimated that 1.2 million adults in the United States identify as nonbinary, with increasing shares of LGBTQ+ youth – 1 in 4 LGBTQ+ Gen Z individuals – embracing a nonbinary identity (Wilson and Meyer 2021).<sup>3</sup> Second, a recent Supreme Court ruling in 2020 in *Bostock vs. Clayton County* ruled that employment discrimination against transgender individuals is prohibited under federal civil rights law (*Bostock v. Clayton County* 590 U.S. \_\_\_\_ 2020). Understanding the extent to which transgender people are experiencing lower employment than otherwise similar cisgender people is likely to be important for enforcing this new policy. Related to this, there is increasing attention to transgender rights and policies in the US and internationally with respect to medical care, bathroom access, sports participation, conversion therapy, and a range of

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<sup>3</sup> Not all nonbinary individuals are transgender, and not all transgender individuals identify as nonbinary. These data, however, speak to the increasing prevalence of gender diverse individuals in the population.

related issues that could affect the ability of gender minorities to accumulate human capital and obtain labor market opportunities.

In this paper, we provide the literature's first nationally representative estimates of the relationship between gender minority status and economic outcomes in the United States. Prior research examining economic outcomes of gender minorities in the US has either used non-representative data derived from snowball or convenience sampling or has used representative data from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS), which administered questions about transgender status only to a limited subset of states. We advance the literature by using data from Wave 3.2 of the US Census Bureau's Household Pulse survey, which was designed to study how COVID-19 affected American households. Beginning in July 2021, the survey included questions that allow identification of transgender and other gender diverse people. Specifically, the Household Pulse asked people their sex assigned at birth as well as their current gender. Regarding current gender, individuals could respond 'male', 'female', 'transgender', or 'None of these'. Across the first six weeks of publicly released Pulse data that included these questions, we identify over 4,400 individuals who are not cisgender (i.e., whose current gender does not match their sex assigned at birth).

In addition to the Household Pulse data being nationally representative, these data have another key advantage related to how gender minorities are

identified in the survey. In the CDC BRFSS, individuals are directly asked: “Do you consider yourself to be transgender?” Response options include: ‘yes, transgender, male-to-female’, ‘yes, transgender, female-to-male’, ‘yes, transgender, gender non-conforming’ or ‘no’. A consequence of this approach is that individuals who are gender non-conforming, non-binary, or who use other terms besides ‘transgender’ to describe their gender identity may plausibly respond ‘No’ to the question ‘Do you consider yourself to be transgender?’ and thus be missed by the BRFSS question. In contrast, the Household Pulse’s two-step approach of asking first about sex assigned at birth and separately about current gender – while also offering a response option of ‘None of these’ in addition to ‘male’, ‘female’, and ‘transgender’ to describe current gender – is arguably more likely to identify individuals who use terms other than ‘transgender’ to describe themselves. In fact, our data show below that the vast majority of non-cisgender individuals in the Household Pulse are people who responded that ‘None of these’ accurately described their current gender. Below we show that the ‘None of these’ respondents – which the CDC BRFSS is likely to miss – are systematically different than cisgender people and other gender minorities. The ‘None of these’ group may include nonbinary individuals and other non-cisgender individuals who use other terms to describe their gender.

We examine a range of economic outcomes available in the Household Pulse, including: employment, household income, poverty status, use of the social

safety net, and food insecurity. Our large samples of transgender individuals also allow us the literature's first examination of the intersections between race/ethnicity and gender minority status using representative data.

We report several key findings. First, we show that individuals who are not cisgender have significantly lower employment rates than cisgender individuals, on the order of 3.9 to 6.6 percentage points. Second, we show that differences in economic outcomes differ significantly across individuals who were assigned male at birth versus individuals who were assigned female at birth. For individuals assigned male at birth, the economic penalties for individuals who are not cisgender are concentrated primarily among those who identify as female (i.e., transgender women, or transgender male-to-female 'MTF' individuals). For individuals assigned female at birth, in contrast, we find no economic penalties for those who identify as male (i.e., transgender men, or transgender female-to-male 'FTM' individuals). In fact, we consistently estimate that transgender men have higher employment rates and household incomes than otherwise similar cisgender women. Although not all of these estimates are statistically significant, they are consistent with a return to maleness in the labor market, as argued by prior work (Schilt and Wiswall 2008, Geijtenbeek and Plug 2018, and others). We do consistently find that individuals assigned female at birth but who said the best descriptor of their current gender was 'None of these' (as opposed to female, male, or transgender) have consistently worse economic outcomes than comparable cisgender women.



Third, we find that transgender women have pervasive economic disadvantages: in addition to much lower employment, they also have lower household incomes, higher poverty rates, greater social safety net use, and greater food insecurity than otherwise similar cisgender men. Finally, we find consistent evidence that non-cisgender Black individuals fare significantly worse compared to otherwise similar non-cisgender white individuals with respect to economic outcomes, and this is true regardless of sex assigned at birth. Taken together, our results provide the most timely evidence using population-based nationally representative data on the challenges facing gender minority individuals coming out of the first major waves of the COVID-19 pandemic and confirm the presence of ‘double disadvantage’ in economic outcomes for non-cisgender Black people.

The remainder of the paper proceeds as follows. Section 2 offers a review of the emerging literature on transgender status and economic outcomes. Section 3 describes the data and empirical approach. Section 4 presents the results, and Section 5 offers a discussion and concludes.

## **2. Literature Review**

Very few studies examine the relative economic position of gender minorities in the United States, largely due to a lack of data. We are aware of just two large-scale multi-state surveys that include information on transgender status in the US. First, the Centers for Disease Control and Prevention’s Behavioral Risk Factor

Surveillance System (BRFSS) has included a standardized sexual orientation and gender identity (SOGI) module since 2014. Individuals are directly asked: “Do you consider yourself to be transgender?”, and respondents can identify that they are male-to-female, female-to-male, or gender non-conforming. The module is optional for states to administer, and from 2014-2020, 35 states have included the SOGI questions and released their data to the public-use file (PUF). Carpenter et al. (2020) examined the 2014-2018 waves of these data and found that transgender people had significantly worse economic outcomes than otherwise similar cisgender people in terms of lower household incomes, lower employment rates, and higher poverty rates. More recently, Mann (2021) has also used these BRFSS data to examine the effects of state policies removing surgery requirements for change of legal gender.

The other multi-state dataset used in the literature is the United States Transgender Survey (USTS). The USTS is an online survey that uses non-representative sampling methods to achieve a large sample of individuals who identify as transgender.<sup>4</sup> These data also identify sex assigned at birth in addition to current gender. Shannon (2021) found that transgender people in the 2015 USTS earned significantly less than otherwise similar individuals in the 2015 American Community Survey.

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<sup>4</sup> USTS has fielded surveys in 2015 and 2022, and its predecessor, National Transgender Discrimination Survey previously fielded a survey in 2008-2009.

The only other evidence on transgender status and economic outcomes in the United States comes from very small non-representative samples or from single state studies. For example, Schilt and Wiswall (2008) studied individuals who attended transgender conferences in the United States as well as individuals who participated in a transgender-focused internet site. They found that individuals who transitioned from male to female experienced a large earnings decline (on the order of 30%), while individuals who transitioned from female to male experienced a small earnings increase. Using data from the 2007-2009 Massachusetts Behavioral Risk Factor Surveillance System, Conron *et al.* (2012) found nonelderly (18-64 year old) transgender adults were more likely to be unemployed (33% vs 12%) and in poverty (31% vs 9%) compared to their non-transgender peers.<sup>5</sup>

Finally, emerging evidence from outside the US uses administrative data where transgender status is identified from a gender change in registry data or from medical diagnoses of gender dysphoria or related conditions. Using administrative data from the Netherlands, Geijtenbeek and Plug (2018) find a similar qualitative pattern as in Schilt and Wiswall (2008) and also find that female-to-male transgender individuals in their sample earn more than similarly situated cisgender women but less than similarly situated cisgender men.<sup>6</sup>

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<sup>5</sup> Other evidence from non-random samples of transgender populations collected through transgender-serving advocacy organizations supports these findings (Grant et al. 2011, Xavier et al. 2007).

<sup>6</sup> In a related paper, Cerf Harris (2015) uses individuals who change their first names and sex coding with the Social Security Administration as a novel way to identify a population of individuals likely

Our study builds on the prior literature in several ways. First, the data we use are the first nationally representative data on transgender and other gender diverse people from the United States. The Household Pulse data are also the only representative data that use a ‘two-step’ method to elicit gender identity by asking direct questions about both sex assigned at birth and current gender. Second, our results are, to our knowledge, the first evidence on the relative difficulties faced by transgender and gender diverse people in the US with respect to food insecurity.<sup>7</sup> We also offer the literature’s first estimates of social safety net use (public health insurance and Supplemental Nutrition Assistance Program receipt) by gender minority people in the United States. Third, because of our large sample sizes of non-cisgender people (over twice the sample size of gender minorities compared to Carpenter et al. 2020), we are able to meaningfully identify intersections between race/ethnicity and gender minority status.

### **3. Data Description and Empirical Approach**

#### **3.1 Data Description**

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to be transgender. Cerf Harris (2015) does not estimate earnings models similar to Schilt and Wiswall (2008) or Geijtenbeek and Plug (2018), however.

<sup>7</sup> Another report worth noting is File and Marshall (2021) who describe mean differences from the Household Pulse data with respect to food and economic insecurity between LGBT and non-LGBT people. Our work differs in that: we explicitly focus on gender minorities and the differences across sub-categories of non-cisgender individuals; we consider other economic outcomes such as employment, household income, and poverty; we estimate regression models that control for observable characteristics; and we examine the intersections of race/ethnicity and gender minority status.

We use data from wave 3.2 of the Census Bureau’s Household Pulse Survey. The Household Pulse was designed to study how Americans were dealing with the COVID-19 pandemic. As such, it includes detailed questions on how COVID-19 affected people with respect to employment, housing, and food security. A key feature of the Household Pulse is its large sample size and very quick release of data. These data have been previously used to examine consumption patterns and financial well-being (Garner, Safir, and Schild 2020), food and housing insecurity (Bitler, Hoynes, and Schanzenbach 2020), and education supply (Bansak and Starr 2021).

The Household Pulse is an online survey that contacts households by email and/or text message using information from the Census Master Address File and other supplemental sources. The Household Pulse records responses if the respondent answered the first set of questions on demography and vaccination; during wave 3.2, the Household Pulse’s response rate was between 5.4 and 6.5 percent. The questions asked later in the survey are subject to nonresponse bias from attrition. The Census Bureau provides weights based on the sampling area’s demographic characteristics from the American Community Survey (ACS) to adjust for the nonresponse bias. Although the weights do not account for the transgender respondent’s selection into nonresponse and the mid-survey attrition, we use the person weights provided in the Household Pulse to improve the sample’s population representativeness.

The Census Bureau added questions about gender identity to the Household Pulse in wave 3.2, which was fielded from July to October 2021. Specifically, respondents are asked: “What sex were you assigned at birth, on your original birth certificate?” Response options include male or female.<sup>8</sup> We refer to the respondent’s reported sex assigned at birth as ‘assigned male at birth’ (AMAB) or ‘assigned female at birth’ (AFAB). Individuals are then asked: “Do you currently describe yourself as male, female, or transgender?” Response options include: male; female; transgender; and ‘None of these’.<sup>9</sup> To reduce the possibility that cisgender individuals incorrectly mark either their sex assigned at birth or their current gender, all individuals whose answers to those two questions do not match are asked a follow-up question that reads: “Just to confirm, you were assigned \_\_\_\_ at birth and now you describe yourself as \_\_\_\_\_. Is that correct?” If the respondent replies ‘no’ to this confirmation question, the questions about sex assigned at birth and current gender are asked again with the additional explicit instruction that respondents “confirm or correct” their answers to each question.<sup>10</sup>

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<sup>8</sup> We drop a small number of individuals whose sex assigned at birth was imputed by the Household Pulse dataset. We discuss this issue in the Online Appendix.

<sup>9</sup> We note that the Household Pulse’s ‘two-step’ approach for ascertaining sex assigned at birth and current gender identity is explicitly recommended as “Best Practice” by leading scholars in this area for having both high sensitivity and high specificity among adults (The GenIUSS Group 2014).

<sup>10</sup> The data do not include flags for whether an individual’s first response to current gender did not match their response to the question about sex assigned at birth. The data also do not include for non-cisgender people information on their first response to the question about current gender (i.e., whether it matched their final response).

A natural question is how to think about the various groups of individuals who are not cisgender. Individuals who were assigned male at birth and who currently identify as female may be those most likely to be thought of as transgender women, or ‘Male-to-Female’ (MTF) transgender individuals. The fact that these individuals were offered ‘transgender’ to describe their gender identity but explicitly chose ‘female’ instead – even after a follow-up question that asked them to confirm their choice – may indicate that they are the furthest along in their process of gender affirmation, including social, medical/surgical, and/or legal steps. The link between self-identification and progress in gender affirmation may also vary based on individual preferences and cultural stigma associated with gender expression, medical procedures, or specific terminology. Unfortunately, the Household Pulse does not include questions about when the individual began their gender affirmation process, what steps – if any – they have taken to affirm their gender, or their ability to ‘pass’ as their current gender.<sup>11</sup> Thus, we refer to these individuals as ‘transgender women’, but strictly speaking it is more accurate to say that they are individuals who were assigned male at birth but who identify as female. The analogous reasoning holds for the group we identify as ‘transgender men’, or individuals who were assigned female at birth but who identify as male.

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<sup>11</sup> ‘Passing’ or the ability to ‘pass’ refers to the congruency between one’s gender identity and others’ perception of their gender. For example, a transgender woman is ‘passing’ if others perceive and treat them in the same way they would perceive and treat a cisgender woman.

It is possible that individuals who identify as ‘transgender’ are not as far along in their transition process. Alternatively, there may be cultural norms and differences attached to the use of terms such as ‘transgender’ that cause an individual to choose ‘transgender’ over ‘female’ or ‘None of these’. The data do not permit us to say much about this, though we offer some hypotheses based on comparisons of demographic characteristics across these groups of non-cisgender individuals in the sections below.

It is difficult to know who comprises the third sub-group of non-cisgender individuals: those who, when asked about their gender, indicated that ‘None of these’ terms offered are good descriptors. It is possible that this group includes individuals who would use a different term such as ‘nonbinary’ or ‘genderqueer’ to describe their gender. It is also possible that there are differential cultural norms associated with specific terms. In some models, we include these individuals with the other two categories of non-cisgender individuals, and in other models, we include separate dummy variables for the ‘None of these’ group. We stress that because the Household Pulse survey included an explicit follow-up for any individual whose response to the question about sex assigned at birth did not match their response to the question about current gender, we are confident that these individuals are telling the survey that they are *not* cisgender. That is, these individuals had two opportunities to indicate that their current gender matched their sex assigned at birth and explicitly rejected that choice both times.



We think the ability to separately identify the group of people who describe their current gender as ‘None of these’ is a significant advantage of the Household Pulse approach relative to the single-question approach used in other datasets such as the CDC BRFSS. This is because the individuals who choose ‘None of these’ when faced with the menu of response options to the question about current gender – which is the vast majority of all gender minority individuals in our sample – may be more likely to be missed by the BRFSS question which is phrased as a ‘yes’ or ‘no’ question to all respondents about being transgender.<sup>12</sup> Indeed, below we show evidence that individuals who choose ‘None of these’ to describe their current gender have systematically different employment outcomes than other non-cisgender individuals, and moreover this varies systematically across individuals assigned male at birth and individuals assigned female at birth (which one cannot know in datasets such as the BRFSS because sex assigned at birth is not asked). Thus, the Household Pulse offers a different and arguably more comprehensive look at individuals in the United States who are not cisgender.

Regarding economic outcomes, individuals report employment status and household income in ranges. Specifically, all individuals report whether they worked for pay or profit in the last seven days and their 2020 household income in ranges. We examine household income directly, as well as poverty status, which is

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<sup>12</sup> In the BRFSS all individuals are asked: “Do you consider yourself to be transgender?” Response options in the BRFSS include: No; Yes, transgender male-to-female; Yes, transgender female-to-male; and Yes, transgender, gender non-conforming.

based on household income and household size (individuals are asked to state the number of adults and the number of children in the household). Regarding social assistance receipt, individuals are asked about their source of health insurance, and we consider an indicator for reporting Medicaid. Individuals in the Household Pulse are also asked whether they or anyone in the household receives food assistance benefits through the Supplemental Nutrition Assistance Program (SNAP). Finally, we consider an indicator for whether the respondent reports that they sometimes or often do not have enough food to eat, a variable we call Food Insecure.

### **3.2 Empirical Approach**

To estimate the association between gender minority status and socioeconomic outcomes, we estimate multiple specifications. The first model takes the form:<sup>13</sup>

$$(1) Y_i = \beta_0 + \beta_1 X_i + \beta_2 (\text{AMAB, NOT CISGENDER})_i + \beta_3 (\text{CISGENDER WOMAN})_i + \beta_4 (\text{AFAB, NOT CISGENDER})_i + \varepsilon_i$$

where  $Y_i$  are the various economic outcomes for individual  $i$  and  $X_i$  is a vector of individual characteristics. We begin by pooling all individuals and controlling for a single dummy for individuals who were assigned male at birth (AMAB) but who do not currently identify as male, a dummy for cisgender women, and a single dummy for individuals who were assigned female at birth (AFAB) but who do not

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<sup>13</sup> For the dichotomous economic outcomes, we estimate linear probability models. For household income, we estimate interval regressions on the categorical responses. We drop a very small share of individuals with missing data on the demographic characteristics. Note that about 21 percent of the sample did not give a usable response to the household income question, which is common in such surveys. For the employment outcome, missingness rates are very low.

currently identify as female. The excluded category is cisgender men.<sup>14</sup> We also estimate additional models separately for individuals assigned female at birth and individuals assigned male at birth.

In the second model, we separate the single NOT CISGENDER indicator into three separate dummies for the three response options that allow us to separately identify non-cisgender people.<sup>15</sup> This model takes the form:

$$(2) Y_i = \beta_0 + \beta_1 X_i + \beta_2(\text{AMAB, NOW FEMALE})_i + \beta_3(\text{AMAB, NOW TRANSGENDER})_i + \beta_4(\text{AMAB, NOW 'NONE OF THESE'})_i + \beta_5(\text{CISGENDER WOMAN})_i + \beta_6(\text{AFAB, NOW MALE})_i + \beta_7(\text{AFAB, NOW TRANSGENDER})_i + \beta_8(\text{AFAB, NOW 'NONE OF THESE'})_i + \varepsilon_i$$

where all variables are as described above.

In addition to these models estimated on the full sample, our preferred specifications consider separate models for individuals assigned female at birth and

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<sup>14</sup> For the models predicting socioeconomic outcomes, these controls include: survey wave, sexual orientation (indicators for each of the following response options to the question about sexual orientation: gay/lesbian, bisexual, 'something else', and 'I don't know', along with a dummy for a missing response on sexual orientation, with the omitted category being heterosexual), age, age squared, race/ethnicity (indicators for white Hispanic, Black non-Hispanic, Black Hispanic, Asian, mixed/other race, with the omitted category being white non-Hispanic), educational attainment (indicators for less than high school, some college, bachelors degree, and graduate degree, with the omitted category being high school degree), marital status (indicators for married/partnered, refusal to provide marital status, with the omitted category being never married or widowed/divorced/separated), an indicator for living in a large MSA, state dummies, and the number of adults in the household.

<sup>15</sup> In all models, we include separate indicators for individuals who report that they 'don't know', refused to provide, or were missing a response to the question about current gender. We do the same for similar responses to the sexual orientation question.

individuals assigned male at birth. To investigate heterogeneity associated with race/ethnicity within the gender minority population, we estimate separate models restricting the sample to non-cisgender individuals and report the coefficients on the race/ethnicity variables.<sup>16</sup> Throughout, we use the Household Pulse person weights, and we estimate White standard errors robust to heteroskedasticity.

## **4. Results**

### **4.1 Descriptive Statistics**

We begin by presenting descriptive statistics for the key demographic characteristics and economic outcomes from the 2021 Household Pulse data separately by gender identity in Tables 1a and 1b for individuals assigned female at birth and individuals assigned male at birth, respectively. The format of Table 1a is as follows: column 1 reports weighted means for cisgender women, column 2 reports weighted means for individuals AFAB who are not cisgender, column 3 reports weighted means for individuals AFAB who identify as male (i.e., transgender men), column 4 reports weighted means for individuals AFAB who identify as transgender, and column 5 reports weighted means for individuals AFAB who describe their current gender as ‘None of these’. Note that column 2 of Table 1a comprises individuals in columns 3, 4, and 5 of the same table. The format

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<sup>16</sup> Small sample sizes of individuals who are MTF, FTM, or who explicitly chose ‘transgender’ to describe their gender identity do not permit us to estimate meaningful models for the non-cisgender subcategories.

of Table 1b is analogous to Table 1a except the columns are cisgender men, individuals AMAB who are not cisgender, individuals AMAB who identify as female (i.e., transgender women), individuals AMAB who identify as transgender, and individuals AMAB who describe their current gender as ‘None of these’. To our knowledge, the descriptive statistics in Tables 1a and 1b represent the first comparisons between transgender and cisgender individuals in the United States using nationally representative data.

Several facts from Tables 1a and 1b stand out. First, we note that the sample size of non-cisgender individuals as a share of the total sample is 1.65 percent for individuals assigned female at birth in Table 1a and 1.63 percent for individuals assigned male at birth in Table 1b. While not reported, the weighted estimate of the share of the total sample that is not cisgender is 2.5 percent for individuals AFAB and 2.4 percent for individuals AMAB. With the caveat that the Household Pulse person weights do not adjust for shares of gender minorities in the population (in part because there is no underlying data to which a benchmark could be matched), these estimates of the prevalence of gender minorities in the population are higher than what has been found from other datasets that use representative sampling methods but that do not cover the entire United States, such as the CDC’s BRFSS.<sup>17</sup>

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<sup>17</sup> Carpenter et al. (2020) report that about 0.46 percent of individuals in the BRFSS – which is population representative but not nationally representative – identified as transgender. The way that non-cisgender status is ascertained is different in the Household Pulse than in the BRFSS, which could contribute to these differences. If we exclude the individuals in the Household Pulse who chose ‘None of these’ when describing their current gender, the range of non-cisgender options

Moreover, among individuals who are not cisgender, the vast majority chose ‘None of these’ when asked about current gender, and this is true both for AMAB and AFAB individuals.

Regarding demographic characteristics, Table 1a for individuals assigned female at birth shows that non-cisgender individuals are much younger, more likely to be sexual minorities, less likely to have a bachelor’s degree, and less likely to be married than cisgender women. Regarding economic outcomes, individuals assigned female at birth who are non-cisgender are less likely to be working for pay, have lower household incomes, are more likely to be below the federal poverty guidelines, are more likely to be using public assistance, and are more likely to be food insecure than cisgender women. Turning to differences for individuals assigned male at birth in Table 1b, we see very similar demographic differences. Among individuals assigned male at birth, non-cisgender individuals are also much younger, more likely to be sexual minorities, less likely to have a bachelor’s degree, and less likely to be married than cisgender men. Similarly, regarding economic outcomes, individuals assigned male at birth who are non-cisgender are less likely to be working for pay, have lower household incomes, are more likely to be below

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remaining in the Household Pulse broadly matches those in the BRFSS. Doing so returns an unweighted share of AFAB individuals that are non-cisgender of 0.45 percent and an unweighted share of AMAB individuals that are non-cisgender of 0.54 percent, closer to the BRFSS share. Put differently, the main difference in the prevalence of non-cisgender people in the Household Pulse as compared to the BRFSS is that the majority of non-cisgender individuals in the Household Pulse chose ‘None of these’ to describe their current gender, and this response option was not explicitly offered in the BRFSS. Also, the BRFSS samples precede the Household Pulse, and Jones (2022) reports that LGBT identification is increasing over time.

the federal poverty guidelines, are more likely to be using public assistance, and are more likely to be food insecure than cisgender men.

### **4.3 Multinomial Logit Results**

Before turning to the main regression results that examine the independent associations between minority gender identity and economic outcomes, we first present multinomial logit results predicting the odds of choosing each of the three gender minority subcategories. Tables 2a and 2b present these results for individuals assigned female at birth and individuals assigned male at birth, respectively. We report adjusted odds ratios of the adjusted likelihood that individuals choose the category listed at the top of each column, and the excluded category is cisgender individuals.

The results in Tables 2a and 2b show that – of the many different patterns documented in the raw means in Tables 1a and 1b – only a few variables are consistently independent and statistically significant predictors of each of the gender minority subcategories. In particular, we consistently find that minority sexual orientation is the strongest predictor of gender minority status for all of the gender minority subcategories among both individuals assigned female at birth in Table 2a and individuals assigned male at birth in Table 2b. In each case, we find that minority sexual orientation is significantly and positively related to an increased likelihood of identifying as a gender minority in Household Pulse.

Notably, we find much less evidence of independent statistical relationships between other observed covariates and the gender minority outcomes in Tables 2a and 2b. While some of the individual coefficients are statistically significant, there is no obvious pattern that is as stark as the sexual minority patterns described immediately above. In particular, age, education, and race/ethnicity are *not* consistently significant predictors of minority gender identity categories in Tables 2a and 2b. Thus, our overall takeaway from the patterns in Tables 2a and 2b is that apart from clear relationships with minority sexual orientation, there are no systematic associations with age, education, or race/ethnicity in explaining the choice of gender minority categories.

#### **4.3 Main Regression Results**

Table 3 presents the regression results from equation (1) for the outcome of employment. This table essentially asks whether individuals who are not cisgender have different employment than cisgender individuals even after accounting for the fact that they have significantly different observable characteristics (e.g., lower levels of education and higher likelihoods of having a minority sexual orientation). The top panel reports results from the model where we simply control for the single indicator for being AMAB and not cisgender and the single indicator for being AFAB and not cisgender. The bottom panel reports results from the model where we separate out each of those single indicator variables into their three component parts (i.e., for individuals AMAB and not cisgender, we separately control for a



dummy for being AMAB and female, a dummy for being AMAB and transgender, and a dummy for being AMAB and describing one's gender as 'None of these'). We report results for a sample that includes all individuals in column 1 (where the excluded category is cisgender men), for individuals assigned female at birth in column 2 (where the excluded category is cisgender women), and for individuals assigned male at birth in column 3 (where the excluded category is cisgender men).

The results in the top panel of Table 3 return strong evidence that non-cisgender individuals experience significant employment penalties relative to cisgender individuals. This is true in the full sample (column 1) and separately for AFAB individuals (column 2) and for AMAB individuals (column 3). The magnitude of the differences in the top panel of Table 3 indicates employment penalties on the order of 3.9 to 6.6 percentage points. When we turn to the subcategories of non-cisgender people in the bottom panel of Table 3, we see that the differences for non-cisgender individuals vary across groups. For individuals assigned female at birth in the bottom panel of column 2 of Table 3, we see that the employment differences are driven by individuals who, when asked about their current gender, chose 'None of these' over 'male', 'female', or 'transgender'. For individuals assigned male at birth in column 3 of Table 3, we see that the

employment penalties are largest for transgender women but are also present for AMAB individuals who describe their current gender as ‘None of these’.<sup>18</sup>

In Table 4, we present results for a range of other economic outcomes. Each column of Table 4 is from a similarly specified model as in Table 3 but with a different outcome: employed in column 1 (reprinted from Table 3), log of household income in column 2, an indicator for being below the federal poverty guidelines based on one’s household income and household size in column 3, an indicator for having Medicaid in column 4, an indicator for having Supplemental Nutrition Assistance Program benefits in column 5, and an indicator for food insecurity in column 6. The top panel of Table 4 reports results for individuals who

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<sup>18</sup> Another possibility we have carefully considered is that people who chose ‘None of these’ to describe their current gender are miscoded cisgender people who may be confused why they are being asked about both sex assigned at birth and current gender or who may find the response options objectionable for some reason. Regardless of whether these individuals are miscoded intentionally or unintentionally, it is less likely that miscoded cisgender people would face labor market discrimination in the same way as, for example, nonbinary individuals who chose ‘None of these’ because their preferred gender description was not listed. We experimented with different ways to assess the degree of potential bias from miscoded cisgender people in our ‘None of these’ group. For example, if cisgender people are confused about the response options, it is possible that they also answered the sexual orientation question with ‘I don’t know’ as opposed to straight, gay/lesbian, bisexual, or ‘something else’. We estimated models where we separately controlled for ‘None of these’ people who responded to the sexual orientation question with straight, gay/lesbian, bisexual, or ‘something else’ versus ‘None of these’ people who chose ‘I don’t know’ to the sexual orientation question. Those models showed that the ‘None of these’ differences we document below are driven by those who responded to the sexual orientation question with straight, gay/lesbian, bisexual, or ‘something else’ as opposed to those who chose ‘I don’t know’ for the sexual orientation question (and who therefore may be more likely to be confused or otherwise miscoded cisgender people). This – along with the double confirmation nature regarding the correspondence between the questions regarding sex assigned at birth and current gender – increases our confidence that our patterns for individuals who describe their gender as ‘None of these’ reflect true differences for gender minority individuals.

were assigned female at birth, while the bottom panel reports results for individuals who were assigned male at birth.

The results in the top panel of Table 4 show that individuals who were assigned female at birth and who chose ‘None of these’ to describe their current gender have significantly lower household incomes than otherwise comparable cisgender women, and we also estimate a significant increased likelihood of having Medicaid. It is notable that we consistently estimate that transgender men have better economic outcomes than cisgender women (higher household incomes, lower poverty rates, and lower social safety net use), though the estimates are not statistically significant. Moving to the bottom panel of Table 4 for individuals assigned male at birth, we see that the significant employment penalty for transgender women demonstrated in Table 3 is also observed with respect to lower household income, higher likelihood of being below the poverty guidelines, higher likelihood of having Medicaid, and higher likelihood of experiencing food insecurity. We also estimate that transgender women are 10.6 percentage points more likely than comparable cisgender men to participate in SNAP, but this estimate is not statistically significant.<sup>19</sup> Interestingly, we do not observe extensive significant economic penalties for individuals assigned male at birth who chose

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<sup>19</sup> We also experimented with restricting attention to individuals with household incomes below 200 percent of the federal poverty guidelines to focus on a sample more likely to be eligible for public assistance. These models continued to return evidence that transgender women were more likely to be on Medicaid and SNAP, though the estimates were not statistically significant.

‘None of these’ to describe their current gender apart from the significant employment penalty demonstrated in Table 3.<sup>20</sup>

Finally, in Table 5, we take advantage of the large sample size of individuals who are not cisgender in the Household Pulse dataset to provide some of the first evidence on intersections between gender minority status and race/ethnicity. Specifically, we restrict attention in Table 5 to non-cisgender individuals, and we show results for individuals assigned female at birth in the top panel and for individuals assigned male at birth in the bottom panel.<sup>21</sup> Each of the columns represents a different outcome, similar to the format of Table 4.

For both AFAB and AMAB individuals, we estimate that non-cisgender Black individuals have significantly lower employment rates than otherwise similar non-cisgender white individuals in column 1. Moreover, the differences are very

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<sup>20</sup> We also experimented with another specification where, instead of using cisgender women as the excluded category for gender minorities who were assigned female at birth, we used cisgender men as their excluded comparison group (and analogously for gender minorities who were assigned male at birth). We continued to find that AFAB now ‘None of these’ individuals had significantly worse economic outcomes than otherwise comparable cisgender men, and these differences were, perhaps not surprisingly, more robust than the differences with otherwise comparable cisgender women. We also continued to estimate that transgender women had worse economic outcomes than otherwise comparable cisgender women, though these differences were slightly smaller than when we compared transgender women to cisgender men. One qualitative difference in the patterns was when we compared individuals assigned male at birth who described their current gender as ‘transgender’ or ‘None of these’: in contrast to when we compared them to cisgender men, we estimated that for some economic outcomes such as household income they performed significantly *better* than otherwise similar cisgender women. This may reflect accumulated human capital and labor market advantages associated with being assigned male at birth, though again, we do not have information on gender expression or gender presentation at any point in the life course. These results are available upon request.

<sup>21</sup> Small sample sizes preclude us from considering models only of transgender individuals, individuals assigned male at birth who identify as female, or individuals assigned female at birth who identify as male. Thus, we combine all non-cisgender respondents for these analyses.

large: at least 12 percentage points for both samples. We do not estimate significant employment differentials for the other non-cisgender racial/ethnic minority groups relative to non-cisgender white individuals. Across the other outcomes in the top panel of Table 5 for individuals assigned female at birth, we see that non-cisgender Black individuals are also significantly more likely to be food insecure and to be on public assistance than otherwise similar non-cisgender white individuals. In the bottom panel of Table 5 for individuals assigned male at birth, we see that non-cisgender Black individuals have significantly higher poverty and public assistance receipt rates than comparable non-cisgender white individuals. For the other racial and ethnic minority groups who are not cisgender, we generally do not find significant differences with non-cisgender white individuals, though there is some evidence that other-race and/or mixed-race non-cisgender individuals have significantly worse economic outcomes than non-cisgender white individuals, regardless of sex assigned at birth.

## **5. Discussion and Conclusion**

We used newly available data from a large, nationally representative sample of adults in the United States from wave 3.2 of the Census Bureau Household Pulse survey to study economic outcomes of gender minorities. These data identify over 4,400 individuals whose gender identity at the time of the survey did not match their sex assigned at birth (i.e., non-cisgender individuals). Our regression models

for economic outcomes that account for observable demographic characteristics return evidence that – compared with otherwise comparable cisgender men – transgender women have significantly lower employment rates, lower household incomes, higher rates of poverty, greater Medicaid use, and increased likelihood of food insecurity. Individuals assigned female at birth who are not cisgender also have significantly lower employment rates than otherwise similar cisgender women. For both AMAB and AFAB individuals, non-cisgender Black individuals have significantly worse economic outcomes than non-cisgender white individuals.

In many ways, our results confirm prior patterns from datasets that have examined outcomes for transgender people in other countries (e.g., Geijtenbeek and Plug 2018), that have used non-representative data (e.g., Shannon 2021), and that have used data for a smaller number of states (e.g., Carpenter, Eppink, and Gonzales 2020, Mann 2021). Those studies also demonstrate that transgender people have worse economic outcomes than cisgender people. Our results advance this literature by: using a two-step approach for identifying non-cisgender individuals, which is ‘Best Practice’; identifying a broader range of gender diverse people than most prior work; studying very recent data coming out of the COVID-19 pandemic; examining social safety net use; and studying intersections of gender minority status and racial minority status.

Our study is subject to some notable limitations, many of which pertain to the data. First, our data are all based on self-reports. As noted in prior work, there

may be systematic selection associated with disclosing to a survey administrator about not being cisgender (Carpenter et al. 2020). Second, our sample of adults who are not cisgender only includes non-institutionalized adults randomly selected for participation in an email survey among US households. Missing from our analysis were homeless adults; adults residing in institutionalized medical facilities, incarceration facilities, and homeless shelters; and individuals without email addresses. Data from non-representative samples of transgender individuals suggest that some of these exclusions may disproportionately affect transgender individuals, since transgender individuals report high rates of homelessness and incarceration compared to the general population (Grant et al. 2011, Burwick et al. 2014, James et al. 2016). Finally, our sample is based on gender identity rather than gender expression, and we cannot determine the respondents' progress in gender transition. If one's gender identity affects economic outcomes through gender expression (e.g., workplace discrimination) and group membership (e.g., expectations of discrimination based on the experience of others), our estimates are lower bounds on the economic disadvantages faced by gender minorities.

Despite these limitations, our paper makes an important contribution to the emerging literature on gender identity and economic outcomes. As the first estimates for the US based on nationally representative population-based data, the first estimates coming out of the 2019 COVID pandemic, and the first estimates after the 2020 landmark ruling barring employment discrimination against

transgender individuals in *Bostock vs. Clayton County*, our results indicating pervasive economic hardship experienced by gender minorities, especially transgender women and Black gender minorities, are a call for more research and policy attention to understanding how to reduce inequality experienced by gender diverse populations in the United States.



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**Table 1a: Descriptive Statistics, Household Pulse wave 3.2, 18-64 year olds, individuals Assigned Female at Birth**

Variable	(1) Cisgender women	(2) Individuals AFAB who are not cisgender	(3) Individuals AFAB whose current gender is male	(4) Individuals AFAB whose current gender is transgender	(5) Individuals AFAB whose current gender is 'None of these'
Age	42.057 (12.988)	32.909 (12.882)	28.232 (11.436)	27.511 (9.029)	35.309 (13.465)
White, non-Hispanic	0.579 (0.494)	0.530 (0.499)	0.596 (0.492)	0.637 (0.481)	0.485 (0.500)
Gay or lesbian	0.022 (0.148)	0.137 (0.344)	0.322 (0.468)	0.212 (0.409)	0.091 (0.288)
Bisexual	0.071 (0.257)	0.250 (0.433)	0.362 (0.482)	0.380 (0.486)	0.192 (0.394)
Partnered	0.522 (0.500)	0.270 (0.444)	0.310 (0.464)	0.156 (0.363)	0.307 (0.461)
Less than high school	0.073 (0.260)	0.129 (0.336)	0.142 (0.350)	0.123 (0.329)	0.130 (0.336)
High school degree	0.263 (0.440)	0.291 (0.454)	0.302 (0.460)	0.293 (0.455)	0.290 (0.454)
Some college	0.323 (0.468)	0.338 (0.473)	0.321 (0.468)	0.349 (0.477)	0.336 (0.473)
College or more	0.341 (0.474)	0.241 (0.428)	0.235 (0.425)	0.238 (0.424)	0.244 (0.429)
# of adults in HH	2.688 (1.228)	3.149 (1.636)	3.314 (1.435)	3.384 (1.853)	3.049 (1.563)
Any children in HH	0.478 (0.500)	0.367 (0.482)	0.268 (0.444)	0.282 (0.450)	0.408 (0.492)
Any employment	0.635 (0.461)	0.564 (0.481)	0.673 (0.469)	0.574 (0.477)	0.550 (0.484)
Household income	79,229 (59,626)	61,988 (53,172)	74,373 (62,740)	65,867 (50,485)	58,980 (52,995)

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Below federal poverty guidelines	0.205 (0.338)	0.321 (0.445)	0.285 (0.466)	0.295 (0.447)	0.335 (0.442)
Medicaid receipt	0.213 (0.359)	0.288 (0.427)	0.153 (0.409)	0.274 (0.435)	0.309 (0.426)
Supplemental Nutrition Assistance Program receipt	0.165 (0.308)	0.216 (0.371)	0.155 (0.395)	0.161 (0.359)	0.243 (0.373)
Food Insecure	0.103 (0.253)	0.176 (0.358)	0.174 (0.370)	0.213 (0.368)	0.163 (0.355)
N	163,267	2,756	178	576	2,002

Weighted means (standard deviations). Note average household income and poverty status are determined using the midpoint of each household income range or the 80<sup>th</sup> percentile of annual household income for those who reported the highest income category; percent of poverty is calculated by dividing household income by household size specific U.S. Census Bureau poverty thresholds, following Conron et al. (2012).

**Table 1b: Descriptive Statistics, Household Pulse wave 3.2, 18-64 year olds, individuals Assigned Male at Birth**

Variable	(1) Cisgender men	(2) Individuals AMAB who are not cisgender	(3) Individuals AMAB whose current gender is female	(4) Individuals AMAB whose current gender is transgender	(5) Individuals AMAB whose current gender is 'None of these'
Age	41.750 (13.207)	36.852 (13.264)	31.069 (10.703)	34.816 (13.663)	38.422 (13.067)
White, non-Hispanic	0.597 (0.490)	0.541 (0.498)	0.654 (0.477)	0.559 (0.497)	0.519 (0.500)
Gay or lesbian	0.048 (0.213)	0.147 (0.354)	0.334 (0.473)	0.299 (0.459)	0.059 (0.235)
Bisexual	0.028 (0.166)	0.153 (0.360)	0.239 (0.428)	0.276 (0.448)	0.090 (0.286)
Partnered	0.551 (0.497)	0.338 (0.473)	0.299 (0.459)	0.203 (0.403)	0.401 (0.490)
Less than high school	0.079 (0.270)	0.201 (0.401)	0.146 (0.354)	0.275 (0.447)	0.176 (0.381)
High school degree	0.326 (0.469)	0.298 (0.457)	0.284 (0.452)	0.278 (0.449)	0.308 (0.462)
Some college	0.302 (0.459)	0.277 (0.447)	0.403 (0.492)	0.243 (0.429)	0.274 (0.446)
College or more	0.294 (0.455)	0.226 (0.418)	0.168 (0.377)	0.204 (0.403)	0.243 (0.429)
# of adults in HH	2.761 (1.319)	3.628 (2.097)	2.987 (1.446)	3.699 (2.082)	3.675 (2.157)
Any children in HH	0.421 (0.494)	0.434 (0.496)	0.325 (0.470)	0.413 (0.493)	0.456 (0.498)
Any employment	0.717 (0.416)	0.558 (0.475)	0.526 (0.477)	0.575 (0.480)	0.554 (0.473)
Household income	90,351 (61,837)	73,068 (61,239)	52,727 (61,774)	75,287 (58,239)	75,084 (61,750)

*Economic Outcomes for Transgender People in the United States*

Below federal poverty guidelines	0.152 (0.290)	0.295 (0.429)	0.473 (0.465)	0.267 (0.462)	0.282 (0.405)
Medicaid receipt	0.124 (0.287)	0.233 (0.384)	0.423 (0.455)	0.223 (0.419)	0.209 (0.350)
Supplemental Nutrition Assistance Program receipt	0.104 (0.232)	0.175 (0.320)	0.248 (0.346)	0.185 (0.363)	0.160 (0.295)
Food Insecure	0.093 (0.223)	0.229 (0.375)	0.336 (0.378)	0.235 (0.411)	0.211 (0.359)
N	101,632	1,698	162	403	1,133

Weighted means (standard deviations). Note average household income and poverty status are determined using the midpoint of each household income range or the 80<sup>th</sup> percentile of annual household income for those who reported the highest income category; percent of poverty is calculated by dividing household income by household size specific U.S. Census Bureau poverty thresholds, following Conron et al. (2012).

**Table 2a: Multinomial Logit Models Show that Minority Sexual Orientation is the Strongest Independent Predictor of Gender Minority Status, Household Pulse wave 3.2, 18-64 year olds Assigned Female at Birth**

	(1) AFAB, now Male	(2) AFAB, now Transgender	(3) AFAB, now 'None of These'
Age	-0.292*** (0.112)	-0.071* (0.041)	-0.076*** (0.026)
Age squared	0.003** (0.001)	0.000 (0.001)	0.001** (0.000)
Urban	0.320 (0.321)	-0.123 (0.171)	-0.076 (0.092)
Less than high school	0.418 (0.552)	0.331 (0.290)	0.268 (0.226)
Some college	-0.291 (0.396)	-0.323 (0.219)	-0.192 (0.127)
Associates degree	-0.463 (0.805)	-0.071 (0.417)	-0.143 (0.152)
Bachelors degree	-0.093 (0.401)	-0.166 (0.226)	-0.355*** (0.125)
Graduate degree	0.091 (0.431)	-0.021 (0.256)	-0.112 (0.129)
Gay or lesbian	4.272*** (0.388)	5.006*** (0.469)	2.039*** (0.186)
Bisexual	2.875*** (0.477)	4.074*** (0.463)	1.471*** (0.129)
'Something else' sexual orientation	3.314*** (0.427)	5.421*** (0.461)	3.120*** (0.125)
'I don't know' sexual orientation	2.673*** (0.536)	3.811*** (0.560)	1.802*** (0.163)
Married	0.717 (0.725)	-0.462** (0.220)	-0.271** (0.117)
Widowed	-0.549 (0.896)	1.710*** (0.604)	0.542** (0.222)
Divorced	0.618 (0.799)	0.042 (0.278)	-0.180 (0.152)
Separated	0.515 (0.753)	0.477 (0.426)	0.279 (0.204)
Black	-0.669* (0.366)	-0.271 (0.274)	0.356*** (0.123)
Asian	-2.560*** (0.593)	-0.446 (0.313)	0.360* (0.190)
Mixed/other	0.214 (0.418)	0.498* (0.288)	0.594*** (0.128)
Hispanic	0.254 (0.417)	-0.183 (0.228)	0.101 (0.125)
N	164,118	164,118	164,118



\*, \*\*, and \*\*\* denote statistical significance at 10%, 5%, and 1%, respectively. Multinomial logit models adjusted odds ratios reported. In addition to the controls listed above, these models also include controls for survey wave dummies and state dummies (not reported but available upon request). Results use Household Pulse person weights, and standard errors are robust to heteroscedasticity.

**Table 2b: Multinomial Logit Models Show that Minority Sexual Orientation is the Strongest Independent Predictor of Gender Minority Status, Household Pulse wave 3.2, 18-64 year olds Assigned Male at Birth**

	(1) AMAB, now Female	(2) AMAB, now Transgender	(3) AMAB, now 'None of These'
Age	-0.054 (0.072)	-0.112** (0.053)	0.009 (0.035)
Age Squared	0.000 (0.001)	0.001* (0.001)	0.000 (0.000)
Urban	0.205 (0.302)	-0.459** (0.220)	-0.123 (0.144)
Less than high school	0.472 (0.518)	1.081*** (0.383)	0.107 (0.272)
Some college	0.112 (0.450)	-0.363 (0.262)	-0.323* (0.175)
Associates degree	-0.153 (0.513)	-0.260 (0.395)	0.060 (0.233)
Bachelors degree	-0.435 (0.452)	-0.138 (0.287)	-0.221 (0.176)
Graduate degree	-0.523 (0.495)	0.201 (0.308)	0.213 (0.183)
Gay or lesbian	4.026*** (0.528)	4.496*** (0.377)	1.413*** (0.246)
Bisexual	3.797*** (0.490)	4.826*** (0.358)	2.337*** (0.204)
'Something else' sexual orientation	4.688*** (0.521)	5.576*** (0.365)	4.094*** (0.189)
'I don't know' sexual orientation	2.693*** (0.603)	3.605*** (0.540)	3.887*** (0.172)
Married	0.821* (0.477)	-0.419 (0.274)	0.097 (0.173)
Widowed	2.678*** (0.733)	0.700 (0.663)	1.261*** (0.341)
Divorced	0.998** (0.462)	-0.270 (0.354)	0.568** (0.287)
Separated	1.837** (0.723)	0.803 (0.580)	0.302 (0.307)
Black	0.354 (0.484)	1.171*** (0.336)	0.335 (0.223)
Asian	-2.009*** (0.689)	-0.207 (0.404)	0.058 (0.243)
Mixed/other	0.843** (0.339)	0.305 (0.301)	0.663*** (0.185)
Hispanic	-1.333*** (0.424)	-0.0174 (0.278)	-0.206 (0.178)
N	102,226	102,226	102,226

\*, \*\*, and \*\*\* denote statistical significance at 10%, 5%, and 1%, respectively. Multinomial logit models, adjusted odds ratios reported. In addition to the controls listed above, these models also include controls for survey wave dummies and state dummies (not reported but available upon request). Results use Household Pulse person weights, and standard errors are robust to heteroscedasticity.

**Table 3: Individuals who are Not Cisgender are Significantly Less Likely to be Employed, Household Pulse wave 3.2, 18-64 year olds**

	(1)	(2)	(3)
	Outcome is employed; sample is all individuals	Outcome is employed; sample is individuals AFAB	Outcome is employed; sample is individuals AMAB
Mean of outcome:	0.672	0.632	0.712
Model 1:			
Cisgender Woman	-0.091*** (0.004)	--	--
AFAB, not Cisgender	-0.112*** (0.018)	-0.039** (0.019)	--
AMAB, not Cisgender	-0.091*** (0.025)	--	-0.066** (0.026)
N	259,877	160,023	99,854
Model 2:			
Cisgender woman	-0.091*** (0.004)	--	--
AFAB, now Male	-0.011 (0.064)	0.060 (0.069)	--
AFAB, now Transgender	-0.113*** (0.038)	-0.050 (0.038)	--
AFAB, now None of these	-0.122*** (0.021)	-0.046** (0.021)	--
AMAB, now Female	-0.168** (0.072)	--	-0.151** (0.070)
AMAB, now Transgender	-0.058 (0.045)	--	-0.024 (0.044)
AMAB, now None of these	-0.095** (0.032)	--	-0.073** (0.033)
N	259,877	160,023	99,854

\*, \*\*, and \*\*\* denote statistical significance at 10%, 5%, and 1%, respectively. Linear probability models. Models control for survey wave dummies, age, race/ethnicity, sexual orientation, education, marital status, urban status, and state dummies as described in the text. Results use Household Pulse person weights, and standard errors are robust to heteroscedasticity.

**Table 4: Some Groups of Non-Cisgender Individuals Have Worse Economic Outcomes than Cisgender Individuals – Especially Transgender Women, Household Pulse wave 3.2, 18-64 year olds**

	(1)	(2)	(3)	(4)	(5)	(6)
	Employed	Log of household income	Below federal poverty guidelines	Has Medicaid	Participates in Supplemental Nutrition Assistance Program (SNAP)	Food insecure (often or sometimes did not have enough to eat)
<b>AFAB individuals, excluded category is cisgender women</b>						
Mean of outcome:	0.632	78,744	0.209	0.154	0.166	0.105
AFAB, now Male	0.060 (0.069)	0.172 (0.163)	-0.034 (0.070)	-0.069 (0.044)	-0.023 (0.042)	0.034 (0.048)
AFAB, now Transgender	-0.050 (0.038)	0.140 (0.095)	-0.031 (0.039)	-0.007 (0.040)	-0.048 (0.034)	0.063* (0.037)
AFAB, now None of these	-0.046** (0.021)	-0.088** (0.045)	0.033 (0.023)	0.047** (0.024)	0.031 (0.023)	0.014 (0.017)
N	160,023	129,237	129,237	133,086	145,959	147,539
<b>AMAB individuals, excluded category is cisgender men</b>						
Mean of outcome:	0.712	89,871	0.155	0.092	0.106	0.096
AMAB, now Female	-0.151** (0.070)	-0.490*** (0.160)	0.281*** (0.084)	0.262*** (0.083)	0.106 (0.067)	0.183** (0.081)
AMAB, now Transgender	-0.024 (0.044)	0.109 (0.113)	0.007 (0.043)	0.023 (0.042)	-0.009 (0.043)	0.044 (0.047)
AMAB, now None of these	-0.073** (0.033)	-0.063 (0.057)	0.050 (0.029)	0.017 (0.029)	-0.001 (0.028)	0.040 (0.027)
N	99,854	80,805	80,805	81,690	91,153	92,133

\*, \*\*, and \*\*\* denote statistical significance at 10%, 5%, and 1%, respectively. Linear probability models, except column 2 which uses interval regression. Models control for survey wave dummies, age, race/ethnicity, sexual orientation, education, marital status, urban status, and state dummies as described in the text. Results use Household Pulse person weights, and standard errors are robust to heteroscedasticity.

**Table 5: Non-Cisgender Black Individuals Have Significantly Worse Economic Outcomes than Non-Cisgender White Individuals, Household Pulse wave 3.2, 18-64 year olds**

	(1)	(2)	(3)	(4)	(5)	(6)
	Employed	Log of household income	Below federal poverty guidelines	Has Medicaid	Participates in SNAP	Food insecure
<b>AFAB non-cisgender individuals</b>						
Mean of outcome:	0.564	61,988	0.321	0.240	0.216	0.176
Black	-0.122** (0.052)	0.009 (0.138)	-0.022 (0.067)	0.107* (0.063)	0.136** (0.055)	0.132*** (0.046)
Asian	0.026 (0.074)	0.113 (0.136)	-0.122* (0.065)	-0.066 (0.072)	0.020 (0.070)	-0.011 (0.037)
Other Race	-0.050 (0.050)	-0.041 (0.120)	0.067 (0.056)	0.148** (0.058)	0.034 (0.051)	0.190*** (0.049)
Hispanic	-0.012 (0.046)	-0.112 (0.114)	0.078 (0.053)	0.060 (0.057)	-0.007 (0.046)	0.053 (0.035)
N	2,621	2,058	2,058	2,170	2,343	2,380
<b>AMAB non-cisgender individuals</b>						
Mean of outcome:	0.558	73,068	0.295	0.180	0.175	0.229
Black	-0.162** (0.066)	-0.171 (0.149)	0.159** (0.065)	0.131** (0.066)	0.115** (0.056)	0.031 (0.068)
Asian	-0.022 (0.080)	0.064 (0.243)	-0.041 (0.082)	0.081 (0.095)	-0.065 (0.063)	0.012 (0.082)
Other Race	0.075 (0.059)	-0.223 (0.158)	0.148** (0.060)	-0.013 (0.052)	0.013 (0.060)	0.120* (0.062)
Hispanic	0.014 (0.055)	-0.077 (0.162)	0.065 (0.060)	-0.062 (0.052)	-0.004 (0.043)	0.045 (0.050)
N	1,614	1,233	1,233	1,299	1,419	1,439

\*, \*\*, and \*\*\* denote statistical significance at 10%, 5%, and 1%, respectively. Linear probability models, except column 2 which uses interval regression. Models control for survey wave dummies, age, race/ethnicity, sexual orientation, education, marital status, urban status, and state dummies as described in the text. Results use Household Pulse person weights, and standard errors are robust to heteroscedasticity.

ONLINE APPENDIX

**Economic Outcomes for Transgender People and Other Gender Minorities  
in the United States:  
First Estimates from a Nationally Representative Sample**

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February 2022

## **1. The Role of Missing Data on Sex Assigned at Birth in Household Pulse**

As noted in our paper, our analysis of transgender people and other gender minorities in the Household Pulse survey drops any respondent whose response to the question on sex assigned at birth was allocated by the Census Bureau. Recall that the Household Pulse is the first nationally representative dataset in the US to our knowledge that follows the ‘Best Practice’ of using a two-step approach for ascertaining gender minority status. In the first step, individuals are asked about the sex they were assigned at birth on their original birth certificate. Response options include ‘male’ and ‘female’. In the second step, individuals are asked about their current gender. Response options include ‘male’, ‘female’, ‘transgender’, and ‘None of these’.

A small share of individuals do not answer the question about sex assigned at birth. The Census Bureau allocates a response in this case based on a hotdecking procedure. Our discussions with survey experts at the Census Bureau who work on the Household Pulse revealed that the hotdecking procedure matches on state of residence and age group and assigns missing values of sex assigned at birth to the record that appears most recently in the same state-by-age-group bin.<sup>22</sup> Again, the actual and imputed responses for sex assigned at birth can only be one of two options: ‘male’ or ‘female’. Moreover, the Household Pulse does not impute

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<sup>22</sup> The Census Bureau similarly allocates imputed values to missing responses in all variables used in the construction of weights. These variables are: birth year, sex assigned at birth, race and ethnicity, educational attainment, and the number of people in the household.



missing data on current gender; they only impute missing data on sex assigned at birth.

It is true that the share of total observations missing sex assigned at birth is very small, around 1-2 percent of the total sample. However, for our research, there are two closely related problems. First, it is probable that the true underlying share of gender minorities in the population is also very low, probably between 0.5 and 1.5 percent of the population, based on other population-based surveys. Because of this first problem, the allocation procedure for sex assigned at birth can introduce a very large number of falsely coded transgender individuals into the sample, such that a large share of gender minorities we would identify in the Household Pulse are actually cisgender, and the number of all gender minorities is grossly overstated, if we do not exclude individuals with allocated values for sex assigned at birth.

To see this, consider that the allocation procedure does not use any information from Household Pulse or other Census Bureau products to try to ascertain whether the individual with allocated sex assigned at birth is actually not cisgender. It simply assigns an individual only one of two categories: ‘male’ or ‘female’ with approximately equal probability. So, for people who leave the question about sex assigned at birth blank but answer the question about current gender identity, many of them will end up looking like MTF transgender individuals or FTM transgender individuals despite that they are in truth cisgender individuals. Without other information in the Household Pulse dataset that can be

used to provide additional insight into a person's true sex assigned at birth, we are forced to drop anyone whose response to the question about sex assigned at birth was allocated in order to make sure that the individuals we identify as gender minorities truly and actively gave discordant responses to the questions about sex assigned at birth and current gender.

Note that there could be many reasons why a person might leave the question about sex assigned at birth blank. Maybe they are a gender minority and struggle with the binary options offered for sex assigned at birth. Maybe they were not born with dimorphic sex characteristics or identify as intersex. But, equally, there are valid possibilities that might cause a cisgender person to leave the question about sex assigned at birth blank. For example, the question about current gender immediately follows the question about sex assigned at birth. Cisgender individuals may think that the former question is redundant given the latter question and choose to leave the former question blank. Because we have no way to determine which types of people leave the question about sex assigned at birth blank (and who thus get an allocated value from the Census Bureau), we are forced to drop these individuals.

Interestingly, we report here that if we instead include those observations back into the dataset and use the same procedure for identifying gender minorities, we obtain even stronger evidence that transgender and other gender minority populations experience worse economic outcomes than cisgender individuals. This

could be because struggling with a valid response to the question about sex assigned at birth may be correlated with gender minority status, and these gender minorities may face particularly strong discrimination, for example. It could also reflect negative selection among cisgender people who think a question about sex assigned at birth is redundant given a question about current gender. Other explanations for the patterns are also possible, but we leave those for future research.

In summary, there is good reason to think that, in the context of studying gender minorities, information from Household Pulse on people whose sex assigned at birth was allocated by the Census Bureau is invalid. We therefore drop these individuals from our analyses and recommend that other researchers do so as well. Despite this, there is still pervasive evidence from Household Pulse that gender minorities have significantly worse economic outcomes than otherwise comparable cisgender individuals.