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Influence of Imputed Sex of Birth on Gender Minority Populations in the Household Pulse Survey (The AGENID=2 Memo)

by Bill M. Jesdale, PhD[1]

Identification of Transgender Individuals in the Household Pulse Survey

Transgender individuals are identifiable in the Household Pulse Survey (HPS) from answers to two items, namely:

D6 What sex were you assigned at birth, on your original birth certificate?
Male (1)
Female (2)
D7 Do you currently describe yourself as male, female or transgender?
Male (1)
Female (2)
Transgender (3)
None of these (4)

There are two methods for identifying individuals as transgender in this survey: a direct and indirect method. For the **"direct" method**, respondents who identify themselves as "transgender" when responding to D7 can confidently be identified as transgender (and further identified as transmasculine or transfeminine depending on their answer to D6).

There is also an **"indirect" method**, where individuals who answer D6 and D7 with different responses {D6=1 (Male) and D7=2 (Female)} OR {D6=2 (Female) and D7=1 (Male)} are identified as transgender (and also further classified as transmasculine or transfeminine). In order to reduce errors resulting from inattentive respondents or unintended responses, HPS asks respondents with discordant responses to D6 and D7 to affirmatively confirm these responses, and to make corrections as needed (item D8).

In this approach, HPS uses state-of-the-art methods for identifying transgender populations.

[1] Assistant Professor, Population and Quantitative Health Sciences, University of Massachusetts Chan Medical School, Worcester, william.jesdale@umassmed.edu, (401) 480-5728

The Role of Imputed Sex at Birth in Inflating Transgender Populations

However, analysts may not fully appreciate the role that imputed data plays in affecting the **"indirect" method** for identifying respondents as transgender. Several variables needed for developing respondent weights are imputed when missing, including D6 (sex at birth), using a "hot deck" imputation method. This imputation method appears to generate values for D6 that are largely independent of the values for D7. In other words, nearly half of respondents with missing sex at birth are assigned male, and nearly half female, and this allocation is nearly random.

As a result, nearly half of respondents with an imputed sex at birth would be identified as transgender using the "indirect" method resulting from different responses to D6 and D7. These imputed responses do not go through the verification process in question D8, thus respondents do not have the opportunity to review & correct the imputed value. Fortunately, relatively few cases (~1%) are imputed. Unfortunately, these imputed cases have a major impact on gender minority populations identified via the indirect method due to the relatively small size of the population.

Thus, over half of respondents identified as transgender via the indirect method are attributable to imputation of sex at birth, or nearly one in four after combining both the direct and indirect methods (one in five after weighting).

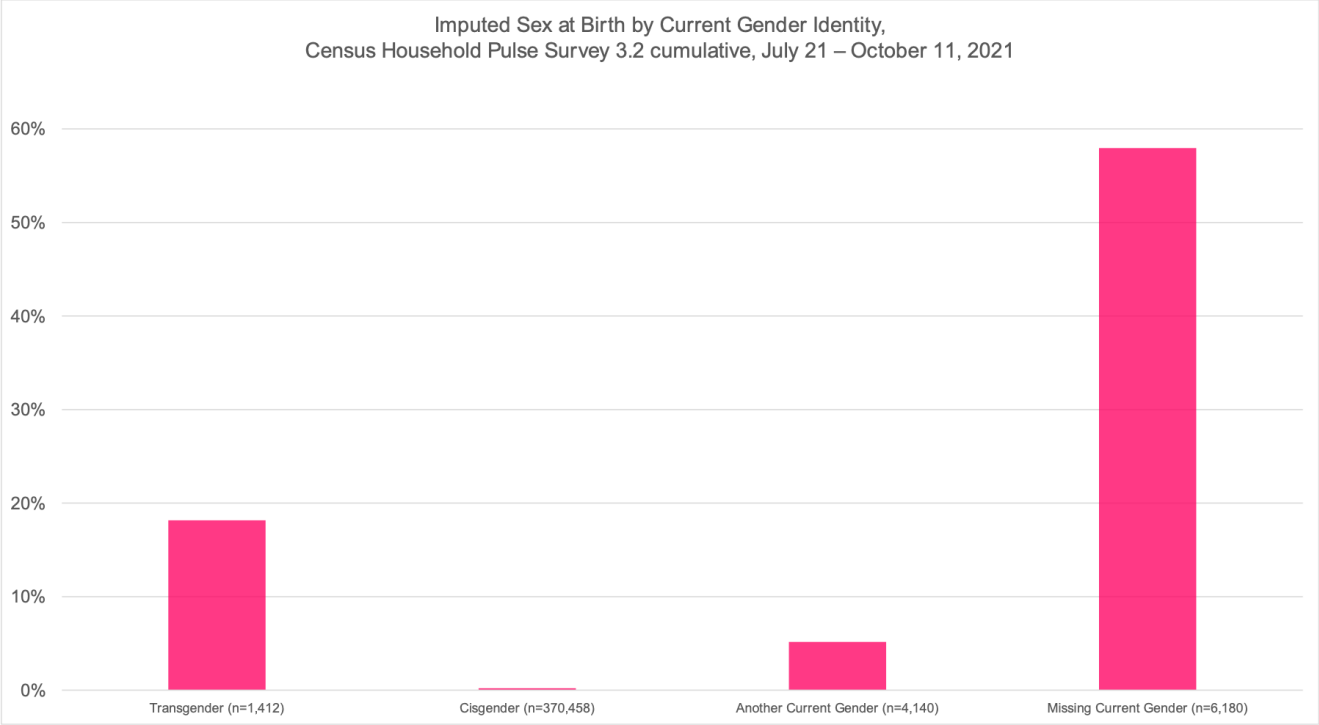
Solutions

Fortunately, a simple method to getting more accurate samples of transgender individuals in HPS exists. Namely, analyses using current gender identity (transgender, cisgender, another gender), should be restricted to those with known sex at birth (`AGENID=2`).

It would generally be good practice to take account of imputation of other variables as well (such as age and race/ethnicity), either by subsetting to the not-imputed sample, or using methods that are more sophisticated that this memo will not go into detail on.

Detailed Examination of the Data

Below, I explore the magnitude and potential impact of the issue of imputed sex at birth on the observed demographic profiles of respondents identified as transgender in HPS. Specifically, I examine data from the 3.2 waves (July 21– Oct 11, 2021). To start, I calculated the proportion of respondents with imputed sex at birth among those directly or indirectly identified as transgender, those identified as cisgender, and those reporting "none of these" as their current gender identity (labelled "another current gender").



Without restricting the analysis to AGENID=2, nearly half of respondents identified as transgender through the indirect method have imputed sex at birth, much higher than respondents directly identified as transgender:

Among cases with known sex at birth (AGENID_BIRTH=2):
1,094 transgender via the direct method
408 transgender via the indirect method
369,848 cisgender (all via the indirect method)
Among cases with imputed sex at birth (AGENID_BIRTH=1):
18 transgender via the direct method
529 transgender via the indirect method
610 cisgender
Thus, the following proportions of each of these groups had an imputed sex at birth:
1.62% of transgender via the direct method
56.46% of transgender via the indirect method
0.16% of cisgender

On the following pages, charts are presented in pairs to demonstrate the demographics of respondents by current gender identity with known (AGENID=1) and imputed (AGENID=2) sex at birth. The **left chart** shows the distribution by gender identity for known sex at birth (AGENID=1).The **right chart** shows the distribution by gender identity for imputed sex at birth (AGENID=2).

Note that, not only are cases with imputed sex at birth disproportionately assigned to “transgender”, but the demographics of these imputed cases are markedly different from the demographics of cases with known sex at birth.

Age

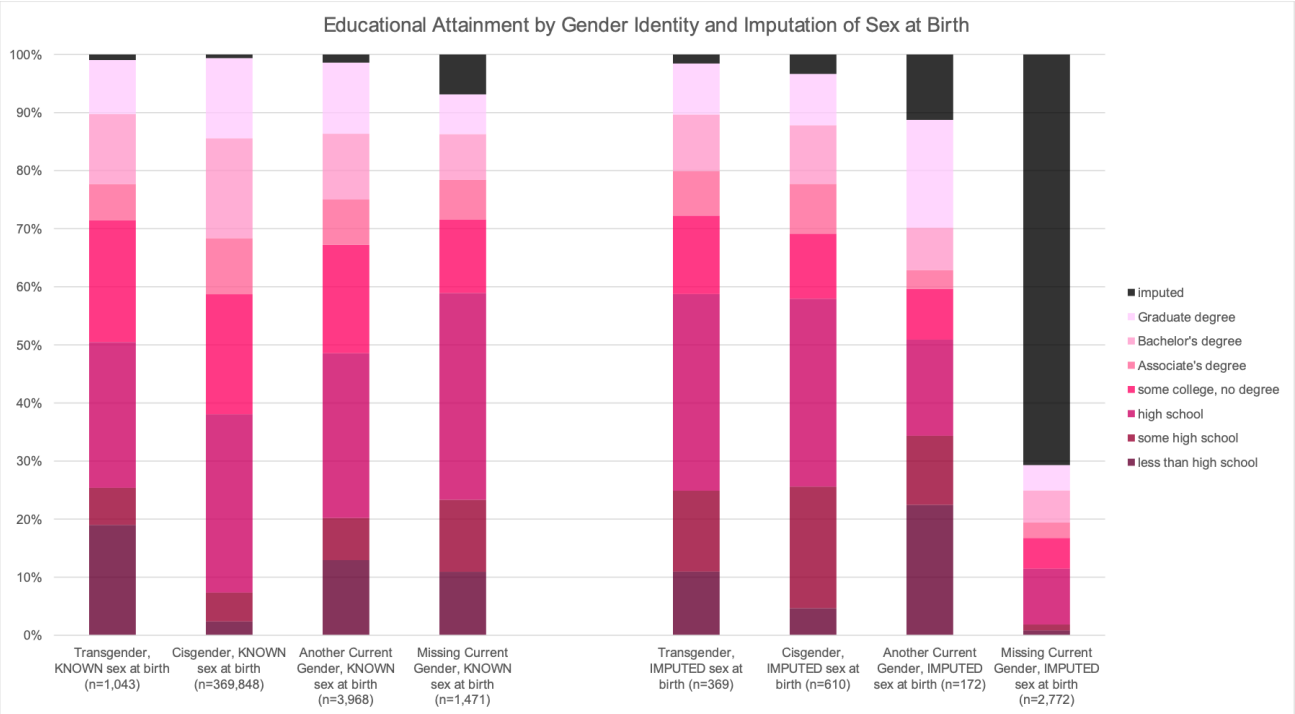
In other large surveys of general population in the United States, transgender respondents are markedly younger than cisgender populations. This is also true among HPS respondents restricted to known sex at birth. But among HPS respondents with imputed sex at birth, those identified as “transgender” have marked shift in the age distribution towards older respondents.

Sexual Orientation

In other large surveys of general population in the United States, transgender respondents are more likely to identify as a sexual minority (gay, lesbian, bisexual), as “something else”, or don’t know. This is also true among HPS respondents restricted to known sex at birth. But among HPS respondents with imputed sex at birth, those identified as “transgender” have almost the same sexual orientation distribution as cisgender respondents.

Educational Attainment

In other large surveys of general population in the United States, transgender respondents are more likely to report low levels of educational attainment. This is also true among HPS respondents restricted to known sex at birth. But among HPS respondents with imputed sex at birth, those identified as “transgender” have almost the same sexual educational attainment distribution as cisgender respondents, with a somewhat heavier weight towards low levels of education.



Marital Status

In other large surveys of general population in the United States, transgender respondents are more likely to report never having been married, and less likely to report being married. This is also true among HPS respondents restricted to known sex at birth But among HPS respondents with imputed sex at birth, those identified as “transgender” have a marital status distribution more closely resembling cisgender respondents.