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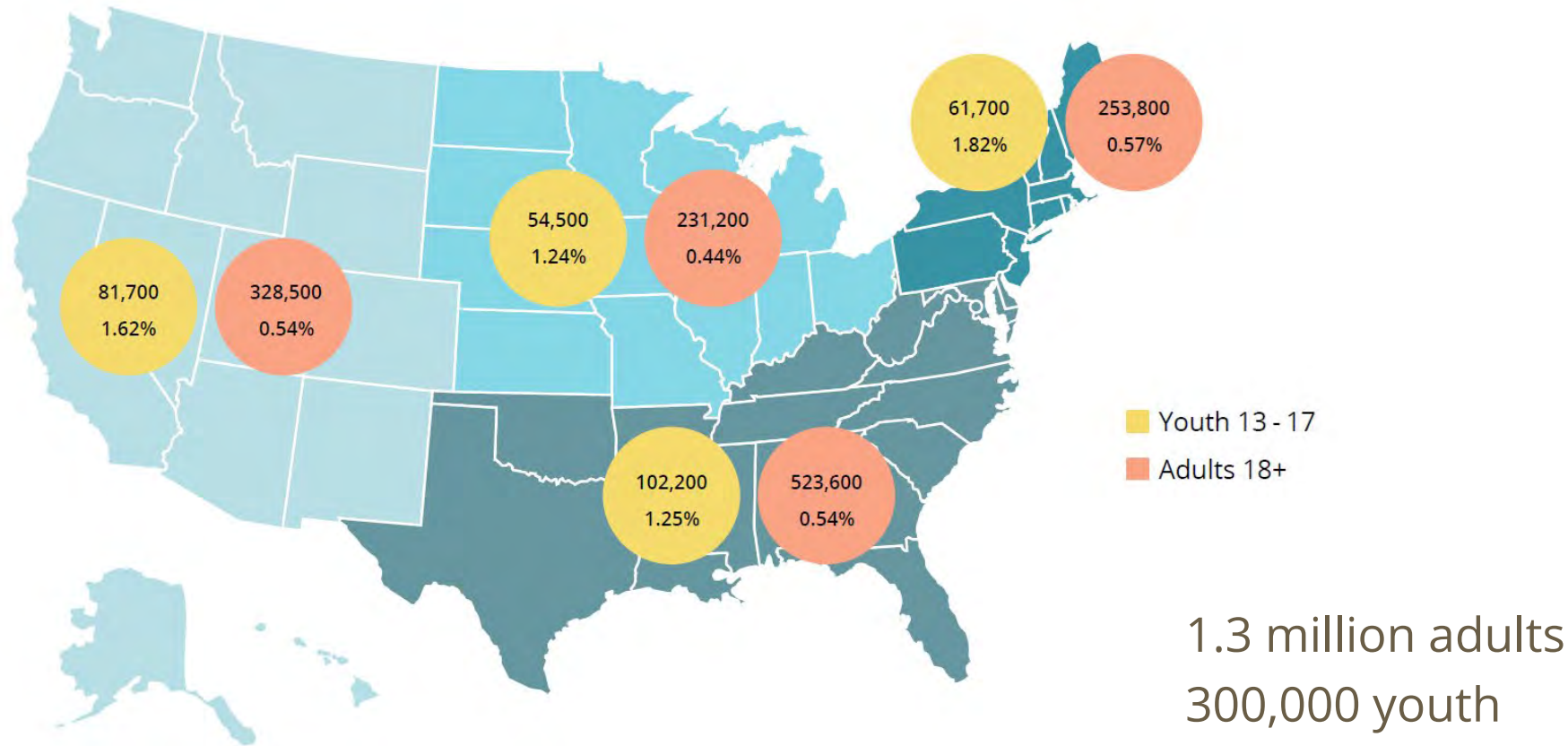
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# Survey Measurement of Sex and Transgender Identity in the Behavioral Risk Factor Surveillance System

Kathryn O'Neill  
October 2023  
FCSM

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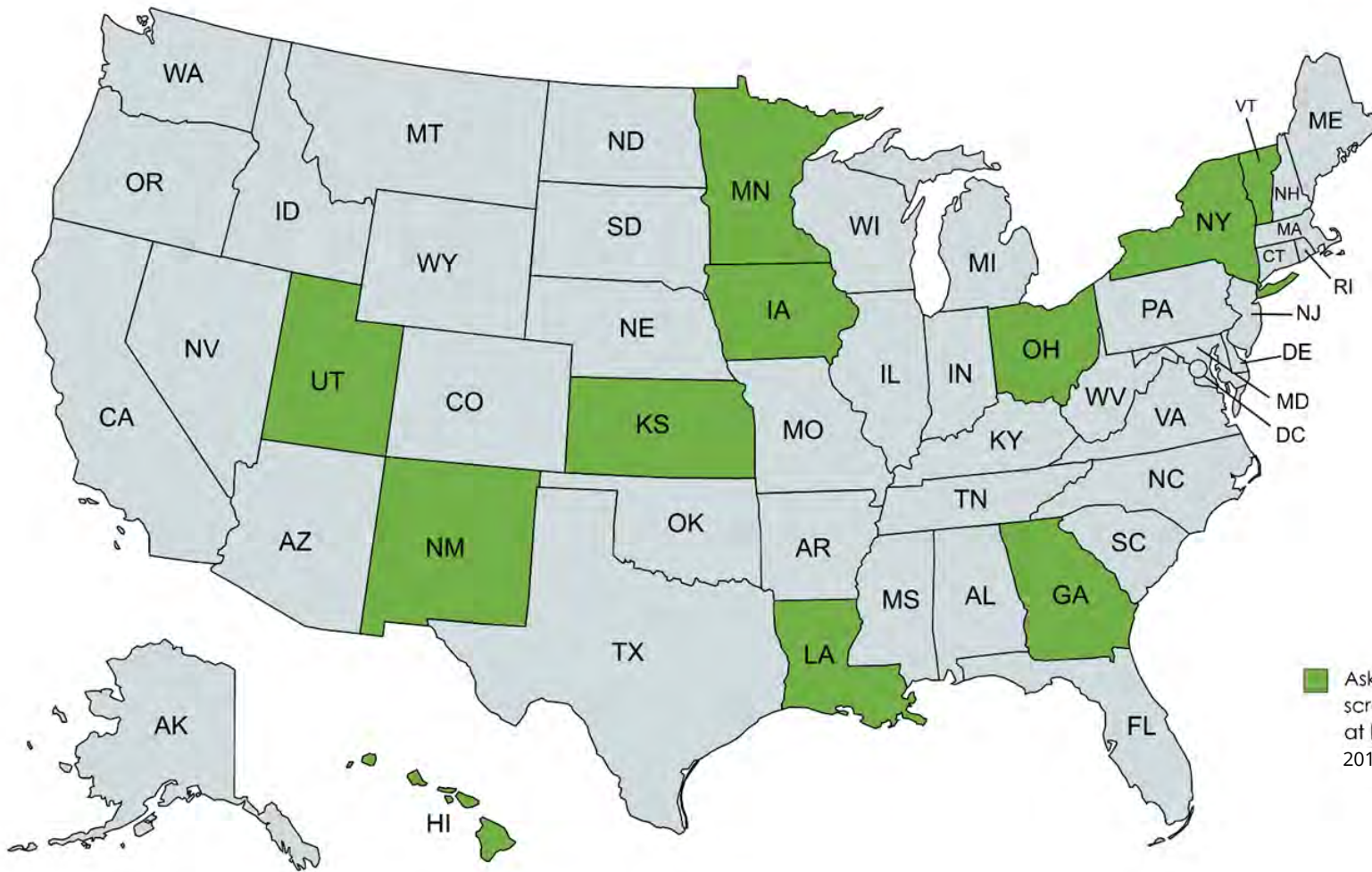
## Behavioral Risk Factor Surveillance System


- BRFSS data have allowed for research into not only the size of the transgender population, but also its health (Du Bois et al., 2021; Alzahrani et al., 2019; Downing & Przedworski, 2018; Du Bois et al., 2018; Meyer et al., 2017) and socioeconomic status (Carpenter et al., 2020) .
- The BRFSS remains the largest and most reliable source of population-based sexual orientation and gender identity data since it began collecting such data in some states in 2014.
- The survey consists of a rotating core of questions asked by all states, CDC-provided optional modules, and state-provided additions.



## Behavioral Risk Factor Surveillance System

- The BRFSS sexual orientation and gender identity (SOGI) module has also attracted research into survey measures and methodology (Jesdale, 2021; Riley et al., 2017; Tordoff et al., 2019; Cicero et al., 2020; Lett & Everhart, 2022)
- A sex at birth (SAB) module was introduced in 2019, and has since been adopted by 11 states for at least one year in 2019-2021.



 Asked SAB, SOGI, and screener questions at least once 2019-2021

# Research Questions

- How many people received different survey questions than they otherwise would have because of the sex at birth module?
- How did transgender respondents respond? Were their answers about SAB consistent with the question about transgender identity?
- How does this affect missingness patterns for sex-specific health questions?

# BRFSS measures

## Screening section

Are you male or female?

- Male
- Female

## Sex at Birth module

What was your sex at birth? Was it male or female?

- Male
- Female
- Don't know/not sure
- Refused

## SOGI module: Transgender identity

Do you consider yourself to be transgender?

- Yes, Male to Female
- Yes, Female to Male
- Yes, Gender non-conforming
- No
- Don't know/not sure
- Refused



If these contradict, the SAB module takes precedence in determining the sex-specific survey questions that are administered.

# BRFSS measures

## Screening section

Are you male or female?

- Male
- Female

California did not use this question; some state-years allowed 'don't know' and 'refused' responses

## Sex at Birth module

What was your sex at birth? Was it male or female?

- Male
- Female
- Don't know/not sure
- Refused

Some states used their own version of a sex at birth module which differs from this, although this data is not included in national dataset. Such answers do affect classification of respondents and the health questions people receive

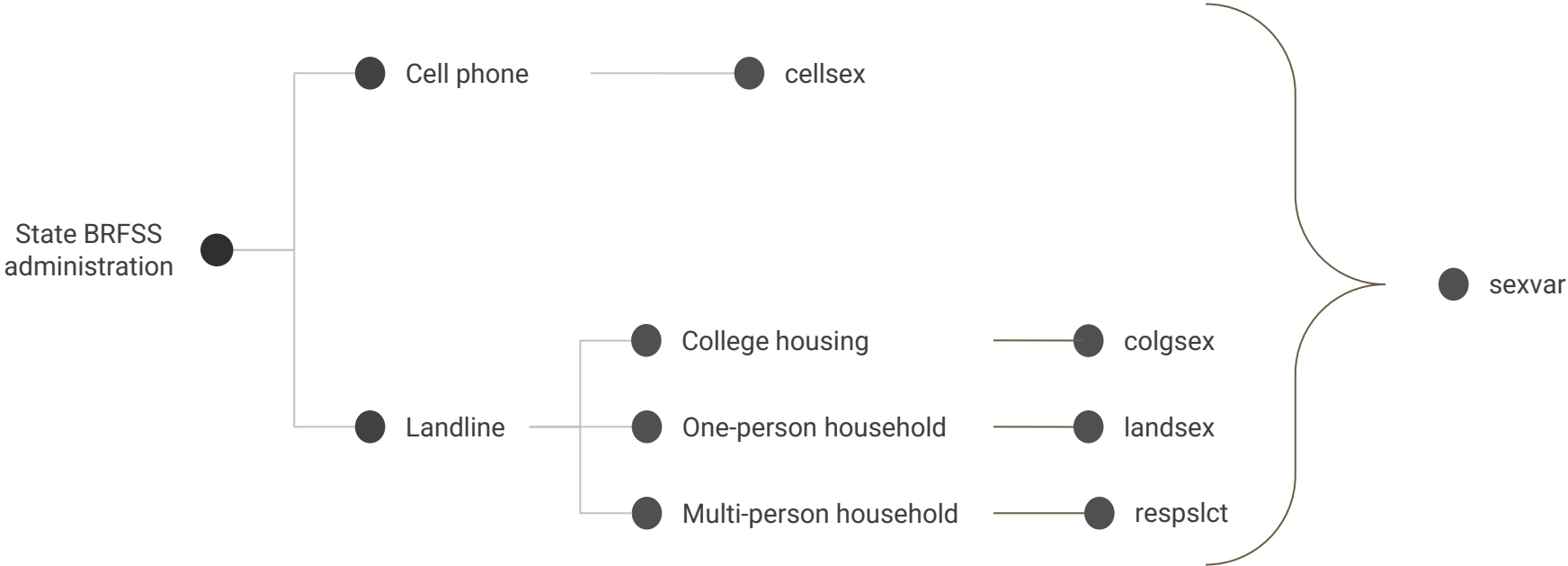
## SOGI module: Transgender identity

Do you consider yourself to be transgender?

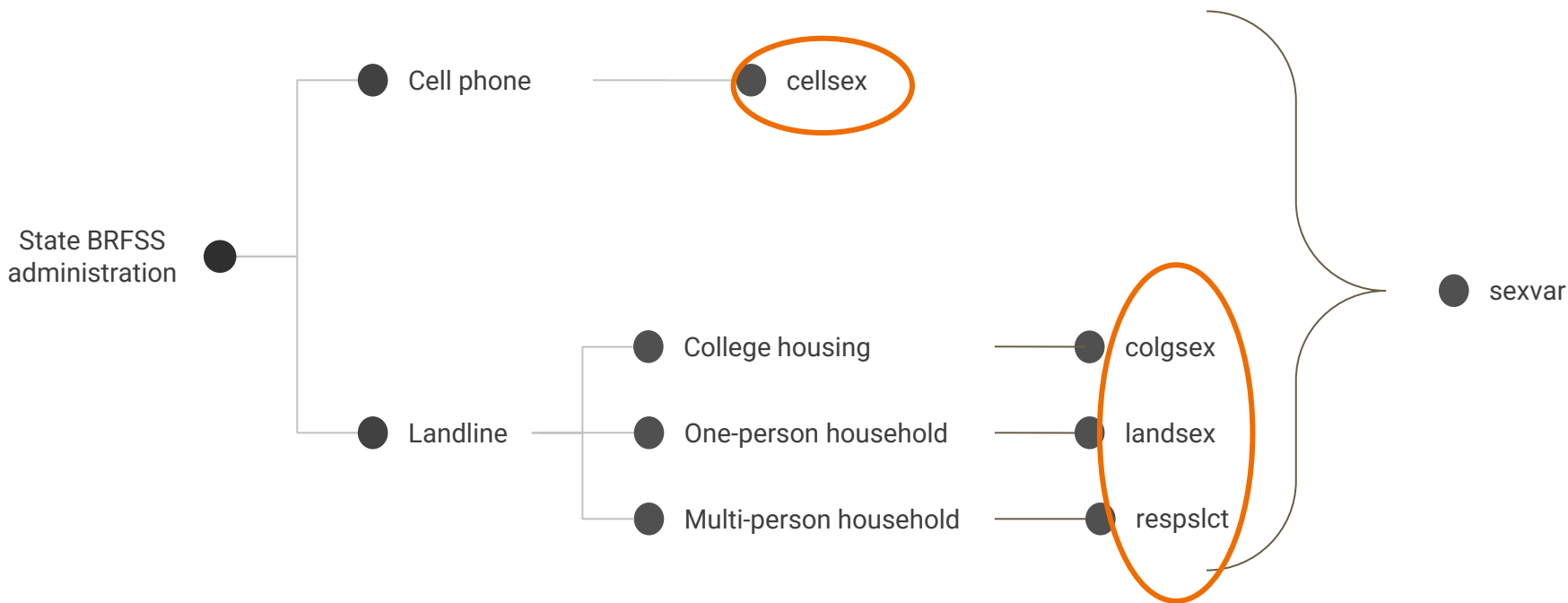
- Yes, Male to Female
- Yes, Female to Male
- Yes, Gender non-conforming
- No
- Don't know/not sure
- Refused



# Screening section: Are you male or female?

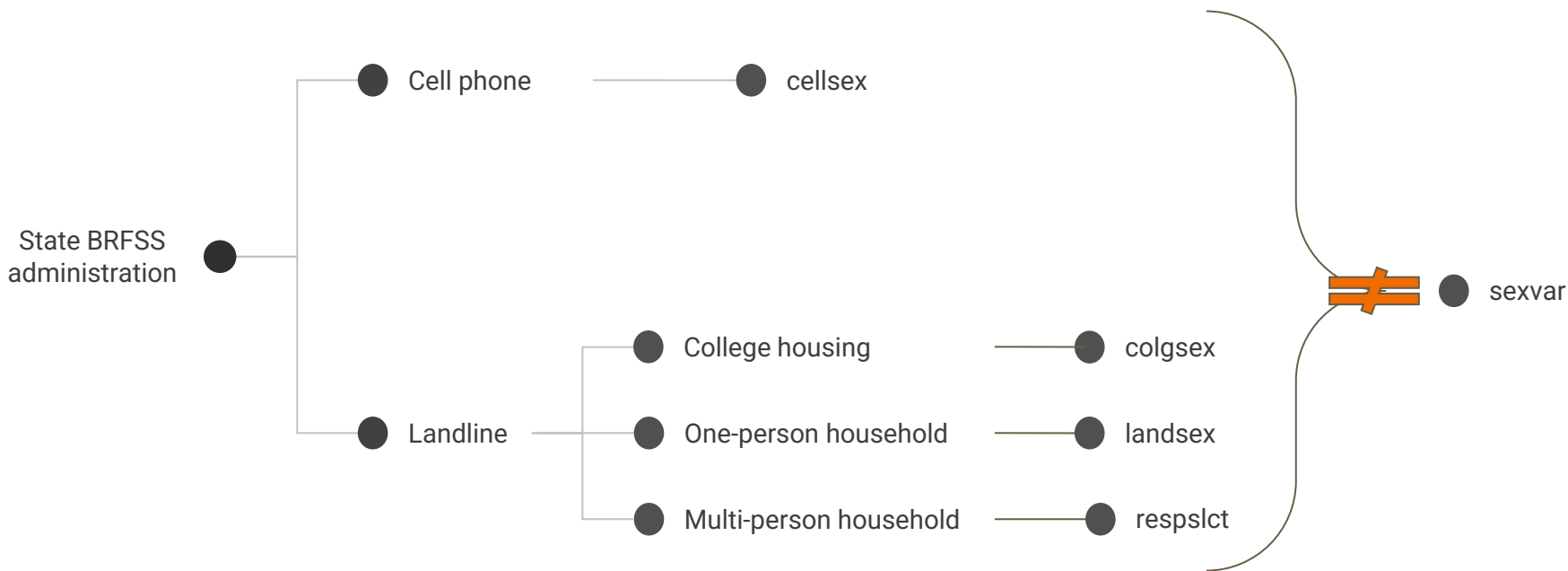


## Screening section: Are you male or female?



About 3% of respondents from 2019-2021, spread across states, have no values for any of these component variables, but do have a value for sexvar.

## Screening section: Are you male or female?

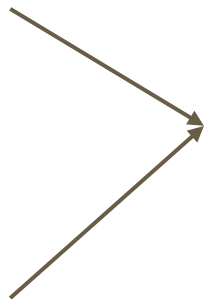


For some respondents, the values of the component variables do not match the value of sexvar. This is concentrated in some states.

# BRFSS measures

Screening section  
(sexvar)

Sex at Birth module



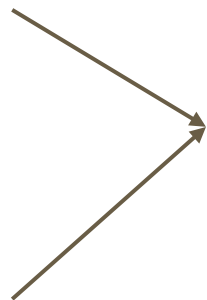
Survey classification of sex (\_sex)

# BRFSS measures

Screening section  
(sexvar)



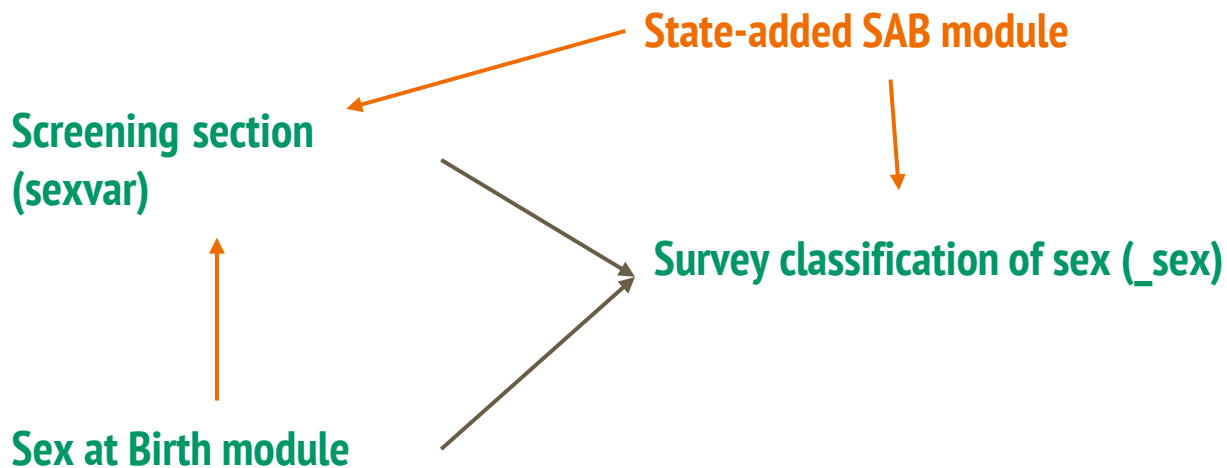
Sex at Birth module



Survey classification of sex (`_sex`)

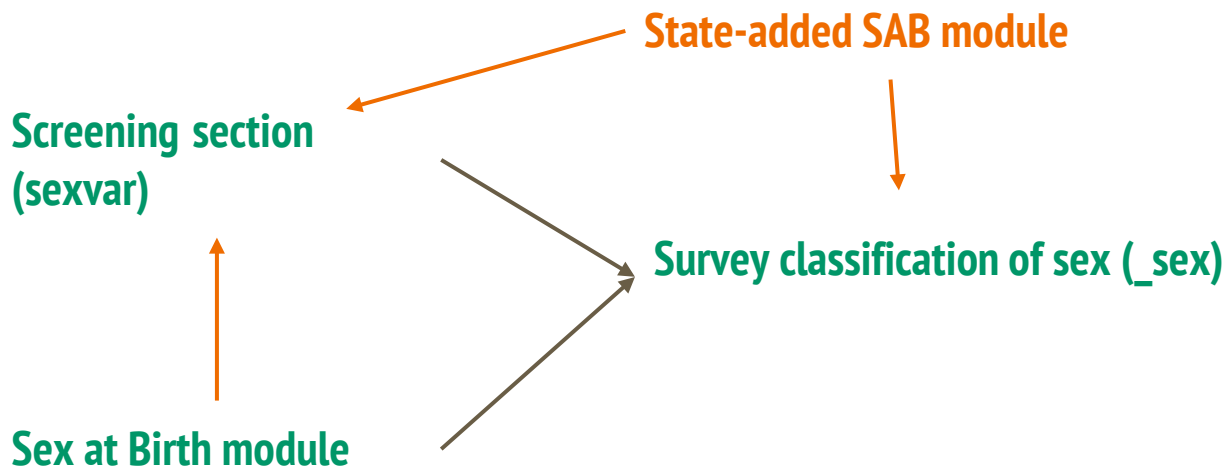
Some states *override* the value of the screening section variable with the answer to the sex at birth question

# BRFSS measures



Some states *override* the value of the screening section variable with the answer to the sex at birth question

# BRFSS measures



Some states *override* the value of the screening section variable with the answer to the sex at birth question

By relying on the final sex variable available in the dataset, we do not know what question(s) that value came from.

Additionally, respondents who answered different questions differently are hidden.

# BRFSS measures

## Screening section

Are you male or female?

- Male
- Female

Rely on component variables only

## Sex at Birth module

What was your sex at birth? Was it male or female?

- Male
- Female
- Don't know/not sure
- Refused

Remove states known to have used their own SAB module

## SOGI module: Transgender identity

Do you consider yourself to be transgender?

- Yes, Male to Female
- Yes, Female to Male
- Yes, Gender non-conforming
- No
- Don't know/not sure
- Refused



# Research Questions

- How many people received different survey questions than they otherwise would have because of the sex at birth module?
- How did transgender respondents respond? Were their answers about SAB consistent with the question about transgender identity?
- How does this affect missingness patterns for sex-specific health questions?

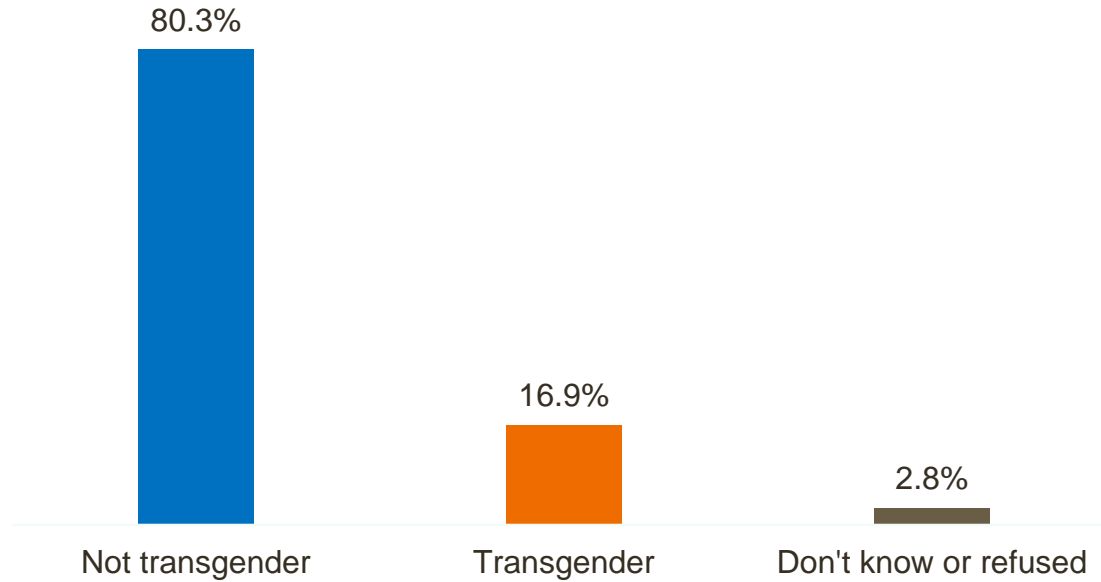
Table 1: Sex screener and sex at birth, BRFSS 2019-2021, N=251,611

		Are you male or female?	
		Male <i>n=117,636</i>	Female <i>n=133,975</i>
What was your sex at birth? Was it male or female?	Male	98.6	0.9
	Female	0.9	98.8
	Don't know / Not sure	0.2	0.1
	Refused	0.3	0.2
	<i>Total</i>	<i>100</i>	<i>100</i>
Total percentage whose answer to SAB overrode their sex screener response			0.9

Note: Weighted column percentages. Results from all states which asked about sex at birth.

About 1% of all respondents answered these two questions differently

Responses to “Are you male or female” and “What is your sex at birth” are different (n=1,514)



Among those that answered the two questions differently, only about 17% are transgender

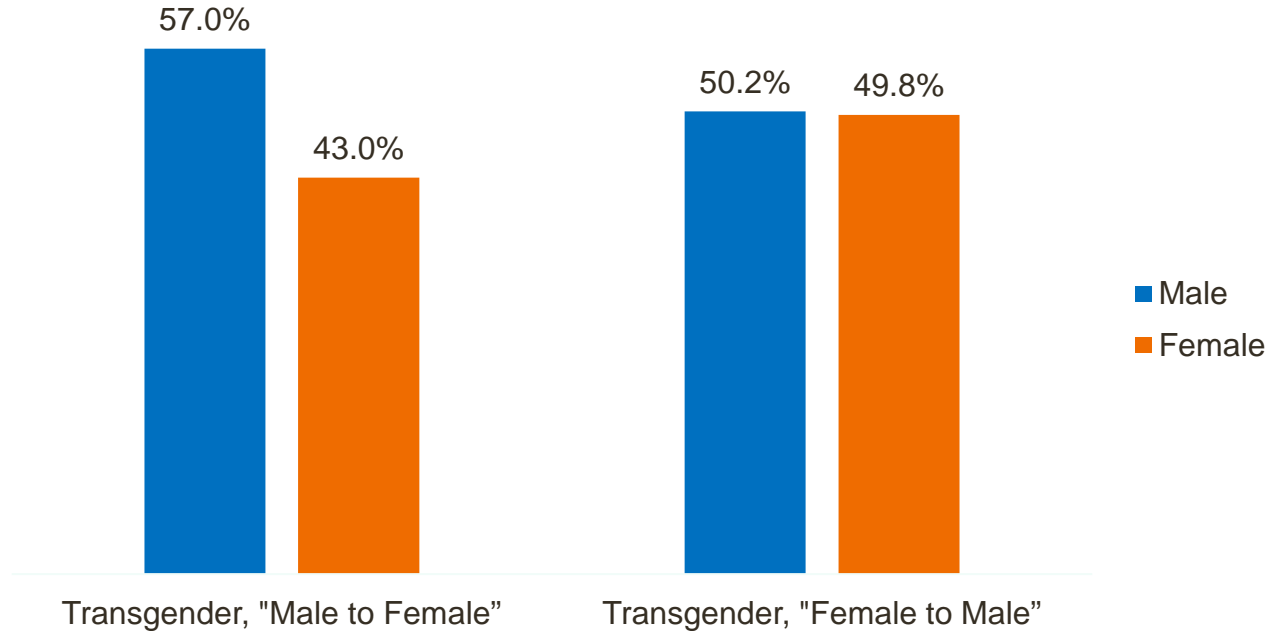
Table 3. Sex screener and sex at birth of respondents who identify as transgender, BRFSS 2019-2021, N=1,092

		Are you male or female?	
		Male <i>n=545</i>	Female <i>n=547</i>
What was your sex at birth? Was it male or female?	Male	71.4	27.3
	Female	27.8	70.7
	Don't know/ Not sure	0.3	0.7
	Refused	0.3	1.3
	<i>Total</i>	<i>100</i>	<i>100</i>
Total percentage whose answer to SAB overrode their sex screener response		27.6	

Note: Weighted column percentages. Results from all states which asked about sex at birth.

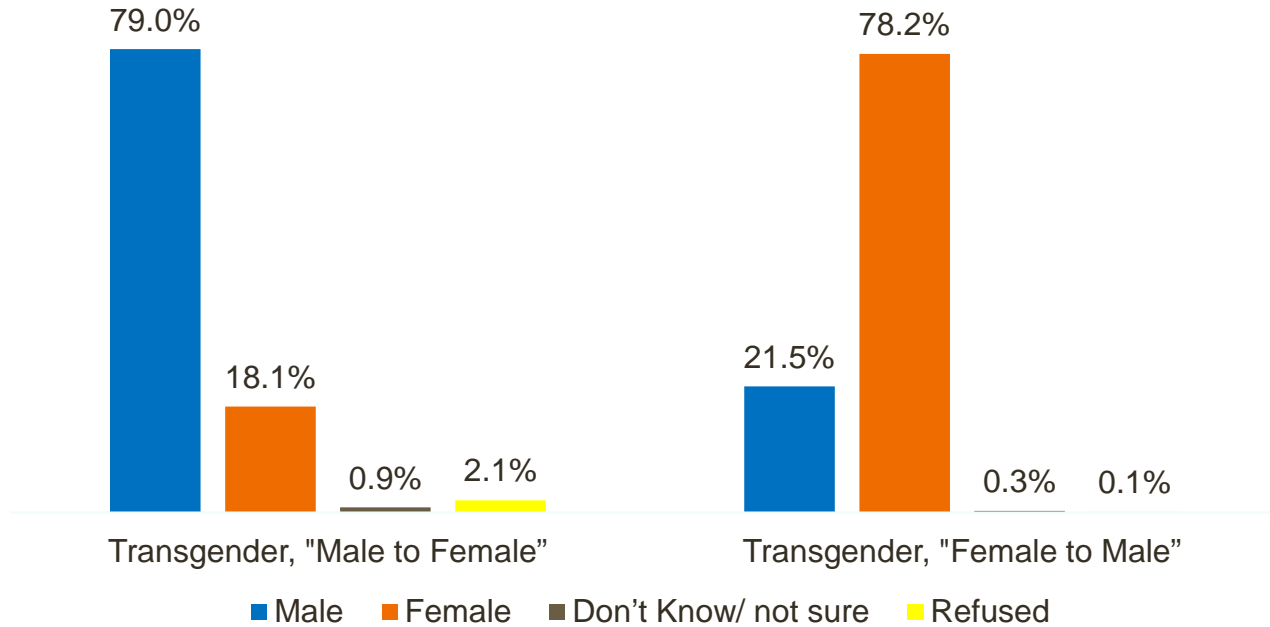
About 28% of transgender respondents answered these two questions differently

## Are you male or female?



About half of transgender men and transgender women appear to have answered "Are you male or female" with their sex, and half with their implied gender

## What was your sex at birth? Was it male or female?



18% to 21% of transgender respondents provide incongruent responses to the SAB question and the transgender identity question

# Sex-specific health questions

Pregnancy

Pap test

Hysterectomy

Mammogram

H.P.V test

*Don't know or refused: 0.6% - 9.9%*

Prostate-specific antigen test  
(4 questions)

*Don't know or refused: 2.8%-5%*

# Sex-specific health questions

Table 10. Relationship between state inclusion of the CDC sex at birth module and don't know or refused responses to sex-selective questions.

	Count of refused or don't know responses to breast & cervical cancer screening and pregnancy questions (Poisson)	Count of refused or don't know responses to prostate cancer screening questions (Negative Binomial)
Identify as transgender (reference category: not transgender)	0.869 (0.648, 1.165)	1.030 (0.680, 1.560)
Age	1.023*** (1.021, 1.025)	1.016*** (1.014, 1.018)
In a state which asked the CDC SAB module	0.991 (0.950, 1.034)	0.831*** (0.789, 0.875)
Constant	0.093*** (0.085, 0.102)	.073*** (0.064, 0.085)
Ln alpha		1.920*** (1.879, 1.960)
McFadden's Pseudo R-squared	0.0092	0.0034
Observations	40,958	75,687

Note: Incidence Rate Ratios. 95% Conf. Intervals in parentheses; \* p<0.05, \*\* p<0.01, \*\*\* p<0.001



# Results

- Survey classification of transgender respondents' sex changes about 28% of the time in states which ask the sex at birth module.
- About 1% of all respondents' sex was re-categorized by the SAB module.
  - In states without the SAB module, this implies that 3,000 people per year were asked questions that were not relevant to them.
- Transgender respondents' combinations of answers to questions about their transgender identity, sex at birth, and the screening question are quite diverse, implying a need for improvement in these measures.
- Some evidence that respondents classified as male are more likely to answer questions about prostate cancer screening in states which ask the sex at birth module.

# Implications - survey design

- As one of the largest health surveys in the world, measures of sex and/or gender should be clear, distinct, and measured well and consistently across states.
- State-added modules should not affect other items in the survey.
- Questions about sex should be asked consistently in form and method across states.
- Justify asking questions about sex at birth - i.e. , this information is needed for later health questions.
- Terminology could be more clear in the question of transgender identity; i.e., instead of "female to male", "female sex assigned at birth, identify as a male".

# Considerations when using BRFSS

- The sex at birth module is important, especially for transgender respondents, although only available in 11 states.
- Do not rely upon the recoded sex variables (sexvar and \_sex) if the source of that variable is important (sex at birth module or screening question).
- Be aware that some states used their own SAB modules which are not included in the national dataset.
  - Be aware that some national documentation is misleading on this account. See CA sexvar 2019.

# Thank you!

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she/her

# New York 2021

NY State-Added Module 2ABC: Sex at Birth - Ask before CDEM.05

Question Number	Question text	Variable names	Responses (DO NOT READ UNLESS OTHERWISE NOTED)	SKIP INFO/ CATI Note	Interviewer Note (s)	Column(s)
SA_SAB.01	What sex were you assigned at birth?	BIRTHSEX_SA	1 Male 2 Female 3 Intersex 4 Sex assigned at birth not listed, please specify: <hr/> 7 Don't know/Not sure 9 Refused		Intersex is a general term used for a variety of conditions in which a person is born with a reproductive or sexual anatomy that doesn't seem to fit the typical definitions of female or male.	

# Maine 2020

## CELLSEX

CP05. Are you male or female?

- 1 Male
- 2 Female
- 7 Don't know/Not sure
- 9 Refused

[INTERVIEWER NOTE: IF RESPONSE IS TRANSGENDER MALE, CODE AS MALE; IF RESPONSE IS TRANSGENDER FEMALE, CODE AS FEMALE. IF INITIAL RESPONSE IS ANYTHING OTHER THAN MALE OR FEMALE, INCLUDING DK/NS OR REFUSED, READ: We understand that this question does not recognize non-binary people, but we will ask about gender identity later in the survey. For now, to move forward in the survey, is it possible to tell me what sex is listed on any of your identification, such as your birth certificate, driver's license or passport? ]

# California 2019

## Screening section

### **SEX2 (CDC-CORE)**

INTERVIEWER NOTE: CONFIRM SEX OF SELECTED RESPONDENT.  
YOU MUST ASK:

#### **What was your sex at birth?**

¿Cuál fue su género (sexo) (asignado) al nacer?

1. MALE RESPONDENT
2. FEMALE REPENDENT

Table 4. Transgender identity of respondents by whether responses to “Are you male or female?” differs from their sex at birth BRFSS 2019-2021, N=234,705

	Responses to “Are you male or female” and “What is your sex at birth” are the same. n=233,191	Responses to “Are you male or female” and “What is your sex at birth” are different. n=1,514	Total n=234,705
	%	%	%
Not transgender	98.1	80.3	98.0
Transgender	0.4	16.9	0.6
Don't know or refused	1.4	2.8	1.4

Note: Weighted column percentages. Results from all states which asked about both sex at birth and gender identity.

About 0.6% of the sample is transgender.

Among those that answered the two questions differently, only about 17% are transgender



Table 4: Transgender identity and sex screening question, BRFSS 2019-2021

Do you consider yourself to be transgender?		
“Are you male or female?”	Transgender women “Yes, Male to Female” <i>n=366</i>	Transgender men “Yes, Female to Male” <i>n=402</i>
Male	57.0	50.2
Female	43.0	49.8
<i>Total</i>	<i>100</i>	<i>100</i>

About half of transgender men and transgender women appear to have answered “Are you male or female” with their sex, and half with their implied gender

Table 5. Transgender identity and sex at birth, BRFSS 2019-2021

What was your sex at birth? Was it male or female?	Do you consider yourself to be transgender?	
	Transgender women “Yes, Male to Female” <i>n=366</i>	Transgender men “Yes, Female to Male” <i>n=402</i>
Male	79.0	21.5
Female	18.1	78.2
Don't Know/ not sure	0.9	0.3
Refused	2.1	0.1
<i>Total</i>	<i>100.0</i>	<i>100.0</i>

Note: Weighted column percentages. Results from all states which asked about both sex at birth and gender identity.

18% to 21% of transgender respondents provide incongruent responses to the SAB question and the transgender identity question

OUT POLITICS AND POLICY

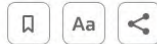
## DeSantis signs 'Don't Say Gay' expansion and gender-affirming care ban

The new Florida measures will expand what critics call the state's "Don't Say Gay" law through eighth grade and restrict transition-related care for minors.

## Florida education board extends ban on gender identity lessons to all grades

By Joseph Ax

April 19, 2023 4:43 PM EDT · Updated 3 months ago



LGBTQ+

## Texas could ban instruction on sexual orientation, gender identity at all grade levels

by: [Will DuPre](#)

Posted: May 25, 2023 / 01:14 PM CDT

Updated: May 25, 2023 / 01:14 PM CDT



(Getty Images)

OUT POLITICS AND POLICY

# DeSanti gender-

The new Florida  
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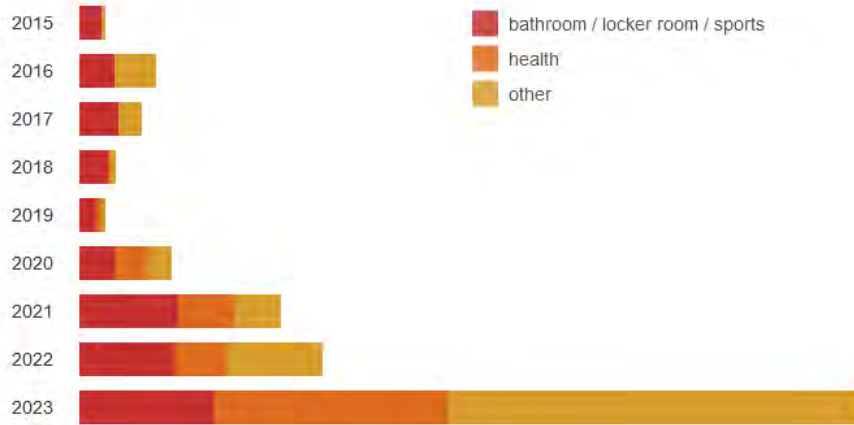
# Tracking the rise of anti-trans bills in the U.S.

The United States has experienced a long rise in anti-trans legislation. Now it's surging.

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hover for bill totals

<https://translegislation.com/learn>

# struction n, ll grade



(Getty Images)