Letter to the Editor Regarding "Gender Identity Disparities in Cancer Screening Behaviors"

We read the article by Tabaac and colleagues,[1] "Gender Identity Disparities in Cancer Screening Behaviors," in the March 2018 issue of the *American Journal of Preventive Medicine* with great interest as there is a paucity of information on cancer screening patterns in transgender and gender-nonconforming populations.[2] We thank and commend the authors for writing this innovative manuscript; however, a few items in the manuscript were unclear to us.

Authors state that 2014, 2015, and 2016 Behavioral Risk Factor Surveillance System (BRFSS) data were used. According to Table 1 in Tabaac et al., more than 70% of the sample was from the 2015 survey and 2% or less was from the 2016 survey. From BRFSS documentation, questions on gender identity and breast, cervical, and colorectal cancer (CRC) screening were fielded in fewer than ten states in the 2015 survey and in more than 20 states in 2016.[3] Thus, we would anticipate that a greater proportion of the sample would come from the 2016 than 2015 data.

Furthermore up-to-date (UTD) CRC, breast, and cervical cancer screening rates are presented, but only among those with lifetime testing. We did not find this conditioned prevalence to be plainly defined based on Tables 3 and 4 in Tabaac et al., and without careful attention, could be misinterpreted. For example, UTD CRC screening prevalence as presented in the manuscript by Tabaac et al. in Table 3 exceeds 90% when conditioned on ever having a fecal occult blood or endoscopic test. Unconditioned UTD CRC screening rates are remarkably lower. For example, we applied the American Cancer Society definition of UTD CRC screening (colonoscopy in the past 10 years, sigmoidoscopy in the past 5 years, and stool testing in the past year)[4] to 2014 and 2016 BRFSS data and found that trans men (67.3%) had similar CRC screening prevalence as cis men (67.5%) and cis women (69.9%), though rates are lower among trans women (49.1%) and gender nonconforming (53.0%).

In addition, we encourage readers to interpret the ORs presented in Table 4 in Tabaac et al. with caution. These ORs appear to be correctly calculated, but could be misunderstood if readers are not aware of the divergence of ORs and prevalence ratios when outcomes are common.[5,6] For example, according to Table 3 in Tabaac et al., more than 90% of respondents were UTD with CRC screening when condition on lifetime endoscopy or fecal occult blood test. The magnitude of the greatest absolute difference was between cis men and gender nonconforming is 98.5% −91.6%=6.9%, or in terms of prevalence ratios: 91.6/98.5=0.93. When the odds are used, because of the high prevalence of the outcome, the unadjusted OR is [(0.916/[1−0.916])/(0.985/[1−0.985])]=0.17.

We hope that our letter helps clarify some of the data presentation and again would like to express our appreciation to the authors for examining cancer screening in this understudied population.

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REFERENCES

1. Tabaac AR, Sutter ME, Wall CSJ, Baker KE. Gender identity disparities in cancer screening behaviors. *Am J Prev Med.* 2018;54(3):385–393. https://doi.org/10.1016/j.amepre.2017.11.009.
2. Braun H, Nash R, Tangpricha V, Brockman J, Ward K, Goodman M. Cancer in transgender people: evidence and methodological considerations. *Epidemiol Rev.* 2017;39(1):93–107. https://doi.org/10.1093/epirev/mxw003.
3. BRFSS questionnaires. CDC. www.cdc.gov/brfss/questionnaires/index.htm. Updated January 18, 2018. Accessed May 21, 2018.
4. Smith RA, Andrews KS, Brooks D, et al. Cancer screening in the United States, 2017: a review of current American Cancer Society guidelines and current issues in cancer screening. *CA Cancer J Clin.* 2017;67(2):100–121. https://doi.org/10.3322/caac.21392.
5. Cummings P. The relative merits of risk ratios and odds ratios. *Arch Pediatr Adolesc Med.* 2009;163(5):438–445. https://doi.org/10.1001/archpediatrics.2009.31.
6. Tamhane AR, Westfall AO, Burkholder GA, Cutter GR. Prevalence odds ratio versus prevalence ratio: choice comes with consequences. *Stat Med.* 2016;35(30):5730–5735. https://doi.org/10.1002/sim.7059.

Author Response to "Letter to the Editor Regarding 'Gender Identity Disparities in Cancer Screening Behaviors'"

First, we would like to thank S. A. Fedewa, A. G. Sauer, and A. Jemal for their Letter to the Editor[1] regarding our publication "Gender Identity Disparities in Cancer Screening Behaviors."[2]

Fedewa and colleagues[1] first noted that fewer than expected cases from survey year 2016 were presented in

the original analyses. Upon further investigation, we realize it was an unintentional error that resulted in data merging incorrectly, and the majority of participants from survey year 2016 were inadvertently excluded from the original analyses. In our correction, the year variable now reflects survey year (2014, 2015, and 2016) as opposed to the year of interview (years 2014–2017 represented) that was originally used.

Also noted by Fedewa et al.,[1] our original up-to-date (UTD) variable excluded individuals who never screened for the respective tests, which was unclear in the description and, indeed, unconventional. In our correction, a new UTD variable was computed to include those who did not report lifetime screening as not UTD.

In response to these two points, we have published an erratum[3] that describes in detail the changes to the original publication. As a result of these corrections and re-coding of the UTD outcome, all descriptive data in-text have been edited and Tables 1, 3, and 4 have been reconstructed as Revised Tables 1, 3, and 4. First, in our correction, transgender men had significantly increased odds of being UTD for colorectal cancer screening (versus lifetime endoscopy), which did not change our discussion of this test. Second, we found that transgender women had significantly lower odds of lifetime mammography and now discuss this contrast with prior findings. Third, in addition to reduced odds of lifetime Pap tests, gender-nonconforming individuals also had significantly lower odds of being UTD for Pap tests, which aligns with our original conclusions regarding provider recommendation and the gendered nature of this test. Fourth, differences in prostate-specific antigen testing were no longer significantly different by gender; however, because differences were originally discussed without speculation, there is no significant change to our conclusions. Emergence of reduced mammography rates among transgender women and lower Pap test rates of gender-nonconforming individuals have been highlighted in the Future Directions section.

The authors' comment regarding potential misinterpretation of ORs when outcomes are common is well taken. However, in our recalculation of the UTD variables, the imbalance between outcome categories was reduced, so this concern is significantly abated in the corrected publication.

We apologize for any confusion this may have caused the readers and once again thank Fedewa and colleagues[1] for their Letter that brought this to our attention.

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REFERENCES

1. Fedewa SA, Godin Sauer A, Jemal A. Letter to the editor: regarding the Tabaac et al. article on gender identity disparities in cancer screening behaviors. *Am J Prev Med*. In press.
2. Tabaac AR, Sutter ME, Wall CSJ, Baker KE. Gender identity disparities in cancer screening behaviors. *Am J Prev Med*. 2018;54(3):385–393. https://doi.org/10.1016/j.amepre.2017.11.009.
3. Tabaac AR, Sutter ME, Wall CSJ, Baker KE. Erratum: gender identity disparities in cancer screening behaviors. *Am J Prev Med*. In press.

Table 1. Weighted Percentages and Bivariate Results of Sample Characteristics by Gender Identity (Revised)

	Cisgender		Transgender			
Characteristics	**Men**	**Women**	**Women**	**Men**	**GNC**	***p*-value**
Sample, *n*	192,670	249,017	936	593	384	
Age, years						**<0.001**
18–24	11	10	17	15	25	
25–34	17	16	12	15	21	
35–44	17	17	16	26	14	
45–54	19	19	18	14	9	
55–64	18	18	23	14	16	
≥65	19	20	16	16	15	
Sexual orientation						**<0.001**
Straight	96	96	81	78	56	
Gay/lesbian	2	1	4	10	12	
Bisexual	1	2	11	10	23	
Other	0	0	5	1	9	
Race/ethnicity						**<0.001**
White NH	68	67	59	54	50	
Black NH	10	12	13	13	14	
Hispanic	14	13	16	24	24	
Other NH	8	7	13	8	13	
Employment status						**<0.001**
Employed	55	47	47	46	36	
Self-employed	12	6	11	8	11	
Out of work	5	5	9	10	6	
Homemaker	0	12	3	11	3	
Student	4	5	5	4	12	
Retired	18	18	16	13	19	
Unable to work	6	7	10	10	12	
Relationship status						**<0.001**
Partnered	60	56	56	44	47	
Not partnered	40	44	44	56	53	
Education						**<0.001**
Did not graduate HS	13	12	27	23	17	
Graduated HS	30	27	35	41	30	
Some college	29	33	25	25	35	
Graduated college	27	28	14	11	18	
Income						**<0.001**
<$15,000	8	12	20	20	18	
$15,000 to <$25,000	15	18	22	26	21	
$25,000 to <$35,000	10	11	16	15	11	
$35,000 to <$50,000	14	14	11	12	13	
≥$50,000	53	46	32	28	37	
Health insurance						**<0.001**
Yes	88	91	84	79	88	
No	12	9	16	21	12	

(*continued on next page*)

Table 1. Weighted Percentages and Bivariate Results of Sample Characteristics by Gender Identity (Revised) (*continued*)

	Cisgender		Transgender			
Characteristics	**Men**	**Women**	**Women**	**Men**	**GNC**	***p*-value**
Personal doctor						<**0.001**
Yes	76	86	76	73	76	
No	24	14	24	27	24	
Survey year						<**0.001**
2014	23	23	27	28	18	
2015	32	32	38	34	41	
2016	45	45	36	38	41	

Note: Values are weighted percentages unless otherwise noted. Boldface indicates statistical significance ($p<0.05$).
GNC, gender-nonconforming; HS, high school; NH, non-Hispanic.

Table 3. Weighted Percentages and Bivariate Results of Lifetime and Up-to-Date Screenings by Gender Identity (Revised)

	Cisgender		Transgender			
Cancer screening	**Men**	**Women**	**Women**	**Men**	**GNC**	***p*-value**
CRC screening, *n*	124,826	169,099	610	370	214	
Lifetime BST, *n*	87,511	119,240	420	254	136	<**0.001**
Yes, %	30.4	34.0	23.2	34.4	30.1	
No, %	69.6	66.0	76.8	65.6	69.9	
Lifetime endoscopy[a], *n*	87,756	119,652	418	257	136	<**0.001**
Yes, %	68.7	70.7	52.6	75.2	47.1	
No, %	31.3	29.3	47.4	24.8	52.9	
UTD CRC screening, *n*	68,517	88,638	332	187	96	<**0.001**
Yes, %	70.9	74.3	55.4	81.3	58.4	
No, %	29.1	25.7	44.6	18.7	41.6	
Mammogram, *n*	—	187,879	676	422	231	
Lifetime mammogram, *n*	—	132,364	135	209	74	<**0.001**
Yes, %	—	95.2	85.4	96.3	89.3	
No, %	—	4.8	14.6	3.7	10.7	
UTD mammogram, *n*	—	131,576	133	207	74	0.069
Yes, %	—	70.1	54.5	78.1	66.1	
No, %	—	29.9	45.5	21.9	33.9	
Pap test, *n*	—	245,772	—	574	179	
Lifetime Pap, *n*	—	172,927	—	277	126	<**0.001**
Yes, %	—	94.2	—	80.2	71.4	
No, %	—	5.8	—	19.8	28.6	
UTD Pap, *n*	—	116,467	—	185	92	<**0.001**
Yes, %	—	83.6	—	69.2	62.4	
No, %	—	16.4	—	30.8	37.6	
PSA test, *n*	126,101	—	619	—	110	
Discuss PSA, *n*	85,602	—	298	—	68	0.090
Yes, %	68.9	—	57.5	—	43.2	
No, %	31.1	—	42.5	—	56.8	
Lifetime PSA, *n*	84,719	—	293	—	67	**0.048**
Yes, %	64.6	—	48.0	—	49.8	
No, %	35.4	—	52.0	—	50.2	
UTD PSA, *n*	83,762	—	291	—	67	0.406
Yes, %	48.9	—	40.3	—	39.6	
No, %	51.1	—	59.7	—	60.4	

Note: Initial header row's *n* reports the number of survey respondents who met sample selection requirements for the named tests; subsequent *n* refer to the number of respondents who responded to each survey item. Boldface indicates statistical significance ($p<0.05$).
[a]Sigmoidoscopy/colonoscopy.
BST, blood stool test; CRC, colorectal cancer; GNC, gender-nonconforming; PSA, prostate-specific antigen; UTD, up to date.

Table 4. Multivariate gistic Regression Analyses (Revised)

Cancer screening	Lifetime BST, AOR (95% CI)	Lifetime endoscopy[a], AOR (95% CI)	UTD CRC screening, AOR (95% CI)
CRC screening			
Cis man	ref	ref	ref
Trans woman	0.88 (0.55, 1.41)	0.66 (0.39, 1.13)	0.84 (0.43, 1.64)
Trans man	1.31 (0.79, 2.17)	1.63 (0.95, 2.78)	**2.29** (**1.18, 4.44**)
GNC	1.08 (0.57, 2.05)	**0.46** (**0.24, 0.89**)	0.76 (0.36, 1.61)
Cis woman	ref	ref	ref
Trans woman	0.79 (0.50, 1.23)	0.65 (0.39, 1.09)	0.72 (0.37, 1.42)
Trans man	1.14 (0.68, 1.90)	1.51 (0.87, 2.59)	**1.97** (**1.02, 3.83**)
GNC	0.95 (0.50, 1.82)	**0.43** (**0.23, 0.81**)	0.65 (0.31, 1.38)
	Discuss PSA test	Lifetime PSA test	UTD PSA test
PSA test			
Cis man	ref	ref	ref
Trans woman	1.01 (0.57, 1.78)	0.85 (0.51, 1.42)	1.08 (0.65, 1.80)
GNC	0.58 (0.22, 1.49)	1.09 (0.39, 3.00)	1.32 (0.47, 3.72)
	Lifetime mammogram	UTD mammogram	—
Mammogram			
Cis woman	ref	ref	
Trans woman	**0.33** (**0.15, 0.72**)	0.70 (0.31, 1.60)	
Trans man	2.18 (0.85, 5.59)	**2.03** (**1.25, 3.30**)	
GNC	0.44 (0.14, 1.38)	0.87 (0.41, 1.81)	
	Lifetime Pap test	UTD Pap test	—
Pap test			
Cis woman	ref	ref	
Trans man	**0.50** (**0.26, 0.97**)	0.70 (0.39, 1.24)	
GNC	**0.20** (**0.08, 0.49**)	**0.33** (**0.14, 0.79**)	

Note: Covariates included age, sexual orientation, race, relationship status, education, income, health insurance, personal doctor, and survey year. Boldface indicates statistical significance ($p<0.05$).

[a]Sigmoidoscopy/colonoscopy.

BST, blood stool test; Cis, cisgender; CRC, colorectal cancer; GNC, gender-nonconforming; PSA, prostate-specific antigen; Trans, transgender; UTD, up to date.