

Statistical Brief on the Reactions to Race Module, Behavioral Risk Factor Surveillance System, 2022

(updated 08/23/2023)

Objective

This statistical brief provides general guidance to Behavioral Risk Factor Surveillance System (BRFSS) coordinators and researchers on the analysis of BRFSS Reactions to Race (R2R) Module data to enable consistency in analytic methods and results reporting.

Background and Rationale

Social identity theory, first proposed in the 1970s and 1980s, asserts that individual identity is based on self-perception in group membership, including categories of race and gender (1). More recent literature suggests that both self-identification of race and identification of race by others can affect a person socially and economically (2).

In the United States, racial classification is made solely by self-identification, with a growing number of people reporting they are of multiple or mixed race. Researchers have used Census data on self-identified race/ethnicity to examine the impact of race on a variety of other social, economic, and political factors. However, there is increased need for more research to determine how other people's perception of an individual's race can affect that person's health. This remains an area where little is known currently. White et al. (3) note that a measure of "socially assigned race" or the perception of race by others may be a determinant of unequal treatment, including treatment when seeking health care. The recognition of the need for data in this area of

research prompted the development and testing of questions to be included on the BRFSS as an optional module for state use.

The Reactions to Race Module

The Reactions to Race Module had been included in the BRFSS from 2004 through 2014. However, only a few states used this module each year. In 2022, the Reactions to Race Module was used with data collected from more states (28 states and the District of Columbia). Several of the questions were derived from previous state added questions chosen by individual health departments or from previous modules that focused on social determinants of health. The module had a prologue and six questions. The prologue was intended to focus responses on how the participants felt that others perceived them rather than their actual race, which is recorded in the demographic section of the BRFSS questionnaire. The question about work-related treatment was only asked of respondents who were employed. All other questions in the module were asked of all respondents in the states administering the module. Table 1 summarizes the six questions in the 2022 Reactions to Race Module, with response options for each of the questions.

Table 1. Reactions to Race Module Questionnaire in BRFSS, 2022

Question No. /Variable Name	Question	Response Option	Notes
Prologue	Earlier I asked you to self-identify your race. Now I will ask you how other people identify you and treat you.		“We want to know how OTHER people usually classify you in this country, which might be different from how you classify yourself.”

MRTR.01 RRCLASS3	How do other people usually classify you in this country? Would you say: White, Black or African American, Hispanic or Latino, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or some other group?	01 White 02 Black or African American 03 Hispanic or Latino 04 Asian 05 Native Hawaiian or Other Pacific Islander 06 American Indian or Alaska Native 07 Mixed Race 08 Some other group 77 Don't know/Not sure 99 Refused	
MRTR.02 RRCOGNT2	How often do you think about your race? Would you say never, once a year, once a month, once a week, once a day, once an hour, or constantly?	1 Never 2 Once a year 3 Once a month 4 Once a week 5 Once a day 6 Once an hour 8 Constantly 7 Don't know/Not sure 9 Refused	
MRTR.03 RRTREAT	Within the past 12 months, do you feel that in general you were treated worse than, the same as, or better than people of other races?	1 Worse than other races 2 The same as other races 3 Better than other races 4 Worse than some races, better than others 5 Only encountered people of the same race 7 Don't know/Not sure 9 Refused	
MRTR.04 RRATWRK2	Within the past 12 months at work, do you feel you were treated worse than, the same as, or better than people of other races?	1 Worse than other races 2 The same as other races 3 Better than other races 4 Worse than some races, better than others 5 Only encountered people of the same race 7 Don't know/Not sure 9 Refused	Ask If EMPLOY1= 3, 5, 6, 7, 8, 9 [CATI skip pattern: This question should only be asked of those who are "employed for wages," "self-employed," or "out of work for less than one year."]

MRTR.05 RRHCARE4	Within the past 12 months, when seeking health care, do you feel your experiences were worse than, the same as, or better than people of other races?	1 Worse than other races 2 The same as other races 3 Better than other races 4 Worse than some races, better than others 5 Only encountered people of the same race 7 Don't know/Not sure 9 Refused	
MRTR.06 RRPHYSM2	Within the past 30 days, have you experienced any physical symptoms, for example, a headache, an upset stomach, tensing of your muscles, or a pounding heart, as a result of how you were treated based on your race?	1 Yes 2 No 7 Don't know/Not sure 9 Refused	

Preparation of the final data set for analyzing Reactions to Race Module data

In 2022, a total of 28 states and DC collected the Reactions to Race module data—24 states and DC collected the data through the common combined landline and cell phone survey; Nebraska collected the data using the version 1 questionnaire; Oklahoma collected the data using the version 2 questionnaire; New York state used the split surveys of versions 1 and 2 questionnaires; and Michigan used the split surveys of versions 2 and 3 questionnaires. Table 2 summarizes the states with corresponding data set names and weight variable for each of the data sets. For more information on survey versions and module data analysis, please refer to the 2022 document for [Complex Sampling Weights and Preparing Module Data for Analysis](#).

Table 2. US States That Used the Reactions to Race Module with Corresponding Data Set Names and Weight Variables in BRFSS, 2022

Module	Description	Data Set	Data Weight	State(s)
Reactions to Race	Combined Land Line and Cell Phone data	LLCP2022	_LLCPWT	California, District of Columbia, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Minnesota, Montana, Nevada, New Mexico, North Carolina, North Dakota, Ohio, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
	Combined Land Line and Cell Phone data, version 1	LLCP22V1	_LCPWTV1	Nebraska, New York
	Combined Land Line and Cell Phone data, version 2	LLCP22V2	_LCPWTV2	Michigan, New York, Oklahoma
	Combined Land Line and Cell Phone data, version 3	LLCP22V3	_LCPWTV3	Michigan

The following SAS and R codes are used for preparation of final Reactions to Race Module data set for analysis:

SAS code:

```

data RR11cp2022 (where=(_state in (6,11,13,17,18,20,21,22,23,
    24,27,30,32,35,37,38,39,44,45,47,50,51,54,55,56)));
set LLCP2022; *This is the Common combined dataset;
*Rename final weight variable to be consistent across new data
sets;
rename _LLCPWT=_finalwt;
run;

data RR11cp22v1 (where=(_state in (31,36)));;
set LLCP22V1; *This is the Version 1 dataset;
If _State in (31) then _finalwt=_LCPWTV1; *Nebraska(31) used
version 1 questionnaire;
If _State in (36) then _finalwt=_LCPWTV1/2; *New York (36) used
the split surveys of versions 1 and 2 questionnaires;
run;

data RR11cp22v2 (where=(_state in (26,36,40)));;
set LLCP22V2; *This is the Version 2 dataset;
If _State in (26,36) then _finalwt=_LCPWTV2/2;
*Michigan (26) used the split surveys of versions 2 and 3
questionnaires;
*New York (36) used the split surveys of versions 1 and 2
questionnaires;
If _State in (40) then _finalwt=_LCPWTV2; *Oklahoma(40) used
version 2 questionnaire;
run;

data RR11cp22v3 (where=(_state in (26)));;
set LLCP22V3; *This is the Version 3 dataset;
_finalwt=_LCPWTV3/2; *Michigan (26) used the split surveys of
versions 2 and 3 questionnaires;
run;

*Combine 4 data sets together for Reactions to Race 2022 BRFSS;
data BRFSS2022R2R;
set RR11cp2022 RR11cp22v1 RR11cp22v2 RR11cp22v3;
run;

```

R Code:

```
#Load tidyverse package
library("tidyverse")

#Keep states that used Reactions to Race module. These are the states
in the Common combined dataset.
RRLCP2022 <- LLCP2022[LLCP2022$STATE %in%
c(6,11,13,17,18,20,21,22,23,
24,27,30,32,35,37,38,39,44,45,47,50,51,54,55,56), ]

#FINALWT assigned from LLCPWT - weight variable
RRLCP2022$FINALWT <- RRLCP2022$LLCPWT

#remove LLCPWT variable from data
RRLCP2022 = subset(RRLCP2022, select = -c(LLCPWT))

#Keep Nebraska (31) - used version 1 questionnaire
LLCP22V1A <- LLCP22V1[LLCP22V1$STATE %in% c(31), ]

#FINALWT assigned from LCPWTV1
LLCP22V1A$FINALWT <- LLCP22V1A$LCPWTV1

#Keep New York (36)- used version 1 questionnaire, split in versions 1
and 2
LLCP22V1B <- LLCP22V1[LLCP22V1$STATE %in% c(36), ]

#FINALWT assigned from LCPWTV1 and divided by 2
LLCP22V1B$FINALWT <- LLCP22V1B$LCPWTV1/2

# Combine version 1 questionnaire datasets for Nebraska, New York
RRLCP22V1 <- rbind(LLCP22V1A, LLCP22V1B)

#Keep Oklahoma (40) - used version 2 questionnaire
LLCP22V2A <- LLCP22V2[LLCP22V2$STATE %in% c(40), ]

#FINALWT assigned from LCPWTV2
LLCP22V2A$FINALWT <- LLCP22V2A$LCPWTV2

#Keep states Michigan (26) and New York (36)- used version 2
questionnaire, split in versions 1 and 2
LLCP22V2B <- LLCP22V2[LLCP22V2$STATE %in% c(26,36), ]

#FINALWT assigned from LCPWTV2 and divided by 2
LLCP22V2B$FINALWT <- LLCP22V2B$LCPWTV2/2

# Combine version 2 questionnaire datasets for Oklahoma, Michigan, New
York
RRLCP22V2 <- rbind(LLCP22V2A, LLCP22V2B)
```

```
#Keep Michigan (26) - used version 3 questionnaire, split in versions
2 and 3
RRLCP22V3 <- LCP22V3[LLCP22V3$STATE %in% c(26), ]

#FINALWT assigned from LCPWTV3 and divided by 2
RRLCP22V3$FINALWT <- RRLCP22V3$LCPWTV3/2

# Combine all data sets for analysis
BRFSS2022R2R <- bind_rows(RRLCP2022, RRLCP22V1, RRLCP22V2,
RRLCP22V3)
```

Variable Recoding

We suggest creating the following recoded variables from participants' original response options to each of the questions in the Reactions to Race module. The recoded variables are presented in Table 3. Participants who respond “don't know/not sure,” refuse to answer, or have missing responses to any of the questions will be set as missing.

Table 3. Calculated Variables from Responses to the Questions in the Reactions to Race Module, BRFSS, 2022

Recoded Variable Name	2022 Reactions to Race Module Question with Recoding
RR_RACE6	<p data-bbox="423 1255 1386 1318">Earlier I asked you to self-identify your race. Now I will ask you how other people identify you and treat you.</p> <p data-bbox="423 1360 1386 1461">How do other people usually classify you in this country? Would you say: White, Black or African American, Hispanic or Latino, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or some other group?</p> <p data-bbox="423 1503 548 1533">SAS Code:</p> <pre data-bbox="423 1537 1370 1829"> if RRCLASS3=1 then RR_RACE6=1; else if RRCLASS3=2 then RR_RACE6=2; else if RRCLASS3=6 then RR_RACE6=3; else if RRCLASS3=4 then RR_RACE6=4; else if RRCLASS3=3 then RR_RACE6=5; else if RRCLASS3 in (5,7,8) then RR_RACE6=6; else if RRCLASS3 in (77,99,.) then RR_RACE6=.; Label RR_RACE6='1=White, 2=Black/AA, 3=AI/AN, 4=Asian, 5=Hispanic/Latino, 6=Other';</pre> <p data-bbox="423 1871 521 1896">R Code:</p>

	<pre>RR_RACE6 <- case_when(RRCLASS3 %in% 1 ~ 1, RRCLASS3 %in% 2 ~ 2, RRCLASS3 %in% 6 ~ 3, RRCLASS3 %in% 4 ~ 4, RRCLASS3 %in% 3 ~ 5, RRCLASS3 %in% 5 ~ 6, RRCLASS3 %in% 7:8 ~ 6) RR_RACE6 <- factor(RR_RACE6, levels = c(1:6), labels = c("White", "Black/AA", "AI/AN", "Asian", "Hispanic/Latino", "Other"))</pre>
RR_THKRACE4	<p>How often do you think about your race? Would you say never, once a year, once a month, once a week, once a day, once an hour, or constantly?</p> <p>SAS Code:</p> <pre>if RRCOGNT2=1 then RR_THKRACE4=1; else if RRCOGNT2 in (2,3) then RR_THKRACE4=2; else if RRCOGNT2 in (4,5) then RR_THKRACE4=3; else if RRCOGNT2 in (6,8) then RR_THKRACE4=4; else if RRCOGNT2 in (7,9,.) then RR_THKRACE4=.; Label RR_THKRACE4='1=Never, 2=Once/month-year, 3=Once/day-week, 4=Once/hour-constantly';</pre> <p>R Code:</p> <pre>RR_THKRACE4 <- case_when(RRCOGNT2 %in% 1 ~ 1, RRCOGNT2 %in% 2:3 ~ 2, RRCOGNT2 %in% 4:5 ~ 3, RRCOGNT2 %in% 6 ~ 4, RRCOGNT2 %in% 8 ~ 4) RR_THKRACE4 <- factor(RR_THKRACE4, levels = c(1:4, labels = c("Never", "Once/month-year", "Once/day-week", "Once/hour-constantly"))</pre>
RR_TRT5	<p>Within the past 12 months, do you feel that in general you were treated worse than, the same as, or better than people of other races?</p> <p>SAS Code:</p> <pre>if RRTREAT=1 then RR_TRT5=1; else if RRTREAT=2 then RR_TRT5=2; else if RRTREAT=3 then RR_TRT5=3; else if RRTREAT=4 then RR_TRT5=4; else if RRTREAT=5 then RR_TRT5=5; else if RRTREAT in (7,9,.) then RR_TRT5=.; Label RR_TRT5='1=Worse than other races, 2=The same, 3=Better than other races, 4=Worse than some races, but better than others, 5=Only encountered with same race';</pre> <p>R Code:</p> <pre>RR_TRT5 <- case_when(RRTREAT %in% 1 ~ 1, RRTREAT %in% 2 ~ 2,</pre>

	<pre> RRTREAT %in% 3 ~ 3, RRTREAT %in% 4 ~ 4, RRTREAT %in% 5 ~ 5) RR_TRT5 <- factor(RR_TRT5, levels = c(1:5), labels = c("Worse than other races", "The same", "Better than other races", "Worse than some races, but better than others", "Only encountered with same race")) </pre>
RR_WKTRT5	<p>Within the past 12 months at work, do you feel you were treated worse than, the same as, or better than people of other races?</p> <p>SAS Code:</p> <pre> if RRATWRK2=1 then RR_WKTRT5=1; else if RRATWRK2=2 then RR_WKTRT5=2; else if RRATWRK2=3 then RR_WKTRT5=3; else if RRATWRK2=4 then RR_WKTRT5=4; else if RRATWRK2=5 then RR_WKTRT5=5; else if RRATWRK2 in (7,9,.) then RR_WKTRT5=.; Label RR_WKTRT5='1=Worse than other races, 2=The same, 3=Better than other races, 4=Worse than some races, but better than others, 5=Only encountered with same race'; </pre> <p>R Code:</p> <pre> RR_WKTRT5 <- case_when(RRATWRK2 %in% 1 ~ 1, RRATWRK2 %in% 2 ~ 2, RRATWRK2 %in% 3 ~ 3, RRATWRK2 %in% 4 ~ 4, RRATWRK2 %in% 5 ~ 5) RR_WKTRT5 <- factor(RR_WKTRT5, levels = c(1:5), labels = c("Worse than other races", "The same", "Better than other races", "Worse than some races, but better than others", "Only encountered with same race")) </pre>
RR_HCATRT5	<p>Within the past 12 months, when seeking health care, do you feel your experiences were worse than, the same as, or better than for people of other races?</p> <p>SAS Code:</p> <pre> if RRHCARE4=1 then RR_HCATRT5=1; else if RRHCARE4=2 then RR_HCATRT5=2; else if RRHCARE4=3 then RR_HCATRT5=3; else if RRHCARE4=4 then RR_HCATRT5=4; else if RRHCARE4=5 then RR_HCATRT5=5; else if RRHCARE4 in (7,9,.) then RR_HCATRT5=.; Label RR_HCATRT5='1=Worse than other races, 2=The same, 3=Better than other races, 4=Worse than some races, but better than others, 5=Only encountered with same race'; </pre> <p>R Code:</p> <pre> RR_HCATRT5<- case_when(RRHCARE4 %in% 1 ~ 1, RRHCARE4 %in% 2 ~ 2, RRHCARE4 %in% 3 ~ 3, </pre>

	<pre>RRHCARE4 %in% 4 ~ 4, RRHCARE4 %in% 5 ~ 5) RR_HCATRT5<- factor(RR_HCATRT5, levels = c(1:5), labels = c("Worse than other races", "The same", "Better than other races", "Worse than some races, but better than others", "Only encountered with same race"))</pre>
RR_PHYSMP2	<p>Within the past 30 days, have you experienced any physical symptoms, for example, a headache, an upset stomach, tensing of your muscles, or a pounding heart, as a result of how you were treated based on your race?</p> <p>SAS Code:</p> <pre>if RRPHYSM2=1 then RR_PHYSMP2=1; else if RRPHYSM2=2 then RR_PHYSMP2=2; else if RRPHYSM2 in (7,9,.) then RR_PHYSMP2=.; Label RR_PHYSMP2='1=Had physical symptoms, 2=No';</pre> <p>R Code:</p> <pre>RR_PHYSMP2 <- case_when(RRPHYSM2 %in% 1 ~ 1, RRPHYSM2 %in% 2 ~ 2) RR_WKTRT5 <- factor(RR_WKTRT5, levels = c(1:2), labels = c("Had physical symptoms", "No"))</pre>

Analytic Notes

When analyzing data by perceived race and self-identified race/ethnicity in the demographic section, researchers should pay particular attention to the two variables because codes on these two variables are not matched. Recoding may be necessary to adjust categories of interest in the analysis. In Table 3, the perceived race (RR_RACE6) is recoded following the categories as shown in the self-identified race/ethnicity (_RACE1) in the BRFSS data set.

When analyzing data from this module, keep in mind that some of the response sets are not in ordinal order and may need to be recoded if the analysis requires scales.

Researchers using this module should read all technical documentation related to analysis of module data. Note that some states may only ask modules of portions of the population (as noted by version numbers) or may not include the module for every year.

Contact Information:

For general questions or questions on SAS codes, please contact Dr. Guixiang (Grace) Zhao:

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For questions on R codes, please contact Dr. Karen Kirtland: gon6@cdc.gov

References:

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