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Arthritis in the USA: a longitudinal analysis of three nationally representative studies

SUPPLEMENT 1

Table I – Sampling information, response rates, weighting information, and additional sampling information for each BRFSS survey year used

Table II - Sampling information, response rates, weighting information, and additional sampling information for each NHIS survey year used

Table III - Sampling information, response rates, weighting information, and additional sampling information for each NHANES (Continuous) survey cycle used

Table I: Sampling information, response rates, weighting information, and additional sampling information for each BRFSS survey year used

Year	Data quality report and sampling information	RR ^α (%)	State-specific RR (%)	Additional weighting or sampling information
2001	https://www.cdc.gov/brfss/annual_data/2001/pdf/2001SummaryDataQualityReport.pdf	52.7	Available in Data Quality Report	Information available from the other link listed for 2001, or at https://www.cdc.gov/brfss/annual_data/2001/pdf/overview_01.pdf Poststratification weighting methods Inclusion of landlines only
2003	https://www.cdc.gov/brfss/annual_data/2003/pdf/2003SummaryDataQualityReport.pdf	53.2	Available in Data Quality Report	Information available from the other link listed for 2003, or at https://www.cdc.gov/brfss/annual_data/2003/pdf/overview_03.pdf Poststratification weighting methods Inclusion of landlines only
2005	https://www.cdc.gov/brfss/annual_data/annual_2005.htm	51·1	Available in Data Quality Report	Information available from the other link listed for 2005, or at https://www.cdc.gov/brfss/annual_data/2005/pdf/overview_05.pdf One Poststratification weighting methods Inclusion of landlines only Response rate excludes Guam, Puerto Rico, and Virgin Islands
2007	https://www.cdc.gov/brfss/annual_data/2007/pdf/2007SummaryDataQualityReport.pdf	50.6	Available in Data Quality Report	Information available from the other link listed for 2007, or at https://www.cdc.gov/brfss/annual_data/2007/pdf/overview_07.pdf Poststratification weighting methods Inclusion of landlines only Response rate excludes Guam, Puerto Rico, and Virgin Islands
2009	https://www.cdc.gov/brfss/annual_data/2009/pdf/2009_Summary_Data_Quality_Report.pdf	52.5	Available in Data Quality Report	Information available from the other link listed for 2009, or at https://www.cdc.gov/brfss/annual_data/2009/pdf/overview_09.pdf Poststratification weighting methods Inclusion of landlines only Response rate excludes Guam, Puerto Rico, and Virgin Islands
2011	https://www.cdc.gov/brfss/annual_data/2011/pdf/2011_Summary_Data_Quality_Report.pdf	49.7	https://www.cdc.gov/brfs s/annual_data/2011/resp onse_rates_11.htm	Information available from the other two links listed for 2011, or at https://www.cdc.gov/brfss/annual_data/2011/pdf/overview_11.pdf Comparable to data from 2011 onwards Inclusion of cell-phones and landlines Iterative proportional fitting (raking) to obtain design weights Weight trimming to increase the value of very low weights and decrease the value of very high weights

				° Response rate excludes Guam, Puerto Rico, and Virgin Islands
2012	https://www.cdc.gov/brfss/annual_data/2012/pdf/SummaryDataQualityReport2012_20130712.pdf	45.2	https://www.cdc.gov/brfs s/annual_data/2012/resp onse_rates_12.htm	Information available from the other two links listed for 2012, or at https://www.cdc.gov/brfss/annual_data/2012/pdf/Overview_2012.pdf Comparable to data from 2011 onwards Inclusion of cell-phones and landlines Iterative proportional fitting (raking) to obtain design weights Weight trimming to increase the value of very low weights and decrease the value of very high weights
2013	https://www.cdc.gov/brfss/annual_data/2013/pdf/2013_DQR.pdf	46.4	https://www.cdc.gov/brfs s/annual_data/2013/resp onse_rates_13.htm	Information available from the other two links listed for 2013, or at https://www.cdc.gov/brfss/annual_data/2013/pdf/Overview_2013.pdf Comparable to data from 2011 onwards Inclusion of cell-phones and landlines Iterative proportional fitting (raking) to obtain design weights Weight trimming to increase the value of very low weights and decrease the value of very high weights
2014	https://www.cdc.gov/brfss/annual_data/2014/pdf/2014_dqr.pdf	47.0	https://www.cdc.gov/brfs s/annual_data/2014/2014 _ResponseRates.html	Information available from the other two links listed for 2014, or at https://www.cdc.gov/brfss/annual_data/2014/pdf/Overview_2014.pdf Comparable to data from 2011 onwards Inclusion of cell-phones and landlines Iterative proportional fitting (raking) to obtain design weights Weight trimming to increase the value of very low weights and decrease the value of very high weights
2015	https://www.cdc.gov/brfss/annual_data/2015/pdf/2015-sdqr.pdf	47.2	https://www.cdc.gov/brfs s/annual_data/2015/2015 _ResponseRates.html	Information available from the other two links listed for 2015, or at https://www.cdc.gov/brfss/annual_data/2015/pdf/overview_2015.pdf Comparable to data from 2011 onwards Inclusion of cell-phones and landlines Iterative proportional fitting (raking) to obtain design weights Weight trimming to increase the value of very low weights and decrease the value of very high weights
2016	https://www.cdc.gov/brfss/annual_data/2016/pdf/2016-sdqr.pdf	47·1	https://www.cdc.gov/brfs s/annual_data/2016/pdf/2 016_ResponseRates_Tab le.pdf	Information available from the other two links listed for 2016, or at https://www.cdc.gov/brfss/annual_data/2016/pdf/overview_2016.pdf Comparable to data from 2011 onwards Inclusion of cell-phones and landlines Iterative proportional fitting (raking) to obtain design weights

2017	https://www.cdc.gov/brfss/annual_	45.9	https://www.cdc.gov/brfs	Information available from the other two links listed for 2017, or at
	data/2017/pdf/2017-sdqr-508.pdf		s/annual_data/2017/pdf/2	https://www.cdc.gov/brfss/annual_data/2017/pdf/overview-2017-
			017-response-rates-table-	508.pdf>
			508.pdf	° Comparable to data from 2011 enviouds
				Comparable to data from 2011 offwards
				o Inclusion of cell-phones and landlines
2010	1-44	40.0	1-44	O Iterative proportional fitting (raking) to obtain design weights
2018	https://www.cdc.gov/brfss/annual_	49.9	https://www.cdc.gov/brfs	Information available from the other two links listed for 2018, or at
	data/2018/pdf/2018-sdqr-508.pdf		s/annual_data/2018/pdf/2	https://www.cdc.gov/brfss/annual_data/2018/pdf/overview-2018-
			018-response-rates-table-	508.pdf>
			508.pdf	° Comparable to data from 2011 onwards
				o Inclusion of cell-phones and landlines
				o Iterative proportional fitting (raking) to obtain design weights
2019	https://www.cdc.gov/brfss/annual	49.4	Available in Data	Information available from the other link posted for 2019; or at
2017	data/2019/pdf/2019-sdqr-508.pdf	72 7	Quality Report	https://www.cdc.gov/brfss/annual_data/2019/pdf/overview-2019-
	data/2017/pdi/2017-sdq1-308.pd1		<i>Quanty Report</i>	508.pdf>
				506.pu1>
				° Comparable to data from 2011 onwards
				° Inclusion of cell-phones and landlines
				° Iterative proportional fitting (raking) to obtain design weights
2020	https://www.cdc.gov/brfss/annual	47.9	Available in Data	Information available from the other link posted for 2020; or at
	data/2020/pdf/2020-sdqr-508.pdf		Quality Report	https://www.cdc.gov/brfss/annual data/2020/pdf/overview-2020-
	1 1			508.pdf>
				° Comparable to data from 2011 onwards
				° Inclusion of cell-phones and landlines
				 Iterative proportional fitting (raking) to obtain design weights

^α RR: median (by state) response rate

Additional Information

Additional information on weighting for each year can be found within each year's data files at https://www.cdc.gov/brfss/annual_data/annual_data.htm.

Table II: Sampling information, response rates, weighting information, and additional sampling information for each NHIS survey year used

Year	Survey description ^β	RR ^α (%)	Field guide and manual	Design and weighting information
1997	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/1997/srvydesc.pdf Sample adult file begins on page 32	80.4	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/1997/frmanual.pdf	New design implemented from 1995, as outlined in https://www.cdc.gov/nchs/data/series/sr_02/sr02_130.pdf ; thus, the
1998	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/1998/srvydesc.pdf Sample adult file begins on page 36	73.9	Part A: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1998/frmanu_a.pdf Part B: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1998/frmanu_b.pdf Part C: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1998/frmanu_c.pdf Part D: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1998/frmanu_d.pdf	below features apply to this timeframe All area sampling (from 1985) State stratification and increased PSU's Oversampling black and Hispanic persons
1999	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/1999/Srvydesc.pdf Sample adult file begins on page 40	69.6	Part A: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1999/frmanu_a.pdf Part B: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1999/frmanu_b.pdf Part C: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1999/frmanu_c.pdf	

		1	
			Part D: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/1999/frmanu_d.pdf
2000	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2000/srvydesc.pdf	72.1	Part A: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/2000/frmanu_a.pdf
	 Sample adult file begins on page 42 		Part B: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/2000/frmanu_b.pdf
			Part C: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/2000/frmanu_c.pdf
			Part D: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/2000/frmanu_d.pdf
2001	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2001/Srvydesc.pdf	73.8	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2001/frmanual.pdf
	 Sample adult file begins on page 44 		
2002	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2002/srvydesc.pdf	74.3	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2002/frmanual.pdf
	 Sample adult file begins on page 46 		
2003	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2003/Srvydesc.pdf\	74.2	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2003/frmanual.pdf

		1		
	° Sample adult file begins on			
	page 44			
2005	ftp://ftp.cdc.gov/pub/Health_Statis	69.0	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai	
	tics/NCHS/Dataset Documentatio		res/NHIS/2005/frmanual.pdf	
	n/NHIS/2005/srvydesc.pdf		•	
	° Sample adult file begins on			
	page 51			
2006	ftp://ftp.cdc.gov/pub/Health_Statis	70.8	ftp://ftp.cdc.gov/pub/Health Statistics/NCHS/Survey Questionnai	
2000	tics/NCHS/Dataset Documentatio	70.8		
	_		res/NHIS/2006/frmanual.pdf	New design implemented, as
	n/NHIS/2006/srvydesc.pdf			outlined in
	° Sample adult file begins on			https://www.cdc.gov/nchs/data/ser
	page 51			ies/sr_02/sr02_165.pdf>
2007	ftp://ftp.cdc.gov/pub/Health_Statis	67.8	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai	° All area sampling (continued)
	tics/NCHS/Dataset Documentatio		res/NHIS/2007/frmanual.pdf	State stratification
	n/NHIS/2007/srvydesc.pdf		1	
	iii i viii s/200 // si v y dese.pai			Oversampling of black,
				Hispanic, and Asian persons
	 Sample adult file begins on 			
	page 57			
2008	ftp://ftp.cdc.gov/pub/Health_Statis	62.6	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai	
	tics/NCHS/Dataset_Documentatio		res/NHIS/2008/frmanual.pdf	
	n/NHIS/2008/srvydesc.pdf			
	° Sample adult file begins on			
	page			
2009	ftp://ftp.cdc.gov/pub/Health Statis	65.4	ftp://ftp.cdc.gov/pub/Health Statistics/NCHS/Survey Questionnai	
2007	tics/NCHS/Dataset Documentatio	05.7	res/NHIS/2009/frmanual.pdf	
	_		103/111113/2007/1111aftual.pul	
	n/NHIS/2009/srvydesc.pdf			
	 Sample adult file begins on 			
	page 57			
2010	ftp://ftp.cdc.gov/pub/Health_Statis	60.8	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai	
	tics/NCHS/Dataset Documentatio		res/NHIS/2010/frmanual.pdf	
	n/NHIS/2010/srvydesc.pdf			
	° Sample adult file begins on			
	Sample adult the degins on			
	page 60			

2011	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2011/srvydesc.pdf Sample adult file begins on page 62	66.3	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2011/frmanual.pdf	
2012	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2012/srvydesc.pdf Sample adult file begins on page 63	61.2	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2012/frmanual.pdf	
2013	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2013/srvydesc.pdf Sample adult file begins on page 53	61.2	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2013/frmanual.pdf	
2014	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2014/srvydesc.pdf Sample adult file begins on page 55	58.9	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2014/frmanual.pdf	
2015	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2015/srvydesc.pdf Sample adult file begins on page 57	55.2	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2015/frmanual.pdf	

2016	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2016/srvydesc.pdf Sample adult file begins on page 58	54.3	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2016/frmanual.pdf	New design implemented, as outlined in <ftp: 2016="" dataset_documentation="" ftp.cdc.gov="" health_statis="" nchs="" nhis="" pub="" srvydesc.pdf="" tics="">, found on</ftp:>
2017	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2017/srvydesc.pdf Sample adult file begins on page 56	53.0	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnai res/NHIS/2017/frmanual.pdf	page 8. Changed US population distribution considered Oversampling of black, Hispanic, and Asian persons no longer required State stratification Commercial address lists used as main source of addresses
2018	ftp://ftp.cdc.gov/pub/Health_Statis tics/NCHS/Dataset_Documentatio n/NHIS/2018/srvydesc.pdf Sample adult file begins on page 51	53.1	ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2018/frmanual.pdf	

^αRR: Response rate is the unconditional response rate, and accounts for household and family survey sections non-response ^β Annual new additions, sample design, questionnaire, interviewing procedures, sample sizes and response rates, weighting, and other mathematical specifics

Table III: Sampling information, response rates, weighting information, and additional sampling information for each NHANES (Continuous) survey cycle used

Survey Cycle	Sampling information link	Unweighter response rate ^a (%)	Response rate and population information link	Notes/annotations
1999-2000		82.0 76.0	https://wwwn.cdc.gov/nchs/data/nhanes3/ ResponseRates/RRT0102MF.pdf	Oversampled groups: Mexican Americans Black people White/'other' people below 130% of the federal poverty level White/'other' people over 70 Adolescents aged 12 to 19 (not relevant for this study) Only survey cycle for which a representative population was based on 1990 government census
2001-02	https://www.cdc.gov/nchs/data /series/sr_02/sr02_155.pdf	84.0 80.0	https://wwwn.cdc.gov/nchs/data/nhanes3/ ResponseRates/RRT0102MF.pdf	Oversampled groups: o Mexican Americans o Black people o White/'other' people below 130% of the federal poverty level o White/'other' people over 70 o Adolescents aged 12 to 19 (not relevant for this study) Representative population based on 2000 census
2003-04		79.0 76.	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/RRT0304MF.pdf	Oversampled groups: o Mexican Americans o Black people o White/'other' people below 130% of the federal poverty level o White/'other' people over 70 o Adolescents aged 12 to 19 (not relevant for this study) Representative population based on 2000 census

2005-06		80.5	77.4	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/RRT0506MF.pdf	Oversampled groups: Mexican Americans Black people White/'other' people below 130% of the federal poverty level White/'other' people over 70 Adolescents aged 12 to 19 (not relevant for this study) Representative population based on 2000 census
2007-08	https://www.cdc.gov/nchs/data/	78.4	75.4	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/RRT0708MF.pdf	Over sampled groups: Hispanic people Non-Hispanic black people Non-Hispanic white/'other' people below 130% of the federal poverty line Non-Hispanic white/'other' people aged 80 or above Representative population based on 2000 census
2009-10	series/sr_02/sr02_160.pdf	79.4	77.3	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/RRT0910.pdf	Over sampled groups: Hispanic people Non-Hispanic black people Non-Hispanic white/'other' people below 130% of the federal poverty line Non-Hispanic white/'other' people aged 80 or above Representative population based on 2000 census
2011-12	https://www.cdc.gov/nchs/data/ series/sr_02/sr02_162.pdf	72.6	69.5	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/rrt1112.pdf	Oversampled groups: Hispanic people Non-Hispanic black people Non-Hispanic, non-black Asian people Non-Hispanic white/'other' people below 130% of the deferral poverty level Non-Hispanic white/'other' people aged 80 and over Representative population based on 2000 census

2013-14		71.0	68.5	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/2013_2014_response_rates.pdf	Oversampled groups: Hispanic people Non-Hispanic black people Non-Hispanic, non-black Asian people Non-Hispanic white/'other' people below 130% of the deferral poverty level Non-Hispanic white/'other' people aged 80 and over Representative population based on 2000 census
2015-16	https://www.cdc.gov/nchs/data/ series/sr_02/sr02-184-508.pdf	61.3	58.7	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/2015-2016_response_rates.pdf	Oversampled groups: Hispanic people Non-Hispanics black people Non-Hispanic, non-black Asians Non-Hispanic white/'other' people below 185% of federal poverty level Non-Hispanic white/'other' people aged 0 to 11, and 80 and above Representative population based on 2000 census
2017-18		51.9	48.8	https://wwwn.cdc.gov/nchs/data/nhanes3 /ResponseRates/NHANES-2017-2018- Response-Rates-508.pdf	Oversampled groups: Hispanic people Non-Hispanics black people Non-Hispanic, non-black Asians Non-Hispanic white/'other' people below 185% of federal poverty level Non-Hispanic white/'other' people aged 0 to 11, and 80 and above Representative population based on 2000 census

^aResponse rate for people who were interviewed (I) and people who were examined (E)

Additional information

Specific information can be found on the NHANES (Continuous) portion of the CDC website. Additional sampling information on specific weighting mathematics and analysis specifications can be found in *National Health and Nutrition Examination Survey: Analytic Guidelines, 1999-2010* (at https://wwwn.cdc.gov/nchs/data/nhanes/analyticguidelines.pdf), and in *National Health and Nutrition Examination Survey: Analytic Guidelines, 2011-2014 and 2015-2016* https://wwwn.cdc.gov/nchs/data/nhanes/analyticguidelines/11-16-analytic-guidelines.pdf. In addition, specific information on the operational methods used for NHANES (Continuous) data collection is available in the *National Health and Nutrition Examination Survey: Plan and Operations*, 1999-2010 document (at https://www.cdc.gov/nchs/data/series/sr-01/sr01-056.pdf).