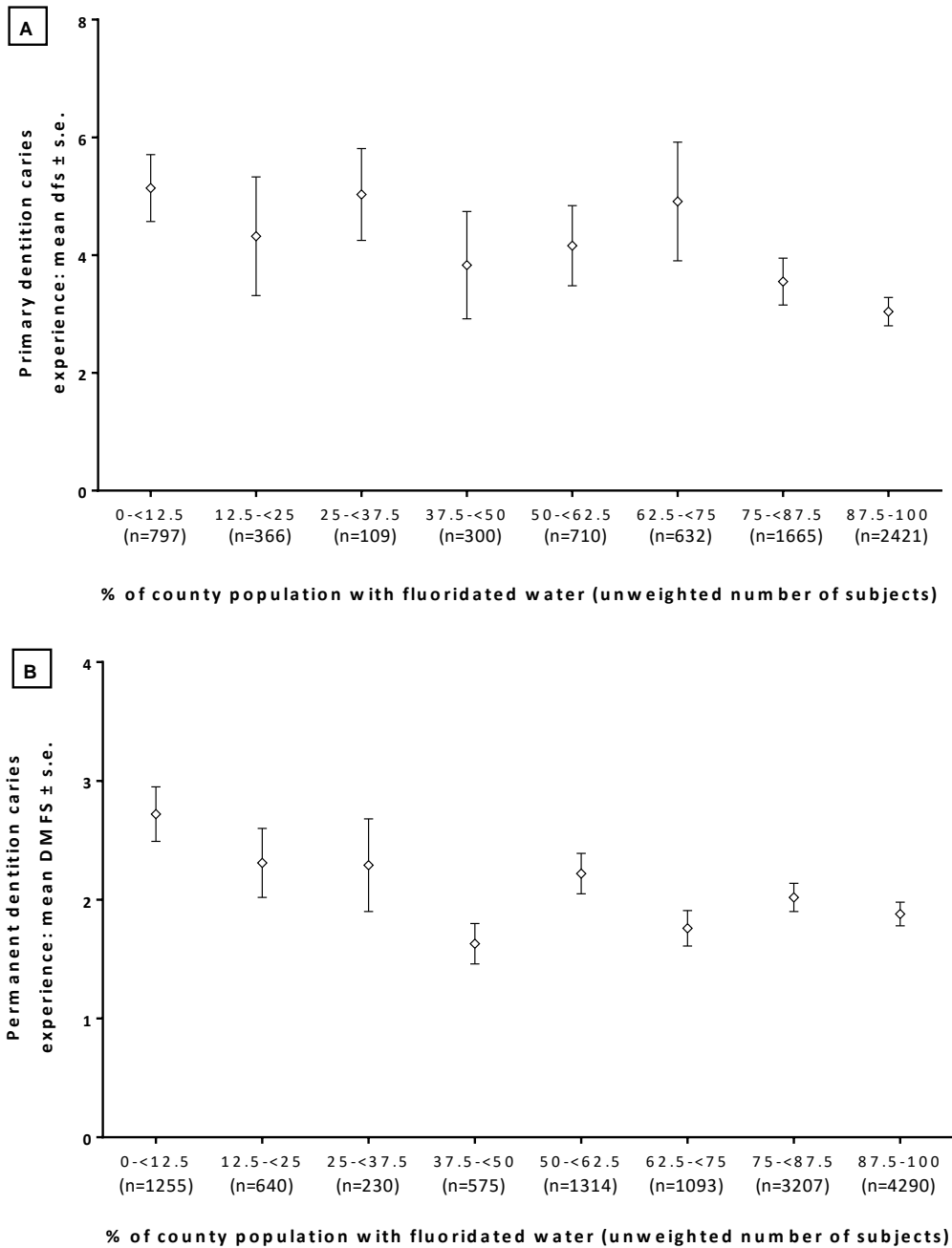


# Water Fluoridation and Dental Caries in U.S. Children and Adolescents

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## Appendix

Appendix Figure: Population estimates of caries experience according to eight levels of fluoridation coverage



A: Primary dentition caries among n=7,000 2-8 year olds; B: Permanent dentition caries among n=12,604 6-17 year olds

Appendix Table 1: Regression models estimating dental caries experience among U.S. 2-17 yr olds, NHANES 1999-2004 and 2011-2014: fully adjusted models using binary fluoridation variable.

Variable	Parameter coding	2-8 yr old dfs (n=6,633)		6-17 yr old DMFS (n=11,971)	
		$\beta$ (se)	P-value	$\beta$ (se)	P-value
%CWF [Ref: <75%]	$\geq 75\%$	-1.39 (0.47)	<0.01	-0.25 (0.13)	0.06
Age [continuous variable, centered]	Years	0.63 (0.08)	<0.01	0.46 (0.02)	<0.01
Gender [Ref: Female]	Male	0.66 (0.26)	0.01	-0.15 (0.10)	0.13
Race [Ref: non-Hispanic White]	Non-Hispanic Black	-0.02 (0.34)	0.96	0.10 (0.14)	0.49
	Hispanic	1.26 (0.33)	<0.01	0.35 (0.13)	0.01
	Other	1.82 (0.49)	<0.01	0.63 (0.20)	<0.01
Education [Ref: College graduate]	Less than high school	3.81 (0.43)	<0.01	1.59 (0.18)	<0.01
	High school	2.53 (0.42)	<0.01	1.01 (0.13)	<0.01
	Some college	1.42 (0.33)	<0.01	0.78 (0.15)	<0.01
Period since last dental visit [Ref: <1 year]	>2 years or never	-2.84 (0.36)	<0.01	-1.08 (0.14)	<0.01
	1-2 years	-1.07 (0.65)	0.10	-0.32 (0.20)	0.11
Rural-Urban Classification [Ref: Urban]	Small rural	0.86 (0.73)	0.24	-0.08 (0.25)	0.76
	Large rural	1.06 (0.86)	0.22	0.03 (0.21)	0.89
NHANES cycle [Ref: 2013-2014]	1999-2000	-0.34 (0.69)	0.63	-0.28 (0.21)	0.18
	2001-2002	-0.58 (0.51)	0.26	-0.08 (0.19)	0.66
	2003-2004	0.75 (0.53)	0.16	0.09 (0.17)	0.61
	2011-2012	0.15 (0.52)	0.77	0.04 (0.19)	0.83
Intercept		1.30 (0.15)	0.01	1.49 (0.04)	<0.01

$\beta$ s are parameter estimates from linear regression models estimating the linear CWF exposure and extent of dental caries experience (dfs per child for 2-8 year olds; DMFS per child for 6-17 year olds). Negative parameter estimates signify lower mean caries experience for the listed subgroup relative to the reference group signified as "Ref". Positive parameter estimates signify greater mean caries experience for the listed subgroup relative to the reference group. For example; the group with less than high school education had greater mean caries experience than the reference group that had college education; and the group whose last dental visit was >2 years or never had less mean caries experience than the reference group that visited the dentist within the preceding year. (se) = standard error of  $\beta$ . n=unweighted number of participants analyzed, P-value is from test of null hypothesis that  $\beta=0$ . Age was centered at the median value for the respective age groups: 5 years for 2-8 year olds and 11 years for 6-17 year olds.

Appendix Table 2: Regression models estimating dental caries experience among U.S. 2-17 yr olds, NHANES 1999-2004 and 2011-2014: sensitivity analysis cohort using binary fluoridation variable.

Variable	Parameter coding	2-8 yr old dfs (n=4,829)		6-17 yr old DMFS (n=8,753)	
		$\beta$ (se)	P-value	$\beta$ (se)	P-value
%CWF [Ref: <75%]	$\geq 75\%$	-1.79 (0.50)	<0.01	-0.53 (0.15)	<0.01
Age [continuous variable, centered]	Years	0.61 (0.09)	<0.01	0.46 (0.02)	<0.01
Gender [Ref: Female]	Male	0.54 (0.28)	0.06	-0.12 (0.12)	0.31
Race [Ref: non-Hispanic White]	Non-Hispanic Black	0.46 (0.42)	0.28	0.20 (0.17)	0.25
	Hispanic	1.52 (0.38)	<0.01	0.31 (0.15)	0.05
	Other	1.93 (0.63)	<0.01	0.46 (0.27)	0.09
Education [Ref: College graduate]	Less than high school	3.09 (0.41)	<0.01	1.61 (0.23)	<0.01
	High school	2.40 (0.52)	<0.01	1.01 (0.15)	<0.01
	Some college	1.26 (0.43)	<0.01	0.79 (0.19)	<0.01
Period since last dental visit [Ref: <1 year]	>2 years or never	-3.05 (0.40)	<0.01	-1.00 (0.18)	<0.01
	1-2 years	-1.64 (0.54)	<0.01	-0.23 (0.25)	0.35
Rural-Urban Classification [Ref: Urban]	Small rural	1.03 (0.82)	0.21	-0.29 (0.28)	0.31
	Large rural	1.05 (0.85)	0.22	-0.07 (0.21)	0.75
NHANES cycle [Ref: 2013-2014]	1999-2000	-0.09 (0.59)	0.88	-0.20 (0.23)	0.39
	2001-2002	-0.48 (0.62)	0.44	-0.18 (0.25)	0.49
	2003-2004	0.78 (0.64)	0.23	0.02 (0.20)	0.92
	2011-2012	0.24 (0.64)	0.70	0.08 (0.21)	0.72
Intercept		1.17 (0.28)	0.05	1.32 (0.11)	0.01

$\beta$ s are parameter estimates from linear regression models estimating the linear CWF exposure and extent of dental caries experience (dfs per child for 2-8 year olds; DMFS per child for 6-17 year olds). (se) = standard error of  $\beta$ . n=unweighted number of participants analyzed, P-value is from test of null hypothesis that  $\beta=0$ . Age was centered at the median value for the respective age groups: 5 years for 2-8 year olds and 11 years for 6-17 year olds.

Appendix Table 3: Regression models estimating dental caries experience among U.S. 2-17 yr olds, NHANES 1999-2004 and 2011-2014: fully adjusted models using continuous fluoridation variable.

Variable	Parameter coding	2-8 yr old dfs (n=6,633)		6-17 yr old DMFS (n=11,971)	
		$\beta$ (se)	P-value	$\beta$ (se)	P-value
CWF [continuous variable]	Proportion	-2.08 (0.54)	<0.01	-0.88 (0.24)	<0.01
Age [continuous variable, centered]	Years	0.63 (0.08)	<0.01	0.46 (0.02)	<0.01
Gender [Ref: Female]	Male	0.67 (0.26)	0.01	-0.15 (0.10)	0.14
Race [Ref: non-Hispanic White]	Non-Hispanic Black	0.03 (0.38)	0.93	0.18 (0.13)	0.18
	Hispanic	1.18 (0.35)	<0.01	0.36 (0.12)	<0.01
	Other	1.81 (0.51)	<0.01	0.66 (0.20)	<0.01
Education [Ref: College graduate]	Less than high school	3.88 (0.45)	<0.01	1.60 (0.18)	<0.01
	High school	2.59 (0.43)	<0.01	1.00 (0.13)	<0.01
	Some college	1.45 (0.33)	<0.01	0.78 (0.15)	<0.01
Period since last dental visit [Ref: <1 year]	>2 years or never	-2.83 (0.36)	<0.01	-1.06 (0.14)	<0.01
	1-2 years	-1.06 (0.65)	0.11	-0.34 (0.20)	0.09
Rural-Urban Classification [Ref: Urban]	Small rural	1.09 (0.70)	0.12	-0.14 (0.24)	0.55
	Large rural	1.20 (0.88)	0.17	-0.01 (0.18)	0.95
NHANES cycle [Ref: 2013-2014]	1999-2000	-0.05 (0.67)	0.94	-0.16 (0.18)	0.38
	2001-2002	-0.45 (0.49)	0.36	-0.06 (0.17)	0.70
	2003-2004	0.90 (0.51)	0.08	0.18 (0.15)	0.25
	2011-2012	0.23 (0.51)	0.65	0.09 (0.17)	0.61
Intercept		3.14 (0.22)	<0.01	2.12 (0.27)	0.02

$\beta$ s are parameter estimates from linear regression models estimating the linear CWF exposure and extent of dental caries experience (dfs per child for 2-8 year olds; DMFS per child for 6-17 year olds). (se) = standard error of  $\beta$ . n=unweighted number of participants analyzed, P-value is from test of null hypothesis that  $\beta=0$ . Age was centered at the median value for the respective age groups: 5 years for 2-8 year olds and 11 years for 6-17 year olds.

Appendix Table 4: Regression models estimating dental caries experience among U.S. 2-17 yr olds, NHANES 1999-2004 and 2011-2014: sensitivity analysis cohort using continuous fluoridation variable.

Variable	Parameter coding	2-8 yr old dfs (n=4,829)		6-17 yr old DMFS (n=8,753)	
		$\beta$ (se)	P-value	$\beta$ (se)	P-value
CWF [continuous variable]	Proportion	-2.40 (0.57)	<0.01	-1.09 (0.24)	<0.01
Age [continuous variable, centered]	Years	0.61 (0.09)	<0.01	0.46 (0.02)	<0.01
Gender [Ref: Female]	Male	0.56 (0.28)	0.05	-0.12 (0.12)	0.32
Race [Ref: non-Hispanic White]	Non-Hispanic Black	0.53 (0.45)	0.25	0.28 (0.17)	0.10
	Hispanic	1.45 (0.39)	<0.01	0.30 (0.15)	0.05
	Other	1.99 (0.65)	<0.01	0.51 (0.26)	0.05
Education [Ref: College graduate]	Less than high school	3.13 (0.40)	<0.01	1.62 (0.23)	<0.01
	High school	2.42 (0.53)	<0.01	1.00 (0.15)	<0.01
	Some college	1.25 (0.43)	<0.01	0.78 (0.19)	<0.01
Period since last dental visit [Ref: <1 year]	>2 years or never	-3.06 (0.40)	<0.01	-0.97 (0.18)	<0.01
	1-2 years	-1.66 (0.53)	<0.01	-0.26 (0.25)	0.30
Rural-Urban Classification [Ref: Urban]	Small rural	1.48 (0.77)	0.06	-0.24 (0.25)	0.34
	Large rural	1.40 (0.89)	0.12	0.00 (0.18)	0.98
NHANES cycle [Ref: 2013-2014]	1999-2000	0.10 (0.61)	0.87	-0.09 (0.20)	0.64
	2001-2002	-0.37 (0.57)	0.52	-0.16 (0.22)	0.47
	2003-2004	0.88 (0.66)	0.18	0.09 (0.20)	0.66
	2011-2012	0.23 (0.64)	0.72	0.09 (0.20)	0.64
Intercept		3.36 (0.25)	0.01	2.19 (0.17)	0.01

$\beta$ s are parameter estimates from linear regression models estimating the linear CWF exposure and extent of dental caries experience (dfs per child for 2-8 year olds; DMFS per child for 6-17 year olds). (se) = standard error of  $\beta$ . n=unweighted number of participants analyzed, P-value is from test of null hypothesis that  $\beta=0$ . Age was centered at the median value for the respective age groups: 5 years for 2-8 year olds and 11 years for 6-17 year olds.