



# PURPOSE

The 2016 National Survey of Children's Health (NSCH) is a two-step cross sectional survey focused on physical and emotional health of children aged birth through 17 years of age in the United Sates. The survey collects data on many aspects of the child's well-being and health. Questions included aspects of the child's physical health, mental health, presence of a medical home, family interactions, parental health, school experiences, and safe neighborhoods along with demographic information (age, sex, insurance, primary language, socioeconomic indicators to name a few). 2016 was the first time the NSCH and the National Survey of Children with Special Health Care needs were combined with future iterations to be implemented on an annual basis. Subjects with special health care needs and children who were birth through 5 years of age were oversampled.

The survey included a new question on testing visual acuity (VA) requested by the National Center for Children's Vision and Eye Health (NCCVEH) to describe access to VA testing. The research looks at responses to VA testing and the location testing occurred. The analysis looks at factors that would direct the NCCVEH to improve public health interventions promoting vision health, development, and learning readiness.

## METHODS

The survey was funded by the Health and Human Services, HRSA and MCHB and administered by the US Census Bureau. The initial invitation to participate in the 2016 NSCH survey was mailed to a sample of 364,150 households from Census Master Address File. Interested respondents were provided with access to a website to be able to participate in the survey on-line or, if they prefer, on paper.

The 2016 data, released 2017, was analyzed with SPSS V21.0 in additional to the analysis of the data using the weighted data from the Data Resource Center for Child and Adolescent Health. 50,212 surveys were completed reflecting approximately 985 surveys per state. This analysis will reflect the association of VA testing with age, SES, and child health status. "Don't know" and missing responses were denoted as missing. The NSCH is publicly available data and Institutional Review Board approval was not required for this study.

### RESULTS

- 50,212 valid surveys representing all states and DC were included.
- survey questions.
- 51.2% of the children included in the analysis were male.
- 5.27

The original surveys (NSCH and NS-CSHCN) included two questions related to vision. The questions were worded to identify those children who were visually impaired or blind. The questions were also included in the 2016 NSCH survey. The results are:

	Yes	No
% (C.I)	1.6 (1.3-1.9)	98.4 (98.1-98.7)
N	606	49,358
Population Estimate	1,143,997	71,713,349
DATA BY AGE GROUP		
Birth-5 years of age (n-110)	0.7 (0.5-1.0)	99.3 (99.0-99.5)
6-11 years (n-198)	1.6 (1.2-2.1)	98.4 (97.9-98.8)
12-17 years (n-298)	2.4 (1.8-3.1)	97.6(96.9-98.2)

The challenge with this question is that it only focuses on the children with significant visual impairment and blindness.

The National Center for Children's Vision had the opportunity to suggest a new question for the 2016 NSCH with the intent to focus on all children. The goal of the question was to determine the extent of vision testing in children- not simply who has a severe visual deficit. The question that the NCCVEH developed was:

### Has the child had his or her vision tested with pictures, shapes or letters ever (for children from birth to age 5 years) or during the past 2 years (for children from 6 – 17 years of age)?

The question was written in an effort to try to determine whether children had received a vision screening or an eye examination in the time specified. The question, as written, does not discriminate between a vision screening or an eye examination. An additional challenge with the data is the respondent may not be aware of the vision screening if it took place in the academic setting and they were unaware of the testing. Following are the results of the question:



# Results from 2016 National Survey of Children's Health

### • One child per household was the chosen to be the subject for the

• The mean age of the children included in the analysis was 9.4 years  $\pm$ 

Yes	No
6 (68.6-70.5)	30.4 (29.5-31.4)
36,272	13,783
50,798,467	22,235,174
% (37.2-40.6)	61.1% (59.4-62.8)
% (83.7-86.6)	14.8% (13.4-16.3)
2% (82-84.3)	16.8% (15.7-18.0)

			Ear the follow up of the primery questions, there were a significant
All respondents birth – 17 y	/ears of age - sex Yes	Νο	For the follow up of the primary questions, there were a significant
Male	<b>68.5</b> (67.2 - 69.8)	<b>31.5</b> (30.2 - 32.8)	number of respondents who indicated that the child did have their
	Sample Count         18,389           Pop. Est.         25,527,784	7,255 11,728,907	vision tested with pictures, shapes, or letters but did not indicate the
Female	* Op. Lst.         23,327,734           % C.I.         70.6 (69.3 - 72.0)	<b>29.4</b> (28.0 - 30.7)	location:
Temale	Sample Count         700 (03.3 / 2.0)           17,883	6,528	
	<b>Pop. Est.</b> 25,270,683	10,506,267	
Distribution of race for child	dren who received a vision screening:		<ul> <li>Birth to 5 years of age: 8,574</li> </ul>
100% r			• 6-11 years of age: 1,999
			• 12-17 years of age: 3,521
90% -			12 17 years of age. 5,521
80% -			
70%-			The review of the raw data reflected the following responses:
60%-			<ul> <li>For all age groups testing occurred in eye doctor or eye</li> </ul>
00 /6 -			specialist-59.1%, pediatrician or other general doctor's office-39.6%,
50%-			
40%-		_	clinic or health center-3.3%, at school-23.1%.
30%-			The likelihood of seeing an eye doctor increased with age (0-5yrs-
			32.5%, 6-11yrs-53.1%, 12-17yrs-72.9%).
20% -			
10% -			Children with neurodevelopmental problems (CP, ID, DS, DD, ADD/
0% 69.9 70	.2 69.6 65.5 30.1 29.8 30.4	34.5	ADHD) and LD were found to have the VA checked in 79% or higher
Hispar	ed vision screening Did not receive vision screening Did not receive vision screening Did not receive vision screening	lispanic	cases.
llowing tables		race responses are seen in ed for these tables is raw	The following histogram reflects the difference of screening for children labeled as Children with Special Health Care Needs (CSHCN) as compared to those without being labelled as Children with Special Health Care Needs (non-CSHCN).
White alone		40.4% 59.6%	
Black or African		46.3% 53.7%	Receipt of vision screening Children age 0-17 years
American Indian Asian alone	or Alaska Native alone	51.0%     49.0%       42.5%     57.5%	100% J
	and other Pacific Islander alone	33.3% 66.7%	90%-
Some other race		43.4% 56.6%	80%-
Two or more rac	ces	41.6% 58.4%	70%-
	6-11 Years (%)		60%-
	RACE	Yes No	50%-
White alone		88.1% 11.9%	40% -
Black or African	American alone	84.5% 15.5%	30%-
American Indian	or Alaska Native alone	83.6% 16.4%	20%-
Asian alone		82.2% 17.8%	10%-
Native Hawaiian	and other Pacific Islander alone	84.8% 15.2%	82.0 66.6 18.0 33.4
Some other race		82.4% 17.6%	0% Received vision screening Did not receive vision screening
Two or more rac	ces	88.1% 11.9%	CSHCN Non-CSHCN
	$12 \ 17 \ V_{0.0} rc (0/)$		
	12- 17 Years (%) RACE	Yes No	Those children on food stamps, meal plans, or WIC had vision tested:
White alone	KACE	83.7% 16.3%	69.4%, 71.1% and 49.2%, respectively with age variations. The
Black or African	American alone	85.6% 14.4%	
	or Alaska Native alone	78.9% 21.1%	following reflects responses as it relates to insurance coverage.
Asian alone		83.7% 16.3%	
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Two or more rac	ces	84.1% 15.9%	Children age 0-17 years
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nd not weight	ed data):		90%-
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<b>J</b>	estion led to follow up sul	•	70% -
ndent indicated that the child had their vision checked, they were		vision checked, they were	
			60% -
			50% -
			40%-
at kind of plac	ce or places did this chil	a nave his or her vision	30%-
ed?			20%-
Eye doctor or eye specialist (ophthalmology, optometry)		almology, optometry)	10%-
	or eye specialist (opliting		70.2     59.1     29.8     40.9       Did not receive vision screening
	office		Insured at time of survey     Not insured at time of survey
Pediatrician or other general doctor's office		r's office	
Clinic or health center			
School Other, specify:			



### Compa the foll

reconcidente hirth 17 v			For the follow up of the primary questions, there were a significal
respondents birth – 17 y	Yes	Νο	number of respondents who indicated that the child did have the
Male	% C.I.         68.5 (67.2 - 69.8           Sample Count         18,389	3) <b>31.5</b> (30.2 - 32.8) 7,255	vision tested with pictures, shapes, or letters but did not indicate
	Pop. Est.         25,527,784	11,728,907	
Female	<b>% C.I. 70.6</b> (69.3 - 72.0		location:
	Sample Count         17,883           Pop. Est.         25,270,683	6,528 10,506,267	
			<ul> <li>Birth to 5 years of age: 8,574</li> </ul>
stribution of race for child	Iren who received a vision screening:		-
00%			• 6-11 years of age: 1,999
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80%-			
00%-			The review of the rew data reflected the following responses:
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50%-			specialist-59.1%, pediatrician or other general doctor's office-39
			clinic or health center-3.3%, at school-23.1%.
40%-			
30% -			<ul> <li>The likelihood of seeing an eye doctor increased with age (0-5y</li> </ul>
20%-			32.5%, 6-11yrs-53.1%, 12-17yrs-72.9%).
			Children with neurodevelopmental problems (CP, ID, DS, DD, Al
10%-			
0% 69.9 70. Receive	2 69.6 65.5 30.1 29.8 3 ed vision screening Did not receive vision	screening	ADHD) and LD were found to have the VA checked in 79% or hi
Hispan	ic White, non-Hispanic Black, non-Hispanic Other, n	on-Hispanic	cases.
son of age of	group and more detailed	d race responses are seen in	The following histogram reflects the difference of screening for
		ised for these tables is raw	children labeled as Children with Special Health Care Needs (CSH
wing tables	(picase note that data b		as compared to those without being labelled as Children with Sp
	Birth - 5 Years (%)		
	RACE	Yes No	Health Care Needs (non-CSHCN).
White alone		40.4% 59.6%	
Black or African	American alone	46.3% 53.7%	Receipt of vision screening
American Indian	or Alaska Native alone	51.0% 49.0%	Children age 0-17 years Nationwide
Asian alone		42.5% 57.5%	100%
Native Hawaiian	and other Pacific Islander alone	33.3% 66.7%	90%-
Some other race		43.4% 56.6%	80%-
Two or more rac	es	41.6% 58.4%	70%-
			60%-
	6-11 Years (%)		
	RACE	Yes No	50%-
White alone		88.1% 11.9%	40%-
Black or African		84.5% 15.5%	30%-
	or Alaska Native alone	83.6% 16.4%	20%-
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Some other race		82.4% 17.6%	Received vision screening Did not receive vision screening
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	12 17 Voors $(0/)$		
	12- 17 Years (%) RACE	Yes No	<ul> <li>Those children on food stamps, meal plans, or WIC had vision t</li> </ul>
White alone	RACE	Yes No 83.7% 16.3%	69.4%, 71.1% and 49.2%, respectively with age variations. The
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			50%-
			40% -
kind of plac	e or places did this ch	ild have his or her vision	30%-
7	•		20%-
			10% -
	or eye specialist (ophth	nalmology, optometry)	10 %     70.2     59.1     29.8     40.9
office			0% Received vision screening Did not receive vision screening
Pediatrician	or other general doct	or's office	Insured at time of survey Not insured at time of survey
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	Pop. Est.         25,270,683		
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«- <del> </del>	T		The review of the raw data reflected the following responses:
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Some other race	and other Pacific Islander alone	67.6%         32.4%           79.1%         20.9%	
Two or more rac		84.1% 15.9%	Receipt of vision screening
			Children age 0-17 years Nationwide
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	estion led to follow up :	sub quastions if the	80% -
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			50%-
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			30%- 20%-
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	or eye specialist (ophi	thalmology, optometry)	<u>70.2</u> 59.1 29.8 40.9
ffice			Received vision screening     Did not receive vision screening     Insured at time of survey     Not insured at time of survey
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son of ago o	aroup and mo	oro dotailad ra	ce responses a	The following histogram reflects the difference of screening for
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	Birth - 5 `	Years (%)		as compared to those without being labelled as Children with Sp
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Some other race			43.4% 56.6%	80% -
Two or more rac	es		41.6% 58.4%	70%-
				60%-
		ears (%)	Vac Na	50%-
White alone	RACE		Yes No 88.1% 11.9%	40%-
Black or African A	American alone		84.5% 15.5%	30%-
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Some other race			82.4%         17.6%           88.1%         11.9%	Received vision screening Did not receive vision screening
Two or more rac			00.170 11.370	
	12- 17 Y	'ears (%)		
	RACE		Yes No	<ul> <li>Those children on food stamps, meal plans, or WIC had vision t</li> </ul>
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The orio respond ask:

### What teste

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• There was also the ability to compare the access to vision screening by federal poverty level (FPL). The following graph breaks it down to <200%, 200%-<300%, 300%-399%, 400% or greater.



# CONCLUSIONS

Analysis of data from the 2016 NSCH indicates wide disparities exist in rates of VA testing and utilization of eye care by age, systemic condition, and socio-economic factors. Several important results have been seen with the responses to the new vision question that was suggested by the National Center for Children's Vision and Eye Health.

- Parents are less likely to respond to questions when the child is birth to 5 years of age and may not be aware of the role that vision health plays in development during this critical period.
- Less than 70% of children in the United States are receiving appropriate vision screening or eye examinations.
- Slightly more females received vision screening/examinations than males
- White, non-Hispanics are the most likely to receive vision screening/ examinations followed by Hispanics, and Black children with minimal difference, Native Hawaiian and Pacific Islanders have a much lower
- Children who are labeled as Children with Special Health Care Needs are significantly more likely to have received a vision screening or eye examination.
- Children with insurance are more likely to receive a vision screening/ eye examination.
- Children are more likely to receive a vision screening/eye examination as income increases from below the FPL to over the FPL.

On-going data collection will be critical for targeted interventions, revisions to health policy, and improved access to services resulting in improved vision health for children in the U.S.

http://childhealthdata.org

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