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Caretaker Awareness of Health Care Provided Developmental Screening: Increases from 2007 to 2012

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Abstract *Objectives* Developmental screening is considered critical to identifying children with developmental delays and disabilities so that they may receive early intervention. To date, only a handful of studies report data on the percentage of health care professionals (HCP) who provide developmental screening. These reports are limited by low participation rates and reporters being pediatricians who may be biased towards reporting higher rates of developmental screening. The purpose of this study is to verify reported increases by reporting on changes in caretakers' awareness of HCP provided developmental screening from 2007/2008 to 2011/2012. *Methods* Authors report data on caretaker reported receipt of HCP provided developmental screening from the National Survey of Children's Health (NSCH, 2007/2008) and NSCH (2011/2012), as well as changes from the 2007/2008 to 2011/2012. Changes for the 50 states plus Washington D.C. are visualized using 'micromapST' and states are organized in ascending order according to changes in caretaker awareness of developmental screening. *Results* Nationally, the proportion of caretakers aware that their HCP provided developmental screening increased from 23.0% in 2007/2008 (range 12.6–46%) to 33.3% in 2011/2012 (range 19.4–61.6%) and states level changes ranged from −2 to +35%, with a median change of +10%. *Conclusions for Practice* Data reported here indicate that a greater number of caretakers are aware that their HCP is providing developmental screening. This reinforces the existing reports indicating increases in HCP reported developmental screening. Despite growth, there is still a need to increase developmental screening efforts in many states.

Keywords Developmental surveillance · Developmental screening · Micromaps · Early identification

Significance

What is already known on this subject? Research on pediatricians and other health care providers (HCP) indicates that developmental screening is increasing. However, most studies are from single states or circumscribed regions and many have low response rates from HCP. Thus, current data is limited.

What this study adds? The present study provides a nationally representative analysis of changes in developmental screening rates from 2007 to 2012 as provided by caretakers. The findings augment the existing literature by querying non-medical population about their remembrance of receiving developmental screening for their child from their HCP. National and state estimates are provided.

Introduction

Children with developmental disabilities and delays require early identification in order to reap the benefits of early intervention services (EI) (American Academy of Pediatricians [AAP] 2006; Nelson and Mann 2011). Current estimates indicate that around 13% of children under 3 and 15% of children 3–17 have developmental disabilities and

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delays (Boyle et al. 2011; Rosenberg et al. 2008); the vast majority of children in need of EI, or other treatments, are not identified until they reach school age. This is troublesome as children with disabilities that receive EI have better long term developmental and educational outcomes than those who do not (Guralnick 2011; Nelson and Mann 2011). In order to increase early identification in young populations, multiple groups have promoted the increased use of standardized developmental screening instruments (AAP 2006; Duncan et al. 2008). Standardized screening instruments are short questionnaires that health care professionals (HCP) provide caretakers of children in order to ascertain whether children display developmentally typical behaviors (Macy 2012; Sheldrick et al. 2011). Scoring algorithms allow HCP to flag children who are suspected of developmental delays and disabilities so that they may receive more intensive assessments to determine if the child has a developmental delay and/or disability and is in need of more intensive EI or treatment services.

There is now a large body of literature documenting a host of developmental screeners with good psychometric properties that HCP may use to inform their early identification efforts (Macy 2012). Furthermore, evidence indicates that developmental screening increases the number of children who are referred, assessed, and ultimately receive EI services (Guevara et al. 2013; Hix-Small et al. 2007; Limbos and Joyce 2011; Morelli et al. 2014; Schonwald et al. 2009). In a compelling recent randomized control trial, Guevara et al. (2013), found that children who received developmental screening were significantly more likely to receive EI services compared to children who did not receive screening. Furthermore, the same study revealed that developmental screening resulted in shorter times to diagnosis and receipt of services. Collectively, data on developmental screening suggests that screening facilitates the process of early identification.

In response to evidence supporting developmental screening, numerous organized efforts aim to increase HCP use of developmental screening. One of the most well-known is the American Academy of Pediatrics (AAP 2006) who has released two policy statements indicating their support for developmental screening by HCP at well child visits. Additionally, screening is a major focus of Title V Maternal and Child Health Service as witnessed by their Block Grants-National Priority Area # 6: Developmental Screening for Child Health (U.S. Department of Health and Human Services 2015). Despite a solid policy and research foundation supporting the use of developmental screening, the research base tracking changes in developmental screening practices across time is relatively scant. An early national study of pediatricians and family care physicians found that in 2004 only 23% reported using standardized developmental screeners, while 52% reported using informal checklists (Sand et al. 2005). A 2006 study found that 82% of pediatricians in Delaware and New Hampshire reported using any autism specific screeners, but 15% reported that they did not use standardized screeners (Dosreis et al. 2006). In a 2011 nationally representative study of pediatricians use of developmental screening tools, Radecki et al. reported an increase from 23% in 2002 to ~48% in 2009 (Radecki et al. 2011). A study from 2012 found that of physicians from six states; approximately 42% screened children at 9 months, 58% at 18 months, and 52% at 24 months (Arunyanart et al. 2012).

Overall, the research base indicates that developmental screening among HCP is increasing; however, there is a need to further investigate these trends. Currently, the literature investigating changes in developmental screening rates relies solely on HCP, particularly pediatricians, as the reporters; the response rate for these studies has ranged from ~10% (Arunyanart et al. 2012) to 57% (Radecki et al. 2011), with most others around the 50% range. There may be multiple reasons for a lack of response, including time constraints, but one reasonable possibility is that HCP responding to these studies have a strong social motivation to report in the positive (for discussion, see Radecki et al. 2011). Thus, it is quite possible that current estimates of developmental screening rates are lower than currently reported. Whether or not current reports are accurate, developmental screening rates are currently limited by their sole reliance on HCP and data from other sources would be a welcome addition to the literature.

Despite an increasing interest in developmental screening, there have been relatively few efforts to document whether more children are receiving developmental screening; existing data primarily focuses on self-reports of pediatricians and other HCP. Furthermore, to date there is only a single report documenting longitudinal changes in developmental screening rates by HCP (Radecki et al. 2011). Thus, there is a need for more data determining whether developmental screening is increasing.

Methods

Data for this study comes from the National Surveys of Children's Health (2007/2008; 2011/2012). The NSCH (2007/2008) data were collected between April 2007 and July 2008 and for NSCH (2011/2012) between February 2011 and June 2012. The Maternal and Child Health Bureau of the Health Resources and Services Administration funded both NSCH surveys; the National Center for Health Statistics (NCHS) administered both surveys using the State and Local Area Integrated Telephone Survey. For analyses from both datasets, estimates were adjusted for non-response bias and weighted to represent the

non-institutionalized U.S. population. Further details are described in publications available from the NCHS.

For both 2007/2008 and 2011/2012 data, we calculated rates of caretakers' awareness of developmental screening from a single item: "During the past 12 months, did a doctor or other health care provider have you fill out a questionnaire about specific concerns or observations you may have about [child]'s development, communication, or social behaviors?" Critically, this survey item indicates caretakers' receipt of a developmental screener, but does not indicate if the HCP used a formal standardized developmental screening instrument.

Data Analysis

All data manipulation was conducted in R (version 3.0.2) (https://cran.r-project.org/) and Excel. The R 'survey' package (Lumley 2012) was used to develop all state and national population level estimates of developmental screening that also account for the complex survey weighting and stratification scheme of the NSCH. Rao–Scott χ^2 tests were used to test for statistically significant changes in caretaker awareness of developmental screening in both national and state level subsets of outcome variables. National level changes in caretakers' awareness of developmental screening by HCP included an overall national analysis, as well as stratified analyses for the following socio-demographic variables: child age, child gender, child race, whether children had special healthcare needs, parental education, socio-economic status, insurance status, and whether the household was English speaking or not. For national level stratified comparisons significant group differences was set at $p < 0.001$. A separate analysis of state level changes in caretaker awareness of developmental screening was also considered. For state level analyses, to control for Type I errors due to multiple comparisons statistical significance was set at $p < 0.001$.

In recent years, many sub-fields of public health have embraced advances in data visualization to better interpret spatial data (e.g., Sopan et al. 2012), but research on developmental surveillance rarely employs current techniques (see Rosenberg et al. 2013 for recent exception). The current investigation uses 'micromapST' to visualize data from the 50 United States and the District of Columbia (Pickle et al. 2015). As a core function, 'micromapST' (1) creates an ordered list of 50 states according to a the variable of interest with a single state occupying the median demarcating the 25 states above and below that variable; (2) creates a series of maps clustered into groups of five based on the order of the list; and (3) allows for the addition columns to the right that may display either single point data (i.e., "static maps") or changes over time (i.e., "dynamic maps"). Presently, we provide a dynamic map displaying changes in developmental screening proportions from 2007/2008 to 2011/2012 organized by the difference score (i.e., 2011/2012 screening proportions minus 2007/2008 proportion) in ascending order. The dynamic map includes a column with arrows indicating the direction of change where the tail end of the arrow indicates the 2007/2008 rate and the pointed end indicates the 2011/2012 rate. A second column includes a bar graph displaying the magnitude of change in the rates of children receiving screening from 2007/2008 to 2011/2012; left centered bars indicate decreases in proportion of children screened and right centered bars indicate increases.

Table 1 contains data on the raw and estimated population estimates of our sample for children's age (<18 months, 18–24 months, 2, 3, 4, and 5 years old), gender, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Other, and Unreported), highest parental degree (less than high school, high school, more than high school), insurance status (none, public, and private), children with special healthcare need status, poverty level, and whether children's families were primarily English speaking or not. All data except for age if children in the U.S. under the age of five. Table 2 contains data on the estimated under five population whose caretakers reported that their HCP provided developmental screening for each of the U.S. states and Washington D.C.

Results

There was a statistically significant increase in the proportion of the birth to 5 years U.S. population whose parents reported receiving developmental screening questionnaires from HCP from 23% in 2007/2008 (range 12.6–46%) to 33.3% in 2011/2012 (range 19.4–61.6%), $F(1, 574{,}461) = 132.3446$, $p < 0.001$. Table 1 breaks down the increases in developmental screening by different socio-demographic groups. All age groups, both genders, insurance levels, Children with Special Health Care Needs (CSHCN) status groups (CSHCN indicates children have a known developmental, physical, or neurological condition), and poverty levels had significant increases in parental awareness of HCP provided developmental screening (all p values <0.001). White, Hispanic and Other race groups also reported significant increases, but caretakers of Black and Other race groups did not report significant increases. For caretakers of Black children there was a non-significant increase from 29.4 to 34.2% ($p > 0.05$) and for the Other group there was a non-significant increase from 17.8 to 32.9% ($p > 0.01$). Notably, the Other group had low power to detect significant differences, particularly at our more stringent value of 0.001. Although caretakers of children with High School Degree or higher reported significant

Table 1 National level proportion of parental awareness of developmental screening by socio-demographic groups

Socio-demographic group	2007/2008			2011/2012			Change in screening	*p*
	Raw N	Population estimate	Population screened	Raw N	Population estimate	Population screened		
Age								
<18 months	7571	6,581,147	0.143	8058	6,577,814	0.210	0.067	<0.001*
18–24 months	2051	1,870,173	0.258	1982	1,588,961	0.468	0.210	<0.001*
2 year olds	3978	3,713,519	0.290	4047	3,454,098	0.439	0.149	<0.001*
3 year olds	4694	3,990,211	0.256	5363	4,066,345	0.353	0.097	<0.001*
4 year olds	4714	4,039,002	0.245	5300	4,212,604	0.356	0.111	<0.001*
5 year olds	4558	4,286,314	0.260	5247	4,230,757	0.347	0.087	<0.001*
Gender								
Females	13,304	11,960,000	0.228	14,742	11,811,976	0.336	0.108	<0.001*
Males	14,243	12,502,548	0.231	15,233	12,306,931	0.331	0.100	<0.001*
White	17,618	13,023,998	0.225	18,256	11,760,771	0.338	0.113	<0.001*
Black	2427	3,009,927	0.294	2714	2,863,766	0.342	0.048	ns
Hispanic	4166	5,449,544	0.209	4609	6,198,442	0.323	0.114	<0.001*
Other	3092	2,699,246	0.231	3872	2,764,248	0.328	0.097	<0.001*
Unreported race	263	297,652	0.178	546	543,354	0.329	0.151	ns
Parent education								
Less that High School	2,260	3,000,458	0.240	2,325	3,328,354	0.313	0.073	ns
High School	4,521	5,451,880	0.241	5,068	4,957,964	0.333	0.092	<0.001*
More than High School	19,400	14,756,757	0.228	20,595	14,271,939	0.338	0.110	<0.001*
Insurance status								
Uninsured	1,769	1,917,729	0.201	1,035	1,107,312	0.303	0.102	ns
Public insurance	7,211	8,431,620	0.259	10,629	10,382,234	0.331	0.072	<0.001*
Private insurance	18,291	13,927,581	0.216	17,955	12,358,575	0.339	0.123	<0.001*
CSHCN	3,303	2,854,907	0.319	3,412	2,741,353	0.439	0.120	<0.001*
Non-CSHCN	24,263	21,625,460	0.218	26,585	21,389,227	0.319	0.101	<0.001*
Poverty level								
<100%	3,933	5,148,641	0.246	5,793	6,304,703	0.337	0.091	<0.001*
100–199%	4,948	5,394,356	0.243	5,734	5,255,835	0.345	0.102	<0.001*
200–299%	4,878	4,114,649	0.227	4,701	3,809,626	0.319	0.092	<0.001*
300–399%	4,048	2,995,265	0.209	3,894	2,660,224	0.321	0.112	<0.001*
400%+	9,759	6,827,457	0.219	9,875	6,100,192	0.335	0.116	<0.001*
English								
English speaking	25,523	21,225,786	0.232	27,522	20,302,192	0.335	0.103	<0.001*
Non-English speaking	1,732	2,909,394	0.219	1,665	3,044,991	0.326	0.107	ns

Rao–Scott χ^2 test

*Significance at p value <0.001

increases in awareness of developmental screening, caretakers of children with less than a High School education had non-significant increases in awareness of developmental screening from 24% in 2007 to 31.3% in 2012 ($p > 0.01$). Finally, English speaking caretakers reported statistically significant increases in awareness of developmental screening, but non-English speakers had non-significant increases from 21.9 to 32.6% ($p > 0.01$), but also lower power to detect differences.

Table 2 breaks down the changes in caretaker awareness of developmental screening provided by HCP from 2007 to 2012. States ranged in their changes in from −2% in Mississippi to an increase of 35% in Massachusetts; Connecticut and Kansas tied for the median level change of 10.1%. Sixteen states had statistically significant increases in the proportion of caretakers reporting that their HCP provided developmental screening: Alabama, Washington D.C., Delaware, Georgia, Iowa, Illinois, Massachusetts, Montana,

Table 2 State level proportion of parental awareness of developmental screening

State	2007/2008		2011/2012		Change in screening	s.e.	*p*
	Population estimate	Population screened	Population estimate	Population screened			
AK	62,167	0.24	64,174	0.37	0.13	0.03	<0.001*
AL	361,407	0.15	358,796	0.26	0.11	0.02	ns
AR	233,536	0.19	228,619	0.26	0.06	0.03	ns
AZ	585,791	0.20	538,571	0.26	0.06	0.03	ns
CA	3,143,831	0.20	3,046,670	0.32	0.12	0.03	ns
CO	408,685	0.28	408,415	0.44	0.16	0.03	<0.001*
CT	252,320	0.22	235,175	0.32	0.10	0.02	ns
DC	43,169	0.15	43,096	0.27	0.12	0.02	<0.001*
DE	66,904	0.13	66,261	0.31	0.18	0.02	<0.001*
FL	1,339,181	0.21	1,297,654	0.27	0.07	0.03	ns
GA	858,652	0.27	818,277	0.44	0.17	0.03	<0.001*
HI	98,353	0.31	100,800	0.41	0.10	0.03	ns
IA	229,897	0.22	239,249	0.36	0.15	0.03	<0.001*
ID	141,682	0.22	145,071	0.28	0.06	0.03	ns
IL	1,059,984	0.23	993,583	0.38	0.14	0.03	<0.001*
IN	529,711	0.23	518,135	0.27	0.04	0.03	ns
KS	233,466	0.30	243,943	0.40	0.10	0.03	ns
KY	343,420	0.18	337,037	0.29	0.11	0.02	ns
LA	356,645	0.33	374,121	0.39	0.07	0.03	ns
MA	453,274	0.18	435,582	0.53	0.35	0.03	<0.001*
MD	446,781	0.24	434,285	0.35	0.10	0.03	ns
ME	86,675	0.27	81,827	0.33	0.05	0.03	ns
MI	759,350	0.23	707,851	0.28	0.05	0.03	ns
MN	420,914	0.46	418,635	0.47	0.01	0.03	ns
MO	458,272	0.23	459,232	0.33	0.10	0.03	ns
MS	252,719	0.21	242,563	0.19	-0.02	0.03	ns
MT	72,178	0.17	77,405	0.29	0.11	0.02	<0.001*
NC	745,326	0.45	753,194	0.61	0.16	0.03	<0.001*
ND	47,584	0.22	52,894	0.25	0.03	0.03	ns
NE	155,534	0.21	151,809	0.34	0.13	0.03	<0.001*
NH	88,564	0.22	81,839	0.35	0.13	0.03	<0.001*
NJ	653,126	0.14	653,982	0.27	0.12	0.02	<0.001*
NM	164,404	0.32	177,116	0.43	0.11	0.03	ns
NV	230,347	0.23	224,600	0.23	0.01	0.03	ns
NY	1,430,302	0.17	1,386,193	0.23	0.06	0.02	ns
OH	883,346	0.22	855,308	0.34	0.12	0.03	ns
OK	304,513	0.24	316,364	0.31	0.08	0.03	ns
OR	279,908	0.18	282,715	0.37	0.19	0.03	<0.001*
PA	869,370	0.13	869,650	0.33	0.21	0.03	<0.001*
RI	74,441	0.16	69,047	0.32	0.16	0.02	<0.001*
SC	347,416	0.22	363,396	0.33	0.12	0.03	ns
SD	65,290	0.21	68,204	0.27	0.05	0.02	ns
TN	480,987	0.32	478,282	0.42	0.10	0.03	ns
TX	2,329,518	0.22	2,358,393	0.30	0.09	0.03	ns
UT	299,916	0.24	307,757	0.28	0.04	0.02	ns
VA	603,512	0.23	613,870	0.30	0.07	0.03	ns
VT	42,288	0.24	38,852	0.33	0.09	0.03	ns
WA	501,527	0.3	521,962	0.34	0.04	0.03	ns
WI	416,491	0.31	418,164	0.39	0.08	0.03	ns

Table 2 (continued)

State	2007/2008		2011/2012		Change in screening	s.e.	*p*
	Population estimate	Population screened	Population estimate	Population screened			
WV	123,648	0.35	125,937	0.37	0.02	0.03	ns
WY	44,046	0.24	46,025	0.32	0.08	0.03	ns

Rao–Scott χ^2 test

*Significance at p value <0.001

North Carolina, Nebraska, New Hampshire, New Jersey, New Mexico, Oregon, Pennsylvania, and Rhode Island.

Figure 1 provides a graphical representation of Table 1 data in 'micromapST' form. Data are organized by the differences in awareness of developmental screening in 2007 and 2012. From this graph we can see that in the majority of states parental awareness of developmental increased. 26 states (i.e., Kansas and below) had a 10% or greater increase in caretaker awareness of parents screening; 15 states had a 5–10% increase; 9 states had a <5% increase; and 1 state had slight decrease.

Discussion

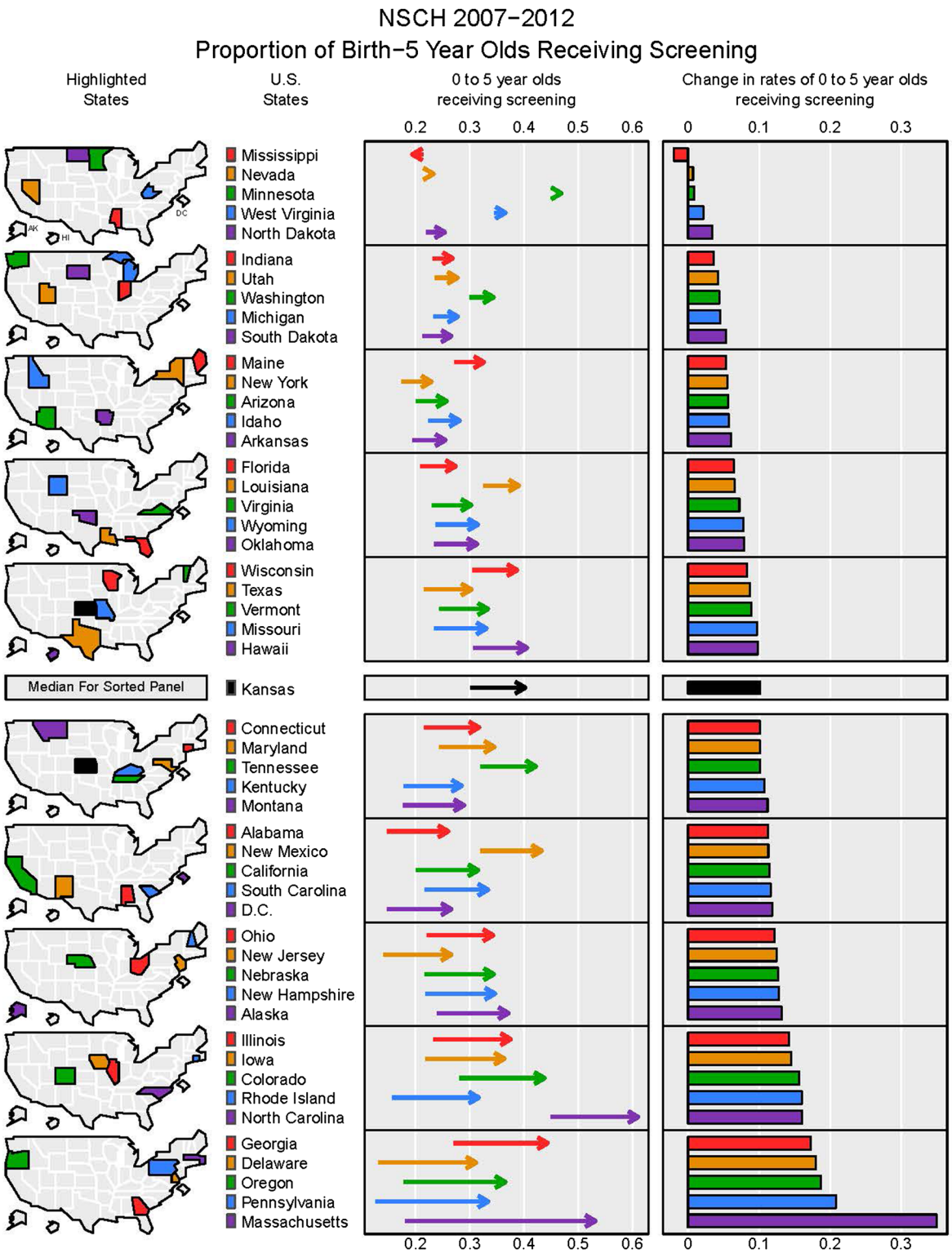
The results from this study indicate that caretaker's awareness of developmental screening increased from 2007 to 2012 nationally and in a number of states. Nationally, and in 14 states, there was a statistically significant increase in caretaker's awareness of developmental screening; 26 states had increases of 10% or more; 15 states had a 5–10% increase; 9 states had a <5% increase; and 1 decreased. Collectively, the data indicates that states vary widely in the degree to which caretakers are aware that their HCP are conducting developmental screening. However, the general trend is positive and indicates that nationally more caretakers are aware of HCP provided developmental screening. Thus, this data reinforces Radecki et al. (2011) conclusion that HCP reported developmental screening rates are increasing.

This report allows us to more flexibly assess the reported national level changes in developmental screening. Radecki et al. (2011) data indicated that developmental screening increased nationally from 23% in 2002 to 48% in 2009. The NSCH 2007/2008 data indicated parental awareness of 23%, the same as Radecki et al. (2011) rate. While these data seem to conflict, they are actually complementary. Critically, Radecki et al. reported data from a subset of pediatricians (57%) reporting on their developmental screening practices; our data reports parental *awareness* of HCP developmental screening. The primary discrepancy in our findings likely stem from differences in participants' motivations and awareness. Radecki et al. notes that for their HCP oriented analysis "social desirability may have motivated pediatricians to over-report their application of these instruments given current attention to the importance of early identification of developmental delay" (Radecki et al. 2011, p. 18). On the other hand, caretakers in this current study are likely underreporting as many may misremember their screening experience or their HCP may have asked questions directly from a screener, but without caretakers' awareness (Belli 2014; Torangeau 1999). Collectively, however, both data sources indicate that developmental screening rates are on the rise.

Socio-demographic Considerations

Aside from general state level increases, several socio-demographic factors related to national level screening are important to consider. In particular, White, Hispanic, and Other race/ethnicity groups had significant increases in national level developmental screening receipt, but Black and Unreported groups did not. The lack of statistically significant increases for Black children appears to relate to the fact that they had higher 2007/2008 baseline rates (see also Bethell et al. 2011), but similar rates to other race groups by 2011/2012 (all 33–34%). Thus, our data indicate that other race/ethnicity groups' developmental screening rates have equalized at a national level.

Furthermore, there were non-significant increases in developmental screening receipt by caretakers with less than High School education whereas those with High School and post-High School education had significant increases; and non-English speaking households had non-significant increases and those from English speaking households had significant increases. These non-significant increases must be balanced with the fact that within years, the rates of low education parents receiving screening are fairly similar, or equal, to those with High School, or more; similarly, non-English speakers have rates close to those of English speakers (Table 1). That these groups did not witness statistically significant increases is more likely a function of lower power to detect differences coupled with the stringent alpha set for this study rather than truly meaningful differences between the social strata.



Notes States are organized by changes in the proportion of caretakers of children birth to 5 reporting that their HCP provided developmental screening. The *first column breaks* provides five state clusters with a median state flagged. The *second column* provides state names. The *third column* provides *arrows* indicating changes in caretakers awareness of developmental screening from 2007 (*flat ends of arrows*) to 2012 (*pointed ends of arrows*). The *fourth column* provides *barcharts* indicating the proportional change in caretaker awareness of developmental screening per state; *left centered bars* indicate decreasing awareness and *right centered bars* indicate increasing awareness

Fig. 1 Micromap of changes in caretakers perceptions of developmental screening receipt from 2007 to 2012

Policy Implications

This study indicates that developmental screening rates are increasing, but universal receipt is clearly not yet attained. Only Massachusetts and North Carolina had >50% of caretakers report developmental screening receipt in 2011/2012. Massachusetts and North Carolina both have unique early child development tracking systems that other states might consider emulating. Massachusetts displayed the most dramatic increases across the nation, which may be related to their implementation of an interconnected medical record system connecting birth records, death records, and early intervention allowing for a readily available surveillance database tracking children (for recent discussion, see Barger et al. 2016). North Carolina's displayed a less dramatic rise, but already had a strong reported rate of developmental screening receipt in 2007/2008 and has prioritized screening since the early 2000s via their Assuring Better Child Health and Development (ABCD) program aiming to increase the use of developmental screeners across the state (Earls et al. 2009). As states strive to meet the goal of all children screened, these state systems and policies may serve as key examples of effective implementation.

Limitations and Future Directions

The analyses presented here are interesting, but limited in a number of different ways. First, the data relies on parent's recollection of filling out a developmental screener. For any caretaker, developmental screeners are just one of multiple forms filled out during a health care visit and it is very likely that many caretakers do not recall whether they filled one out or not. Second, our statistical criteria for significance is fairly strict and should be balanced with magnitude of differences between 2007/2008 to 2011/2012. The proportion of parents in most states reported a 10% or greater increase the proportion of caretakers aware that their HCP provided a developmental screener. Thus, although not reaching our stringent criteria, in most states an increasing number of caretakers report receiving developmental screening. Finally, this data stops at 2012 and does not represent the most current national estimates; however, the NSCH are scheduled to begin reporting yearly starting in 2017 or 2018. Thus, future reports will be able to more closely monitor the yearly increases in caretaker's awareness of HCP screening.

Conclusions

The current analysis used a micromaps visualization approach to display state variation in changes in caretakers' awareness of HCP provided developmental screening from 2007/2008 to 2011/2012. This visualization technique helps us to quickly identify which states are witnessing meaningful increases in developmental screening and which ones are not. State policymakers may use this data to inform their policies and/or projects to positively increase the likelihood of children receiving developmental screening. For example, caretakers' awareness of HCP screening in Massachusetts rose dramatically from 18% in 2007/2008 to 53% in 2011/2012. During this time period Massachusetts also connected their medical and early intervention data systems to track children from the community in need of developmental services (Derrington 2013). Likewise, North Carolina's ABCD program likely has led to it leading the states in number of total children screened (61%). It may be that states could emulate the policies and programs of Massachusetts and North Carolina to effectively increase screening rates. Collectively, this data indicates HCP provided developmental screening is increasing, but more work is still clearly needed.

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