

Estimating the Number of Three and Four Year Olds in Maryland below 300% of Poverty

Report submitted by the Maryland State Department of Education to the Governor, the Senate Budget and Taxation Committee, the Senate Education, Health, and Environmental Affairs Committee, the House Ways and means Committee, and the House Appropriations Committee.

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Background

In April 2014, the Governor signed into law the Prekindergarten Expansion Act of 2014. The purpose of the law is to establish a grant program, administered by the Maryland State Department of Education (MSDE), to expand access to prekindergarten classrooms for four-year old children from families with household incomes of 300% of the Federal Poverty Guidelines (FPG). Prior to the enactment of the law, Maryland established, through the Bridge to Excellence in Public School Act of 2002, a provision by which local boards of education were required to enroll all four-year olds “from economically disadvantaged backgrounds.” That law went into effect in school year 2007-08. The Maryland State Board of Education promulgated regulations that defined “economically disadvantaged” as children from families who are eligible for free and reduced priced meals, i.e., 185% of FPG.

The new expansion is part of a larger effort to gradually increase the access to publicly funded quality prekindergarten to all four-year olds in an effort to improve the school readiness skills of entering kindergarteners and enhance the chances of eliminating the achievement gap. Long-term the investment might also include three year old children from low income families.

Thus, the expansion created a new group of four-year olds that will be eligible to access, at a minimum, a publicly funded half-day prekindergarten. Since 2007-08, MSDE has monitored the implementation of the prekindergarten in public schools, including the compliance with the Bridge to Excellence mandate. The new group of children which falls under the new eligibility provision represents families with incomes from 185% to 300% FPG.

The Legislative Charge

The Prekindergarten Expansion Act of 2014 included language that charged MSDE, the Maryland Department of Health and Mental Hygiene, and the Maryland Department of Planning to jointly report the estimated number of 3-year old and 4-year old children. The legislative provision also included the reporting of the estimated number not only for the State of Maryland but also for the 23 counties and Baltimore City for school year 2013-14 and the next 5 years.

Current Methodology of Estimating Enrollment

MSDE’s current methodology for determining the enrollment of prekindergarten students is based on the enrollment count of September 30 of the school year. Local school systems report to MSDE the number of prekindergarten enrollees which is defined as four-year olds whose fourth birthday is on or before September 1 of the year of enrollment. The enrollment information also includes three-year olds in specialized programs such as Judy Centers or Head Start programs in public schools. Since the enrollment is not compulsory and determined by parental choice, only a fraction of all income eligible three- and four-year olds are enrolled in prekindergarten. Table 1 depicts the enrollment patterns of three- and four-year olds in public school prekindergarten for the past five years.

Table 1: Prekindergarten Students in Public Schools – 2007-08 to 2013-14

SY 2007 - 2008	SY 2008 - 2009	SY 2009 - 2010	SY 2010 - 2011	SY 2011 - 2012	SY 2012 - 2013	SY 2013 - 2014
Total Enrollment						
27,179	28,783	28,626	29,377	28,850	29,671	29,811

It should be noted that the State’s prekindergarten regulations enable local school systems to enroll four-year olds for “vacancies remaining after complying” with the mandate, i.e., only a subset of the enrolled prekindergarten students meets the income eligibility criterion of 185% of FPG. MSDE does not collect information on that subset.

Methodology of Estimating 3- and 4-Year Olds with New Income Guidelines

The new income guidelines of 300% FPG increases the pool of preschoolers who are eligible for prekindergarten. The new eligibility criterion applies only to prekindergarten classrooms that have been established with the new prekindergarten expansion funds, i.e., it does not change the Bridge to Excellence income criteria of 185% of FPG for publicly funded prekindergarten.

Table 2 provides the 2014 Federal Poverty Guidelines from 100% to 400% by household size.

Table 2: 2014 Federal Poverty Guidelines (effective as of February 2014)

Household Size	100%	133%	150%	200%	250%	300%	400%
1	\$11,670	\$15,521	\$17,505	\$23,340	\$29,175	\$35,010	\$46,680
2	15,730	20,921	23,595	31,460	39,325	47,190	62,920
3	19,790	26,321	29,685	39,580	49,475	59,370	79,160
4	23,850	31,721	35,775	47,700	59,625	71,550	95,400
5	27,910	37,120	41,865	55,820	69,775	83,730	111,640
6	31,970	42,520	47,955	63,940	79,925	95,910	127,880
7	36,030	47,920	54,045	72,060	90,075	108,090	144,120
8	40,090	53,320	60,135	80,180	100,225	120,270	160,360

According to the table a household of four can earn up to \$71,550 to meet the eligibility criterion for the prekindergarten expansion grant. This is markedly different from the current criterion of 185% of FPG which translates to \$44,123 for a household of four persons.

Estimating the Number of Three and Four Year Olds in Maryland below 300% of Poverty

Since there are no published figures on the number of four year olds in Maryland below 300% of the Federal Poverty Level (FPL)¹, we have to resort to various estimates derived either from U. S. Census data or relevant Maryland program data. We gathered a number of estimates based on different ways of approaching this problem, from a number of different Maryland State agencies and the research groups recruited by these agencies. Given the challenges of achieving accurate estimates about Maryland's child population, and especially the population in poverty, it is important to compare these different estimates and attempt to zero in on the best estimate among them.

We have assembled five estimates that bear on the problem. The first 3 estimates use Census data, while the fourth and fifth estimates are based on numbers of three and four year old children enrolled in Maryland's Medicaid Program, a program which used 300% of poverty as an eligibility threshold. Since the problem of estimation is the same for both three and four year olds, we will focus on four year olds, and then extend our conclusion to the three year olds as well.

The Census estimates are based on the American Community Survey (ACS), a continuing, nationwide survey which replaced the Census long form after the 2000 Census. As such, it is subject to the errors inherent to the survey process: measurement error due to inaccurate questions and responses, non-response error when some subjects refuse to answer the survey, and sampling errors resulting from sample sizes that may be too small accurately to estimate the population. In addition, estimates 1 and 2 below make assumptions about the poverty level population that cannot be verified.

¹ We use Federal Poverty Level here to refer to the Federal Poverty Guidelines, as published by the US Dept of Health and Human Services.

Methodology	Results
<p>#1 (Towson University’s Regional Economic Studies Institute – RESI)</p> <p>Take the estimate of four year olds in the State and reduce that by the estimated proportion of all children at 200% of poverty, available online from AEC Kids Count data, and then increase that estimate using the ratio of all families at 200% and at 300% of poverty.</p>	<p>Roughly 36,000 four year olds (or 48.5 to 49% of the child population), assuming the ratio between four year olds at 200% and 300% of poverty resembles the ratio between all families at the same poverty levels, and assuming the ratio between four year olds and all children at 200% of poverty is the same.</p>
<p>#2 (Advocates for Children and Youth and MDP)</p> <p>Use the Census ACS estimate for children under age 6 below 300% FPL in Maryland, which is 220,128 children.² Of that number, roughly 17% might be four’s, assuming that the distribution of children in poverty by age matches the distribution of all children.</p>	<p>Roughly 37,400 four year olds.</p> <p>The same source also provides estimates of three and four year olds under 300% FPL by county, with rather wide margins of error.</p>
<p>#3 (Population Reference Bureau, Washington, D.C.)</p> <p>Use micro data available from the Census to arrive at what is likely the most accurate set of Census estimates, with margin of error information showing the range of confidence around the estimates.</p>	<p>Provided three estimates with associated margins of error and central estimate (as shown).</p> <p>ACS One Year, 2012: 37,298</p> <p>ACS, Three Year, 2010-2012: 37,833</p> <p>ACS Five Year, 2008-2012: 35,205</p> <p>If we take the three year estimate as the best compromise between a lower margin of error and a more up-to-date time period, we arrive at a range of 34,206 to 41,460 four year olds, with a single point estimate of 37,833, corresponding to data as of 2011. There is no estimate of three year old children from this source.</p>

² We are indebted to Al Passarella of Advocates for Children and Youth, and Mark Goldstein of MDP for this approach, Al directed us to Census Table B-17024 where this information is found.

Methodology	Results
<p>#4 (Maryland Medicaid Program)</p> <p>The fourth estimate is not an estimate at all, but a count of enrolled children in Maryland’s Medicaid program.</p>	<p>According to data obtained from DHMH, the number of unduplicated 4 yr olds (with age determined as of Sept 1) at or under 300% of FPL in Medicaid for SFY 2014 was 39,328. This figure exceeds the highest single point estimate using Census data by 1,500 children, but it still falls within the margin of error of the three year Census figure in Estimate #3.³ The Medicaid data is also available on a county basis.</p> <p>Note that this data is a simple count, not an estimate, and thus is not subject to many of the sources of error cited for the first three estimates. It is subject to other sorts of error, of course, involving potentially inaccurate income data reporting on the part of the Medicaid family, and operator or computer error on the part of eligibility workers, and such errors are largely invisible and unmeasurable. The counts must also be considered minimum figures since clearly 100% of children could not possibly be enrolled in Medicaid.</p>
<p>#5 (Maryland Medicaid Program)</p> <p>Since Estimate #4 is only the number of enrolled four year olds, it should be increased by some factor depending on the estimated enrollment rate in the population of all eligible 4 year olds. Since this enrollment rate has recently been estimated at 91.9% for Maryland, we should increase Estimate 4’s number by dividing it by .919.⁴</p>	<p>Roughly 42,800 children, a figure which exceeds even the highest margin of error estimate from Census data. This participation rate is subject to error as well, similar to the types of errors noted for Estimates #1 to #3.</p>

³ We are indebted to Laura Goodman of DHMH’s Office of Planning, and David Idala. of UMBC’s Hilltop Institute for these figures.

⁴ See US Dept of Health and Human Services Medicaid participation rate estimates at <http://insurekidsnow.gov/professionals/reports/index.html> which are based in turn on Urban Institute model estimates of state Medicaid child eligibility numbers at http://www.rwjf.org/en/research-publications/find-rwjf-research/2013/09/medicaid-chip-participation-rates-among-children--an-update.html?cid=XEM_A7563

To summarize, we have listed the range of estimates in order of magnitude below, including the minimum and maximum figures from Estimate #3:

Minimum of Estimate #3	34,200
Estimate #1	36,000
Estimate #2	37,400
Estimate #3	37,833
Estimate #4	39,328
Maximum of Estimate #3	41,460
Estimate #5	42,800

The range of estimates is significant. From top to bottom the estimates vary by 8,600.

Discussion

Perhaps the greatest advantage of using the unadjusted Medicaid figure (Estimate 4) is the usefulness of the county breakouts of the Medicaid data. These figures avoid the estimation difficulties of Census based data on the county level, i.e., that the smaller sample sizes render county level estimates extremely problematic. Other advantages of using Estimate #4 are:

- It is an actual count, not a survey-based estimate, and is thus better documentable and more easily explainable than the other estimates.
- It maintains consistency across State agencies. It could be problematic to have one State agency enrolling children based on figures that are lower than those used in on-going operations by another agency.
- Although higher than most of the Census-based estimates, it is still within the maximum range of the most solid of those estimates.
- It is more up-to-date than any of the Census-based estimates, and thus has a better chance of reflecting current economic realities than the other estimates.
- Its age counts are calculated based on the same September 1 date used for Kindergarten entry, which make its counts more in line with public school enrollment practices than those of other estimates.

Thus, to summarize, the recommended estimates from the Medicaid data are as follows:

Four year olds: 39,328	Three year olds: 38,102
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County-level Estimates

Using actual Medicaid data by county eliminates the small sample problems inherent in estimating county-level enrollments from Census data. We obtained county level enrollment totals from the same source as the statewide four-year-old and three-year-old estimates above, Estimate #4. They are shown below in the Appendix, in the column on the left of the table labeled “Actual Data.” While they are subject to unknown levels of error from county to county, and differ from Census estimates by county derived from data in Estimate #2 above, they are the best estimates that we have. Using them, we can develop county level forecasts from school year 2014-15 through school year 2018-19.

Five-year projections

Maryland Department of Planning projects public Kindergarten enrollments based on the ratio of historical enrollments to vital statistics data on births by county. We have used approximately the same methodology here to forecast the number of children in the three and four year old age groups below 300% of FPL. We took the actual Medicaid enrollments by county from DHMH, divided them by the number of births for the county three or four years before, depending on the age group involved, and then applied the resulting ratios to forecasts of births provided by MDP. The results are shown in the Appendix, where they are listed to the right of the column of actual Medicaid enrollments by county. We believe that the use of Maryland Department of Planning’s methodology and forecasts of births ensures, to the fullest extent possible, the production of high quality county level forecasts.

Appendix

Medicaid Enrollee Children aged Three and Four in SFY 2014* and Projections of Children under 300% of FPL through 2019 by County

COUNTY	AGE GROUP	Actual Data	Forecast				
		2014	2015	2016	2017	2018	2019
Allegany	Age Three	479	494	444	437	423	436
	Age Four	512	510	525	473	473	463
	Total	991	1,003	970	910	896	900
Anne Arundel	Age Three	2,627	2,590	2,563	2,586	2,624	2,654
	Age Four	2,619	2,590	2,553	2,527	2,549	2,586
	Total	5,246	5,180	5,117	5,112	5,173	5,240
Baltimore City	Age Three	6,766	6,716	6,705	6,690	6,758	6,863
	Age Four	7,103	7,077	7,024	7,013	6,998	7,068
	Total	13,869	13,793	13,729	13,703	13,755	13,931
Baltimore County	Age Three	4,961	4,835	4,596	4,410	4,299	4,238
	Age Four	5,256	5,339	5,203	5,075	5,123	5,204
	Total	10,217	10,174	9,799	9,485	9,422	9,442
Calvert	Age Three	348	336	341	345	345	345
	Age Four	364	384	371	376	380	380
	Total	712	720	712	721	725	725
Caroline	Age Three	306	296	284	299	299	299
	Age Four	310	292	282	271	286	286
	Total	616	588	566	571	585	585
Carroll	Age Three	554	568	537	548	576	576
	Age Four	571	567	582	550	561	590
	Total	1,125	1,135	1,119	1,098	1,137	1,166
Cecil	Age Three	652	655	634	640	696	747
	Age Four	695	683	686	664	670	729
	Total	1,347	1,338	1,320	1,303	1,366	1,476
Charles	Age Three	883	949	878	907	970	1,024
	Age Four	814	807	867	802	829	887
	Total	1,697	1,756	1,745	1,709	1,799	1,911
Dorchester	Age Three	311	328	333	325	316	316
	Age Four	350	327	345	350	341	332
	Total	661	655	678	675	657	648
Frederick	Age Three	1,104	1,077	1,061	1,073	1,147	1,202
	Age Four	1,139	1,123	1,096	1,080	1,092	1,168
	Total	2,243	2,200	2,157	2,153	2,239	2,370
Garrett	Age Three	181	202	192	206	206	206
	Age Four	190	176	196	187	200	200
	Total	371	377	388	392	405	405

Harford	Age Three	1,039	970	1,000	1,004	1,042	1,090
	Age Four	1,102	1,114	1,039	1,072	1,076	1,116
	Total	2,141	2,083	2,040	2,076	2,118	2,207
Howard	Age Three	1,066	1,081	1,081	1,078	1,106	1,157
	Age Four	1,072	1,069	1,084	1,084	1,081	1,109
	Total	2,138	2,150	2,165	2,162	2,187	2,266
Kent	Age Three	136	131	147	131	131	131
	Age Four	125	111	107	120	107	107
	Total	261	242	254	251	239	239
Montgomery	Age Three	5,442	5,353	5,332	5,394	5,488	5,550
	Age Four	5,653	5,642	5,549	5,528	5,592	5,690
	Total	11,095	10,994	10,881	10,922	11,080	11,240
Prince George's	Age Three	7,704	7,664	7,553	7,565	7,648	7,719
	Age Four	7,780	7,634	7,595	7,484	7,497	7,579
	Total	15,484	15,299	15,148	15,050	15,145	15,298
Queen Anne's	Age Three	222	199	196	205	218	227
	Age Four	247	255	228	225	235	250
	Total	469	454	424	429	453	477
St. Mary's	Age Three	590	557	519	488	466	447
	Age Four	658	674	651	623	600	586
	Total	1,248	1,231	1,171	1,111	1,066	1,033
Somerset	Age Three	213	199	230	222	230	245
	Age Four	218	229	214	247	238	247
	Total	431	428	443	469	468	492
Talbot	Age Three	209	204	193	205	205	205
	Age Four	202	189	185	174	186	186
	Total	411	393	377	380	391	391
Washington	Age Three	1,111	1,110	1,107	1,100	1,107	1,126
	Age Four	1,133	1,116	1,116	1,112	1,105	1,112
	Total	2,244	2,227	2,222	2,212	2,212	2,238
Wicomico	Age Three	891	877	818	839	860	874
	Age Four	916	920	906	845	866	888
	Total	1,807	1,797	1,724	1,683	1,726	1,761
Worcester	Age Three	307	292	285	278	285	285
	Age Four	299	318	302	295	288	295
	Total	606	610	588	573	573	580
Total Age Three		38,102	37,682	39,414	36,976	37,446	37,963
Total Age Four		39,328	39,144	38,707	38,176	38,372	39,058
Total Ages Three and Four		77,430	76,826	78,121	75,152	75,818	77,021

* A unique count of individuals enrolled in the programs at anytime during SFY 2014.

Source: DHMH and UMBC.