The End of Virginia's Triennial Census

How Applied Demography Resulted in Public Policy Change

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Abstract

In 2008, the Weldon Cooper Center at UVa undertook a study of Virginia's Triennial Census of school-age children. The Triennial Census was required by law and was conducted by school divisions. The resulting counts of school division residents ages 5-19 determined each district's appropriation of state sales and use tax for public education. The study by the Cooper Center identified major problems related to the methodology of the triennial census and the accuracy of the counts.

The Cooper Center shared report findings with Virginia state legislators, school divisions, and policy makers. Our work, along with the work of many others, resulted in a change to the *Code of Virginia*. The law now commissions the Cooper Center to produce yearly estimates of the school-age population for Virginia. These estimates constitute a significant improvement over the accuracy and timeliness of the former triennial census, and save Virginia's school divisions millions of dollars.

Summary

For the last sixty years, the Code of Virginia stated that each school division was required to conduct a triennial census of all persons ages 5 – 19 residing in the school district. The resulting number determined that district's relative appropriation of state sales and use tax for public education.

In 2008, the Weldon Cooper Center for Public Service at the University of Virginia undertook a preliminary study of the Commonwealth of Virginia's Triennial Census of the school-age population. This paper reports the findings from that preliminary study and describes the public policy changes that occurred after results of the study were shared with policy makers.

The preliminary study noted the following information significant to Virginia public school districts:

- Costs of the triennial census, borne by school divisions, were substantial, totaling $5 million (when last reported in 1995);
- In fiscal year 2009, sales and use tax allocations based on the triennial census were estimated at $1.2 billion;
- In the absence of uniform procedures for conducting the triennial census, methods varied substantially across localities, resulting in wide variation in the accuracy of results.
- Our study of 2005 allocations and census results found that over $17 million may have been misallocated in Fiscal Year 2007 as a result of over- or undercounting in the 2005 triennial census;
- Based on Cooper Center population estimates, school divisions throughout Virginia received unequal "per child" shares of the tax distribution. For example, while the 2007 appropriation should have been approximately $768 per child for every school district, Martinsville received $928 per child, the highest amount in the state, due to overcounting and Portsmouth received $582 per child, the lowest amount in the state, due to undercounting.

After the preliminary study, the Cooper Center worked diligently to share the findings with the Virginia state legislators, school divisions, and policy makers throughout the Commonwealth, and presented results to the Joint Legislative Committee on Elementary and Secondary Education Funding. The work resulted in a change to the *Code of Virginia*. The law no longer requires a triennial census of the school age population, but instead commissions the Weldon Cooper Center to produce yearly estimates of the school-age population in Virginia's counties, cities, and towns. These estimates constitute a significant improvement over the accuracy and timeliness of the former triennial census, and save Virginia school divisions millions of dollars.

Study Results: The Virginia Triennial Census

In 2008, the Weldon Cooper Center for Public Service at the University of Virginia undertook a study of the Commonwealth's Triennial Census of the school-age population. This section of the paper reports the major findings from the 2008 study: the operational problems with the triennial census and an analysis of the 2005 triennial census results. The next section, *Policy Changes*, provides a discussion of the changes made to the *Code of Virginia* after results of the study were shared with policy makers.

Background

Sections 22.1-281 through 22.1-286 of the 2008 Code of Virginia stated that every three years each school division was to conduct a count of all persons ages 5 through 19 residing within the district. In addition, the Code specified that:

1. Persons ages 5 through 19 who resided in orphanages, federal military or naval reservations, or other federal property would be included in the census of the school district within which the institutions belongs.
2. Persons ages 5 through 19 who resided in state hospitals, state training schools, state mental institutions, state or federal correctional institutions, the Virginia School for the Deaf and Blind at Hampton or the Virginia School for the Blind at Staunton would be included in the census for the school division within which their parents or guardians legally reside.

The most recent triennial census was conducted in 2008. The results from the triennial census were used primarily for the distribution of 1.125 percent of the state sales tax to the school divisions as part of the Commonwealth's funding for public education.

The Census Process

While the Virginia Department of Education (VDOE) provided guidelines for conducting the triennial census, the planning and execution of the triennial census was left to local school boards. The following is a summary of recommendations made in the Virginia Department of Education's *Instructions for Conducting the 2008 School Census*[i]:

School divisions conducted the official count of the school-aged population during each designated census year. Each school division was responsible for appointing a census director, preparing a budget, developing a schedule, and planning how the census would be conducted. Division costs included personnel, enumerators, postage, printing, training, travel, and publicity.

Each census director identified all households in the school division so that proper steps could be taken to contact all residents. The VDOE suggested that school divisions could be divided into areas, zones or tracks to which mailings or enumerators would be assigned. School boards could contact local government organizations (such as planning commissions, zoning boards, utility departments, and tax authorities) for help identifying all households. The census director must have also contacted and collaborated with a number of organizations such as private and parochial schools, orphanages, correctional facilities, state hospitals, the community, and military and naval reservations to gather a complete list of all persons ages 5 to 19.

The VDOE also *recommended* that each school division conduct a pre-census count (a preliminary survey of the in-school population) that could be used for planning the full triennial census. This pre-count could be obtained using existing student information databases or through a form filled out by students and parents.

The school divisions were required to provide "adequate publicity" of the triennial census to inform the community about the purpose and importance of the census, and so that higher response rates were achieved.

The VDOE did not provide specific requirements for the triennial census process, but did make the following recommendations for data collection:

A. Survey mailings to private schools, institutions, and all households in the school division,
B. In-school forms (pre-printed with enrollment data) to be sent to parents for corrections and verifications, and
C. Door-to-door enumeration[1].

After data collection, the school divisions tabulated the census counts using information systems, scanning procedures, or clerical personnel. Additionally, each school division was required to have a follow-up procedure in place for households that were not responsive to information requests and for residents who were repeatedly absent from home. Such procedures included additional mailers, reminder notices, follow-up calls, and return call notification.

Finally, school divisions were advised to establish procedures for evaluating the data, which included form completion, data accuracy, and cross-checking the data against any of the following: the results of the preliminary census of the in-school population, enrollment reports, school membership totals, previous triennial census data, or U.S. Census Bureau data. Once the census count was complete, it was reported to the VDOE by the division superintendent. The VDOE then submitted the data to the VDOE Budget Office for distribution of the state sales tax.

Problems with the Triennial Census

As of 2008, Virginia had no central and uniform procedure for conducting the triennial school census; consequently, the process varied widely across school divisions – and so did the accuracy of the data. Important variations between school divisions included: inaccurate or incomplete identification of the target population; poor or inconsistent training of census enumerators; widely varying methods for obtaining responses; and differences in the actual questionnaires used. Each of the variations is described in brief below.

[1] When school divisions utilized enumerators, the schools were also responsible for ensuring the enumerators received adequate training. The VDOE stated that areas to be covered in training included background information on the triennial census, safety, state laws pertaining to the school census, overall school organization, review of forms and instructions, practice enumeration, accounting purposes, and respondent refusal.

Inaccurate or incomplete identification of the target population

Professional demographers call the list of all members of the target population a "census frame." Making the list of everyone who should be included (known as frame development) was a key component of triennial census preparation because it determined which students should be given a census form to take home, which mailing addresses should be sent a census form, which houses should be visited by enumerators, etc. While the goal was to have a target population of every person 5 – 19 in the school division, actually making the list of where those people were and how to contact them was quite a challenge, because not all of those who should have been counted were enrolled in the public schools.

For the triennial census, the VDOE provided recommendations for building the frame, but each locality ultimately decided how it was done. As a result, localities with many resources were more able to develop a complete frame by combining data from many sources, by maintaining a single staff expert or database between the censuses, or by paying outside firms to produce accurate and timely address lists. Localities with scarce resources may have start the census process with an incomplete frame, therefore having no chance of counting the entire target population, and little chance of receiving a fair share of the sales and use tax allocations.

By providing no consistent requirements for preparing the census frame, VDOE allowed variation between divisions and inadequate coverage in some divisions.

Poor or inconsistent training of enumerators

Enumerators are census employees or volunteers who go door-to-door collecting census information or following-up on non-responsive households. Adequate training of enumerators is crucial to accurate census counts; in fact, research has shown that the amount of training enumerators receive is important to their success in completing their job.[ii] The VDOE recommended that triennial census enumerator training sessions last ½ to 1 full day, and recommended topics to be covered, including background information on the triennial census, safety, state laws pertaining to the triennial census, overall school organization, review of forms and instructions, practice enumeration, accounting purposes, and respondent refusal. It is likely that the ½ to full day sessions recommended by VDOE did not provide enough time to train enumerators fully in each of these areas. Additionally, the training was not standardized state-wide, so some divisions' enumerators were better prepared than others to complete an accurate count.

Widely varying data collection methods

In addition to variations in the accuracy of the target population and the training of enumerators, Virginia school divisions used a number of methods to actually collect the triennial census data. The methods included: web-based questionnaires, mailed forms, and face-to-face enumeration. Localities often chose to conduct a mixed mode census that incorporated two or more methods of data collection.

The choice of method was critical because: 1) different methods have different requirements, 2) the methods vary in the quality of the data produced, and 3) coverage errors and non-response rates vary between the methods. For example, each method requires creating a different

frame. The frame for mailed forms is a list of mailing addresses in the locality, while the frame for face-to-face enumeration may be a list of physical addresses (not including PO boxes), or a map of the locality. If a locality decided to use BOTH mailed forms and enumerators, significant resources were required to create accurate frames for each approach.

Additionally, data collection method may determine the quality of data collected. Research has shown that face-to-face enumeration results in a higher rate of data completeness.[iii] When people fill out forms without the help of enumerators (in the case of web-based and mailed forms), the respondents may fail to read and follow the instructions, resulting in incomplete or inaccurate data.

Coverage error and nonresponse rates also vary between data collection methods. In mail and web-based surveys, for example, localities were less able to differentiate between nonrespondents who had children (who just ignored the form or threw it away) and nonrespondents who did not have children. Enumerators increased the likelihood of being able to identify those with children.

Census collection methods also vary significantly in cost. Mail and web-based data collection is relatively low cost, but face-to-face enumeration (more expensive) provides more accurate results, more complete answers, and more participation.[iv] Enumerators can answer questions, assist respondents in providing complete and accurate responses, and alleviate parental concerns about sharing information about their children. Localities with the resources to use enumerators for the census were likely to have more accurate census counts.

Differences in questionnaire design

Questionnaire design also affected the triennial census count, for example:

1. Instructions – Forms with explicit instructions were more likely to result in accurate data. Without explicit instructions, parents may have been confused about whether to list children attending college away from home or children in private schools. The two forms on pages 1 and 2 provide examples of differing instructions to respondents.

2. Space to list names – The number of lines provided to list children's names may have affected responses. If there were five lines available, a parent with six children may have listed only five if there were no instructions to "attach an additional sheet if necessary." On web-based forms, like the one on page 3, there may have been no way to submit additional names.

To achieve optimal accuracy in a census, the same form should be used throughout the entire operation. In Virginia's triennial census, localities had the options of using a sample form provided by the VDOE or designing and using their own form.

Overall, the quality of Virginia's triennial census suffered from both the lack of a centralized and uniform procedure for conducting the operation, and disparities between school divisions' ability to pay for careful and complete procedures. Our experience working with the United

States Census and with other forms of professional census and survey research suggested the need to improve the approach to Virginia's triennial census.

In the 2008 study, we also examined whether the approach to the triennial census in 2005 resulted in inaccuracies.

Census accuracy

The goal of the triennial census was to obtain an accurate count of the population aged 5-19 in each locality. To evaluate the accuracy of the 2005 Triennial Census counts, we compared them to two data sources:

1) Weldon Cooper Center population estimates for July 1, 2005
2) Census Bureau population estimates for July 1, 2005

Additionally, we compared the 1999 Triennial Census counts to the 1999 Census Bureau Population Estimates and the 2000 Decennial Census counts; we also compared the 2002 Triennial Census counts to the 2002 Census Bureau Population Estimates. All of these data sources allowed us to quantify the over- or undercount of the population in the triennial census. We found similar patterns of over- and undercounting in all comparisons (see Figure 7).

The results in this report show the comparison of the Cooper Center 2005 estimates with the 2005 Triennial Census counts. The Center's estimates are developed using a cohort component method that incorporates births, life tables, and age-specific migration rates. We also examined 2005 public school enrollment counts by grade as a reference point.

Important notes:

1) The Weldon Cooper Center estimates and the triennial census differ in their treatment of "usual residence" for college students. In Cooper Center estimates, children who attend college away from home are counted in their college location, whereas they are counted at their parents' home in the triennial census. This could cause the two population numbers to be drastically different for college towns. An adjustment to account for this methodological difference was outside the bounds of the 2008 study. Therefore, the analysis that follows excludes all major college towns in Virginia. The list of excluded cities and counties can be found on page C-1.
2) The total counts used by VDOE for the sales tax distribution in 2005 comprised the triennial census count and the December 1, 2004 special education count of persons ages 2, 3, 4, 20, and 21. Since the triennial census is the focus of this analysis, all tax distributions have been adjusted to represent only the tax money that was distributed for the 5-19 year olds that were counted through the triennial census.

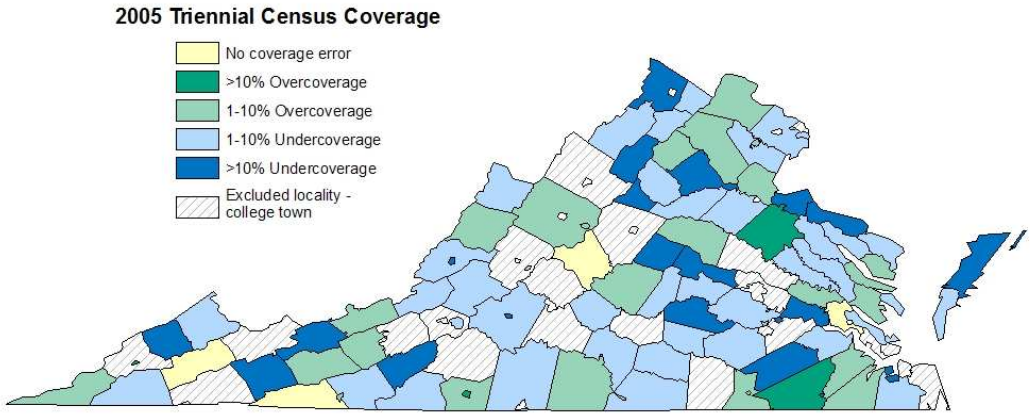


Figure 1 – Map of Coverage Errors in 2005 Triennial Census

For the Commonwealth overall (excluding college towns), our 2008 analysis revealed a total triennial census count in 98 localities of 940,496 children, compared to an expected figure from the Weldon Cooper Center of 981,520 children. This means that more than 41,000 children age 5-19 (4.2 percent) may have been missed by the triennial census and therefore not accounted for in the distribution of sales and use tax funds. Out of the 98 counties and cities included in this analysis, only Grayson County, James City County, Nelson County, and Russell County had no coverage error in their triennial census results.

Our analysis identified coverage errors across the state, ranging from a 20.7 percent overcount in Martinsville to a 24.3 percent undercount in Portsmouth (shown in Figure 1 and Figure 2). The Martinsville triennial census reported 3,351 children ages 5-19, while the Weldon Cooper Center estimate of 5-19 year olds in that locality was 2,776. In Portsmouth, the triennial census count was 15,784 and the Weldon Cooper Center estimate was 20,856.

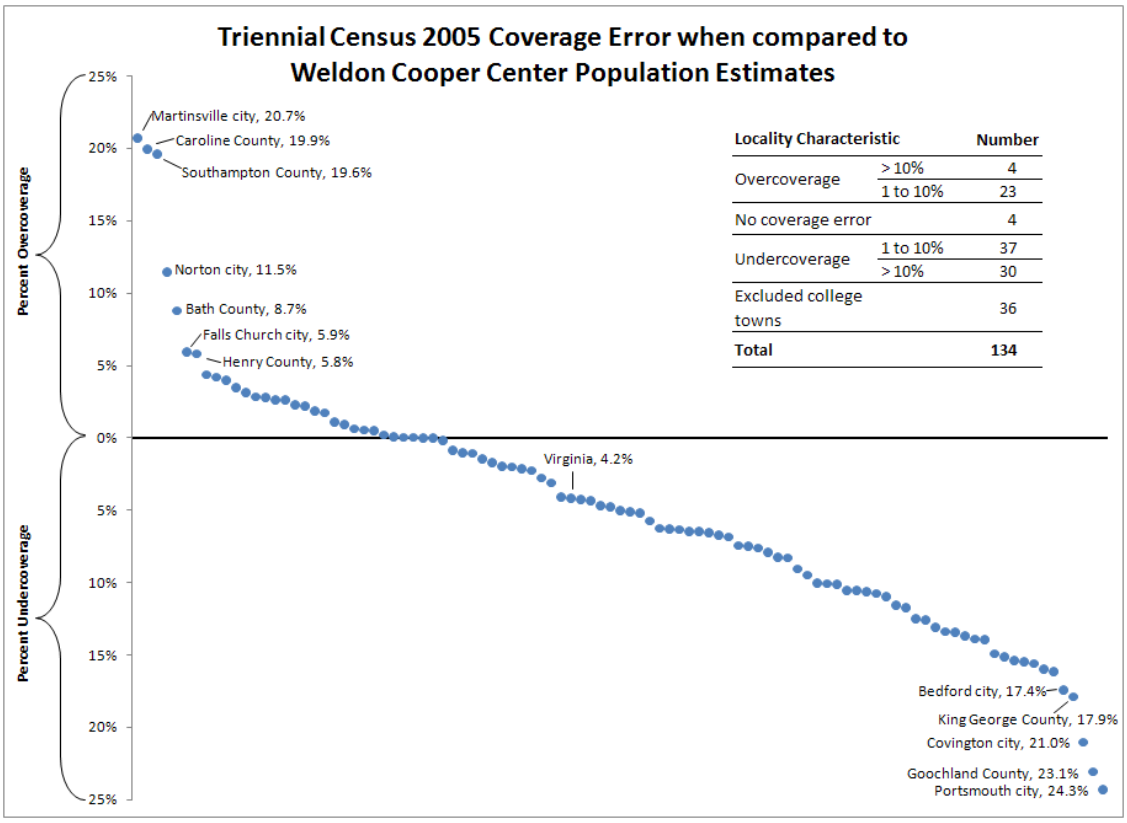


Figure 2 – Chart of Coverage Error in 2005 Triennial Census

The significance of coverage errors from the triennial census is the effect these errors had on a locality's funding. To determine how much money should be distributed to a given locality, the VDOE used the following formula:

$$Tax\ Distribution\ for\ Locality = Tax\ Distribution\ for\ Virginia \times \frac{Triennial\ Census\ Count\ for\ Locality}{Triennial\ Census\ Count\ for\ Virginia}$$

This means that an inaccurate count could have a dramatic effect on the amount of tax money distributed. To measure the impact of the inaccuracy in dollars given to each locality, we first used the following formula to calculate a theoretical statewide "dollars per child" allocation:

$$Theoretical\ Dollars\ per\ Child = \frac{Tax\ Distribution\ for\ Virginia}{Triennial\ Census\ Count\ for\ Virginia}$$

An accurate triennial census count in each locality should result in every school division receiving the same dollar amount per child. By dividing the total 2007 tax distribution for our 98 localities ($723 million) by the total number of children in these localities, we determined that the distribution should have been $768.44 per child. In actuality, each school division received a different amount of money per child.

To determine how many actual dollars each locality received per child, we divided the tax distribution for a given locality by Weldon Cooper Center's estimate of 5-19 year olds in the locality:

$$\text{Actual Dollars per Child} = \frac{\text{Tax Distribution for Locality}}{\text{Weldon Cooper Center Population Estimate for Locality}}$$

For example, Martinsville received a tax distribution based on a triennial census count of 3,351. At $768.44 per child, this means that Martinsville should have received a total distribution $2,575,057[2]. However, the Weldon Cooper Center population estimates show that the true number of 5-19 year olds living in that locality was 2,776. The result of dividing the total tax distribution for the locality by the Weldon Cooper Center population estimate for that locality shows that Martinsville City actually received $928 per child.

Figure 3 shows that actual dollars per child varied widely across localities, from $928 per child in Martinsville to $582 per child in Portsmouth.

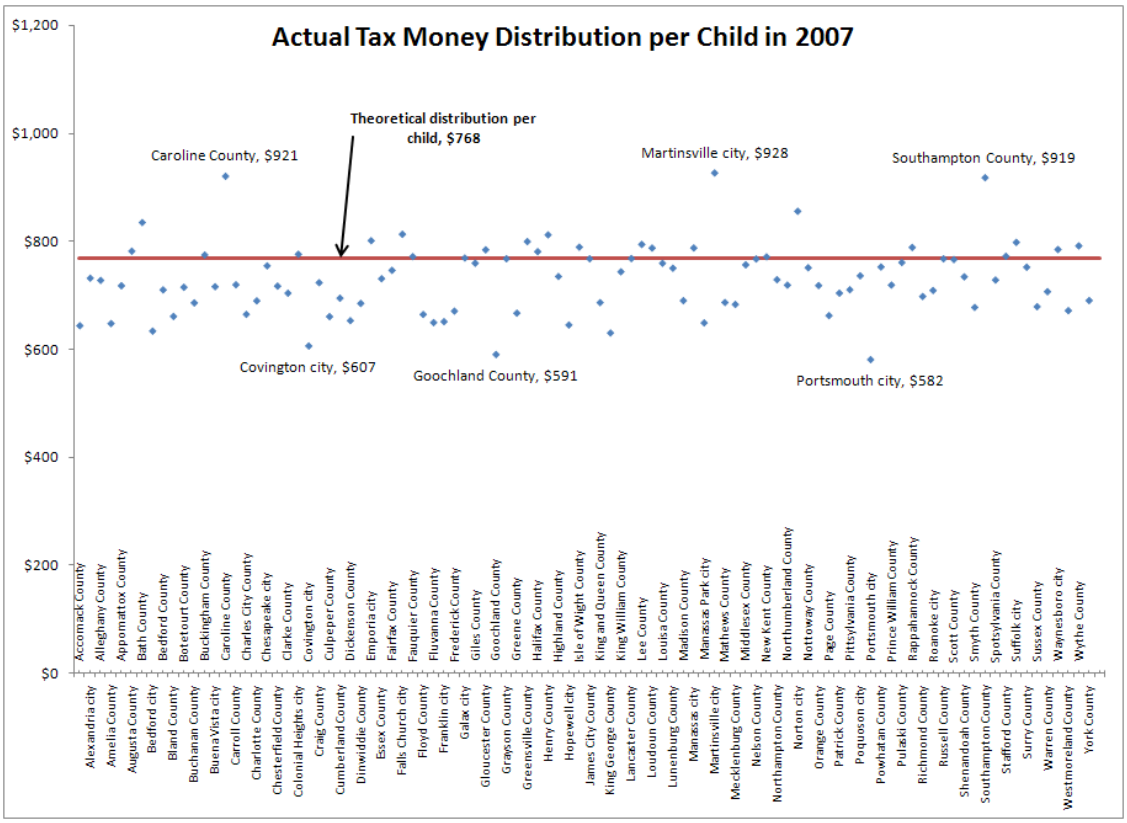


Figure 3 - Actual Distribution per Student in 2007

[2] Differences due to rounding error.

This analysis in the 2008 report showed that, according to comparisons with Weldon Cooper Center 2005 estimates of the population ages 5-19, the 2005 triennial census counts were inaccurate, with the level of inaccuracy varying across localities. The coverage error in the triennial census had significant fiscal impact on localities as state sales and use tax funds were distributed proportionally based on inaccurate counts. According to estimates from the 2008 research, in fiscal year 2007 over $17 million were misdirected to localities reporting significantly more 5-19 year olds than the Weldon Cooper Center population estimates show. That same $17 million theoretically should have gone to localities that undercounted their population. Finally, accuracy errors in the triennial census were perpetuated because localities were instructed to rely on past triennial census statistics to verify current triennial census data.

Conclusions of the 2008 Study

The triennial census presented a burden of time and resources on public school divisions and did not result in accurate data. Since the census came only once every three years, school divisions did not have permanent professional staff with experience in census taking. Often the census responsibility was assigned to individuals without proper training or adequate time for planning or preparation. Only a few school divisions had sufficient resources to devote to the triennial census; and they were often quite successful. Fairfax County spent almost $600,000 for the 2005 Triennial Census and received fairly accurate data. Most school divisions, however, did not have this level of resources, and census accuracy suffered as a result. While the VDOE did not collect information on expenditures for conducting the triennial census, the most recent estimates for the total cost date back to 1992 and 1995, when the cost was $4.1 million and $5 million, respectively. While costs of the 2008 triennial census are unknown, they were, presumably, significantly higher.

Policy Changes: Virginia School-Age Population Estimates

After the 2008 report was published, the Cooper Center worked diligently to share the findings with state legislators, school divisions, and policy makers throughout Virginia. Thanks to the work of Cooper Center professionals and many others, two bills were proposed during the 2010 Virginia legislative session. House Bill 669, sponsored by Delegate Joe T. May, and Senate Bill 413, sponsored by Senator Jill Holtzman Vogel, proposed the elimination of the requirement that every three years a census of all school-age persons residing within each school division take place. The bill, which amended the procedures so that the sales and use tax distribution was based on an annual estimate of the school-age population produced by the Weldon Cooper Center for Public Service at UVA, passed the House and the Senate and was signed into law by Governor Bob McDonnell on April 10, 2010.

This policy shift reduces costs significantly, removes the burden of conducting and paying for a census from the school divisions, and provides estimates annually instead of every three years. While typically population estimates are less accurate than census counts, in this case population estimates actually provide more accuracy than the former methodology. Additionally, the estimates will apply the same methodology to all school divisions, which will result in a fairer balance of “per child” shares of the tax distribution throughout the state.

[i] Virginia Department of Education Office of Educational Information Management. "School Census 2008 – Instructions for Conducting the 2008 School Census." http://www.doe.virginia.gov/VDOE/Publications/schcensus/2008/instructions.pdf, accessed September 1, 2008.

[ii] Groves, et. al. *Survey Methodology*. John Wiley & Sons, Inc., Hoboken, New Jersey, 2004, 294.

[iii] Groves, et.al., 155.

[iv] Groves, et. al., 156.

Appendix A

Figure 4 - Clarke County Census Form

VIRGINIA SCHOOL CENSUS 2008

Please check ✓only one:
I live in the ....
☐ Town of Berryville
☐ Town of Boyce
☐ County of Clarke

School(s) student or students attend:
___ Primary ___ Private
___ Cooley ___ Home School
___ Boyce ___ College
___ JWMS ___ Other
___ CCHS

NAME OF PARENT(S), GUARDIAN(S) OR OTHER and ADDRESS OF RESIDENCE			Primary language spoken at home English _____ Other _____	
Last Name:	First Name:	Middle Initial	Street No. and Name (***Do not use PO Box addresses)***	
Last Name:	First Name:	Middle Initial	City or Town	Zip

Names and dates of all persons in family with birthdates between January 1, 1988 and December 31, 2008.

Names of Children			Birthdate			Gender	Type of School Planning* to Attend Next Year (2008-09) * Planning does not mean commitment
Last Name	First Name	MI	Mo.	Day	Year	M/F	Infant/Preschool (P), Public (L), Private (V), Home School (H), College (C), None/Work (O)
Sample: Doe	John	F	1	1	96	M	L

If more room is needed, please attach another sheet of paper.

Please call 540-955-6100 if you have any questions.

PLEASE RETURN FORM

Mail to: Clarke County Public Schools, Attn: School Census, 309 W. Main St., Berryville, VA 22611
Or Return form with your child to his or her school
Or Fax to 540-955-6109

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS IMPORTANT INFORMATION.

Figure 5 - Madison County Census Form

Madison County Schools

Post Office Box 647
Madison, Virginia 22727

Office of
Supervisor of Pupil Services

phone: 540-948-3780
fax: 540-948-5143

VERY IMPORTANT FOR MADISON COUNTY PARENTS

2008 Triennial School Census – Conducted By Madison County Public Schools

In Accordance With the Provisions of §22.1-281 through §22.1-286, Code of Virginia

The total number of people (**turning 5 through 19 on or before 12-31-2008**) living in Madison County directly affects the amount of 1% sales tax our county can get from the state.

Please review this family census form and send it back to school immediately. Note that only your youngest child (if you have more than one child in Madison County Public Schools) will carry forms home.

Please follow these directions:

- ☺ Carefully look at family information in each section. Mark through errors and print the correct information.
- ☺ Add the name and date of birth of children not listed living in your home including < those ages 2, 3, or 4 > and < those away at college or in the military who maintain residency status in your home ages 18 or 19 >.
- ☺ Write any comment on the form you feel helps us understand changes or additional children added on the form.
- ☺ Questions? Please call Bob Francis, Supervisor of Pupil Services, 948-3780.

⇨

_____ _____ _____

Signature of Parent or Guardian Reviewing This Form And Affirming the Information Below Is Correct | Date | Phone Number

Name of Parents, Guardians, or Other (Last Name, First Name, Middle Initial)	Mailing Address of Residence	Physical Address of Residence If a PO Box is used for Mailing Address

☺ *Please follow directions listed above. Carefully look Add Write Questions?*

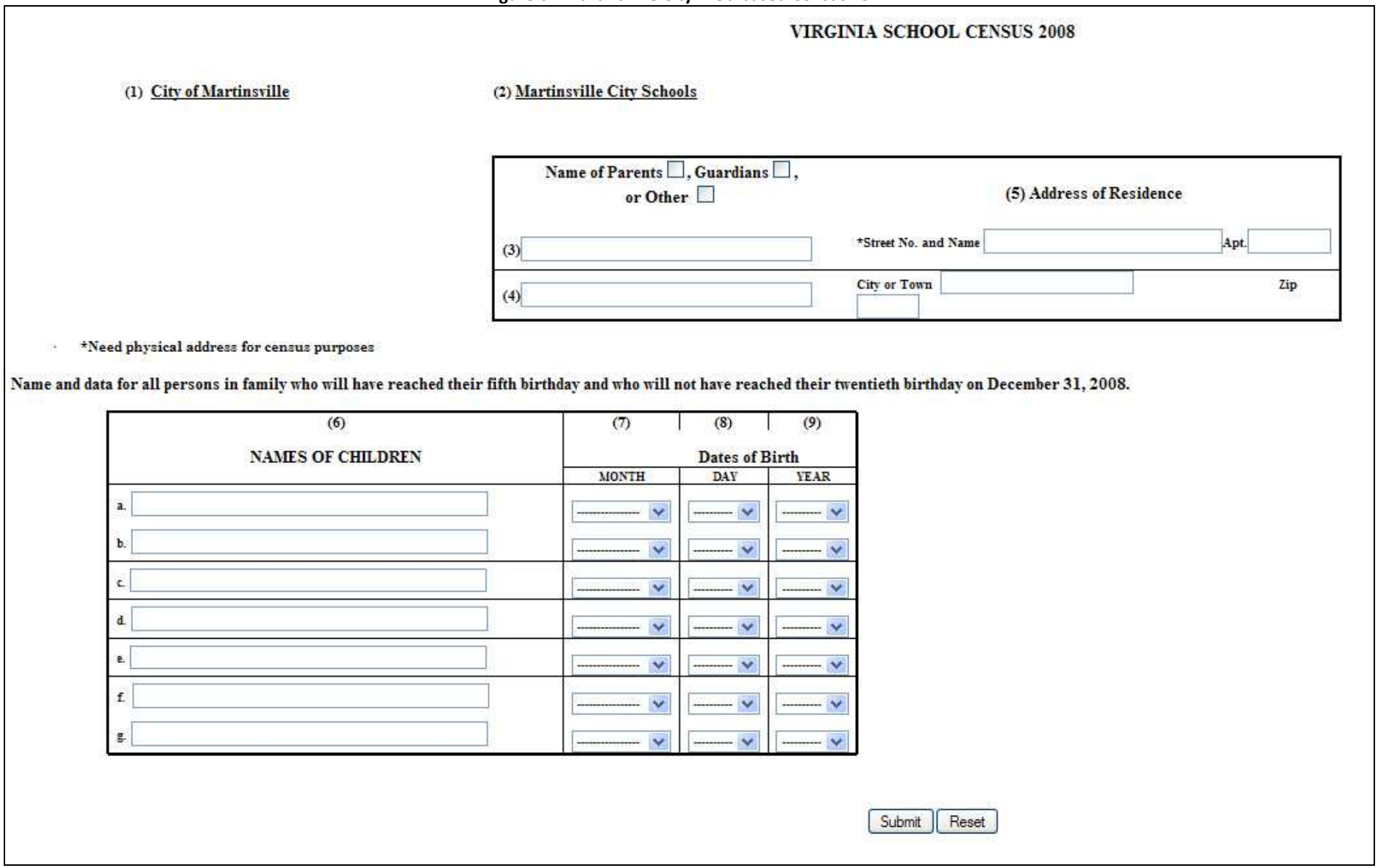
Names of Children in My Home <2 Through 19 Years of Age >	Dates of Birth (Mo.-Day-Year)	Age on 12-31-08	School	Grade	Homeroom

Comments:_____

_____

_____ *(continue on back if needed)*

Figure 6 - Martinsville City Web-based Census Form



VIRGINIA SCHOOL CENSUS 2008

(1) City of Martinsville

(2) Martinsville City Schools

Name of Parents ☐, Guardians ☐, or Other ☐	(5) Address of Residence
(3)	*Street No. and Name Apt.
(4)	City or Town Zip

*Need physical address for census purposes

Name and data for all persons in family who will have reached their fifth birthday and who will not have reached their twentieth birthday on December 31, 2008.

(6) NAMES OF CHILDREN	(7) Dates of Birth MONTH	(8) DAY	(9) YEAR
a.	----------	--------	--------
b.	----------	--------	--------
c.	----------	--------	--------
d.	----------	--------	--------
e.	----------	--------	--------
f.	----------	--------	--------
g.	----------	--------	--------

Submit Reset

Appendix B

Table 1 – 2007 Tax money distribution for Triennial Census vs. Weldon Cooper Center population estimates

County	2005 Triennial School Census, Ages 5-19		2005 Weldon Cooper Center Population Estimates, Ages 5-19	
	Count	Distribution	Estimate	Distribution
Accomack County	6,418	$ 4,931,876	7,653	$ 5,635,386
Alexandria city	13,669	$ 10,503,867	14,339	$ 10,558,204
Alleghany County	3,061	$ 2,352,208	3,229	$ 2,377,591
Amelia County	2,048	$ 1,573,774	2,427	$ 1,786,954
Appomattox County	2,588	$ 1,988,734	2,768	$ 2,038,002
Augusta County	13,928	$ 10,702,894	13,677	$ 10,070,473
Bath County	931	$ 715,422	856	$ 630,382
Bedford city	897	$ 688,989	1,086	$ 799,628
Bedford County	11,602	$ 8,915,798	12,542	$ 9,235,363
Bland County	997	$ 766,139	1,158	$ 852,676
Botetourt County	6,184	$ 4,752,060	6,640	$ 4,888,869
Buchanan County	3,854	$ 2,961,585	4,313	$ 3,175,531
Buckingham County	2,829	$ 2,173,930	2,803	$ 2,064,146
Buena Vista city	1,210	$ 929,817	1,297	$ 955,248
Caroline County	5,806	$ 4,461,588	4,842	$ 3,565,490
Carroll County	4,920	$ 3,780,747	5,249	$ 3,864,627
Charles City County	1,016	$ 780,740	1,173	$ 863,843
Charlotte County	2,365	$ 1,817,371	2,632	$ 1,937,928
Chesapeake city	52,220	$ 40,128,168	53,121	$ 39,114,330
Chesterfield County	64,208	$ 49,340,279	68,729	$ 50,607,096
Clarke County	2,562	$ 1,968,755	2,794	$ 2,057,036
Colonial Heights city	3,374	$ 2,592,731	3,338	$ 2,457,575
Covington city	739	$ 567,880	936	$ 689,100
Craig County	938	$ 720,801	995	$ 732,924
Culpeper County	7,817	$ 6,006,930	9,084	$ 6,688,466
Cumberland County	1,803	$ 1,385,506	1,992	$ 1,466,832
Dickenson County	2,543	$ 1,954,154	2,989	$ 2,200,600
Dinwiddie County	4,901	$ 3,766,146	5,492	$ 4,043,871
Emporia city	1,165	$ 895,406	1,116	$ 822,054
Essex County	1,936	$ 1,487,708	2,034	$ 1,497,335
Fairfax County	199,127	$ 153,018,016	204,824	$ 150,817,033
Falls Church city	2,281	$ 1,752,821	2,154	$ 1,585,686
Fauquier County	14,445	$ 11,100,180	14,368	$ 10,579,815
Floyd County	2,517	$ 1,934,174	2,907	$ 2,140,644
Fluvanna County	3,894	$ 2,992,322	4,601	$ 3,388,071
Franklin city	1,496	$ 1,149,592	1,763	$ 1,298,296
Frederick County	13,810	$ 10,612,218	15,802	$ 11,635,612
Galax city	1,289	$ 990,525	1,287	$ 947,289
Giles County	3,074	$ 2,362,198	3,107	$ 2,287,710
Gloucester County	7,700	$ 5,917,022	7,536	$ 5,549,277

County	2005 Triennial School Census, Ages 5-19		2005 Weldon Cooper Center Population Estimates, Ages 5-19	
	Count	Distribution	Estimate	Distribution
Goochland County	2,681	$ 2,060,199	3,486	$ 2,566,556
Grayson County	2,777	$ 2,133,970	2,776	$ 2,044,371
Greene County	3,197	$ 2,456,717	3,679	$ 2,709,101
Greensville County	1,831	$ 1,406,854	1,758	$ 1,294,273
Halifax County	7,220	$ 5,548,169	7,098	$ 5,226,354
Henry County	10,506	$ 8,073,277	9,932	$ 7,313,433
Highland County	368	$ 282,788	384	$ 283,039
Hopewell city	4,255	$ 3,269,731	5,063	$ 3,728,309
Isle of Wight County	7,032	$ 5,403,701	6,840	$ 5,036,338
James City County	11,052	$ 8,493,160	11,052	$ 8,137,665
King and Queen County	1,114	$ 856,047	1,246	$ 917,161
King George County	3,795	$ 2,916,247	4,622	$ 3,403,323
King William County*	3,078	$ 2,365,271	3,177	$ 2,339,675
Lancaster County	1,701	$ 1,307,124	1,700	$ 1,251,574
Lee County	4,654	$ 3,576,340	4,498	$ 3,311,871
Loudoun County	59,097	$ 45,412,760	57,603	$ 42,414,329
Louisa County	5,626	$ 4,323,268	5,687	$ 4,187,809
Lunenburg County	2,232	$ 1,715,168	2,284	$ 1,681,595
Madison County	2,398	$ 1,842,730	2,667	$ 1,963,776
Manassas city	8,615	$ 6,620,148	8,395	$ 6,181,425
Manassas Park city	2,523	$ 1,938,785	2,984	$ 2,197,261
Martinsville city	3,351	$ 2,575,057	2,776	$ 2,044,260
Mathews County	1,399	$ 1,075,054	1,564	$ 1,151,415
Mecklenburg County	5,069	$ 3,895,245	5,696	$ 4,193,935
Middlesex County	1,585	$ 1,217,985	1,608	$ 1,184,247
Nelson County	2,739	$ 2,104,769	2,740	$ 2,017,748
New Kent County	3,307	$ 2,541,246	3,291	$ 2,423,425
Northampton County	2,287	$ 1,757,432	2,408	$ 1,773,348
Northumberland County	1,821	$ 1,399,337	1,945	$ 1,431,797
Norton city	835	$ 641,651	749	$ 551,610
Nottoway County	2,829	$ 2,173,929	2,891	$ 2,128,870
Orange County	5,494	$ 4,221,833	5,873	$ 4,324,447
Page County	3,965	$ 3,046,882	4,594	$ 3,383,009
Patrick County	3,081	$ 2,367,577	3,359	$ 2,473,596
Pittsylvania County	11,123	$ 8,547,407	12,019	$ 8,850,144
Poquoson city	2,811	$ 2,160,097	2,931	$ 2,158,280
Portsmouth city	15,784	$ 12,129,127	20,856	$ 15,356,742
Powhatan County	4,919	$ 3,779,978	5,018	$ 3,694,635
Prince William County	80,793	$ 62,084,930	86,253	$ 63,510,198
Pulaski County	5,905	$ 4,537,664	5,959	$ 4,387,484
Rappahannock County	1,415	$ 1,087,349	1,377	$ 1,014,017
Richmond County	1,323	$ 1,016,652	1,455	$ 1,071,409
Roanoke city	15,564	$ 11,960,069	16,851	$ 12,407,806

County	2005 Triennial School Census, Ages 5-19		2005 Weldon Cooper Center Population Estimates, Ages 5-19	
	Count	Distribution	Estimate	Distribution
Russell County	5,014	$ 3,852,980	5,014	$ 3,692,198
Scott County	4,249	$ 3,265,121	4,257	$ 3,134,468
Shenandoah County	7,060	$ 5,425,217	7,381	$ 5,434,663
Smyth County	5,309	$ 4,079,671	6,014	$ 4,428,065
Southampton County	4,069	$ 3,126,801	3,403	$ 2,506,037
Spotsylvania County	28,215	$ 21,681,659	29,739	$ 21,897,617
Stafford County	31,402	$ 24,130,692	31,209	$ 22,980,353
Suffolk city	18,385	$ 14,127,851	17,683	$ 13,020,133
Surry County	1,316	$ 1,011,273	1,343	$ 989,004
Sussex County	1,677	$ 1,288,681	1,896	$ 1,396,154
Warren County	6,697	$ 5,146,272	7,273	$ 5,355,494
Waynesboro city	3,995	$ 3,069,935	3,908	$ 2,877,233
Westmoreland County**	2,696	$ 2,071,726	3,081	$ 2,268,778
Wythe County	5,028	$ 3,863,738	4,876	$ 3,590,368
York County	14,071	$ 10,812,781	15,645	$ 11,519,980

*Results from the 2005 Triennial Census for West Point Public Schools and King William County Public Schools were combined for this analysis.

**Results from the 2005 Triennial Census for Colonial Beach Public Schools and Westmoreland County Public Schools were combined for this analysis.

Appendix C

College Towns Excluded from Coverage Evaluation

Counties	**Cities**
Amherst	Bristol
Albemarle	Charlottesville
Arlington	Danville
Brunswick	Fairfax City
Campbell	Fredericksburg
Franklin	Hampton
Hanover	Harrisonburg
Henrico	Lexington
Montgomery	Lynchburg
Prince Edward	Newport News
Prince George	Norfolk
Roanoke County	Petersburg
Rockbridge	Radford
Rockingham	Richmond City
Tazewell	Salem
Washington	Staunton
Wise	Virginia Beach
	Williamsburg
	Winchester

Appendix D

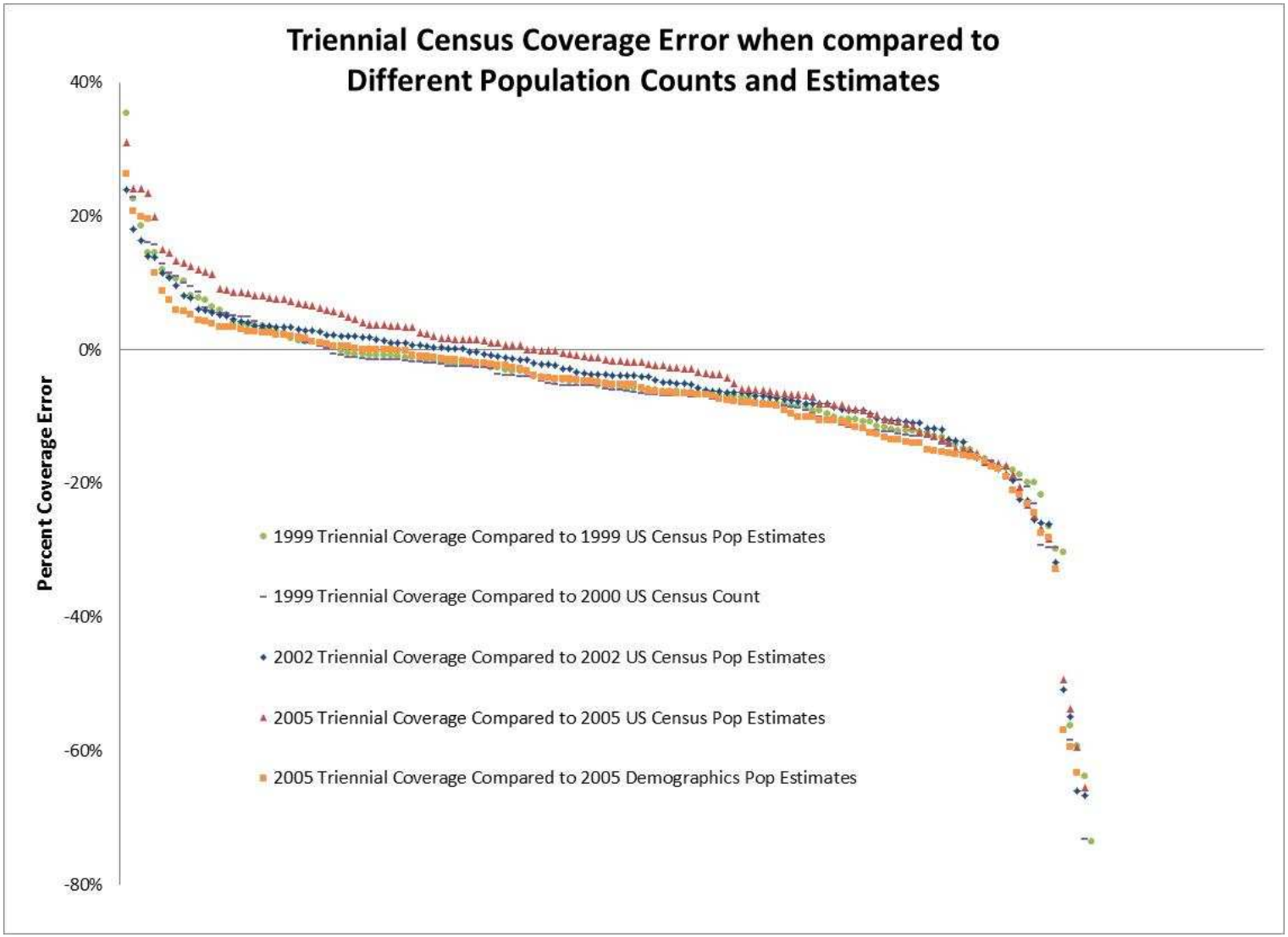


Figure 7 - Percent Coverage Error of Past Triennial Censuses