

Child poverty by local school district and allocation of federal Title 1 funding

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Overview: research questions & method

- (Dis)agreement between confidentiality-protection approaches for estimates of local school district:
 - poverty count in age 5-17 child population, and
 - qualification for and amount of federal Title 1 funding (\$15.5 billion in FY17)?
- Build rough, shared model of outcomes using district files, SAIPE child poverty rates, and program rules.
- District's child population count from DP and SF1 files.
- Characterize (dis)agreement in DP- and SF1-based estimates.

Overview: results

- District's # poor children: mean=8.6% (SD=13.2%) disagreement
- Is district qualified: little disagreement but some
- Rough \$ funding to district: mean=9.0% (SD=19.5%) disagreement
- Disagreements much larger in % terms in smaller districts & states with smaller/fewer districts

Title 1: primary ed. \$ for poor children

USDeptEd => states => districts => schools

Districts qualify based on the number and share of their 5-17 year-olds who are eligible. Main eligibility criterion: child poverty.

- Ignore other eligibility criteria: TANF, abuse/neglect, and foster care.
- 10,862 unified school districts. Drop 29: 0 pop. Ignore 2,757 elem. & sec. districts.

Grant types	Title 1 share	Qualify?
Basic	41%	10+ children eligible AND >2% of children
Concentration	9%	6,500+ children eligible OR >15% of children
Targeted & Educ Finance	50%	10+ children eligible AND >5% of children

Estimate district counts

$$\underline{\#eligible} = \underline{\#poor} = [\text{SAIPE poverty rate}] * \underline{[\text{age 5-17 population}]}$$

2 versions of each district's [age 5-17 population]: built from standard 2010 **Summary File 1 (SF1)** and **differentially-private data (DP)**.



The screenshot shows the United States Census Bureau website. The header includes the logo, a search bar, and navigation links: BROWSE BY TOPIC, EXPLORE DATA, LIBRARY, SURVEYS/ PROGRAMS, INFORMATION FOR..., and FIND. A prominent orange banner reads: "We are hiring thousands of people for the 2020 Census. Click to learn more and apply." Below this, a breadcrumb trail shows the path: // Census.gov > 2020 Census Research, Operational Plans, and Oversight > 2020 Decennial Census Program Resources > 2020 Census Data Products. The main content area is titled "2010 Demonstration Data Products" and includes a brief description of the products. A sidebar on the left lists various resources: Operational Plan and Detailed Operational Plans, Promotional Materials and Guidelines, Memorandum Series, Monthly Status Reports, Program Management Reviews, and a link to "Back to 2020 Census".

United States Census Bureau

Search

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Operational Plan and Detailed Operational Plans

Promotional Materials and Guidelines

Memorandum Series

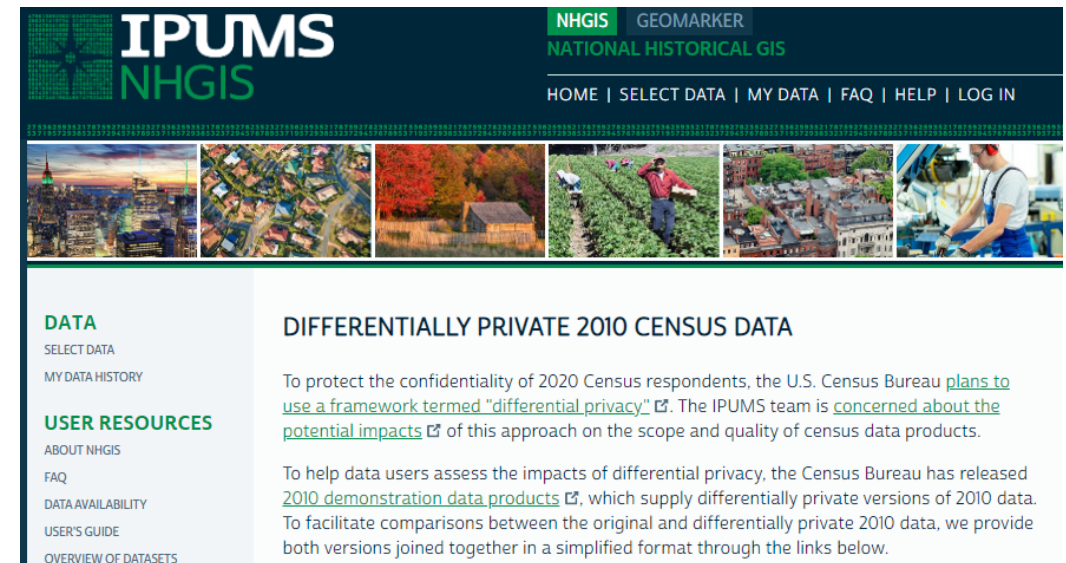
Monthly Status Reports

Program Management Reviews

< Back to 2020 Census

2010 Demonstration Data Products

To help data users understand how differential privacy may or may not impact data products they are used to receiving, the Census Bureau created demonstration data products for review. This set of data products demonstrate the current computational capabilities of the 2020 Disclosure Avoidance System (DAS). The products include the 2010 Demonstration Public Law 94-171 (P.L. 94-171) Redistricting Data Summary File and the Demonstration Demographic and



The screenshot shows the IPUMS NHGIS website. The header includes the logo, navigation links: HOME | SELECT DATA | MY DATA | FAQ | HELP | LOG IN, and a section for "DIFFERENTIALLY PRIVATE 2020 CENSUS DATA". The main content area is titled "2010 Demonstration Data Products" and includes a brief description of the products. A sidebar on the left lists various resources: DATA, SELECT DATA, MY DATA HISTORY, USER RESOURCES, ABOUT NHGIS, FAQ, DATA AVAILABILITY, USER'S GUIDE, and OVERVIEW OF DATASETS.

IPUMS NHGIS

NHGIS GEOMARKER NATIONAL HISTORICAL GIS

HOME | SELECT DATA | MY DATA | FAQ | HELP | LOG IN

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DIFFERENTIALLY PRIVATE 2020 CENSUS DATA

To protect the confidentiality of 2020 Census respondents, the U.S. Census Bureau [plans to use a framework termed "differential privacy."](#) The IPUMS team is [concerned about the potential impacts](#) of this approach on the scope and quality of census data products.

To help data users assess the impacts of differential privacy, the Census Bureau has released [2010 demonstration data products](#), which supply differentially private versions of 2010 data. To facilitate comparisons between the original and differentially private 2010 data, we provide both versions joined together in a simplified format through the links below.

DATA

SELECT DATA

MY DATA HISTORY

USER RESOURCES

ABOUT NHGIS

FAQ

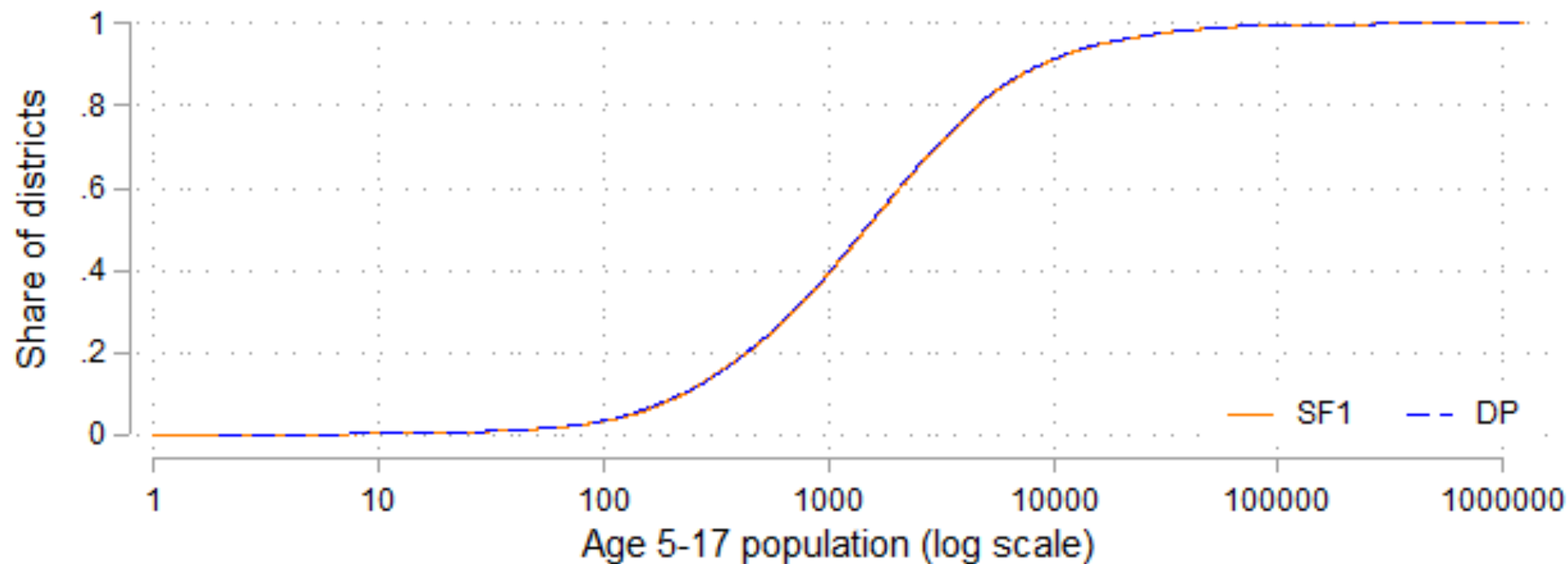
DATA AVAILABILITY

USER'S GUIDE

OVERVIEW OF DATASETS

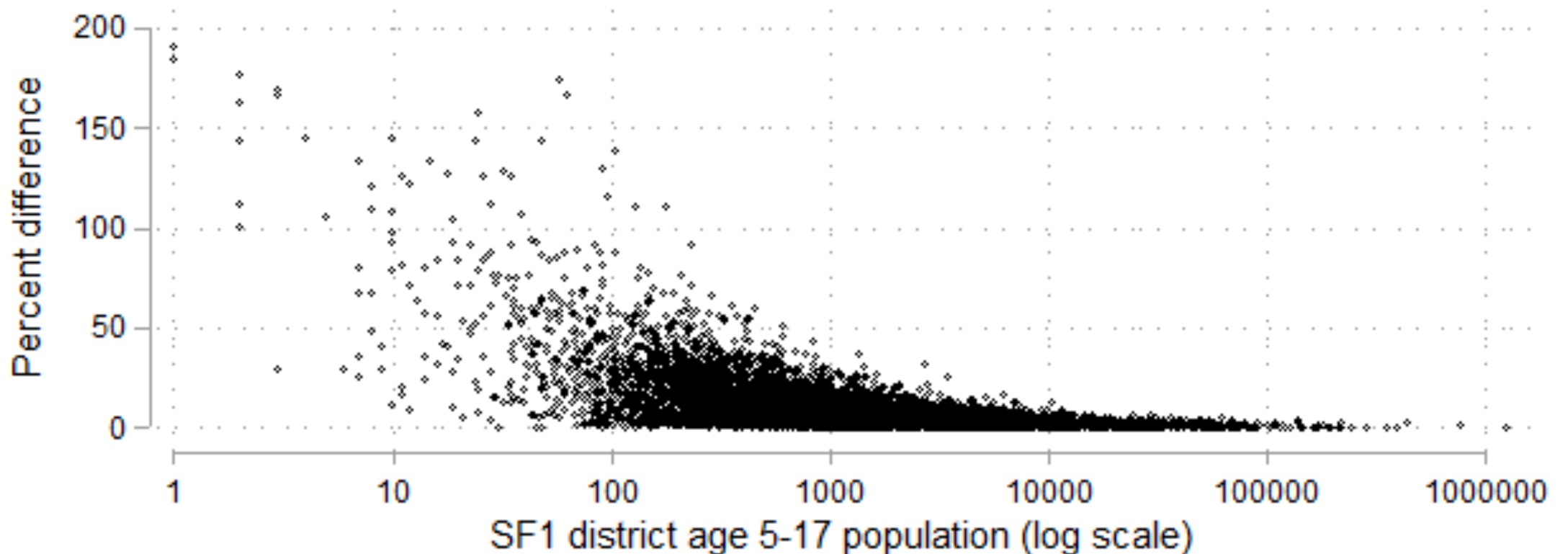
Age 5-17 population: SF1 vs DP distributions across districts

	Mean	SD	Min	Max	25 th ptile	50 th ptile	75 th ptile
Summary File 1	4,589.4	19,299	1	1,249,761	562	1,465	3,726
Differentially Private	4,589.6	19,349	2	1,250,387	568	1,460	3,725

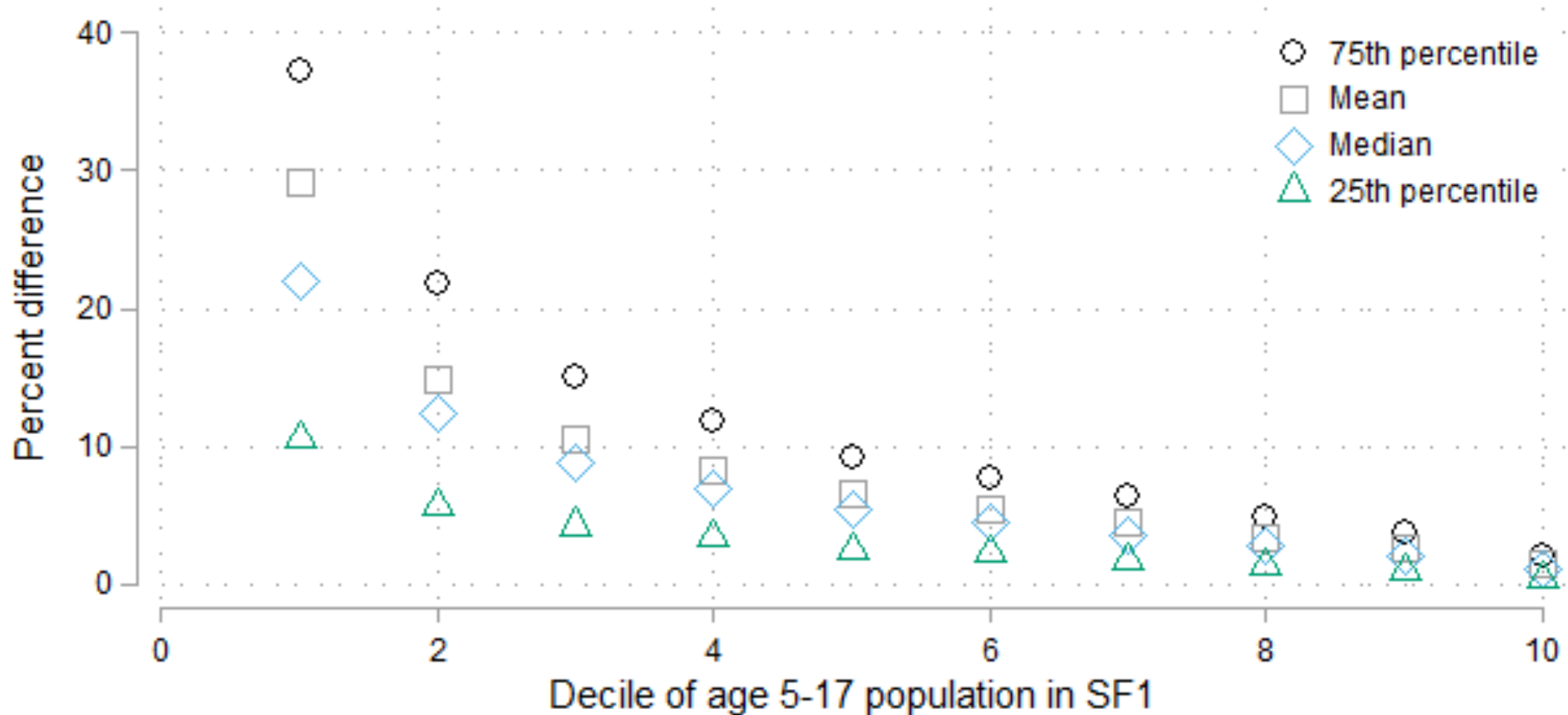


District % difference = $100 * |P_{SF} - P_{DP}| / \bar{P}_{SF,DP}$
:will apply shared district SAIPE poverty rate

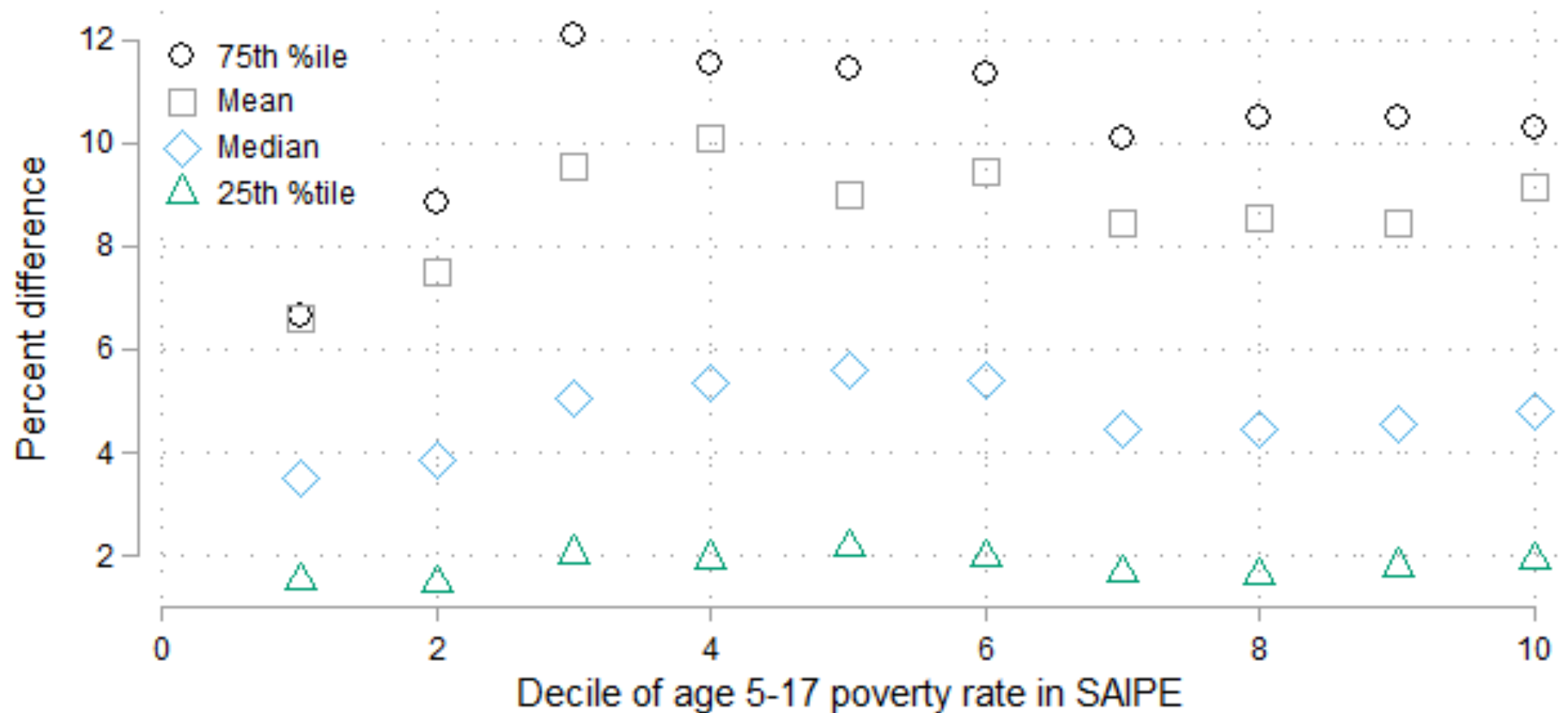
Mean	SD	Min	Max	25 th ptile	50 th ptile	75 th ptile
8.6	13.2	0	190.2	1.8	4.6	10.2



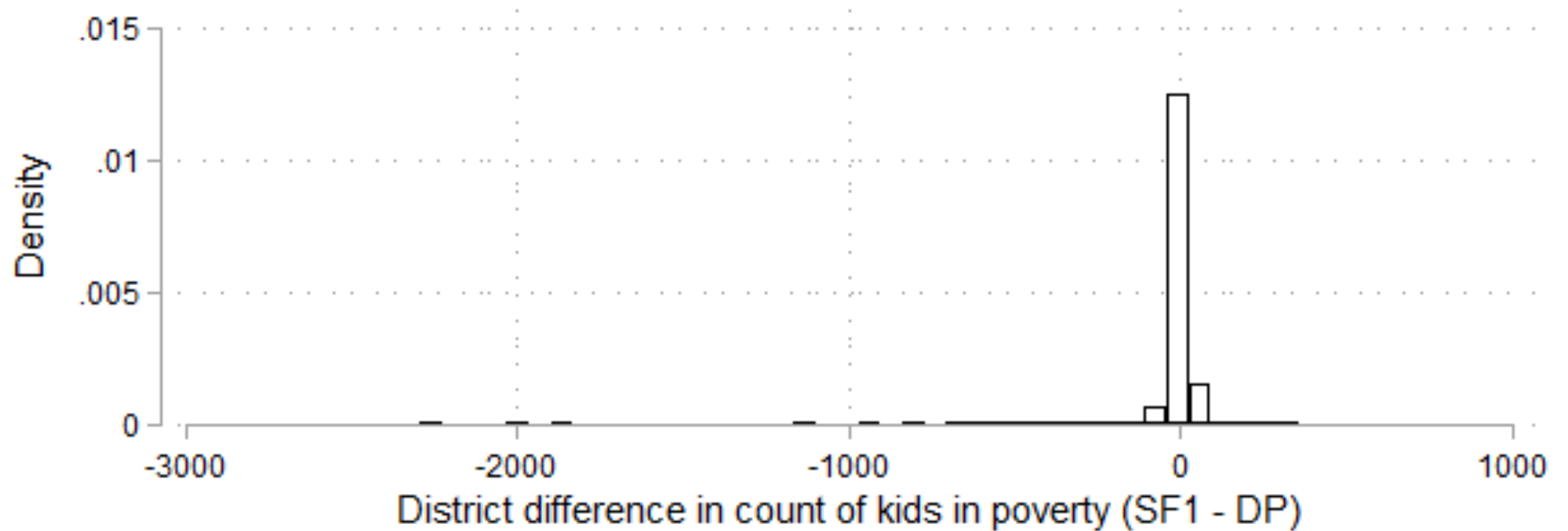
Distribution of population %-difference by district child population decile



Distribution of population %-difference by district **child poverty** decile



Differences in count of children in poverty



Districts' Title I qualification

Grant type	Title 1 share	Qualify?
Basic	41%	10+ children eligible AND >2% of children

		DP		
		No	Yes	Total
SF1	No	1.5%	0.4%	1.9%
	Yes	0.4%	97.7%	98.1%
	Total	1.9%	98.1%	

$1.5/1.9 = 0.79$
 79% agree on No

$97.7/98.1 = 0.996$
 99.6% agree on Yes

Districts' Title I qualification

- In bottom quintile of population, a lower share qualify for basic grant but agreement rates are similar

		DP		
		No	Yes	Total
SF1	No	7.3%	2.0%	9.3%
	Yes	2.0%	88.7%	90.7%
	Total	9.3%	90.7%	

78% agree on No

97.7% agree on Yes

Districts' Title I qualification

Grant type	Title 1 share	Qualify?
Concentration	9%	6,500+ children eligible OR >15% of children

		DP		
		No	Yes	Total
SF1	No	98.2%	0.03%	98.2%
	Yes	0.01%	1.8%	1.8%
	Total	98.2%	1.8%	

100% agree on No

99.4% of SF1 Yes= DP Yes
 98.3% of DP Yes= SF1 Yes

Districts' Title I qualification

Grant type	Title 1 share	Qualify?
Targeted & Educ Finance	50%	10+ children eligible AND >5% of children

		DP		
		No	Yes	Total
SF1	No	5.0%	0.4%	5.3%
	Yes	0.4%	94.2%	94.6%
	Total	5.4%	94.6%	

94.3% agree on No

99.6% agree on Yes

Super-simple district funding model: ignores cross-district variation in per-child funding

Figure 2.1. Title I, Part A total allocation per formula-eligible child and difference between school district locales with the highest and lowest allocations, by state or jurisdiction: 2015

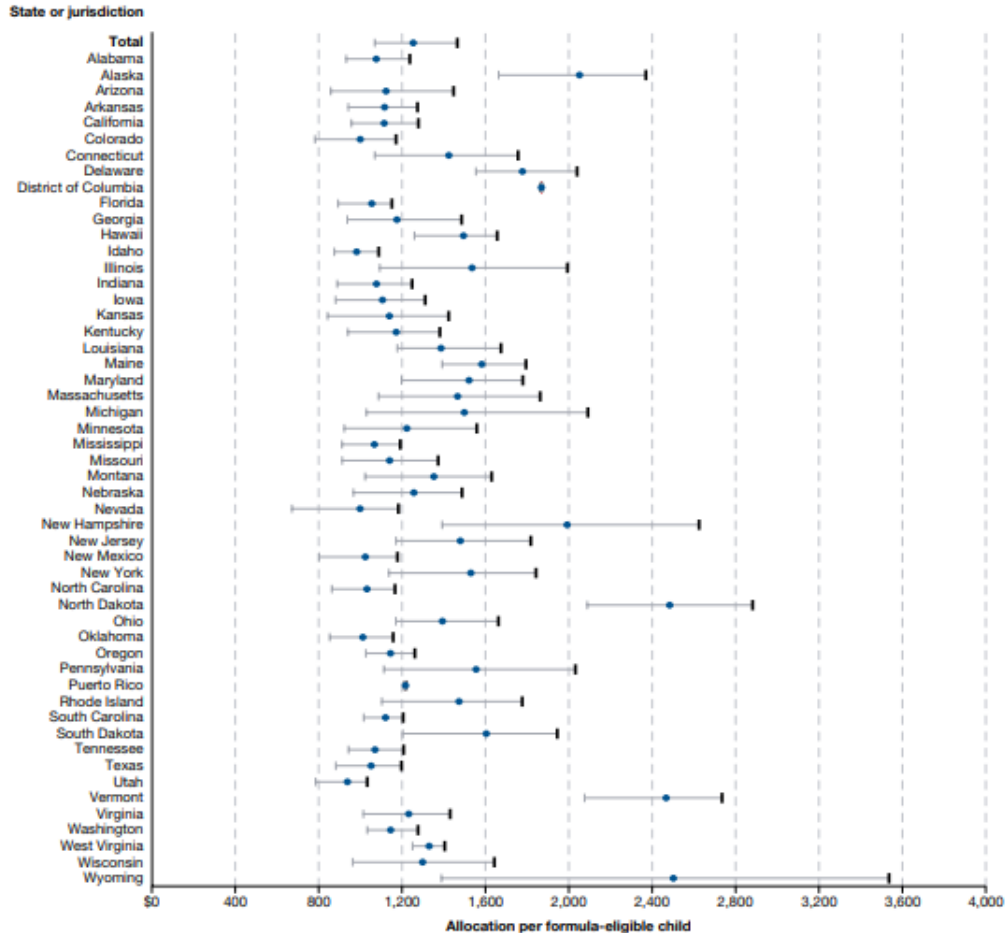
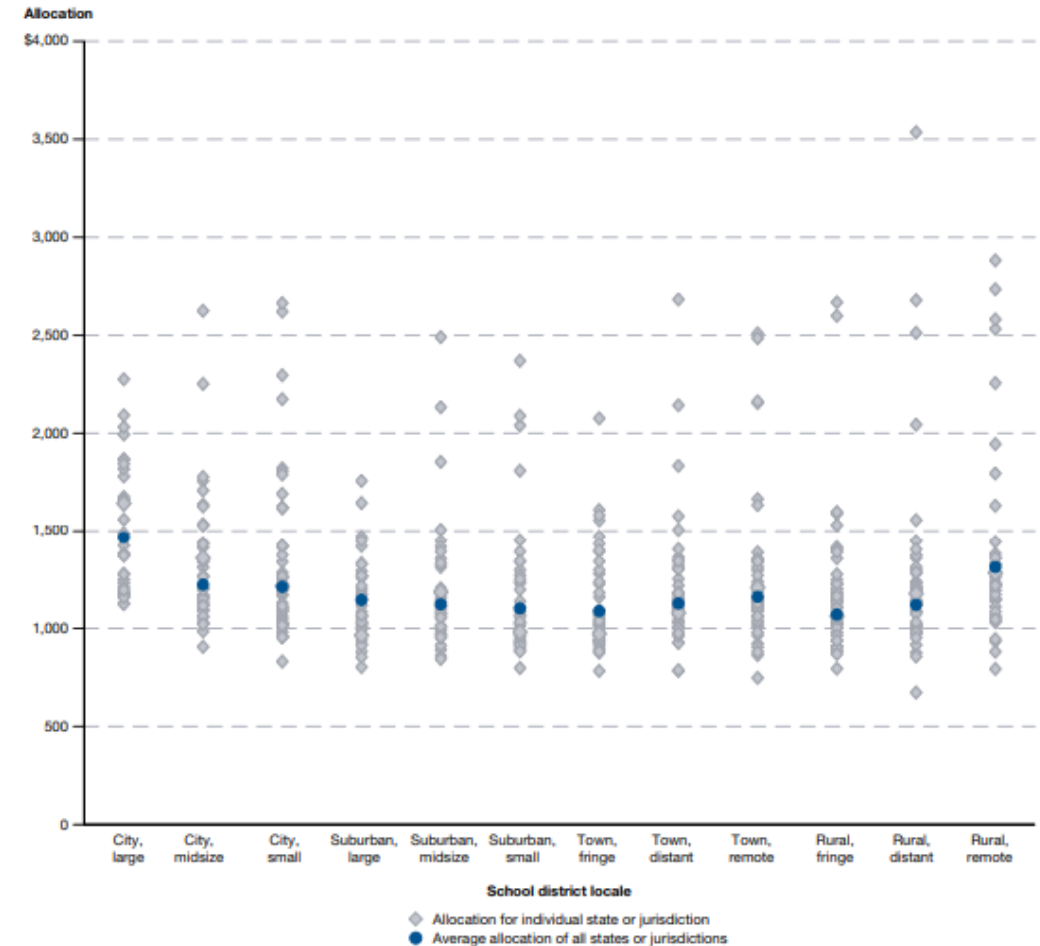


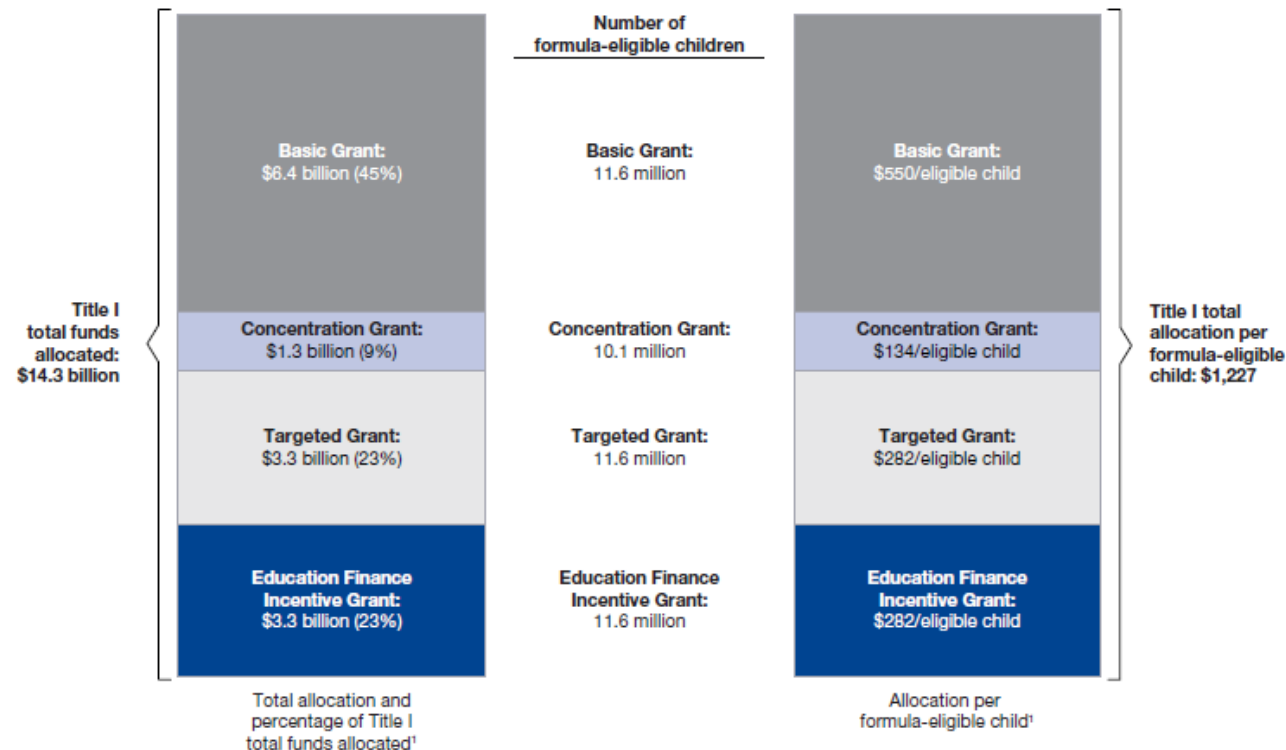
Figure 2.2. Range of average Title I, Part A total allocations per formula-eligible child, by locale type: 2015



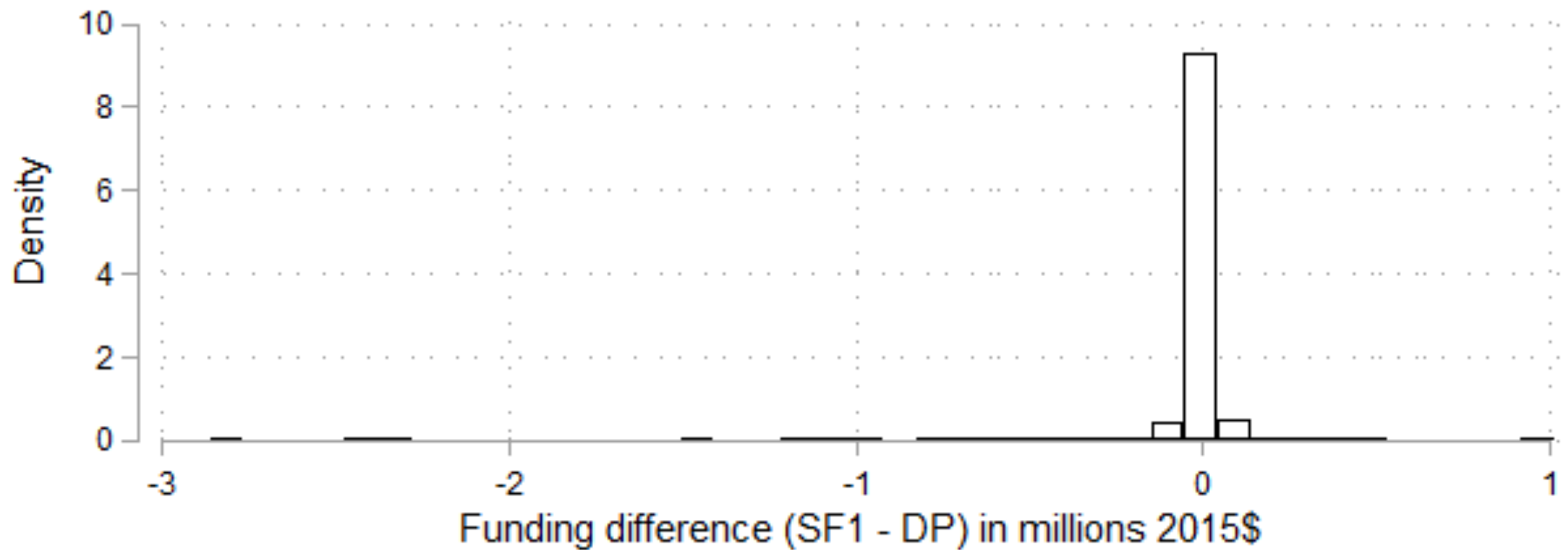
Super-simple district funding model: per-child mean by program only

$$\text{Funding} = \#Poor * [\$550 * 1(\text{QualifyBasic}) + \$134 * 1(\text{QualifyConc.}) + \$564 * 1(\text{QualifyTargetedAndEdFin})]$$

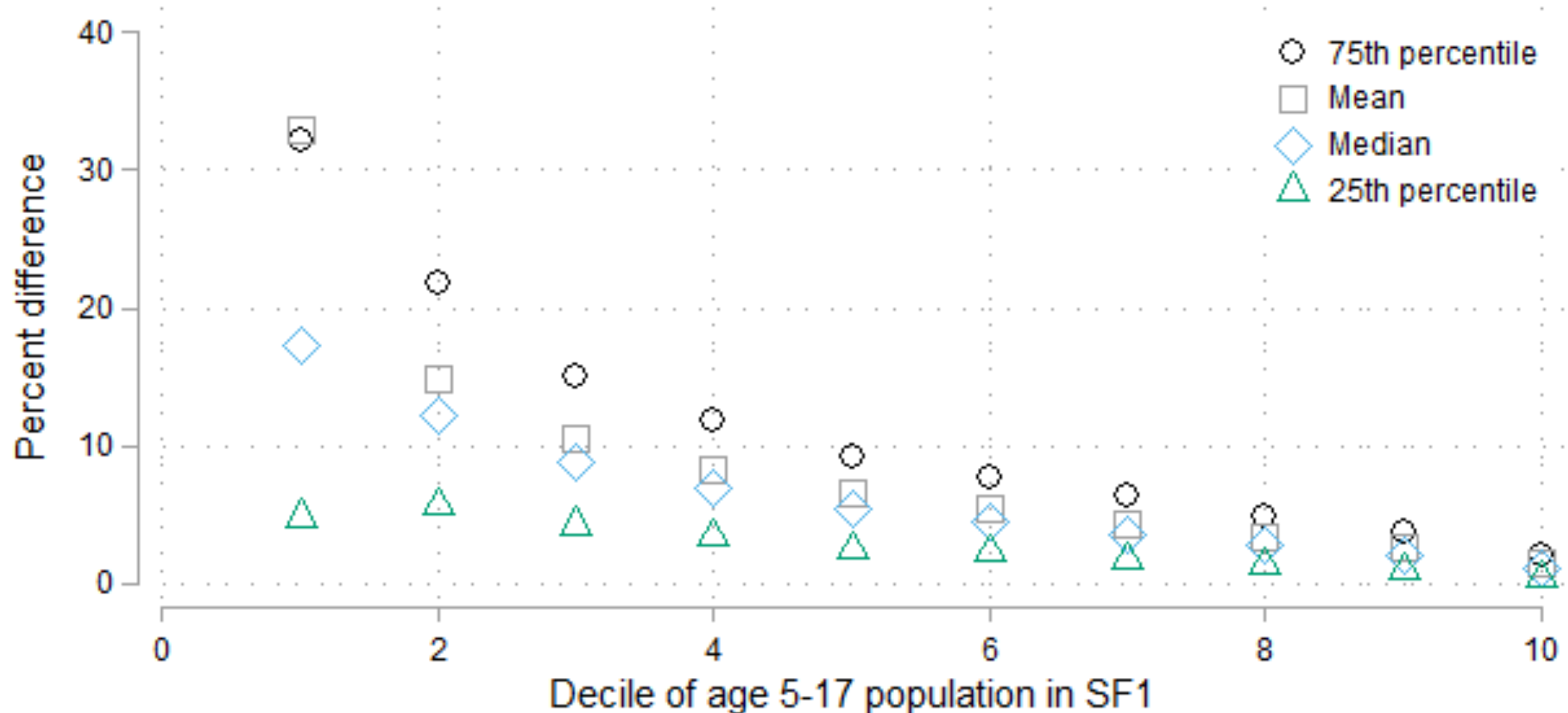
Figure 1.1. Title I, Part A total final allocation, number of formula-eligible children, and allocation per formula-eligible child, by grant type: 2015



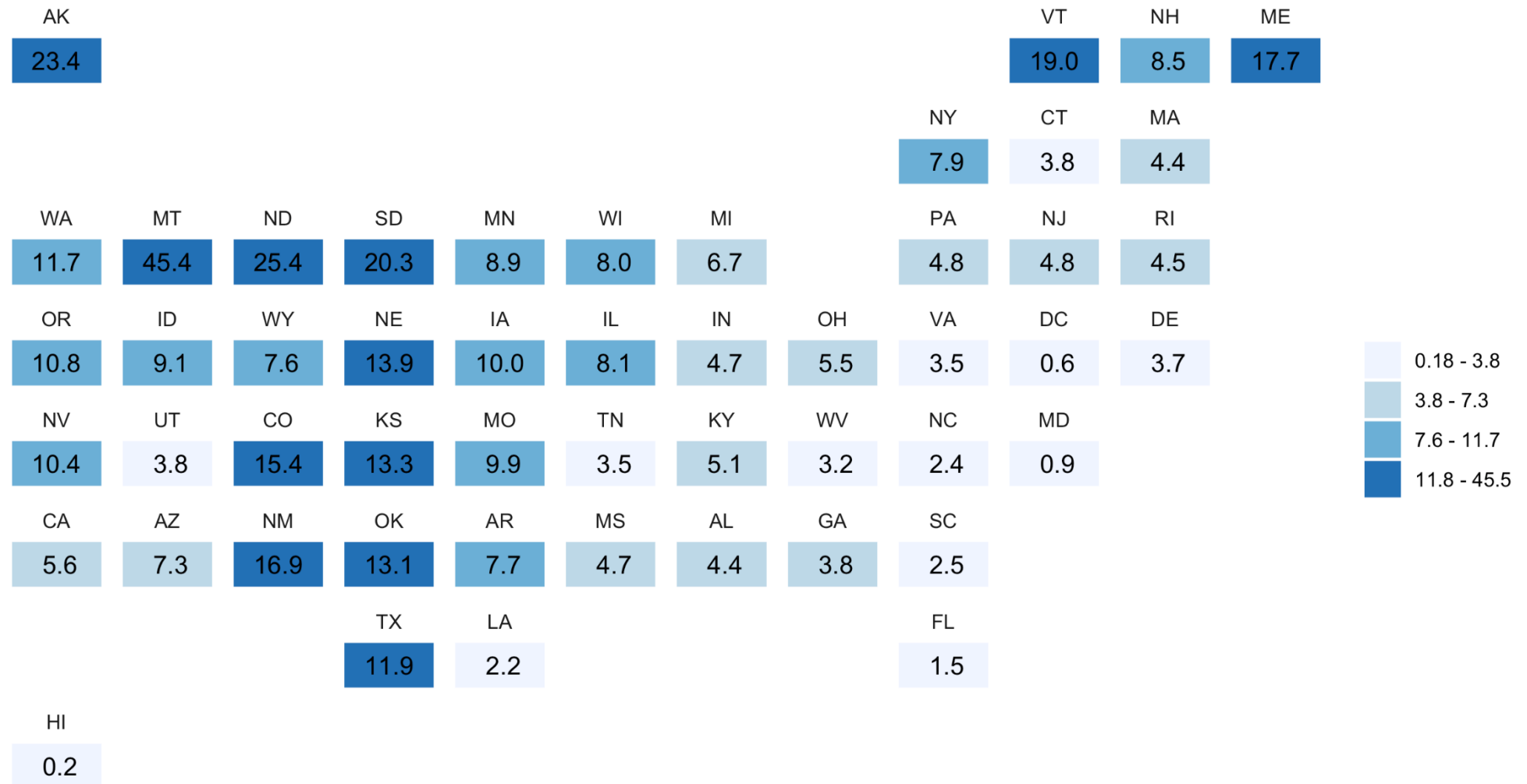
Differences in funding



Distribution of funding %-difference by district child population decile



Average funding %-disagreement by state



Distribution of funding %-difference by district child poverty rate decile

