

Best Practices for Determining Subgroup Size in Accountability Systems While Protecting Personally Identifiable Student Information

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ESSA and Data Protection

States must specify a single value for the minimum number of students needed to provide statistically sound data for all students and for each subgroup, while **protecting personally identifiable information (PII) of individual students.** This value is often referred to as the “minimum n-size.”

ESSA, Data Protection, and IES

Congress required IES to

- produce a report on “best practices for determining valid, reliable, and statistically significant minimum numbers of students for each of the subgroups of students”

ESSA, Data Protection, and IES

Congress required IES to

- describe how such a minimum number **“will not reveal personally identifiable information about students.”**
- ***Not recommend any specific minimum number of students in a subgroup***

ESSA, Data Protection, and IES

Minimum n-size refers to the lowest statistically defensible subgroup size that can be reported in a state accountability system.

Caveat: The minimum n-size a state establishes, and the privacy protections it implements, will directly determine how much data will be publicly reported in the state's accountability system.

Getting Started: Key Steps

Step 1. Establish a team with sufficient statistical and data expertise to lead the effort to establish a minimum n-size for your state accountability system.

Step 2. Verify that the resulting estimates will be statistically valid.

Step 3. Confirm that the resulting estimates will be statistically reliable.

Getting Started: Key Steps

Step 4. Ensure that the resulting estimates will be statistically sound.

- Determine whether the outcome measures will be treated as a **population** or **sample**.
- Establish criteria for triggering a “meaningful difference” (i.e., the smallest change in a reporting group that constitutes a significant difference).

Getting Started: Key Steps

Step 5. Document the statistical rigor that informed the selection of the minimum n-size and describe how this minimum number is statistically sound.

Getting Started: Key Steps

Step 6. Identify recommended privacy controls to be used to ensure that the state accountability system does not inadvertently disclose personally identifiable information

- primary and complementary suppression,
- ranges,
- top and bottom coding, and
- rounding).

Getting Started: Key Steps

Step 7. Confirm that the specified minimum number, in combination with the privacy controls selected in step 6, is sufficient to not reveal any personally identifiable information.

Step 8. Describe how the state collaborated with teachers, principals, other school leaders, parents, and other stakeholders when determining the minimum number.

What's Next?

Chapter 2. Best Practices for Establishing a Valid, Reliable, and Statistically Sound Minimum Number of Students for State Accountability Systems

- provides an in-depth discussion of the statistical concepts and methods to consider when determining a statistically defensible minimum n-size for a state accountability system.

What's Next?

Chapter 3. Protecting Personally Identifiable Information

- reviews best practices for minimizing the likelihood of inadvertently disclosing individual student information in state accountability reporting.

Appendix A. Sampling

- provides a brief discussion of statistical concepts underlying sampling for non-technical readers.

Appendix B. Data Protection Schema from the U.S. Department of Education's Disclosure Review Board (ED DRB)

- provides additional information related to the privacy protections and rationale established by the ED DRB.

What's Next?

Chapter 3. Protecting Personally Identifiable Information

- reviews best practices for minimizing the likelihood of inadvertently disclosing individual student information in state accountability reporting.

Chapter 2: **Universe** or Sample?

Measures from a **Universe/Population** are taken at face value and used to produce descriptive statistics

- Meaningful difference--Each state must define how large a difference must be to qualify as meaningful.

Chapter 2: **Universe** or Sample?

Goal: strike a balance between the number of students required to trigger a meaningful difference of the percent with the characteristic of interest and the size of the smallest population that will yield such a meaningful difference

Caution: in a small subgroup a change in a small number of students can trigger a relatively large percentage change

Chapter 2: Universe or **Sample**?

The results at one point in time are viewed as a **sample** from the universe of similarly defined groups over time

The state must consider how well its accountability system will be able to use inferential statistics to detect meaningful (i.e., statistically significant) differences for subgroups at the school, district, and state levels

Chapter 2: Universe or **Sample?**

When taking a sample perspective States must recognize:

- The margin of error decreases as the group size increases
- Lowering the confidence level (e.g. 95% to 90%) increases the probability of finding no difference when one exists

Chapter 2: Universe versus Sample

If the margin of error (i.e. sampling) is larger than the meaningful difference, a subgroup will demonstrate progress from the population perspective, but not from a sampling approach

- When there are small subgroups at the school level, more subgroups are likely to demonstrate progress using a population perspective than would be the case using a sampling approach

Chapter 2: Universe versus Sample

With a sampling perspective, the size of a significant difference (i.e., the margin of error) decreases as the group size increases making it “easier” to identify significant differences in larger groups

- With smaller margins of error in larger groups, differences of the same size are more likely to be significant at the state level than at the district or school levels

Chapter 2: Sample plus Meaningful Difference

To better balance the results in schools, districts, and states, the state team may want to combine a sampling approach with a meaningful difference.

- Requiring a meaningful difference to be both statistically significant and meet a pre-established percentage point difference.

THANK YOU!

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