



Measuring Significant Discrepancy

An Indicator B4 Technical Assistance Guide

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Chapter 1 Introduction

This technical assistance (TA) guide is designed to help states calculate significant discrepancy for Indicators B4A and B4B of the State Performance Plans (SPPs) and Annual Performance Reports (APRs), which states are required to submit under the Individuals with Disabilities Education Act (IDEA). As shown below, B4A addresses significant discrepancy in the rates of suspensions and expulsions, and B4B addresses significant discrepancy in the rates of suspensions and expulsions by race or ethnicity.

Statutory Basis for Indicator B4 (Rates of Suspension and Expulsion)

(A) IN GENERAL. The State educational agency examines data, including data disaggregated by race and ethnicity, to determine if significant discrepancies are occurring in the rate of long-term suspensions and expulsions of children with disabilities-

- (i)** Among local education agencies in the state; or
- (ii)** Compared to such rates for nondisabled children within such agencies.

(20 U.S.C. 1412(a)(22))

(3) Monitoring priorities. The Secretary shall monitor the States, and shall require each State to monitor the local educational agencies located in the State (except the State exercise of general supervisory responsibility), using quantifiable indicators in each of the following priority areas, and using such qualitative indicators as are needed to adequately measure performance in the following priority areas:

- (A)** Provision of a free appropriate public education in the least restrictive environment.

(20 U.S.C. 1416(a)(3)(A))

Measurement for Indicator B4: Rates of Suspension and Expulsion

- A.** Percent of districts that have a significant discrepancy in the rate of suspensions and expulsions of greater than 10 days in a school year for children with IEPs; and
- B.** Percent of districts that have: (a) a significant discrepancy, by race or ethnicity, in the rate of suspensions and expulsions of greater than 10 days in a school year for children with IEPs; and (b) policies, procedures or practices that contribute to the significant discrepancy and do not comply with requirements relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards.

Throughout this guide, we will use *significant discrepancy* to refer to the measurement requirements of Indicators B4A and B4B.

For convenience, the instructions provided to states by OSEP from the 2012 measurement table are reproduced here. They are also at: <http://www2.ed.gov/fund/data/report/idea/sppapr.html>. Please note that the measurement table can change from year to year.

OSEP's Instructions for Indicator B4—2012	
<p>Data Source: Data collected on Table 5 of Information Collection 1820-0621 (Report of Children with Disabilities Subject to Disciplinary Removal). Discrepancy can be computed by either comparing the rates of suspensions and expulsions for children with IEPs to rates for nondisabled children within the LEA or by comparing the rates of suspensions and expulsions for children with IEPs among LEAs within the State.</p> <p>Measurement:</p> <p>A. Percent = [(# of districts that have a significant discrepancy in the rates of suspensions and expulsions for greater than 10 days in a school year of children with IEPs) divided by the (# of districts in the State)] times 100.</p> <p>B. Percent = [(# of districts that have: (a) a significant discrepancy, by race or ethnicity, in the rates of suspensions and expulsions of greater than 10 days in a school year of children with IEPs; and (b) policies, procedures or practices that contribute to the significant discrepancy and do not comply with requirements relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards) divided by the (# of districts in the State)] times 100.</p> <p>Include State's definition of "significant discrepancy."</p>	<p>Sampling from State's 618 data is not allowed.</p> <p>Describe the results of the State's examination of the data for the year before the reporting year (e.g., for the FFY 2010 APR, use data from 2009-2010), including data disaggregated by race and ethnicity to determine if significant discrepancies are occurring in the rates of long-term suspensions and expulsions of children with IEPs, as required at 20 U.S.C. 1412(a)(22). The State's examination must include one of the following comparisons:</p> <ul style="list-style-type: none"> • The rates of suspensions and expulsions for children with IEPs among LEAs within the State; or • The rates of suspensions and expulsions for children with IEPs to nondisabled children within the LEAs. <p>In the description, specify which method the State used to determine possible discrepancies and explain what constitutes those discrepancies. If the State used a minimum "n" size requirement, report the number of districts excluded from the calculation as a result of this requirement. States have the option of using the "total number of districts" OR the "number of districts that meet the State's minimum n size" as the denominator in the calculation for B4A and B4B.</p> <p>For 4A, provide the actual numbers used in the calculation and if significant discrepancies occurred describe how the State educational agency reviewed and, if appropriate, revised (or required the affected local educational agency to revise) its policies, procedures, and practices relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards, to ensure that such policies, procedures, and practices comply with applicable requirements.</p>
	<p>For 4B, provide the following: (a) the number of districts that have a significant discrepancy, by race or ethnicity, in the rates of suspensions and expulsions of greater than 10 days in a school year for children with IEPs and (b) the number of districts in which policies, procedures or practices contribute to the significant discrepancy and do not comply with requirements relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards.</p> <p>If discrepancies occurred and the district with discrepancies had policies, procedures or practices that contributed to the significant discrepancy and that do not comply with requirements relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards, describe how the State ensured that such policies, procedures, and practices were revised to comply with applicable requirements consistent with OSEP Memorandum 09-02, dated October 17, 2008.</p> <p>Targets must be 0% for 4B.</p>

Central Purpose of This TA Guide

While there are many elements to OSEP's instructions, this TA guide focuses on one central purpose:

To describe the methods a state might use to appropriately determine which of its districts has a significant discrepancy (including a significant discrepancy by race or ethnicity) in the rates of out-of-school suspensions and expulsions totaling greater than 10 days for children with disabilities.

After presenting a set of six basic rates, this document presents a series of methods for determining significant discrepancy, giving a step-by-step example of the use of each method. For each method, this guide includes the question that the method answers, how to interpret its results, and related considerations.

Before outlining and discussing the rates and methods, three factors must be considered: minimum cell size requirements, racial/ethnic reporting categories, and the differences between the reporting requirements for B4B and significant disproportionality.

Minimum Cell Size Requirements

Any of the measures described in this document may be unreliable if the number of children included in the analysis is small. Unreliable analyses caused by small cell sizes may result in districts being inappropriately identified with significant discrepancies. The most common method states use to address this problem is to identify a minimum number of children to be included in the analysis, called the minimum n-size or the minimum cell size. If, however, the minimum cell size is too large, many smaller districts may be eliminated from the analysis altogether, leaving no objective way to identify significant discrepancy in these districts. States need to try to balance the risk of inappropriately identifying districts because of small cell sizes against the risk of not identifying districts because of large minimum cell sizes that eliminate large numbers of districts from the analysis completely. We present a more detailed discussion of small cell sizes in Chapter 6.

Racial/Ethnic Categories

When reporting IDEA 618 data for reference school year 2010-11 and beyond, states are required to use seven racial/ethnic categories as per the 2007 guidance issued by the Department of Education:¹

1. Hispanic/Latino,
2. American Indian or Alaska Native,
3. Asian,
4. Black or African American,
5. Native Hawaiian or Other Pacific Islander,
6. White, and
7. Two or more races.

Previously, states were required to report using five racial/ethnic categories: American Indian or Alaska Native, Asian or Other Pacific Islander, Black (not Hispanic), Hispanic, and White (not Hispanic).

Indicator B4B and Significant Disproportionality

The requirements for Indicator B4B (34 CFR §300.170) should not be confused with the requirements related to significant disproportionality (34 CFR §300.646).

For Indicator B4B:

- States must examine data disaggregated by race/ethnicity to determine if significant discrepancies are occurring in the rates of long-term suspensions/expulsions of children with disabilities either: (1) among LEAs in the state or (2) compared to the rates for children without disabilities within those agencies.
- If discrepancies are identified, the state must review and, if appropriate, revise (or require the affected state agency or LEA to revise) its policies, procedures, and practices relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards, to ensure that these policies, procedures, and practices comply with IDEA.

¹ In October 2007, the Department of Education published its Final Guidance on Maintaining, Collecting and Reporting Racial and Ethnic Data to the U.S. Department of Education in the *Federal Register* (vol. 72, No. 202, available at <http://www.gpoaccess.gov/nara/index.html>). For more information about this guidance, see <http://www2.ed.gov/policy/rschstat/guid/raceethnicity/index.html> and <http://www2.ed.gov/policy/rschstat/guid/raceethnicity/questions.html>.

For significant disproportionality:

- States must examine data to determine if significant disproportionality based on race or ethnicity is occurring with respect to (1) the identification of children as children with disabilities, including identification of children with particular disabilities; (2) the placement of children in particular educational environments; and (3) the incidence, duration, and type of disciplinary actions, including suspensions/expulsions.
- If significant disproportionality is identified, states must: (1) provide for the review (and, if appropriate, revision) of policies, procedures, and practices; (2) require the district to reserve the maximum amount of funds (15%) to be used for coordinated early intervening services (CEIS); and (3) require the district to publicly report on the revision of policies, procedures, and practices.

Because the requirements are different, states should not use the same calculations and definitions for determining significant discrepancy for Indicator B4B that they use for determining significant disproportionality in discipline. This TA guide focuses on methods for identifying significant discrepancies in discipline for Indicator B4A and B4B. Those seeking TA on methods for identifying significant disproportionality should refer to DAC's disproportionality TA guide, called *Methods for Assessing Racial/Ethnic Disproportionality in Special Education: A Technical Assistance Guide (Revised)*.²

² This TA Guide is available at http://ideadata-admin.s3.amazonaws.com/docs/IDC_TA_Guide_508-Compliant-052814.pdf.

Chapter 2 Data Sources and Data Exhibits

In this chapter, we discuss the various sources of data states might need for their analyses. The chapter concludes with the presentation of four data exhibits; we use data from these exhibits for the various examples discussed throughout the remainder of this TA guide.

Data Sources

As noted in the OSEP instructions, data collected for Table 5 of Information Collection 1820-0621 (Report of Children with Disabilities Subject to Disciplinary Removal; ED*Facts* file specification N/X006) should be used for completing Indicator B4. States report discipline data in a number of ways on Table 5. For Indicator B4, states should focus on out-of-school suspensions/expulsions totaling greater than 10 days.

Please note:

To increase the ease of readability, the remainder of this TA guide will use a form of the term “*suspension/expulsion*” when referring to “*out-of school suspensions/expulsions totaling greater than 10 days.*”

States will also need child count data collected for Table 1 of Information Collection 1820-0043 (Report of Children with Disabilities Receiving Special Education under Part B of the *Individuals with Disabilities Education Act*; ED*Facts* file specification N/X002). In addition, if comparing suspension/expulsion rates for children with disabilities to suspension rates for children without disabilities, states will also need counts of children without disabilities and suspension/expulsion data for children without disabilities.³

Data Exhibits

All of the examples in this TA guide are based on data presented in Exhibits 1 through 4. These exhibits present the following data by district for a fictitious State A:

- Total number of children with disabilities in the district (Exhibit 1);
- Total number of children with disabilities suspended/expelled (Exhibit 1);
- Total number of children without disabilities in the district (Exhibit 2);
- Total number of children without disabilities suspended/expelled (Exhibit 2);
- Total number of children with disabilities by race/ethnicity suspended/expelled (Exhibit 3); and
- Total number of children with disabilities by race/ethnicity (Exhibit 4).

Using these data, six basic rates can be calculated:

1. a district-level suspension/expulsion rate for children with disabilities,
2. a district-level suspension/expulsion rate for children without disabilities,
3. a state-level suspension/expulsion rate for children with disabilities,
4. a state mean suspension/expulsion rate for children with disabilities,
5. a district-level suspension/expulsion rate for children with disabilities by race/ethnicity, and
6. a state mean suspension/expulsion rate for children with disabilities by race/ethnicity.

The calculation of these rates is described in Chapter 3.

It should be noted that, in order to simplify the examples, State A has a limited number of districts. However, these methods can be easily translated to states with a larger number of districts.

³ Total enrollment data often include both children with disabilities and children without disabilities. The number of children without disabilities can be derived by subtracting the number of children with disabilities from the total enrollment number.

Exhibit 1 Number of Children with Disabilities Suspended/ Expelled in State A

District	Number of children with disabilities	Number of children with disabilities with out-of-school suspensions/expulsions totaling > 10 days
District 1	110	24
District 2	180	30
District 3	50	2
District 4	4	0
District 5	2,500	600
District 6	60	1
District 7	3,500	100
District 8	75	2
<i>State Totals</i>	<i>6,479</i>	<i>759</i>

Exhibit 2 Number of Children without Disabilities Suspended/ Expelled in State A

District	Number of children without disabilities	Number of children without disabilities with out-of-school suspensions/expulsions totaling > 10 days
District 1	925	75
District 2	1,055	125
District 3	525	122
District 4	28	2
District 5	27,500	1,670
District 6	625	90
District 7	70,120	2,105
District 8	1,500	125
<i>State Totals</i>	<i>102,278</i>	<i>4,314</i>

Exhibit 3 Number of Children with Disabilities by Race/Ethnicity Suspended/ Expelled in State A

District	American Indian or Alaska Native	Asian	Black or African American	Hispanic/Latino	Native Hawaiian or Other Pacific Islander	White	Two or More Races	Total
District 1	0	2	3	10	0	5	4	24
District 2	2	2	10	4	0	8	4	30
District 3	0	0	1	0	0	1	0	2
District 4	0	0	0	0	0	0	0	0
District 5	8	13	175	60	4	160	180	600
District 6	0	0	0	0	0	1	0	1
District 7	3	16	25	35	0	11	10	100
District 8	0	0	0	1	0	1	0	2
<i>State Totals</i>	<i>13</i>	<i>33</i>	<i>214</i>	<i>110</i>	<i>4</i>	<i>187</i>	<i>198</i>	<i>759</i>

Exhibit 4 Number of Children with Disabilities by Race/Ethnicity in State A

District	American Indian or Alaska Native	Asian	Black or African American	Hispanic/Latino	Native Hawaiian or Other Pacific Islander	White	Two or More Races	Total
District 1	3	10	30	35	2	21	9	110
District 2	5	15	52	38	0	40	30	180
District 3	1	2	20	10	0	15	2	50
District 4	0	0	2	2	0	0	0	4
District 5	52	117	1,236	317	39	512	227	2,500
District 6	0	5	15	13	2	17	8	60
District 7	65	200	1,045	1,250	48	567	325	3,500
District 8	0	5	10	25	0	30	5	75
<i>State Totals</i>	<i>126</i>	<i>354</i>	<i>2,410</i>	<i>1,690</i>	<i>91</i>	<i>1,202</i>	<i>606</i>	<i>6,479</i>

Chapter 3 Calculating Basic Suspension/Expulsion Rates

This chapter describes how to calculate the basic suspension/expulsion rates that will be used throughout this TA guide. These basic suspension/expulsion rates set the foundation for the comparisons that are described in the methodological examples that follow (see Chapter 4 for B4A and Chapter 5 for B4B).

Rate #1 District-Level Suspension/Expulsion Rate for Children with Disabilities

QUESTION

In District 1 in State A, what is the percentage of children with disabilities who have been suspended/expelled for more than 10 days?

1. Find the number of children with disabilities suspended/expelled in District 1. Using Exhibit 1, District 1 has 24 children with disabilities suspended/expelled.
2. Find the number of children with disabilities in District 1. Using Exhibit 1, District 1 has 110 children with disabilities.
3. Divide the number of children with disabilities suspended/expelled in District 1 by the number of children with disabilities in District 1.
4. Multiply the quotient by 100 to create a percentage.

Rate

$$\begin{aligned}
 &= \frac{\text{Children with disabilities suspended/expelled in District 1}}{\text{All children with disabilities in District 1}} \times 100 \\
 &= \frac{24}{110} \times 100 \\
 &= 21.8\%
 \end{aligned}$$

ANSWER

For District 1 in State A, the percentage of children with disabilities who have been suspended/expelled for greater than 10 days is 21.8%. Therefore, for District 1, the suspension/expulsion rate for children with disabilities is 21.8%.

In Exhibit 5 below, we have calculated the suspension/expulsion rates for children with disabilities for each of eight districts in State A.

Exhibit 5 Suspension/Expulsion Rates for Children with Disabilities in State A

District	Suspension/expulsion rate for children with disabilities
District 1	21.8%
District 2	16.7%
District 3	4.0%
District 4	0.0%
District 5	24.0%
District 6	1.7%
District 7	2.9%
District 8	2.7%

Rate #2 District-Level Suspension/Expulsion Rate for Children without Disabilities

QUESTION

In District 1 in State A, what is the percentage of children without disabilities who have been suspended/expelled for greater than 10 days?

1. Find the number of children without disabilities suspended/expelled in District 1. Using Exhibit 2, District 1 has 75 children without disabilities suspended/expelled.
2. Find the number of children without disabilities in District 1. Using Exhibit 2, District 1 has 925 children without disabilities.
3. Divide the number of children without disabilities suspended/expelled in District 1 by the number of children without disabilities in District 1.
4. Multiply the quotient by 100 to create a percentage.

Rate

$$\begin{aligned}
 & \frac{\text{Children without disabilities suspended/expelled in District 1}}{\text{All children without disabilities in District 1}} \times 100 \\
 &= \frac{75}{925} \times 100 \\
 &= 8.1\%
 \end{aligned}$$

ANSWER

In District 1 in State A, the percentage of children without disabilities who have been suspended/expelled is 8.1%. Therefore, for District 1, the suspension/expulsion rate for children without disabilities is 8.1%.

In Exhibit 6 below, we have calculated the suspension/expulsion rates for children without disabilities for each of the eight districts in State A.

Exhibit 6 Suspension/Expulsion Rates for Children without Disabilities in State A

District	Suspension/expulsion rate for children without disabilities
District 1	8.1%
District 2	11.8%
District 3	23.2%
District 4	7.1%
District 5	6.1%
District 6	14.4%
District 7	3.0%
District 8	8.3%

Some calculations of significant discrepancy require that a district's suspension/expulsion rate be compared to the suspension/expulsion rates of other districts. We next present two basic rates that are useful for such comparisons—a state-level suspension/expulsion rate (Rate #3) and a state mean suspension/expulsion rate (Rate #4). The two rates are calculated in different ways and have slightly different statistical properties. The state-level rate calculation assigns equal weight to each child with disabilities in the state, therefore giving more weight to districts with larger numbers of children. The state mean rate calculation gives equal weight to each district.

Rate #3 State-Level Suspension/ Expulsion Rate for Children with Disabilities

QUESTION

In State A, what is the percentage of children with disabilities who have been suspended/expelled for greater than 10 days?

1. Find the total number of children with disabilities suspended/expelled in State A. Using Exhibit 1, the total number of children with disabilities suspended/expelled in State A is 759.
2. Find the total number of children with disabilities in State A. Using Exhibit 1, the total number of children with disabilities is 6,479.
3. Divide the total number of children with disabilities suspended/expelled by the total number of children with disabilities.
4. Multiply the quotient by 100 to create a percentage.

Rate

$$\begin{aligned}
 &= \frac{\text{Children with disabilities suspended/expelled in State A}}{\text{All children with disabilities in the state}} \times 100 \\
 &= \frac{759}{6,479} \times 100 \\
 &= 11.7\%
 \end{aligned}$$

ANSWER

In State A, the percentage of children with disabilities who have been suspended/ expelled for greater than 10 days is 11.7%. Therefore, for State A, the state-level suspension/expulsion rate for children with disabilities is 11.7%.

Rate #4 State Mean Suspension/ Expulsion Rate for Children with Disabilities

QUESTION

In State A, what is the state mean suspension/expulsion rate for children with disabilities?

1. Find the suspension/expulsion rates for each of the districts in State A. Using the data in Exhibit 5, the suspension/expulsion rates for District 1 through District 8 in State A are: 21.8%, 16.7%, 4.0%, 0.0%, 24.0%, 1.7%, 2.9%, and 2.7%, respectively.
2. Sum the suspension/expulsion rates for children with disabilities for all of the districts in State A. Using the data in Exhibit 5, the sum of the rates for the eight districts in State A is 73.8%.

Sum of suspension/expulsion rates

$$\begin{aligned}
 &= \text{Rate for District 1} + \text{Rate for District 2} + \text{Rate for District 3} + \\
 &\quad \text{Rate for District 4} + \text{Rate for District 5} + \text{Rate for District 6} + \\
 &\quad \text{Rate for District 7} + \text{Rate for District 8} \\
 &= 21.8\% + 16.7\% + 4.0\% + 0.0\% + 24.0\% + 1.7\% + 2.9\% + 2.7\% \\
 &= 73.8\%
 \end{aligned}$$

3. To find the state mean suspension/expulsion rate, divide the sum of the suspension/expulsion rates for children with disabilities by the total number of districts in State A. There are eight districts in State A.

State mean rate

$$\begin{aligned}
 &= \frac{\text{Sum of the suspension/expulsion rates for children} \\
 &\quad \text{with disabilities}}{\text{Total number of districts in State A}} \\
 &= \frac{73.8\%}{8} \\
 &= 9.2\%
 \end{aligned}$$

ANSWER

In State A, the state mean suspension/expulsion rate is 9.2%.

Rate #5 District-Level Suspension/Expulsion Rate for Children with Disabilities, by Race/Ethnicity

QUESTION

In District 1 in State A, what is the percentage of Black or African American children with disabilities who have been suspended/expelled for more than 10 days?

1. Find the number of Black or African American children with disabilities suspended/expelled in District 1. Using Exhibit 3, District 1 has 3 Black or African American children with disabilities suspended/expelled.
2. Find the number of Black or African American children with disabilities in District 1. Using Exhibit 4, District 1 has 30 Black or African American children with disabilities.
3. Divide the number of Black or African American children with disabilities suspended/expelled in District 1 by the number of Black or African American children with disabilities in District 1.
4. Multiply the quotient by 100 to create a percentage.

Rate

$$= \frac{\text{Black or African American children with disabilities suspended/expelled in District 1}}{\text{Black or African American children with disabilities in District 1}} \times 100$$

$$= \frac{3}{30} \times 100$$

$$= 10.0\%$$

ANSWER

For District 1 in State A, the percentage of Black or African American children with disabilities who have been suspended/expelled for greater than 10 days is 10.0%. Therefore, for District 1, the suspension/expulsion rate for Black or African American children with disabilities is 10.0%.

In Exhibit 7 below, we have calculated the suspension/expulsion rates for children with disabilities by race/ethnicity for each of eight districts in State A.

Exhibit 7 Suspension/Expulsion Rates for Children with Disabilities in State A, by Race/Ethnicity

District	American Indian or Alaska Native	Asian	Black or African American	Hispanic/Latino	Native Hawaiian or Other Pacific Islander	White	Two or More Races
District 1	0.0%	20.0%	10.0%	28.6%	0.0%	23.8%	44.4%
District 2	40.0%	13.3%	19.2%	10.5%	*	20.0%	13.3%
District 3	0.0%	0.0%	5.0%	0.0%	*	6.7%	0.0%
District 4	*	0.0%	0.0%	0.0%	*	*	*
District 5	15.4%	11.1%	14.2%	18.9%	10.3%	31.3%	79.3%
District 6	*	0.0%	0.0%	0.0%	0.0%	5.9%	0.0%
District 7	4.6%	8.0%	2.4%	2.8%	0.0%	1.9%	3.1%
District 8	*	0.0%	0.0%	4.0%	*	3.3%	0.0%

* Denotes a district with zero children with disabilities of the race/ethnicity that is listed in each column header. A suspension/expulsion rate could not be calculated because there were zero children with disabilities from that racial/ethnic group in the district.

Rate #6 State Mean Suspension/Expulsion Rate for Children with Disabilities, by Race/Ethnicity

QUESTION

In State A, what is the state mean suspension/expulsion rate for children with disabilities by race/ethnicity?

- Find the suspension/expulsion rates for each of the racial/ethnic groups in each of the districts in State A that have children with disabilities from the racial/ethnic group. Using the data in Exhibit 7, the suspension/expulsion rates for Districts 1 through District 8 in State A are: 0.0%, 20.0%, 10.0%, 28.6%, 0.0%, 23.8%, 44.4%, 40.0%, 13.3%, 19.2%, 10.5%, 20.0%, 13.3%, 0.0%, 0.0%, 5.0%, 0.0%, 6.7%, 0.0%, 0.0%, 0.0%, 15.4%, 11.1%, 14.2%, 18.9%, 10.3%, 31.3%, 79.3%, 0.0%, 0.0%, 0.0%, 0.0%, 5.9%, 0.0%, 4.6%, 8.0%, 2.4%, 2.8%, 0.0%, 1.9%, 3.1%, 0.0%, 0.0%, 4.0%, 3.3%, and 0.0%.
- Sum the suspension/expulsion rates for children with disabilities for each of the racial/ethnic groups for all of the districts in State A. Using the data in Exhibit 7, the sum of the rates for the eight districts in State A is 471.3%.

Sum of suspension/expulsion rates

$$\begin{aligned}
 &= \text{Rates for racial/ethnic groups in District 1} + \\
 &\quad \text{Rates for racial/ethnic groups in District 2} + \\
 &\quad \text{Rates for racial/ethnic groups in District 3} + \\
 &\quad \text{Rates for racial/ethnic groups in District 4} + \\
 &\quad \text{Rates for racial/ethnic groups in District 5} + \\
 &\quad \text{Rates for racial/ethnic groups in District 6} + \\
 &\quad \text{Rates for racial/ethnic groups in District 7} + \\
 &\quad \text{Rates for racial/ethnic groups in District 8} \\
 \\
 &= 0.0\% + 20.0\% + 10.0\% + 28.6\% + 0.0\% + 23.8\% + 44.4\% + \\
 &\quad 40.0\% + 13.3\% + 19.2\% + 10.5\% + 20.0\% + 13.3\% + 0.0\% + \\
 &\quad 0.0\% + 5.0\% + 0.0\% + 6.7\% + 0.0\% + 0.0\% + 0.0\% + \\
 &\quad 15.4\% + 11.1\% + 14.2\% + 18.9\% + 10.3\% + 31.3\% + \\
 &\quad 79.3\% + 0.0\% + 0.0\% + 0.0\% + 0.0\% + 5.9\% + 0.0\% + \\
 &\quad 4.6\% + 8.0\% + 2.4\% + 2.8\% + 0.0\% + 1.9\% + 3.1\% + 0.0\% + \\
 &\quad 0.0\% + 4.0\% + 3.3\% + 0.0\% \\
 \\
 &= 471.3\%
 \end{aligned}$$

- To find the state mean suspension/expulsion rate by race/ethnicity, divide the sum of the suspension/expulsion rates for children with disabilities for each of the racial/ethnic groups in each of the districts by the total number of rates calculated for State A. There were 47 rates calculated for State A.

State mean rate

$$\begin{aligned}
 &\text{Sum of the suspension/expulsion rates for children with} \\
 &\quad \text{disabilities by race/ethnicity} \\
 &= \frac{\hspace{10em}}{\text{Total number of rates calculated for State A}} \\
 \\
 &= \frac{471.3\%}{47} \\
 \\
 &= 10.0\%
 \end{aligned}$$

ANSWER

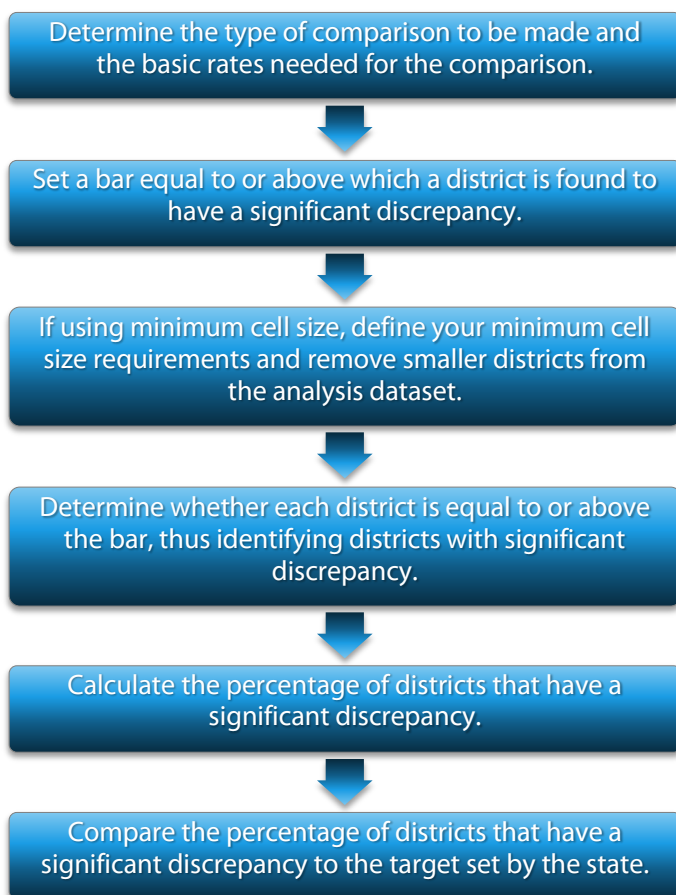
In State A, the state mean suspension/expulsion rate by race/ethnicity is 10.0%.

Chapter 4 Methodologies for Indicator B4A

In this chapter, we discuss methodologies that states may want to consider using to identify whether districts have a significant discrepancy for Indicator B4A. For each method, the TA guide summarizes the question it answers and provides a step-by-step example of how it is calculated. We also include brief discussions of how to interpret the method and some considerations.

Overall Steps for Identifying Significant Discrepancy

The following steps can be used to identify significant discrepancy for B4A.



Types of Comparisons

To determine whether a significant discrepancy exists within a district, one of two types of comparisons can be used. States may either:

1. Compare the rates of suspensions/expulsions for children with disabilities among districts within the state, or
2. Compare the rates of suspensions/expulsions for children with disabilities to the rates for children without disabilities within each district.

Within each of these two types of comparisons, several methods of analysis can be used. The first four methods described in this chapter pertain to the first comparison, and the remaining two methods pertain to the second comparison.

It should be noted that the comparison options and corresponding methodologies described in this chapter do not address whether a district that is identified with a significant discrepancy is not in compliance with *IDEA* requirements. For districts with significant discrepancies, the state needs to review and, if appropriate, revise (or require the district to revise) the policies, procedures, and practices relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards, to ensure that such policies, procedures, and practices comply with applicable requirements.

Exhibit 8 presents a brief overview of the methods discussed in this chapter; each method is then described in more detail.

Exhibit 8 Summary of Methods for Identifying Significant Discrepancy for B4A

Example #	Method	A district has a significant discrepancy when...
Comparison Option 1		
B4A Example #1a (Comparable to B4A Example #4a)	Using the state-level suspension/ expulsion rate for children with disabilities to set the suspension/ expulsion-rate bar.	...its suspension/expulsion rate for children with disabilities is equal to or greater than the state-level suspension/expulsion rate for children with disabilities.
	<ul style="list-style-type: none"> • Variation: Add <i>x</i> percentage points to the state-level suspension/ expulsion rate for children with disabilities to set the suspension/expulsion-rate bar. 	...its suspension/expulsion rate for children with disabilities is <i>x</i> percentage points or more than the state-level suspension/ expulsion rate for children with disabilities.
	<ul style="list-style-type: none"> • Variation: Multiply the state-level suspension/expulsion rate for children with disabilities by <i>x</i> to set the suspension/expulsion-rate bar. 	...its suspension/expulsion rate for children with disabilities is <i>x</i> times or more than the state-level suspension/expulsion rate for children with disabilities. (Expressed with percents...when its suspension/expulsion rate for children with disabilities is $[(x-1)*100]$ percent or more than the state-level suspension/expulsion rate for children with disabilities.)
B4A Example #1b (Comparable to B4A Example #4b)	Using the state mean suspension/ expulsion rate for children with disabilities to set the suspension/ expulsion-rate bar.	...the suspension/expulsion rate for children with disabilities is equal to or greater than the state mean suspension/expulsion rate for children with disabilities.
	<ul style="list-style-type: none"> • Variation: Add <i>x</i> percentage points to the state mean suspension/ expulsion rate for children with disabilities to set the suspension/ expulsion-rate bar. 	...its suspension/expulsion rate for children with disabilities is <i>x</i> percentage points or more than the state mean suspension/ expulsion rate for children with disabilities.
	<ul style="list-style-type: none"> • Variation: Multiply the state mean suspension/expulsion rate for children with disabilities by <i>x</i> to set the suspension/expulsion-rate bar. 	...its suspension/expulsion rate for children with disabilities is <i>x</i> times or more than the state mean suspension/expulsion rate for children with disabilities. (Expressed with percents...when its suspension/expulsion rate for children with disabilities is $[(x-1) * 100]$ percent or more than the state mean suspension/expulsion rate for children with disabilities.)
B4A Example #2	Using percentiles to set the suspension/expulsion-rate bar.	...its suspension/expulsion rate for children with disabilities is equal to or greater than the <i>x</i> percentile.
B4A Example #3	Using standard deviations to set the suspension/expulsion-rate bar.	...its suspension/expulsion rate for children with disabilities is equal to or greater than <i>x</i> standard deviations above the state-level suspension/expulsion rate for children with disabilities.
B4A Example #4a (Comparable to B4A Example #1a)	Using a rate ratio to compare district-level suspension/expulsion rate to the state-level suspension/expulsion rate.	...the rate ratio comparing its suspension/ expulsion rate for children with disabilities to the state-level suspension/expulsion rate for children with disabilities is equal to or greater than <i>x</i> .
B4A Example #4b (Comparable to B4A Example #1b)	Using a rate ratio to compare district-level suspension/expulsion rate to the state mean suspension/expulsion rate.	...the rate ratio comparing its suspension/ expulsion rate for children with disabilities to the state mean suspension/expulsion rate for children with disabilities is equal to or greater than <i>x</i> .

Exhibit 8 Summary of Methods for Identifying Significant Discrepancy for B4A (continued)

Example #	Method	A district has a significant discrepancy when...
Comparison Option 2		
B4A Example #5	Using a rate ratio to compare a district-level suspension/expulsion rate for children with disabilities to the same district's suspension/expulsion rate for children without disabilities.	...the rate ratio comparing its suspension/ expulsion rate for children with disabilities to its suspension/expulsion rate for children without disabilities is equal to or greater than x.
B4A Example #6	Using a rate difference to compare a district-level suspension/expulsion rate for children with disabilities to the same district's suspension/expulsion rate for children without disabilities.	...its suspension/expulsion rate for children with disabilities is x percentage points or more than its suspension/expulsion rate for children without disabilities.

Comparison Option 1: Comparing the Rates of Suspensions/Expulsions for Children with Disabilities Among Districts, or, Equivalently, to a State-Set Suspension/Expulsion-Rate Bar

States may identify a suspension/expulsion rate for children with disabilities that districts should not exceed. This rate can be thought of as a bar. The suspension/expulsion-rate bar should relate to the state-level or state mean or some other measure of the distribution of suspension/expulsion rates throughout the state in order to be congruent with the first approach provided in the SPP/APR instructions. That approach compared the rates of suspensions and expulsions for children with disabilities among districts within the state.

It should be noted that methods described for Comparison Option 1 allow states to identify districts that are significantly discrepant as compared to the overall state-level or state mean suspension/expulsion rate for children with disabilities.

The remainder of this section demonstrates how to determine whether a district is significantly discrepant from other districts in the state by comparing the suspension/expulsion rates of a district's children with disabilities to a state-identified suspension/expulsion-rate bar. It provides examples of three ways to set a bar. In each example, the bar is systematically related to the rates of other districts:

- Using the state-level suspension/expulsion rate or the state mean suspension/expulsion rate (B4A Examples #1a and #1b),
- Using percentiles (B4A Example #2), and
- Using standard deviations (B4A Example #3).

In addition, the state may choose to set a rate ratio bar (B4A Examples #4a and #4b).

Using a State-Level or State Mean Suspension/Expulsion Rate

Some states may choose to compare the district-level suspension/expulsion rate for children with disabilities (Rate #1) to either:

- The state-level suspension/expulsion rate for children with disabilities (Rate #3 from Chapter 3), or to
- The state mean suspension/expulsion rate for children with disabilities (Rate #4 from Chapter 3).

Either of these comparisons can be used as the basis for determining significant discrepancy. B4A Example #1a and B4A Example #1b demonstrate how to make these comparisons. Since these two comparisons are related, the interpretations and considerations are interwoven and appear at the end of B4A Example #1b.

B4A Example #1a: Using the State-Level Suspension/Expulsion Rate for Children with Disabilities to Set the Suspension/Expulsion-Rate Bar

QUESTION

How does District 1's suspension/expulsion rate for children with disabilities compare to the state-level suspension/expulsion rate for children with disabilities?

ANSWER

District 1's suspension/expulsion rate for children with disabilities (21.8%) is higher than the state-level suspension/expulsion rate for children with disabilities (11.7%).

1. Calculate the suspension/expulsion rate for children with disabilities for District 1 (see Rate #1 from Chapter 3). The rate is 21.8%.

District rate

$$\begin{aligned}
 &= \frac{\text{Children with disabilities suspended/expelled in District 1}}{\text{All children with disabilities in District 1}} \times 100 \\
 &= \frac{24}{110} \times 100 \\
 &= 21.8\%
 \end{aligned}$$

2. Calculate the state-level suspension/expulsion rate for children with disabilities for State A (see Rate #3 from Chapter 3). The rate is 11.7%.

State rate

$$\begin{aligned}
 &= \frac{\text{Children with disabilities suspended/expelled in State A}}{\text{All children with disabilities in State A}} \times 100 \\
 &= \frac{759}{6,479} \times 100 \\
 &= 11.7\%
 \end{aligned}$$

3. Use this comparison as a basis for determining significant discrepancy.

B4A Example #1b: Using the State Mean Suspension/Expulsion Rate for Children with Disabilities to Set the Suspension/Expulsion-Rate Bar

QUESTION

How does District 1's suspension/expulsion rate for children with disabilities compare to the mean district-level suspension/expulsion rate for children with disabilities?

1. Calculate the suspension/expulsion rate for children with disabilities for District 1 (see Rate #1 from Chapter 3). The rate is 21.8%.

District rate

$$\begin{aligned}
 &= \frac{\text{Children with disabilities suspended/expelled in District 1}}{\text{All children with disabilities in District 1}} \times 100 \\
 &= \frac{24}{110} \times 100 \\
 &= 21.8\%
 \end{aligned}$$

2. Calculate the state mean suspension/expulsion rate for children with disabilities for State A (see Rate #4 from Chapter 3). The rate is 9.2%.

State mean rate

$$\begin{aligned}
 &= \frac{\text{Sum of the suspension/expulsion rates for children with disabilities}}{\text{Total number of districts in State A}} \\
 &= \frac{73.8\%}{8} \\
 &= 9.2\%
 \end{aligned}$$

3. Use this comparison as a basis for determining significant discrepancy.

ANSWER

District 1's suspension/expulsion rate for children with disabilities (21.8%) is higher than the state mean suspension/expulsion rate for children with disabilities (9.2%).

B4A Examples #1a and #1b: Interpretation

The state-level suspension/expulsion rate for children with disabilities and the state mean suspension/expulsion rate for children with disabilities can be used to set the state suspension/expulsion rate bar. A state using either of these methods would need to calculate a district-level suspension/expulsion rate for children with disabilities for each of its districts and then compare those rates to the state's suspension/expulsion-rate bar. Any district with a rate that is at or above the bar would be identified with a significant discrepancy.

Variation 1: Some states may choose to set the bar by adding a certain number of percentage points to the state-level rate or state mean rate (e.g., any district with a suspension/expulsion rate for children with disabilities that is 3 percentage points or more above the state-level or state mean suspension/expulsion rate for children with disabilities is considered to have a significant discrepancy). In most cases, this will decrease the number of districts that are identified.

Variation 2: Other states may choose to set the bar by multiplying the state-level rate or state mean rate by some number (e.g., any district with a suspension/expulsion rate for children with disabilities that is 1.1 times or more than the state-level suspension/expulsion rate for children with disabilities is considered to have a significant discrepancy), or, equivalently, by setting it at a certain percentage above the calculated rate (e.g., any district with a suspension/expulsion rate for children with disabilities that is 10.0% or more above the state-level suspension/expulsion rate for children with disabilities is considered to have a significant discrepancy). Again, in most cases, this will decrease the number of districts identified.

B4A Examples #1a and #1b: Considerations

Using either the state-level suspension/expulsion rate for children with disabilities or the state mean suspension/expulsion rate for children with disabilities as the state suspension/expulsion-rate bar is a straightforward way to determine significant discrepancy for the state's districts. Using one calculation, a state can set its bar for determining the suspension/expulsion rate for children with disabilities that will be considered a significant discrepancy for every district in the state.

The methods in this section are based on state rates (i.e., the state-level suspension/expulsion rate for children with disabilities or the state mean suspension/expulsion rate for children with disabilities). Each state must decide whether to periodically (e.g., annually) recalculate the bar that is based on this rate or to set the bar in the first year of the SPP/APR and not change it. If the bar is recalculated annually, the state will identify about the same percentage of its districts each year—even if its state-level suspension/expulsion rate for children with disabilities is declining. If the bar is not changed, progress in state-level suspension/expulsion rates is likely to be mirrored by a decrease in the number of districts identified with a significant discrepancy.

Comparisons can be made between these methods (i.e., B4A Examples #1a and #1b) and the rate-ratio methods described in B4A Examples #4a and #4b. For example, using the state-level suspension/expulsion rate for children with disabilities or the mean district-level suspension/expulsion rate for children with disabilities to set the bar is equivalent to the choice of using a rate ratio of 1.0 as the state bar (B4A Examples #4a and #4b). One of the main differences is that methods used in B4A Examples #1a and #1b do not require the calculation of rate ratios for each district.

As noted previously, all methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities at a higher rate than other districts in the state. These methods can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children *without* disabilities.

Using Percentiles

Percentiles can also be used to set the suspension/expulsion-rate bar. When districts are placed in a rank order based on their suspension/expulsion rates for children with disabilities, a percentile can quantify where in the distribution a particular district falls. For example, the median district in this distribution, with an equal number of districts having higher and having lower suspension/expulsion rates for children with disabilities, will be very close to the 50th percentile.⁴ This section shows how to convert the district-level suspension/expulsion rates for children with disabilities to percentiles.

⁴ The median of a list of values always finds the number that is in the "middle of the pack," with an equal number of values above and below the median.

B4A Example #2: Using Percentiles to Set the Suspension/Expulsion-Rate Bar

QUESTION

What percentile is District 1 in State A for suspension/expulsion of children with disabilities? In other words, what percentage of districts in State A have suspension/expulsion rates for children with disabilities lower than District 1?

- Using the data in Exhibit 5 (see Chapter 3), sort the district-level suspension/expulsion rates for children with disabilities in order from lowest to highest.

Sorted from lowest to highest =	
District 4	0.0%
District 6	1.7%
District 8	2.7%
District 7	2.9%
District 3	4.0%
District 2	16.7%
District 1	21.8%
District 5	24.0%

- In the sorted list, find District 1's suspension/expulsion rate for children with disabilities. District 1's suspension/expulsion rate for children with disabilities is 21.8%.

Sorted from lowest to highest =	
District 4	0.0%
District 6	1.7%
District 8	2.7%
District 7	2.9%
District 3	4.0%
District 2	16.7%
District 1	21.8%
District 5	24.0%

- Count the number of districts that have suspension/expulsion rates for children with disabilities that are less than District 1's. In State A, six districts have suspension/expulsion rates for children with disabilities that are less than 21.8%.
- Find the total number of districts. In State A, there are eight districts.
- Divide the number of districts with suspension/expulsion rates for children with disabilities that are less than District 1's by the total number of districts in State A.
- Multiply the quotient by 100 to get a percentage.

Percentile for District 1

$$\begin{aligned}
 &= \frac{\text{Number of districts with rate less than District 1}}{\text{Total number of districts}} \times 100 \\
 &= \frac{6}{8} \times 100 \\
 &= 75.0\%
 \end{aligned}$$

ANSWER

District 1 is in the 75th percentile for suspension/expulsion of children with disabilities in State A. In other words, 75.0% of districts in State A have suspension/expulsion rates for children with disabilities lower than District 1.

B4A Example #2: Interpretation

In order to determine significant discrepancy using percentiles, the state must determine a percentile bar; any district that is at or above that percentile bar would be identified as having a significant discrepancy. For example, if State A sets its bar at the 60th percentile, then District 1 would be identified as having a significant discrepancy. However, if State A set its bar at the 85th percentile, District 1 would not be identified.

B4A Example #2: Considerations

When using percentiles, the state's choice of what percentile to use as the state's bar determines what percentage of the state's districts will be identified as having a significant discrepancy. If, for example, the state chooses the 80th percentile for its suspension/expulsion-rate bar, approximately 20% of the districts included in the analysis will be identified with a significant discrepancy.

Unless the state changes its percentile bar from year to year, the percentage of districts identified will not change even if the state-level suspension/expulsion rate is declining or increasing. Using the prior example, suppose a state chooses the 80th percentile for its bar. It will, by definition, identify about 20% of its districts with a significant discrepancy in the first year. Suppose that every district then reduces its suspension/expulsion rates. In the second year's calculations, this reduction in rates may affect *which* districts are identified, but it will not affect the *percentage* of districts that are identified. In the second year, again, approximately 20% of the districts will be identified. This may be considered a disadvantage in that the same percentage of districts is identified each year, regardless of whether the state is making progress in reducing its overall suspension/expulsion rates.

As noted previously, all methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities at a higher rate than other districts in the state. They can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children *without* disabilities.

Using Standard Deviations

Standard deviations provide a uniform metric that tells something about the spread of a distribution (e.g., the distribution of district-level suspension/expulsion rates for children with disabilities).

When calculating significant discrepancy for B4A, states may choose to use standard deviations to set the suspension/expulsion bar.

B4A Example #3: Using Standard Deviations to Set the Suspension/Expulsion-Rate Bar

QUESTION

How many standard deviations above or below the state mean suspension/expulsion rate for children with disabilities is District 1?

- Using the data in Exhibit 5, calculate the state mean suspension/expulsion rate for children with disabilities (see Rate #4 from Chapter 3) for State A. The state mean suspension/expulsion rate is 9.2%.

State mean rate

$$\begin{aligned}
 &= \frac{\text{Sum of the suspension/expulsion rates for children with disabilities}}{\text{Total number of districts in State A}} \\
 &= \frac{73.8\%}{8} \\
 &= 9.2\%
 \end{aligned}$$

- Calculate each district's deviation from the state mean suspension/expulsion rate for children with disabilities. To calculate the deviations, subtract the state mean suspension/expulsion rate for children with disabilities (9.2%) from each of the eight district-level suspension/expulsion rates for children with disabilities found in Exhibit 5.

Deviation from the mean = district-level rate – state mean rate

District 1:	21.8%	—	9.2%	=	12.6%;
District 2:	16.7%	—	9.2%	=	7.5%;
District 3:	4.0%	—	9.2%	=	-5.2%;
District 4:	0.0%	—	9.2%	=	-9.2%;
District 5:	24.0%	—	9.2%	=	14.8%;
District 6:	1.7%	—	9.2%	=	-7.5%;
District 7:	2.9%	—	9.2%	=	-6.3%;
District 8:	2.7%	—	9.2%	=	-6.5%

- To find the squared deviations from the mean, square each of the deviations from the mean that were calculated in step 2.

Squared deviation from the mean = (deviation from the mean)²

District 1:	12.6 ²	=	158.76;
District 2:	7.5 ²	=	56.25;
District 3:	(-5.2) ²	=	27.04;
District 4:	(-9.2) ²	=	84.64;
District 5:	14.8 ²	=	219.04;
District 6:	(-7.5) ²	=	56.25;
District 7:	(-6.3) ²	=	39.69;
District 8:	(-6.5) ²	=	42.25.

- To find the sum of the squared deviations, add all of the squared deviations from the mean calculated in step 3.

Sum of the squared deviations

$$\begin{aligned}
 &= \text{Sum of all of the squared deviations from the mean} \\
 &= 158.76 + 56.25 + 27.04 + 84.64 + 219.04 + 56.25 + 39.69 + 42.25 \\
 &= 683.92
 \end{aligned}$$

5. To find the standard deviation, divide the sum of the squared deviations calculated in step 4 by one less than the number of districts, then take the square root of the result.

Standard deviation

$$\begin{aligned} &= \sqrt{\frac{\text{Sum of squared deviations}}{(\text{Number of districts} - 1)}} \\ &= \sqrt{\frac{683.92}{(8-1)}} \\ &= \sqrt{\frac{683.92}{7}} \\ &= \sqrt{97.70} \\ &= 9.88 \end{aligned}$$

6. To find how many standard deviations District 1 is above the mean, divide the District 1 deviation from the mean (12.6) by the standard deviation.

Number of standard deviations above the mean

$$\begin{aligned} &= \frac{\text{District deviation from the mean}}{\text{Standard deviation}} \\ &= \frac{12.6}{9.88} \\ &= 1.28 \end{aligned}$$

ANSWER

District 1's suspension/expulsion rate for children with disabilities is 1.28 standard deviations above the state mean suspension/expulsion rate for children with disabilities.

B4A Example #3: Interpretation

A standard deviation tells us how closely a set of data points is clustered around its mean. In this example, in State A, the mean district-level suspension/expulsion rate for children with disabilities is 9.2%, with a standard deviation of 9.88%. This standard deviation is relatively high because the district rates vary widely, from 0% to 24%.

A state may choose to set its suspension/expulsion-rate bar for significant discrepancy by using standard deviation. When using this method, states need to decide how many standard deviations above the mean they want to set their bar. For example, the state might choose to say that all districts that are 2 or more standard deviations above the state mean rate of suspension/expulsion for children with disabilities have a significant discrepancy. In the box below using the state mean rate of 9.2% and the standard deviation of 9.88, 1 standard deviation above the mean would be 19.1% and 2 standard deviations above the mean would be 29.0%.

Exhibit 9 uses the entire set of district suspension/expulsion rates in our fictitious State A (Exhibit 5) to show that if the bar were set at 1 standard deviation above the mean, or 19.1%, then two districts would be significantly discrepant. If the bar was set at 2 standard deviations above the mean or 29.0%, then no districts would be identified since the highest rate in our example is 24.0%.

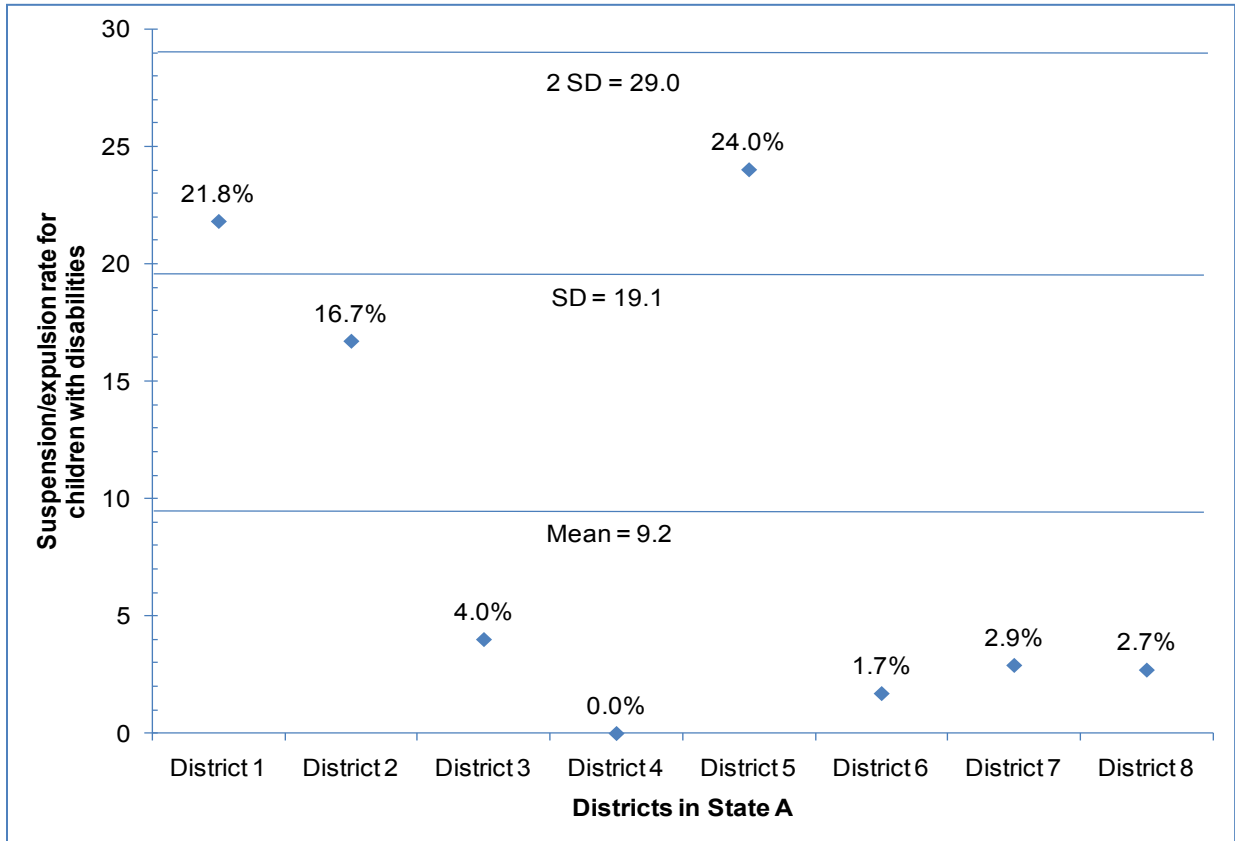
1 standard deviation above the mean

$$\begin{aligned} &= \text{state mean rate} + \text{standard deviation} \\ &= 9.2\% + 9.88 \\ &= 19.1\% \end{aligned}$$

2 standard deviations above the mean

$$\begin{aligned} &= \text{state mean} + 2(\text{standard deviation}) \\ &= 9.2\% + 2(9.88) \\ &= 29.0\% \end{aligned}$$

Exhibit 9 Districts in State A with Suspension/Expulsions Rates 1 and 2 Standard Deviations Above the Mean



B4A Example #3: Considerations

Standard deviations show the variability or spread of the distribution of a set of rates. The greater the spread of rates, the greater the standard deviation will be. Or conversely, if the rates are closely clustered around the mean, then the standard deviation would be smaller. Therefore, standard deviations allow a state to identify districts that are outside the cluster by setting the bar at a state-identified number of standard deviations that a district should not exceed. When deciding whether to set the bar at 1, 2, or 3 standard deviations above the mean, consideration should be given to the amount of spread in the suspension/expulsion rates that exist in the state.

As noted previously, all methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities at a higher rate than other districts in the state. They can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children *without* disabilities.

Using Rate Ratios

States may choose to use ratios to compare the district-level suspension/expulsion rate for children with disabilities to either:

- The state-level suspension/expulsion rate for children with disabilities, or to
- The state mean suspension/expulsion rate for children with disabilities.

In this section, B4A Example #4a and B4A Example #4b demonstrate how to calculate these ratios, referred to as *rate ratios* from this point forward. The interpretations and considerations are interwoven and appear at the end of Example #4b.

B4A Example #4a: Using a Rate Ratio to Compare District-Level Suspension/Expulsion Rates to the State-Level Suspension/Expulsion Rate

The rate ratio equation used to compare district-level suspension/expulsion rates to the state-level suspension/expulsion rates is:

$$\text{Rate ratio} = \frac{\text{District-level suspension/expulsion rate for children with disabilities}}{\text{State-level suspension/expulsion rate for children with disabilities}}$$

QUESTION

What is the suspension/expulsion rate for children with disabilities in District 1 as compared to the state-level suspension/expulsion rate for children with disabilities in State A?

1. Calculate the district-level suspension/expulsion rate for children with disabilities for District 1 (see Rate #1 from Chapter 3). The district-level suspension/expulsion rate for children with disabilities for District 1 is 21.8%

District rate

$$\begin{aligned} &= \frac{\text{Children with disabilities suspended/expelled in District 1}}{\text{All children with disabilities in District 1}} \times 100 \\ &= \frac{24}{110} \times 100 \\ &= 21.8\% \end{aligned}$$

2. Calculate the state-level suspension/expulsion rate for children with disabilities for State A (see Rate #3 from Chapter 3). The state-level suspension/expulsion rate for children with disabilities is 11.7%

State-level rate

$$\begin{aligned} &= \frac{\text{All children with disabilities suspended/expelled in State A}}{\text{All children with disabilities in State A}} \times 100 \\ &= \frac{759}{6,479} \times 100 \\ &= 11.7\% \end{aligned}$$

3. Divide the suspension/expulsion rate for children with disabilities for District 1 by the state-level suspension/expulsion rate children with disabilities for State A.

Rate ratio

$$\begin{aligned} &= \frac{\text{District-level suspension/expulsion rate for children with disabilities in District 1}}{\text{State-level suspension/expulsion rate for children with disabilities in State A}} \\ &= \frac{21.8\%}{11.7\%} \\ &= 1.86 \end{aligned}$$

ANSWER

The suspension/expulsion rate for children with disabilities in District 1 is 1.86 times the state-level suspension/expulsion rate for children with disabilities in State A.

B4A Example #4b: Using a Rate Ratio to Compare District-Level Suspension/Expulsion Rates to the State Mean Suspension/Expulsion Rate

The rate ratio equation used to compare district-level suspension/expulsion rates to the state mean suspension/expulsion rate is:

$$\text{Rate ratio} = \frac{\text{District-level suspension/expulsion rate for children with disabilities}}{\text{State mean suspension/expulsion rate for children with disabilities}}$$

QUESTION

What is the suspension/expulsion rate for children with disabilities in District 1 as compared to the state mean suspension/expulsion rate for all children with disabilities in State A?

1. Calculate the district-level suspension/expulsion rate for children with disabilities for District 1 (see Rate #1 from Chapter 3). The district-level suspension/expulsion rate for children with disabilities for District 1 is 21.8%

District rate

$$\begin{aligned} &= \frac{\text{Children with disabilities suspended/expelled in District 1}}{\text{All children with disabilities in District 1}} \times 100 \\ &= \frac{24}{110} \times 100 \\ &= 21.8\% \end{aligned}$$

2. Calculate the state mean suspension/expulsion rate for children with disabilities in State A (see Rate # 4 from Chapter 3).

State mean rate

$$\begin{aligned} &= \frac{\text{Sum of the suspension/expulsion rates for children with disabilities}}{\text{Total number of districts in State A}} \\ &= \frac{73.8\%}{8} \\ &= 9.2\% \end{aligned}$$

3. Divide the suspension/expulsion rate for children with disabilities for District 1 by the state mean suspension/expulsion rate children with disabilities for State A.

Rate ratio

$$\begin{aligned} &= \frac{\text{District-level suspension/expulsion rate for children with disabilities in District 1}}{\text{State mean suspension/expulsion rate for children with disabilities in State A}} \\ &= \frac{21.8\%}{9.2\%} \\ &= 2.37 \end{aligned}$$

ANSWER

The suspension/expulsion rate for children with disabilities in District 1 is 2.37 times the state mean suspension/expulsion rate for children with disabilities in State A.

B4A Examples #4a and 4b: Interpretation

Rate ratios compare the relative sizes of two rates. B4A Example 4a divides the district-level suspension/expulsion rate for children with disabilities by the state-level suspension/expulsion rate for children with disabilities. B4A Example #4b divides the district-level suspension/expulsion rate for children with disabilities by the state mean suspension/expulsion rate for children with disabilities. In both examples, a rate ratio of 1.00 indicates no difference between the rates. In other words, the district is no more or less likely to suspend/expel children with disabilities than the state overall. A rate ratio greater than 1.00 indicates that the rate for children with disabilities in the district under analysis is greater than the rate for the state overall. A rate ratio less than 1.00 indicates that the rate for children with disabilities in a particular district is less than the rate for the state overall. To give two examples, a rate ratio of 2.00 indicates that children with disabilities in the district are suspended/expelled at twice the rate of children with disabilities in the state overall, while a rate ratio of 0.50 indicates that children with disabilities in the district are suspended/expelled at half the rate of children with disabilities in the state overall.

It is up to the state to pick a rate ratio at or above which a district is identified as having a significant discrepancy. For example, if the state had chosen a rate ratio of 1.5 as its bar, then District 1 in both B4A Examples #4a and #4b would be identified as having a significant discrepancy because its rate ratio is above the bar. If however, the state had chosen a rate ratio of 2.5 as its bar, then District 1 in both B4A Examples #4a and #4b would not be identified as having a significant discrepancy because its rate ratio is below the bar.

B4A Examples #4a and 4b: Considerations

Comparisons can be made between the method described in B4A Examples #1a and #1b and the rate ratio methods described in this section. For example, using the state-level suspension/expulsion rate for children with disabilities or

the mean district-level suspension/expulsion rates for children with disabilities to set the bar is equivalent to the choice of a using a rate ratio of 1.0 as the state bar.

B4A examples #4a and #4b will identify exactly the same districts as corresponding methods from B4A Examples #1a and #1b. For example, State A has a state-level suspension/expulsion rate for children with disabilities of 11.7%.

Consider two methods of setting the bar for significant discrepancy:

1. Any district with a suspension/expulsion rate for children with disabilities that two times or more the state rate ($2 \times 11.7\% = 23.4\%$) has a significant discrepancy (B4A Example #1a).
2. Any district with a suspension/expulsion rate ratio for children with disabilities that 2.0 or greater has a significant discrepancy (B4A Example #4a).

These methods are equivalent in the sense that they will identify exactly the same districts—only District 5 has a suspension/expulsion rate for children with disabilities that at or above 23.4% (see Exhibit 5), and, equivalently, only District 5 has a suspension/expulsion rate ratio for children with disabilities that is 2.0 or greater.

The first method above requires the calculation of each district's suspension/expulsion rate for children with disabilities (see Rate #1 from Chapter 3) followed by the comparison of this rate to a state bar (e.g., 23.4%). The bar is calculated *once* by the state, as described in B4A Example #1a and shown above. The second method also requires the calculation of each district's suspension/expulsion rate for children with disabilities followed by the calculation of the suspension/expulsion rate ratio for *every district*, as described in B4A Example #4a. States may want to take this into consideration when choosing a methodology.

As previously noted, all methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities at a higher rate than other districts in the state. They can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children without disabilities.

Comparison Option 2: Comparing the Rates of Suspensions/Expulsions for Children with Disabilities to the Rates for Children without Disabilities within Each District

The previous section described methods that states might use if they choose to examine significant discrepancies using the first comparison option (i.e., comparing the rates of suspensions/expulsions for children with disabilities among districts within the state). This section describes methods that states might use if they choose to examine significant discrepancies using the second comparison option (i.e., comparing the rates of suspensions/expulsions for children with disabilities to children without disabilities within the districts).

Unlike in the previous section, the methodologies described in this section do not use state-level suspension/expulsion rates. Comparison Option 2 focuses on suspension/expulsion rates within a district by comparing the suspension/expulsion rate of children with disabilities in a district to the suspension/expulsion rate for children without disabilities in the same district. The focus is on rates *within* districts; therefore, it is inappropriate to compare the district-level suspension/expulsion rate for children with disabilities to the state-level suspension/expulsion rate for children without disabilities because this calculation focuses on rates *across or among* districts as opposed to rates within districts.

It should be noted that methods described for Comparison Option 2 allow states to identify districts that are significantly discrepant as compared to the district-level suspension/expulsion rate for children without disabilities. Again, because the focus is on rates within districts, these methods do not address how the suspension/expulsion rates for one district compare to those of other districts within the state.

Comparison Option 2 focuses on comparisons of rates within districts, which makes it work particularly well for states or territories with unitary systems since they are not able to compare rates among districts.

The remainder of this section describes two methodologies that states using Comparison Option 2 may choose to use to compare district-level suspension/expulsion rates for children with disabilities to district-level suspension/expulsion rates for children without disabilities:

- Rate ratios (B4A Example #5),
- Rate differences (B4A Example #6).

Rate Ratio

States may want to compare the suspension/expulsion rate for children with disabilities to the suspension/expulsion rate for children without disabilities within each district by using a rate ratio.

B4A Example #5: Using a Rate Ratio to Compare a District-Level Suspension/Expulsion Rate for Children with Disabilities to the Same District's Suspension/Expulsion Rate for Children without Disabilities

The equation for this rate ratio is:

$$\text{Rate ratio} = \frac{\text{District-level suspension/expulsion rate for children with disabilities}}{\text{District-level suspension/expulsion rate for children without disabilities}}$$

QUESTION

What is the suspension/expulsion rate for children with disabilities in District 1 as compared to the suspension/expulsion rate for children without disabilities in District 1?

1. Calculate the district-level suspension/expulsion rate for children with disabilities for District 1 (see Rate #1 from Chapter 3). The district-level suspension/expulsion rate for children with disabilities for District 1 is 21.8%.

District rate

$$\begin{aligned} &= \frac{\text{Children with disabilities suspended/expelled in District 1}}{\text{All children with disabilities in District 1}} \times 100 \\ &= \frac{24}{110} \times 100 \\ &= 21.8\% \end{aligned}$$

2. Calculate the district-level suspension/expulsion rate for children without disabilities for District 1 (see Rate #2 from Chapter 3). The district-level suspension/expulsion rate for children without disabilities in District 1 is 8.1%.

District rate

$$\begin{aligned} &= \frac{\text{Children without disabilities suspended/expelled in District 1}}{\text{All children without disabilities in District 1}} \times 100 \\ &= \frac{75}{925} \times 100 \\ &= 8.1\% \end{aligned}$$

3. Divide the suspension/expulsion rate for children with disabilities for District 1 by the district-level suspension/expulsion rate for children without disabilities for District 1.

Rate ratio

$$\begin{aligned} &= \frac{\text{District-level suspension/expulsion rate for children with disabilities in District 1}}{\text{District-level suspension/expulsion rate for children without disabilities in District 1}} \\ &= \frac{21.8\%}{8.1\%} \\ &= 2.69 \end{aligned}$$

ANSWER

In District 1, the suspension/expulsion rate for children with disabilities is 2.69 times the suspension/expulsion rate for children without disabilities.

B4A Example #5: Interpretation

This rate ratio compares the relative size of two rates by dividing the district-level suspension/expulsion rate for children with disabilities by the suspension/expulsion rate for children without disabilities in that same district. A rate ratio of 1.00 indicates no difference between the rates. A rate ratio greater than 1.00 indicates that the suspension/expulsion rate for children with disabilities in a particular district is greater than the rate for children without disabilities in that district. A rate ratio less than 1.00 indicates that the suspension/expulsion rate for children with disabilities in a particular district is less than the rate for children without disabilities in that district. To give two specific examples, a rate ratio of 2.00 indicates that children with disabilities are suspended/expelled at twice the rate of children without disabilities in that district, while a rate ratio of 0.5 indicates that children with disabilities are suspended/expelled at half the rate of children without disabilities in that district.

It is up to the state to pick a rate ratio at or above which a district is identified as having a significant discrepancy. For example, if the state had chosen a rate ratio of 1.5 as its bar, then District 1 would be identified as having a significant discrepancy because its rate ratio is above the bar. If, however, the state had chosen a rate ratio of 3.0 as its bar, then District 1 would not be identified as having a significant discrepancy because its rate ratio is below the bar.

B4A Example #5: Considerations

All methods using Comparison Option 2 identify districts within the state that suspend/expel children with disabilities at a higher rate than they suspend children without disabilities. They can say nothing about how either of these rates compares with the corresponding rates in the state's other districts. To use the example above, our calculations tell us that in District 1, children with disabilities are 2.69 times as likely to be suspended/expelled as are children without disabilities—but they tell us nothing about whether children with disabilities are more likely to be suspended/expelled in District 1 than in the state's other districts.

Rate Difference

Another way to compare suspension/expulsion rates is to determine the difference in rates of suspension/expulsion between children with disabilities in a district and children without disabilities in that same district. This comparison shows how far apart the two rates are from each other.

B4A Example #6: Using a Rate Difference to Compare a District-Level Suspension/Expulsion Rate for Children with Disabilities to the Same District's Suspension/Expulsion Rate for Children without Disabilities

The equation for the rate difference is:

$$\text{Rate difference} = \frac{\text{(District-level suspension/expulsion for children with disabilities)}}{\text{(District-level suspension/expulsion rate for children without disabilities)}}$$

QUESTION

What is difference between the suspension/expulsion rates for children with disabilities in District 1 and the suspension/expulsion rate for children without disabilities in District 1?

1. Calculate the district-level suspension/expulsion rate for children with disabilities for District 1 (see Rate #1 from Chapter 3). The district-level suspension/expulsion rate for children with disabilities for District 1 is 21.8%.

District rate

$$\begin{aligned} & \frac{\text{Children with disabilities suspended/expelled in District 1}}{\text{All children with disabilities in District 1}} \times 100 \\ &= \frac{24}{110} \times 100 \\ &= 21.8\% \end{aligned}$$

2. Calculate the district-level suspension/expulsion rate for children without disabilities for District 1 (see Rate #2 from Chapter 3). The district-level suspension/expulsion rate for children without disabilities in District 1 is 8.1%.

District rate

$$\begin{aligned} & \frac{\text{Children without disabilities suspended/expelled in District 1}}{\text{All children without disabilities in District 1}} \times 100 \\ &= \frac{75}{925} \times 100 \\ &= 8.1\% \end{aligned}$$

3. Subtract the district-level suspension/expulsion rate for children without disabilities in District 1 from the district-level suspension/expulsion rate for children with disabilities in District 1. The rate difference is 13.7 percentage points.

Rate difference

$$\begin{aligned} &= \frac{\text{(District-level suspension/expulsion for children with disabilities)}}{\text{(District-level suspension/expulsion rate for children without disabilities)}} \\ &= 21.8\% - 8.1\% \\ &= 13.7 \end{aligned}$$

ANSWER

The difference between the suspension/expulsion rate for children with disabilities in District 1 and the suspension/expulsion rate for children without disabilities in District 1 is 13.7 percentage points.

B4A Example #6: Interpretation

Rate difference tells us how much one rate differs from another—how many percentage points would need to be added to the lower rate to get to the higher rate. A rate difference of 0 would indicate no difference between the two rates. A positive rate difference indicates how much greater the suspension/expulsion rate for children with disabilities in the district is as compared to the suspension/expulsion rate for children without disabilities in that same district. A negative rate difference indicates how much less the suspension/expulsion rate for children with disabilities in the district is as compared to the suspension/expulsion rate for children without disabilities in that same district.

It is up to the state to pick a rate difference to set the bar. Any district that is at or above the rate difference bar would be identified as having a significant discrepancy. For example, if the state had chosen a rate difference of 5 percentage points as its bar, then District 1 would be identified as having a significant discrepancy because its rate difference is above the bar. If however, the state had chosen a rate difference of 15 percentage points as its bar, then District 1 would not be identified as having a significant discrepancy because its rate difference is below the bar.

District A suspends/expels:
16.0% children with disabilities
8.0% children without disabilities

District B suspends/expels:
2.0% of children with disabilities
1.0% of children without disabilities

The rate ratios are:
District A: $16/8=2.0$
District B: $2/1=2.0$

The rate differences are:
District A: $16\%-8\%=8$ percentage points
District B: $2\%-1\%=1$ percentage point

B4A Example #6: Considerations

The rate difference describes how much two rates differ from each other. As described in the previous section, rate ratio compares the relative size of the two rates. For example, suppose in District A, the suspension/expulsion rate for children with disabilities is 16.0% and the suspension/expulsion rate for children without disabilities is 8.0%. In District B, the suspension/expulsion rate for children with disabilities is 2.0% and the suspension/expulsion rate for children without disabilities is 1%. The rate ratios would be the same (2.0) in both cases (i.e., $16.0\%/8.0\% = 2.0$ and $2.0\%/1.0\% = 2.0$). However, the rate differences would be 8 percentage points (i.e., $16.0\%-8.0\%=8$) and 1 percentage point ($2.0\%-1.0\%=1$). The rate difference distinguishes those districts that have high-suspension/expulsion rates from those that have low-suspension/expulsion rates even though the rate ratios are the same. States might want to consider using both of these methods in conjunction since they answer different questions.

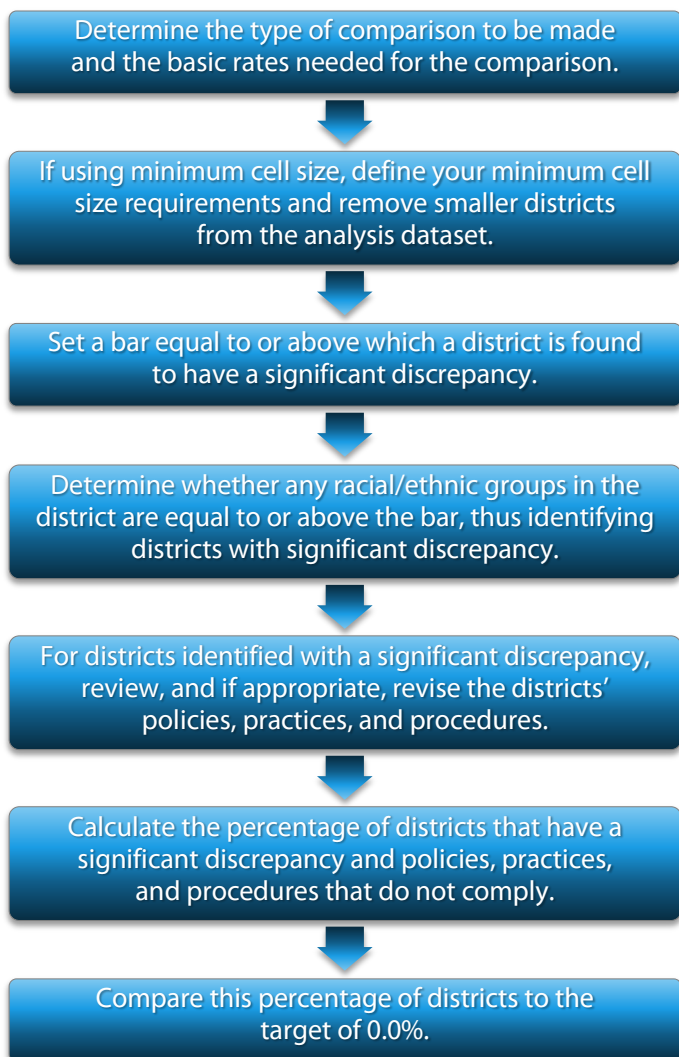
As noted previously, all methods using Comparison Option 2 identify districts within the state that suspend/expel children with disabilities at a higher rate than they suspend children without disabilities. They can say nothing about how either of these rates compares with the corresponding rates in the state's other districts. To use the example above, our calculations tell us that in District 1, the difference between the suspension/expulsion rates for children with disabilities in District 1 and the suspension/expulsion rate for children without disabilities in District 1 is 13.7 percentage points—but they tell us nothing about whether children with disabilities are more likely to be suspended/expelled in District 1 than in the state's other districts.

Chapter 5 Methodologies for Indicator B4B

In this chapter, we discuss methodologies that states may want to consider using to identify whether districts have a significant discrepancy for Indicator B4B. For each method in this section, the TA guide summarizes the question it answers and provides a step-by-step example of how it is calculated. We also include brief discussions of how to interpret the method and some considerations, including some of the similarities and differences between the calculations for Indicator B4 and Indicators B9 and B10 and the requirements related to significant disproportionality.

Overall Steps for Identifying Significant Discrepancy

The following steps can be used to identify significant discrepancy for Indicator B4B.



Types of Comparisons

The measurement for Indicator B4B is:

Percent of districts that have: (a) a significant discrepancy, by race or ethnicity, in the rate of suspensions and expulsions greater than 10 days in a school year for children with IEPs; and (b) policies, procedures, or practices that contribute to the significant discrepancy and do not comply with requirements relating to the development and implementation of IEPs, the use of positive behavioral interventions and supports, and procedural safeguards.

To determine whether a significant discrepancy exists, one of two following comparisons must be used. States may either:

1. Compare the rates of suspensions/expulsions for children with disabilities by race/ethnicity among districts within the state, or
2. Compare the rates of suspensions/expulsions for children with disabilities by race/ethnicity to the rates for children without disabilities within each district.

Within each of these two types of comparisons, several methods of analysis can be used. The first four methods described in this chapter pertain to the first comparison option, and the remaining two methods pertain to the second comparison option.

For Indicator B4B, significant discrepancy is determined in two steps. In Step 1, the state must use a method that uses one of the two comparisons listed above. Second, a policies, practices, and procedures review must be completed for any district identified in Step 1.⁵ Throughout this chapter, when the term significant discrepancy is used, we are referring to Step 1 of this two-step process.

In general, states should establish a single state bar that applies to all race/ethnicities. *Conversely, absent a valid justification for treating different racial/ethnic groups differently, setting separate bars for racial/ethnic groups is unacceptable.*⁶

Exhibit 10 presents a brief overview of the methods discussed in this chapter; each method is then described in more detail.

⁵ There are similarities between the analyses used for Indicators B4B, B9, and B10 and the legal framework employed by the Office for Civil Rights (OCR) when investigating possible violations of Title VI of the Civil Rights Act of 1964 (Title VI), which prohibits discrimination on the basis of race, color, or national origin. However, these similarities should not be taken to imply that a district's lack of identification under one of the IDEA indicators would necessarily show that the district is in compliance with Title VI. OCR conducts its own investigations under Title VI separate from the monitoring undertaken by states pursuant to the IDEA.

⁶ All federal grantees are subject to federal civil rights obligations including Title VI and the Fourteenth Amendment of the United States Constitution, which entitles all persons to equal protection under the law.

Exhibit 10 Summary of Methods for Identifying Significant Discrepancy for B4B

Example #	Method	A district has a significant discrepancy when...
Comparison Option 1		
B4B Example #1a (Comparable to B4B Example #4a)	Using the state-level suspension/ expulsion rate for children with disabilities to set the suspension/ expulsion-rate bar.	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is equal to or higher than the state-level suspension/ expulsion rate for all children with disabilities.
	<ul style="list-style-type: none"> • Variation: Add x percentage points to the state-level suspension/ expulsion rate for children with disabilities to set the suspension/expulsion-rate bar. 	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is x percentage points or more than the state-level suspension/expulsion rate for all children with disabilities.
	<ul style="list-style-type: none"> • Variation: Multiply the state-level suspension/expulsion rate for children with disabilities by x to set the suspension/expulsion-rate bar. 	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is x times or more than the state-level suspension/expulsion rate for children with disabilities. (Expressed with percents...when its suspension/expulsion rate for children with disabilities from any racial/ethnic group is [(x-1)*100] percent or more than the state-level suspension/expulsion rate for all children with disabilities.)
B4B Example #1b (Comparable to B4B Example #4b)	Using the state mean suspension/ expulsion rate for children with disabilities by race/ethnicity to set the suspension/expulsion-rate bar.	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is equal to or greater than the state mean suspension/ expulsion rate for all children with disabilities by race/ethnicity.
	<ul style="list-style-type: none"> • Variation: Add x percentage points to the state mean suspension/ expulsion rate for children with disabilities to set the suspension/expulsion-rate bar. 	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is x percentage point or more than the state mean suspension/expulsion rate for all children with disabilities.
B4B Example #2	Using percentiles to set the suspension/expulsion-rate bar.	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is equal to or greater than the x percentile.
B4B Example #3	Using standard deviations to set the suspension/expulsion-rate bar.	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is equal to or greater than x standard deviations above the state mean suspension/expulsion rate for children with disabilities by race/ ethnicity.
B4B Example #4a (Comparable to B4B Example #1a)	Using a rate ratio to compare district-level suspension/expulsion rates for each racial/ethnic group to the state-level suspension/expulsion rate for all children with disabilities.	...the rate ratio comparing its suspension/ expulsion rate for children with disabilities from any racial/ethnic group to the state-level suspension/expulsion rate for all children with disabilities is equal to or greater than x.
B4B Example #4b (Comparable to B4B Example #1b)	Using a rate ratio to compare district-level suspension/expulsion rates for each racial/ethnic group to the state mean suspension/expulsion rate for children with disabilities by race/ethnicity.	...the rate ratio comparing its suspension/ expulsion rate for children with disabilities from any racial/ethnic group to the state mean suspension/expulsion rate for children with disabilities by race/ethnicity is equal to or greater than x.

Exhibit 10 Summary of Methods for Identifying Significant Discrepancy for B4B (continued)

Example #	Method	A district has a significant discrepancy when...
Comparison Option 2		
B4B Example #5	Using a rate ratio to compare district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group to the same district's suspension/expulsion rate for all children without disabilities.	... the rate ratio comparing its suspension/ expulsion rate for children with disabilities from any racial/ethnic group to its suspension/expulsion rate for all children without disabilities is equal to or greater than x.
B4B Example #6	Using a rate difference to compare district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group to the same district's suspension/expulsion rate for all children without disabilities.	...its suspension/expulsion rate for children with disabilities from any racial/ethnic group is x percentage points or more than its suspension/expulsion rate for all children without disabilities.

Comparison Option 1: Comparing District-Level Suspension/Expulsion Rates for Children with Disabilities from Each Racial/Ethnic Group to a State-Set Suspension/Expulsion-Rate Bar

States should identify a suspension/expulsion rate for children with disabilities that any racial/ethnic group within a district should not exceed. This rate can be thought of as a bar. The suspension/expulsion-rate bar should relate to the state-level suspension/expulsion rate or state mean suspension/expulsion rate or some other measure of the distribution of suspension/expulsion rates throughout the state in order to be congruent with the first approach provided in the SPP/APR instructions. That approach compares the rates of suspensions and expulsions for children with disabilities among districts within the state.

It should be noted that methods described for Comparison Option 1 allow states to identify districts that have higher rates of suspension/expulsion for children with disabilities from any racial/ethnic group as compared to the overall state-level or state mean suspension/expulsion rate for all children with disabilities.

This section demonstrates how to determine whether a district is significantly discrepant by comparing the district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group to a state-identified suspension/expulsion-rate bar. It provides examples of three ways to set a bar. In each example, the bar is systematically related to the rates of other districts:

- Using either the state-level suspension/expulsion rate or state mean suspension/expulsion rate for children with disabilities by race/ethnicity (B4B Examples #1a and #1b),
- Using percentiles (B4B Example #2), and
- Using standard deviations (B4B Example #3).

In addition, the state may choose to set a rate ratio bar (B4B Examples #4a and #4b).

Before discussing these acceptable methods, however, we first discuss a questionable methodology that states should not use for Indicator B4B.



Comparison Option 1 – Questionable Methodology: Different State Bars for Each Racial/Ethnic Group

When using any of the methods discussed in this section to set the suspension/expulsion rate-bar (i.e., the state-level suspension/expulsion rate or state mean suspension/expulsion rate, percentiles, standard deviations, or rate ratios), some states may want to or may inadvertently use a different state bar for each racial/ethnic group.

For example, some states might want to calculate a state-level suspension/expulsion rate for each racial/ethnic group and use those rates to set separate bars for each racial/ethnic group (e.g., the bar for Black or African American children is 10% and the bar for Hispanic/Latino children is 5%, etc.). Furthermore, some states may want to start with these separate bars and then add a percentage to each bar (e.g., a state's definition for significant discrepancy might be "2% higher than the state-level suspension/expulsion rate for each racial/ethnic group"). The addition of the same percentage to each bar does not remove the fact that there are different bars for each racial/ethnic group.

As another example, when using standard deviations, the state may inadvertently calculate separate state mean suspension/expulsion rates and standard deviations for each racial/ethnic group. Again, this approach would result in different bars for each racial/ethnic group.

Absent a valid justification for treating different racial/ethnic groups differently, the Department of Education has stated that it is unacceptable to set a different state bar for each racial/ethnic group.⁷

⁷ All federal grantees are subject to federal civil rights obligations including Title VI and the Fourteenth Amendment of the United States Constitution, which entitles all persons to equal protection under the law.

Using Either the State-Level Suspension/Expulsion Rate or the State Mean Suspension/Expulsion Rate

Some states may choose to compare the district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group (see Rate #5 from Chapter 3) to either:

- The state-level suspension/expulsion rate for children with disabilities (Rate #3 from Chapter 3), or to
- The state mean suspension/expulsion rate for children with disabilities by race/ethnicity (Rate #6 from Chapter 3).

Either of these comparisons can be used as the basis for determining significant discrepancy. B4B Example #1a and B4B Example #1b demonstrate how to make these comparisons. Since these two comparisons are related, the interpretations and considerations are interwoven and appear at the end of B4B Example #1b.

B4B Example #1a: Using the State-Level Suspension/Expulsion Rate for Children with Disabilities to Set the Suspension/Expulsion-Rate Bar

QUESTION

How does District 1's suspension/expulsion rate for Black or African American children with disabilities compare to the state-level suspension/expulsion rate for all children with disabilities?

ANSWER

District 1's suspension/expulsion rate for Black or African American children with disabilities (10.0%) is lower than the state-level suspension/expulsion rate for all children with disabilities (11.7%).

1. Calculate the suspension/expulsion rate for Black or African American children with disabilities for District 1 (see Rate #5 from Chapter 3). The rate is 10.0%.

District rate

$$\begin{aligned}
 & \frac{\text{Black or African American children with disabilities suspended/expelled in District 1}}{\text{Black or African American children with disabilities in District 1}} \times 100 \\
 &= \frac{3}{30} \times 100 \\
 &= 10.0\%
 \end{aligned}$$

2. Calculate the state-level suspension/expulsion rate for children with disabilities for State A (see Rate #3 from Chapter 3). The rate is 11.7%.

State rate

$$\begin{aligned}
 & \frac{\text{Children with disabilities suspended/expelled in State A}}{\text{All children with disabilities in State A}} \times 100 \\
 &= \frac{759}{6,479} \times 100 \\
 &= 11.7\%
 \end{aligned}$$

3. Use this comparison as a basis for determining significant discrepancy.

B4B Example #1b: Using the State Mean Suspension/Expulsion Rate for Children with Disabilities by Race/Ethnicity to Set the Suspension/Expulsion-Rate Bar

QUESTION

How does District 1's suspension/expulsion rate for Black or African American children with disabilities compare to the state mean suspension/expulsion rate for children with disabilities by race/ethnicity?

ANSWER

District 1's suspension/expulsion rate for Black or African American children with disabilities (10.0%) is equal to the state mean suspension/expulsion rate for children with disabilities by race/ethnicity (10.0%).

1. Calculate the suspension/expulsion rate for Black or African American children with disabilities for District 1 (see Rate #5 from Chapter 3). The rate is 10.0%.

District rate

$$\begin{aligned}
 &= \frac{\text{Black or African American children with disabilities suspended/expelled in District 1}}{\text{Black or African American children with disabilities in District 1}} \times 100 \\
 &= \frac{3}{30} \times 100 \\
 &= 10.0\%
 \end{aligned}$$

2. Calculate the state mean suspension/expulsion rate for children with disabilities by race/ethnicity for State A (see Rate #6 from Chapter 3). The rate is 10.0%.

State rate

$$\begin{aligned}
 &= \frac{\text{Sum of the suspension/expulsion rates for children with disabilities by race/ethnicity}}{\text{Total number of rates calculated for State A}} \\
 &= \frac{471.3\%}{47} \\
 &= 10.0\%
 \end{aligned}$$

3. Use this comparison as a basis for determining significant discrepancy.

B4B Examples #1a and #1b: Interpretation

The state-level suspension/expulsion rate for children with disabilities and the state mean suspension/expulsion rate for children with disabilities by race/ethnicity can be used to set the state suspension/ expulsion-rate bar. A state using either of these methods would need to calculate district-level suspension/expulsion rates for children with disabilities for each racial/ethnic group. The state would then compare each of those rates to the state's suspension/expulsion rate-bar. Any district where the suspension/expulsion rate for any racial/ethnic group is equal to or above the bar would be identified as having a significant discrepancy.

Variation 1: Some states may choose to set the bar by adding a certain number of percentage points to the state-level or state mean rate (e.g., any district with a suspension/expulsion rate for children with disabilities in any racial/ethnic group that three percentage points or more above the state-level suspension/expulsion rate for children with disabilities is considered to have a significant discrepancy). In most cases, this will decrease the number of districts that are identified.

Variation 2: Other states may choose to set the bar by multiplying the state-level or state mean rate by some number (e.g., any district with a suspension/expulsion rate for children with disabilities in any racial/ethnic group that is 1.1 times or more the state-level suspension/ expulsion rate for children with disabilities is considered to have a significant discrepancy), or, equivalently, by setting it at a certain percentage above the calculated rate (e.g., any district with a suspension/expulsion rate for children with disabilities in any racial/ethnic group that is 10% or more above the state-level suspension/ expulsion rate for children with disabilities is considered to have a significant discrepancy). Again, in most cases, this will decrease the number of districts identified.

B4B Examples 1a and 1b: Considerations

Using either the state-level suspension/expulsion rate for all children with disabilities or the state mean suspension/ expulsion rate for children with disabilities by race/ethnicity as the state suspension/ expulsion-rate bar is an allowable method for determining significant discrepancy for Indicator B4B. Using one calculation, a state can set its bar for determining the suspension/expulsion rate that will be considered a significant discrepancy for every racial/ethnic group in every district in the state.

The methods in this section are based on state rates (i.e., the state-level suspension/expulsion rate for children with disabilities or the state mean suspension/expulsion rate for children with disabilities by race/ethnicity). Each state must decide whether to periodically (e.g., annually) recalculate the bar that is based on these rates or to set the bar in the first year of the SPP/APR and not change it. If the bar is recalculated annually, the state will identify about the same percentage of its districts each year, even if its state-level suspension/expulsion rate for all children with disabilities is declining. If the bar is not changed, progress in the state-level suspension/expulsion rate is likely to be mirrored by a decrease in the number of districts identified with a significant discrepancy.

Comparisons can be made between these methods (i.e., B4B Examples #1a and #1b) and the rate-ratio methods described in B4B Examples #4a and #4b. For example, using the state-level suspension/ expulsion rate for children with disabilities or the state mean suspension/expulsion rates for children with disabilities by race/ethnicity to set the bar is equivalent to the choice of using a rate ratio of 1.0 as the state bar (B4B Examples #4a and #4b). One of the main differences is that methods used in B4B Examples #1a and #1b do not require the calculation of rate ratios for each racial/ethnic group for each district.

As noted previously, all Indicator B4B methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities from any racial/ethnic group at a higher rate than other districts in the state. These methods can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children *without* disabilities.

Using Percentiles

Percentiles can also be used to set the suspension/expulsion-rate bar. When district-level suspension/expulsion rates for children with disabilities by race/ethnicity are placed in rank order, a percentile can quantify where in the distribution a particular suspension/expulsion rate falls. For example, the median suspension/expulsion rate in this distribution, with an equal number of rates being higher or lower, will be very close to the 50th percentile.⁸ B4B Example #2 shows how to define significant discrepancy by using percentiles and the distribution of district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group.

⁸ The median of a list of values always finds the number that is in the "middle of the pack," with an equal number of values above and below the median.

B4B Example #2: Using Percentiles to Set the Suspension/Expulsion-Rate Bar

QUESTION

What percentile is District 1 in State A for suspension/expulsion of White children with disabilities? In other words, what percentage of suspension/expulsion rates for children with disabilities by race/ethnicity in State A are higher than the rate for White children with disabilities in District 1?

- Using the data in Exhibit 7 (see Chapter 3), sort the district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group in order from lowest to highest.

Sorted from lowest to highest=		
District 1	American Indian or Alaska Native	0.0%
District 1	Native Hawaiian or Other Pacific Islander	0.0%
District 3	American Indian or Alaska Native	0.0%
District 3	Asian	0.0%
District 3	Hispanic/Latino	0.0%
District 3	Two or More Races	0.0%
District 4	Asian	0.0%
District 4	Black or African American	0.0%
District 4	Hispanic/Latino	0.0%
District 6	Asian	0.0%
District 6	Black or African American	0.0%
District 6	Hispanic/Latino	0.0%
District 6	Native Hawaiian or Other Pacific Islander	0.0%
District 6	Two or More Races	0.0%
District 7	Native Hawaiian or Other Pacific Islander	0.0%
District 8	Asian	0.0%
District 8	Black or African American	0.0%
District 8	Two or More Races	0.0%
District 7	White	1.9%
District 7	Black or African American	2.4%
District 7	Hispanic/Latino	2.8%
District 7	Two or More Races	3.1%
District 8	White	3.3%
District 8	Hispanic/Latino	4.0%
District 7	American Indian or Alaska Native	4.6%

Sorted from lowest to highest=		
District 3	Black or African American	5.0%
District 6	White	5.9%
District 3	White	6.7%
District 7	Asian	8.0%
District 1	Black or African American	10.0%
District 5	Native Hawaiian or Other Pacific Islander	10.3%
District 2	Hispanic/Latino	10.5%
District 5	Asian	11.1%
District 2	Asian	13.3%
District 2	Two or More Races	13.3%
District 5	Black or African American	14.2%
District 5	American Indian or Alaska Native	15.4%
District 5	Hispanic/Latino	18.9%
District 2	Black or African American	19.2%
District 1	Asian	20.0%
District 2	White	20.0%
District 1	White	23.8%
District 1	Hispanic/Latino	28.6%
District 5	White	31.3%
District 2	American Indian or Alaska Native	40.0%
District 1	Two or More Races	44.4%
District 5	Two or More Races	79.3%

- In the sorted list, find the suspension/expulsion rate for White children with disabilities in District 1. District 1's suspension/expulsion rate for White children with disabilities is 23.8%.
- Count the number of district-level suspension/expulsion rates for children with disabilities by race/ethnicity that are less than the suspension/expulsion rate for White children with disabilities in District 1. In State A, 41 district-level suspension/expulsion rates for children with disabilities by race/ethnicity are less than 23.8%.

4. Find the total number of district-level suspension/expulsion rates for children with disabilities by race/ethnicity. In State A, there are 47 district-level suspension/expulsion rates for children with disabilities by race/ethnicity.
5. Divide the total number of district-level suspension/expulsion rates by race/ethnicity that are less than the suspension/expulsion rate for White children with disabilities in District 1 by the total number of district-level suspension/expulsion rates for children with disabilities by race/ethnicity.
6. Multiply the quotient by 100 to get a percentage.

Percentile

$$\begin{aligned} & \frac{\text{Number of district-level suspension/expulsion rates} \\ & \quad \text{by race/ethnicity less than the rate for White} \\ & \quad \text{children in District 1}}{\text{Total number of district-level suspension/expulsion} \\ & \quad \text{rates by race/ethnicity}} \times 100 \\ &= \frac{41}{47} \times 100 \\ &= 87.2\% \end{aligned}$$

ANSWER

The suspension/expulsion rate for White children with disabilities in District 1 is in the 87th percentile for suspension/expulsion of children with disabilities by race/ethnicity in State A. In other words, 87% of the district-level suspension/expulsion rates for children with disabilities by race/ethnicity in State A are lower than the rate for White children with disabilities in District 1.

B4B Example #2: Interpretation

B4B Example #2 shows how to identify a significant discrepancy for districts by using percentiles and the distribution of district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group. In order to determine significant discrepancy using percentiles, the state must determine a percentile bar. If the suspension/expulsion rate for any racial/ethnic group in a district is equal to or above the percentile identified by the state, then that district would be identified as having a significant discrepancy.

B4B Example #2: Considerations

When using percentiles, the state's choice of what percentile to use as the state bar determines the percentage of district-level suspension/expulsion rates for children with disabilities by race/ethnicity that are identified. If, for example, the state chooses the 80th percentile for its suspension/expulsion rate bar, approximately 20% of the district-level suspension/expulsion rates would be at or above the bar. This is different from the percentile methodology for B4A, which identifies the percentage of *districts* that are at or above the bar. Because the percentile methodology for B4B identifies district-level suspension/expulsion rates for specific racial/ethnic groups that are at or above the state bar, multiple racial/ethnic groups within a district could be identified. This means that although 20% of the district-level suspension/expulsion rates will be identified, it will likely not translate into 20% of the state's districts being identified.

If the state keeps the same percentile bar from year to year, the percentage of district-level suspension/expulsion rates in the state that are identified for Indicator B4B will not change very much. This is true even if the state mean suspension/expulsion rate is declining or increasing. For example, suppose a state chooses the 75th percentile for its bar. It will, by definition, identify about 25% of its district-level suspension/expulsion rates in the first year. Suppose that every district then reduces its suspension/expulsion rates. In the second year's calculations, this reduction in rates may affect *which* district-level suspension/expulsion rates are identified for Indicator B4B, but it will not affect

the *percentage* of rates that are identified. In the second year, again, approximately 25% of the district-level suspension/expulsion rates will be identified. Therefore, the percentage of *districts* identified with a significant discrepancy may vary from year to year even though the percentage of *rates* identified stays the same.

As noted previously, all Indicator B4B methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities from any racial/ethnic group at a higher rate than other districts in the state. These methods can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children without disabilities.

Using Standard Deviations

Standard deviations provide a uniform metric that tells something about the spread of a distribution (e.g., the distribution of district-level suspension/expulsion rates for children with disabilities by race/ethnicity).

When calculating significant discrepancy, states may choose to use standard deviations to set the bar.

B4B Example #3: Using Standard Deviations to Set the Suspension/Expulsion-Rate Bar

QUESTION

How many standard deviations above or below the state mean suspension/expulsion rate for children with disabilities by race/ethnicity is the suspension/expulsion rate for White children with disabilities in District 1?

1. Calculate the state mean suspension/expulsion rate for children with disabilities by race/ethnicity for State A (see Rate #6 from Chapter 3). The rate is 10.0%.

State rate

$$\begin{aligned}
 &= \frac{\text{Sum of the suspension/expulsion rates for children with disabilities by race/ethnicity}}{\text{Total number of rates calculated for State A}} \\
 &= \frac{471.3\%}{47} \\
 &= 10.0\%
 \end{aligned}$$

2. Calculate the deviation of each individual rate from the state mean rate. To calculate the deviations, subtract the state mean rate (10.0%) from each of the 47 district-level suspension/expulsion rates found in Exhibit 7.

Deviation from the mean = district-level rate for racial/ethnic group – state mean rate		
District 1	American Indian or Alaska Native	0.0% - 10.0% = -10.0%
District 1	Asian	20.0% - 10.0% = 10.0%
District 1	Black or African American	10.0% - 10.0% = 0.0%
District 1	Hispanic/Latino	28.6% - 10.0% = 18.6%
District 1	Native Hawaiian or Other Pacific Islander	0.0% - 10.0% = -10.0%
District 1	White	23.8% - 10.0% = 13.8%
District 1	Two or More Races	44.4% - 10.0% = 34.4%
District 2	American Indian or Alaska Native	40.0% - 10.0% = 30.0%
District 2	Asian	13.3% - 10.0% = 3.3%
District 2	Black or African American	19.2% - 10.0% = 9.2%
District 2	Hispanic/Latino	10.5% - 10.0% = 0.5%
District 2	White	20.0% - 10.0% = 10.0%

Deviation from the mean = district-level rate for racial/ethnic group – state mean rate		
District 2	Two or More Races	13.3% - 10.0% = 3.3%
District 3	American Indian or Alaska Native	0.0% - 10.0% = -10.0%
District 3	Asian	0.0% - 10.0% = -10.0%
District 3	Black or African American	5.0% - 10.0% = -5.0%
District 3	Hispanic/Latino	0.0% - 10.0% = -10.0%
District 3	White	6.7% - 10.0% = -3.3%
District 3	Two or More Races	0.0% - 10.0% = -10.0%
District 4	Asian	0.0% - 10.0% = -10.0%
District 4	Black or African American	0.0% - 10.0% = -10.0%
District 4	Hispanic/Latino	0.0% - 10.0% = -10.0%
District 5	American Indian or Alaska Native	15.4% - 10.0% = 5.4%
District 5	Asian	11.1% - 10.0% = 1.1%
District 5	Black or African American	14.2% - 10.0% = 4.2%
District 5	Hispanic/Latino	18.9% - 10.0% = 8.9%
District 5	Native Hawaiian or Other Pacific Islander	10.3% - 10.0% = 0.3%
District 5	White	31.3% - 10.0% = 21.3%
District 5	Two or More Races	79.3% - 10.0% = 69.3%
District 6	Asian	0.0% - 10.0% = -10.0%
District 6	Black or African American	0.0% - 10.0% = -10.0%
District 6	Hispanic/Latino	0.0% - 10.0% = -10.0%
District 6	Native Hawaiian or Other Pacific Islander	0.0% - 10.0% = -10.0%
District 6	White	5.9% - 10.0% = -4.1%
District 6	Two or More Races	0.0% - 10.0% = -10.0%
District 7	American Indian or Alaska Native	4.6% - 10.0% = -5.4%
District 7	Asian	8.0% - 10.0% = -2.0%
District 7	Black or African American	2.4% - 10.0% = -7.6%
District 7	Hispanic/Latino	2.8% - 10.0% = -7.2%
District 7	Native Hawaiian or Other Pacific Islander	0.0% - 10.0% = -10.0%
District 7	White	1.9% - 10.0% = -8.1%
District 7	Two or More Races	3.1% - 10.0% = -6.9%
District 8	Asian	0.0% - 10.0% = -10.0%
District 8	Black or African American	0.0% - 10.0% = -10.0%
District 8	Hispanic/Latino	4.0% - 10.0% = -6.0%
District 8	White	3.3% - 10.0% = -6.7%
District 8	Two or More Races	0.0% - 10.0% = -10.0%

3. To find the squared deviations from the mean, square each of the deviations from the mean calculated in step 2.

Squared deviation from the mean = (deviation from the mean) ²		
District 1	American Indian or Alaska Native	-10.0 ² = 100.0
District 1	Asian	10.0 ² = 100.0
District 1	Black or African American	0.0 ² = 0.0
District 1	Hispanic/Latino	18.6 ² = 346.0
District 1	Native Hawaiian or Other Pacific Islander	10.0 ² = 100.0
District 1	White	13.8 ² = 190.4
District 1	Two or More Races	34.4 ² = 1183.4
District 2	American Indian or Alaska Native	30.0 ² = 900.0
District 2	Asian	3.3 ² = 10.9
District 2	Black or African American	9.2 ² = 84.6
District 2	Hispanic/Latino	0.5 ² = 0.3
District 2	White	10.0 ² = 100.0
District 2	Two or More Races	3.3 ² = 10.9
District 3	American Indian or Alaska Native	-10.0 ² = 100.0
District 3	Asian	-10.0 ² = 100.0
District 3	Black or African American	-5.0 ² = 25.0
District 3	Hispanic/Latino	-10.0 ² = 100.0
District 3	White	-3.3 ² = 10.9
District 3	Two or More Races	-10.0 ² = 100.0
District 4	Asian	-10.0 ² = 100.0
District 4	Black or African American	-10.0 ² = 100.0
District 4	Hispanic/Latino	-10.0 ² = 100.0
District 5	American Indian or Alaska Native	5.4 ² = 29.2
District 5	Asian	1.1 ² = 1.2
District 5	Black or African American	4.2 ² = 17.6
District 5	Hispanic/Latino	8.9 ² = 79.2
District 5	Native Hawaiian or Other Pacific Islander	0.3 ² = 0.1
District 5	White	21.3 ² = 453.7
District 5	Two or More Races	69.3 ² = 4802.5
District 6	Asian	-10.0 ² = 100.0
District 6	Black or African American	-10.0 ² = 100.0
District 6	Hispanic/Latino	-10.0 ² = 100.0
District 6	Native Hawaiian or Other Pacific Islander	-10.0 ² = 100.0
District 6	White	-4.1 ² = 16.8
District 6	Two or More Races	-10.0 ² = 100.0
District 7	American Indian or Alaska Native	-5.4 ² = 29.2
District 7	Asian	-2.0 ² = 4.0
District 7	Black or African American	-7.6 ² = 57.8
District 7	Hispanic/Latino	-7.2 ² = 51.8

Squared deviation from the mean = (deviation from the mean) ²		
District 7	Native Hawaiian or Other Pacific Islander	-10.0 ² = 100.0
District 7	White	-8.1 ² = 65.6
District 7	Two or More Races	-6.9 ² = 47.6
District 8	Asian	-10.0 ² = 100.0
District 8	Black or African American	-10.0 ² = 100.0
District 8	Hispanic/Latino	-6.0 ² = 36.0
District 8	White	-6.7 ² = 44.9
District 8	Two or More Races	-10.0 ² = 100.0

4. To find the sum of the squared deviations, add all of the squared deviations from the mean calculated in step 3.

Sum of the squared deviations

$$\begin{aligned}
 &= \text{Sum of all of the squared deviations from the mean} \\
 &= 100.0 + 100.0 + 0.0 + 346.0 + 100.0 + 190.4 + 1183.4 + 900.0 + 10.9 + 84.6 + 0.3 + 100.0 + 10.9 + 100.0 + 100.0 + 25.0 + 100.0 + 10.9 + 100.0 + 100.0 + 100.0 + 29.2 + 1.2 + 17.6 + 79.2 + 0.1 + 453.7 + 4802.5 + 100.0 + 100.0 + 100.0 + 100.0 + 16.8 + 100.0 + 29.2 + 4.0 + 57.8 + 51.8 + 100.0 + 65.6 + 47.6 + 100.0 + 100.0 + 36.0 + 44.9 + 100.0 \\
 &= 10,499.6
 \end{aligned}$$

5. To find the standard deviation, divide the sum of the squared deviations calculated in step 4 by one less than the number of district-level suspension/expulsion rates (47), then take the square root of the result.

Standard deviation

$$\begin{aligned}
 &= \sqrt{\frac{\text{Sum of squared deviations}}{(\text{Number of rates} - 1)}} \\
 &= \sqrt{\frac{10,499.6}{(47-1)}} \\
 &= \sqrt{\frac{10,499.6}{46}} \\
 &= \sqrt{228.3} \\
 &= 15.1
 \end{aligned}$$

6. To find how many standard deviations above (or below) the mean the suspension/expulsion rate for White children with disabilities in District 1 is, divide the deviation from the mean for White children with disabilities (13.8) by the standard deviation.

Number of standard deviations above the mean

$$= \frac{\text{Deviation from the mean for White children with disabilities}}{\text{Standard deviation}}$$

$$= \frac{13.8}{15.1}$$

$$= 0.91$$

ANSWER

The suspension/expulsion rate for White children with disabilities in District 1 is 0.91 standard deviations above the state mean suspension/expulsion rate for children with disabilities by race/ethnicity.

B4B Example #3: Interpretation

A standard deviation tells us how closely a set of data points is clustered around its mean. In this example, in State A, the state mean suspension/expulsion rate for children with disabilities by race/ethnicity is 10.0%, with a standard deviation of 15.1%. This standard deviation is high compared to the mean because the district-level suspension/expulsion rates vary widely, from 0.0% to 79.3%, with many at 0.0%.

A state may choose to set its suspension/expulsion-rate bar for significant discrepancy by using standard deviation. When using this method, states need to decide how many standard deviations above the mean they want to set their bar. For example, the state might choose to say that any district where the suspension/expulsion rate for children with disabilities from one or more racial/ethnic groups is 2 or more standard deviations above the state mean has a significant discrepancy. In the box below, using the state mean of 10.0% and the standard deviation of 15.1%, 1 standard deviation above the mean would be 25.1%, and 2 standard deviations above the mean would be 40.2%.

A state using this method would need to calculate a district-level suspension/expulsion rate for each racial/ethnic group and then compare those rates to the standard deviation bar. For example, looking at the entire set of district-level suspension/expulsion rates by race/ethnicity in our fictitious State A (see Exhibit 7), if the bar were set at 1 standard deviation above the mean, or 25.1%, then three districts (Districts 1, 2, and 5) would be identified (see shaded cells below).

1 standard deviation above the mean

= state mean rate, by race + standard deviation

= 10.0% + 15.1

= 25.1%

2 standard deviations above the mean

= state mean rate, by race + 2(standard deviation)

= 10.0% + 2(15.1)

= 40.2%

District	American Indian or Alaska Native	Asian	Black or African American	Hispanic/Latino	Native Hawaiian or Other Pacific Islander	White	Two or More Races
District 1	0.0%	20.0%	10.0%	28.6%	0.0%	23.8%	44.4%
District 2	40.0%	13.3%	19.2%	10.5%	*	20.0%	13.3%
District 3	0.0%	0.0%	5.0%	0.0%	*	6.7%	0.0%
District 4	*	0.0%	0.0%	0.0%	*	*	*
District 5	15.4%	11.1%	14.2%	18.9%	10.3%	31.3%	79.3%
District 6	*	0.0%	0.0%	0.0%	0.0%	5.9%	0.0%
District 7	4.6%	8.0%	2.4%	2.8%	0.0%	1.9%	3.1%
District 8	*	0.0%	0.0%	4.0%	*	3.3%	0.0%

If the bar was set at 2 standard deviations above the mean, or 40.2%, 2 districts (Districts 1 and 5) would be identified (see shaded cells below).

District	American Indian or Alaska Native	Asian	Black or African American	Hispanic/Latino	Native Hawaiian or Other Pacific Islander	White	Two or More Races
District 1	0.0%	20.0%	10.0%	28.6%	0.0%	23.8%	44.4%
District 2	40.0%	13.3%	19.2%	10.5%	*	20.0%	13.3%
District 3	0.0%	0.0%	5.0%	0.0%	*	6.7%	0.0%
District 4	*	0.0%	0.0%	0.0%	*	*	*
District 5	15.4%	11.1%	14.2%	18.9%	10.3%	31.3%	79.3%
District 6	*	0.0%	0.0%	0.0%	0.0%	5.9%	0.0%
District 7	4.6%	8.0%	2.4%	2.8%	0.0%	1.9%	3.1%
District 8	*	0.0%	0.0%	4.0%	*	3.3%	0.0%

B4B Example #3: Considerations

Standard deviations show the variability or spread of the distribution of a set of numbers (in this case, rates). The greater the spread of rates, the greater the standard deviations will be. Or conversely, if the rates are closely clustered around the mean, then the standard deviation will be smaller. Therefore, standard deviations allow a state to identify which districts have suspension/expulsion rates for children with disabilities from one or more racial/ethnic groups that are outside the cluster. When deciding whether to set the bar at 1, 2, or some other number of standard deviations above the mean, consideration should be given to the amount of spread in the suspension/expulsion rates that exist in the state.

As noted previously, all Indicator B4B methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities from any racial/ethnic group at a higher rate than other districts in the state. These methods can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children without disabilities.

Using Rate Ratios

States may choose to use ratios to compare the district-level suspension/expulsion rate for each racial/ethnic group to either:

- The state-level suspension/expulsion rate for all children with disabilities, or to
- The state mean suspension/expulsion rate for children with disabilities by race/ethnicity.

In this section, B4B Example #4a and B4B Example #4b demonstrate how to calculate these ratios, referred to hereafter as *rate ratios*. The interpretations and considerations are interwoven and appear at the end of B4B Example #4b.

B4B Example #4a: Using a Rate Ratio to Compare the District-Level Suspension/Expulsion Rates for Children with Disabilities from Each Racial/Ethnic Group to the State-Level Suspension/Expulsion Rate for All Children with Disabilities

The rate ratio equation used to compare the district-level suspension/expulsion rates for each race/ethnic group to the state-level suspension/expulsion rate is:

$$\text{Rate ratio} = \frac{\text{District-level suspension/expulsion rate for children with disabilities from a racial/ethnic group}}{\text{State-level suspension/expulsion rate for all children with disabilities}}$$

QUESTION

What is the suspension/expulsion rate for Black or African American children with disabilities in District 1 as compared to the state-level suspension/expulsion rate for all children with disabilities in State A?

1. Calculate the suspension/expulsion rate for Black or African American children with disabilities in District 1 (see Rate #5 from Chapter 3). The rate is 10.0%.

District rate

$$\begin{aligned} &= \frac{\text{Black or African American children with disabilities suspended/expelled in District 1}}{\text{Black or African American children with disabilities in District 1}} \times 100 \\ &= \frac{3}{30} \times 100 \\ &= 10.0\% \end{aligned}$$

2. Calculate the state-level suspension/expulsion rate for all children with disabilities for State A (see Rate #3 from Chapter 3). The rate is 11.7%.

State rate

$$\begin{aligned} &= \frac{\text{Children with disabilities suspended/expelled in State A}}{\text{All children with disabilities in State A}} \times 100 \\ &= \frac{759}{6,479} \times 100 \\ &= 11.7\% \end{aligned}$$

3. Divide the suspension/expulsion rate for Black or African American children with disabilities in District 1 by the state-level suspension/expulsion rate for all children with disabilities for State A.

Rate ratio

$$\begin{aligned} &= \frac{\text{District-level suspension/expulsion rate for Black or African American children with disabilities in District 1}}{\text{State-level suspension/expulsion rate for all children with disabilities in State A}} \\ &= \frac{10.0\%}{11.7\%} \\ &= 0.85 \end{aligned}$$

ANSWER

The suspension/expulsion rate for Black or African American children with disabilities in District 1 is 0.85 times the state-level suspension/expulsion rate for all children with disabilities in State A.

B4B Example #4b: Using a Rate Ratio to Compare the District-Level Suspension/Expulsion Rates for Children with Disabilities From Each Racial/Ethnic Group to the State Mean Suspension/Expulsion Rate for Children with Disabilities by Race/Ethnicity

The rate ratio equation used to compare the district-level suspension/expulsion rates for each racial/ethnic group to the state mean suspension/expulsion rate for children with disabilities by race/ethnicity is:

$$\text{Rate ratio} = \frac{\text{District-level suspension/expulsion rate for children with disabilities from racial/ethnic group}}{\text{State mean suspension/expulsion rate for children with disabilities}}$$

QUESTION

What is the suspension/expulsion rate for Black or African American children with disabilities in District 1 as compared to the state mean suspension rate for all children with disabilities by race/ethnicity in State A?

1. Calculate the suspension/expulsion rate for Black or African American children with disabilities for District 1 (see Rate #5 from Chapter 3). The rate is 10.0%.

District rate

$$\begin{aligned} &= \frac{\text{Black or African American children with disabilities suspended/expelled in District 1}}{\text{Black or African American children with disabilities in District 1}} \times 100 \\ &= \frac{3}{30} \times 100 \\ &= 10.0\% \end{aligned}$$

2. Calculate the state mean suspension/expulsion rate for children with disabilities by race/ethnicity for State A (see Rate #6 from Chapter 3). The rate is 10.0%.

State rate

$$\begin{aligned} &= \frac{\text{Sum of the suspension/expulsion rates for children with disabilities by race/ethnicity}}{\text{Total number of rates calculated for State A}} \\ &= \frac{471.3\%}{47} \\ &= 10.0\% \end{aligned}$$

3. Divide the suspension/expulsion rate for Black or African American children with disabilities in District 1 by the state mean suspension/expulsion rate for children with disabilities by race/ethnicity for State A.

Rate ratio

$$\begin{aligned} &= \frac{\text{District-level suspension/expulsion rate for Black or African American children with disabilities in District 1}}{\text{State mean suspension/expulsion rate for children with disabilities by race/ethnicity in State A}} \\ &= \frac{10\%}{10\%} \\ &= 1.0 \end{aligned}$$

ANSWER

The suspension/expulsion rate for Black or African American children with disabilities in District 1 is 1.0 times the state mean suspension/expulsion rate for children with disabilities by race/ethnicity in State A.

B4B Examples #4a and 4b: Interpretation

Rate ratios compare the relative sizes of two rates. B4B Example #4a divides the district-level suspension/expulsion rate for children with disabilities from a particular racial/ethnic group by the state-level suspension/expulsion rate for all children with disabilities. B4B Example #4b divides the district-level suspension/expulsion rate for children with disabilities from a particular racial/ethnic group by the state mean suspension/expulsion rate for children with disabilities by race/ethnicity. A state using either of these methods would need to calculate district-level suspension/expulsion rates for each racial/ethnic group and then calculate the rate ratios. The state would then compare each rate ratio to the state bar. Any district where the rate ratio for one or more racial/ethnic groups is at or above the bar would be identified with a significant discrepancy.

In both examples, a rate ratio of 1.00 indicates no difference between the rates. In other words, the district-level suspension/expulsion rate for children with disabilities from that particular racial/ethnic group is equal to the state-level (or state mean) rate for all children with disabilities. A rate ratio greater than 1.00 indicates that the district-level suspension/expulsion rate for children with disabilities from that particular racial/ethnic group is greater than the state-level (or state mean) for all children with disabilities, while a rate ratio less than 1.00 indicates that the district-level suspension/expulsion rate for children with disabilities from that particular racial/ethnic group is less than the state-level or state mean rate for all children with disabilities. To give two examples, a rate ratio of 2.00 indicates that children with disabilities from that particular racial/ethnic group in the district are suspended/expelled at twice the rate of all children with disabilities in the state overall. A rate ratio of 0.50 indicates that children with disabilities from that particular racial/ethnic group in the district are suspended/expelled at half the rate of all children with disabilities in the state overall. The only difference between B4B Examples #4a and #4b is in how the state rate is calculated.

It is up to the state to pick a rate ratio at or above which a district is identified as having a significant discrepancy. For example, if the state had chosen a rate ratio of 2.0 as its bar, then District 1 would not be identified as having a significant discrepancy for Black or African American children using methods B4B Example 4a or 4b because its rate ratio is below the bar.

B4B Examples #4a and 4b: Considerations

The rate ratio methods have the advantage and disadvantage of being familiar to the many states that are using risk ratios to address Indicators B9 and B10 and the requirements of significant disproportionality. The disadvantage of this familiarity is that the rate ratios for B4B in this document are not analogous to the B9 and B10 risk ratios. These rate ratios compare district-level suspension/expulsion rates for children with disabilities from a particular racial/ethnic group to state-level or state mean suspension/expulsion rates for all children with disabilities. As discussed throughout this chapter, states that use methods appropriate for B9, B10, and significant disproportionality may not be meeting the requirements of B4B.

Comparisons can be made between the methods described in B4B Examples #1a and #1b and the rate ratio methods described in this section. For example, using the state-level suspension/expulsion rate for children with disabilities or the state mean suspension/expulsion rates for children with disabilities by race/ethnicity to set the bar is equivalent to the choice of using a rate ratio of 1.0 as the state bar. Therefore, the methods described in B4B Example #4a will identify exactly the same districts as a corresponding method from B4B Example #1a, and the method described in B4B Example #4b will identify exactly the same districts as a corresponding method from B4B Example #1b.

For example, the state-level suspension/expulsion rate for children with disabilities for State A is 11.7% (see Rate #3 from Chapter 3). Consider these two methods for setting the bar for determining significant discrepancy:

1. Any district where the suspension/expulsion rate for children with disabilities from any racial/ethnic group is two times or more the state rate ($2 \times 11.7\% = 23.4\%$) has a significant discrepancy (B4B Example #1a, Variation 2).
2. Any district where the rate ratio for children with disabilities from any racial/ethnic group is equal to or exceeds 2.0 has a significant discrepancy (B4B Example #4a).

These methods are equivalent in the sense that they will identify exactly the same districts—Exhibit 7 shows that only the suspension/expulsion rates for these racial/ethnic groups in the following districts are equal to or greater than 23.4%:

District	Race/Ethnic group	Rate
District 1	White	23.8%
District 1	Hispanic/Latino	28.6%
District 5	White	31.3%
District 2	American Indian or Alaska Native	40.0%
District 1	Two or More Races	44.4%
District 5	Two or More Races	79.3%

Equivalently, only these racial/ethnic groups in these districts have rate ratios that 2.0 or greater:

District	Race/Ethnic group	Rate
District 1	White	$23.8\% / 11.7\% = 2.03$
District 1	Hispanic/Latino	$28.6\% / 11.7\% = 2.44$
District 5	White	$31.3\% / 11.7\% = 2.68$
District 2	American Indian or Alaska Native	$40.0\% / 11.7\% = 3.42$
District 1	Two or More Races	$44.4\% / 11.7\% = 3.79$
District 5	Two or More Races	$79.3\% / 11.7\% = 6.78$

The first method above requires the calculation of district-level suspension/expulsion rates for each racial/ethnic group (see Rate #5 from Chapter 3) followed by the comparison of these rates to a state bar (e.g., 23.4%). The bar is calculated *once* by the state. The second method (i.e., rate ratio) also requires the calculation of district-level suspension/expulsion rates for each racial/ethnic group followed by the calculation of a rate ratio each racial/ethnic group, as described in B4B Examples #4a and 4b. Each rate ratio would then need to be compared to the state bar. States may want to take this into consideration when choosing a methodology.

As noted previously, all Indicator B4B methods using Comparison Option 1 identify districts within the state that suspend/expel children with disabilities from any racial/ethnic group at a higher rate than other districts in the state. These methods can say nothing about whether these rates are higher than the local or statewide suspension/expulsion rates for children without disabilities.

Comparison Option 2: Comparing the Rates of Suspensions/Expulsions for Children with Disabilities from a Racial/Ethnic Group to the Rates for Children Without Disabilities Within Each District

The previous section described methods that states might use if they choose to examine significant discrepancies by comparing the rates of suspensions/expulsions for children with disabilities among districts within the state. This section describes methods that states might use if they choose to examine significant discrepancies by comparing the rates of suspensions/expulsions for children with disabilities to children without disabilities within districts.

Unlike in the previous section, the methodologies described in this section do not use state-level suspension/expulsion rates. Comparison Option 2 focuses on suspension/expulsion rates within a district by comparing the suspension/expulsion rate for children with disabilities from a particular racial/ethnic group in a district to the suspension/expulsion rate for all children without disabilities in that same district. The focus is on rates *within* districts; therefore, it would be inappropriate to compare the district-level suspension/expulsion rate for children with disabilities from a particular racial/ethnic group to the state-level suspension/expulsion rate for children without disabilities because this calculation focuses on rates *across* or *among* districts as opposed to rates within districts.

It should be noted that methods described for B4B Comparison Option 2 allow states to identify districts that have suspension/expulsion rates for children with disabilities for one or more racial/ethnic groups that are significantly discrepant as compared to the suspension/expulsion rate for all children without disabilities. Again, because the focus is on rates within districts, these methods do not address how the suspension/expulsion rates for one district compare to those of other districts within the state.

Comparison Option 2 focuses on comparisons of rates within districts, which makes it work particularly well for states or territories with unitary systems since they are not able to compare rates among districts.

The remainder of this section describes two methodologies that states using Comparison Option 2 may choose to use to compare the district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group to the suspension/expulsion rate for all children without disabilities in that same district:

- Rate ratios (B4B Example #5),
- Rate differences (B4B Example #6).

Before discussing these methods, however, we first discuss an unacceptable methodology and a questionable methodology that states should not use for B4B.



B4B Comparison Option 2 – Unacceptable Methodology: Within a district, comparing the suspension/expulsion rate for children with disabilities from a racial/ethnic group to the suspension/expulsion rate for all other children with disabilities

States should not calculate a rate ratio or rate difference within each district that compares the suspension/expulsion rate for children with disabilities from one racial/ethnic group to the rate for children with disabilities from all other racial/ethnic groups, similar to the risk ratios and risk difference that are used for Indicators B9 and B10 and significant disproportionality. Rate ratios or rate differences calculated in this manner are not acceptable measures for Indicator B4B because they use neither Comparison Option 1 nor Comparison Option 2. They do not compare suspension/expulsion rates for children with disabilities among districts (Comparison Option 1). Instead, they compare *within* districts. They also do not compare children with disabilities to children without disabilities (Comparison Option 2), instead comparing children *with* disabilities to children *with* disabilities. *The Department of Education has stated that using this methodology is unacceptable for B4B.*



B4B Comparison Option 2 – Questionable Methodology: Within a district, comparing the suspension/expulsion rate for children with disabilities from a racial/ethnic group to the suspension/expulsion rate for children without disabilities from that same racial/ethnic group

It is questionable to calculate a rate ratio or a rate difference that, within a district, compares the suspension/expulsion rate for children with disabilities from one racial/ethnic

group to the suspension/expulsion rate for children without disabilities from that same racial/ethnic group (e.g., comparing the suspension/expulsion rate for Black or African American children with disabilities in a district to the suspension/expulsion rate for Black or African American children without disabilities in that same district).

For example, a state might set a rate ratio bar to 2.00 and then calculate rate ratios by dividing the district-level suspension/expulsion rate for children with disabilities from the racial/ethnic group by the district-level suspension/expulsion rate for children without disabilities from that same racial/ethnic group:

Race/ethnicity	Suspension/expulsion rate for children with disabilities	Suspension/expulsion rate for children without disabilities	Rate ratio	Rate ratio bar set at 2.00
Black or African American	10.0%	10.0%	1.0	Under bar
White	5.0%	2.0%	2.5	Over bar
Hispanic/Latino	8.0%	3.0%	2.7	Over bar

Because the district-level suspension/expulsion rate for children without disabilities for each racial/ethnic group serves as the basis for comparison, this means that a different comparison rate is used to determine significant discrepancy for each racial/ethnic group in that district. Note that, because the suspension/expulsion rates for Black or African American children with disabilities and Black or African American children without disabilities are both high, the district would not be identified as having a significant discrepancy. *Absent a valid justification for treating different racial/ethnic groups differently, the Department of Education has stated that this methodology is unacceptable.*⁹

Rate Ratio

States may want to compare the suspension/expulsion rate for children with disabilities from each racial/ethnic group to the suspension/expulsion rate for children without disabilities within each district by using a rate ratio.

⁹ All federal grantees are subject to federal civil rights obligations including Title VI and the Fourteenth Amendment of the United States Constitution, which entitles all persons to equal protection under the law.

B4B Example #5: Using a Rate Ratio to Compare the District-Level Suspension/Expulsion Rates for Children with Disabilities From Each Racial/Ethnic Group to the Suspension/Expulsion Rate for All Children without Disabilities in That Same District

The equation for this rate ratio is:

$$\text{Rate ratio} = \frac{\text{District-level suspension/expulsion rate for children with disabilities from a racial/ethnic group}}{\text{District-level suspension/expulsion rate for children without disabilities}}$$

QUESTION
What is the suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 as compared to the suspension/expulsion rate for all children without disabilities in District 1?

1. Calculate the district-level suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 (see Rate #5 from Chapter 3). The district-level suspension/expulsion rate for Hispanic/Latino children with disabilities for District 1 is 28.6%.

District rate

$$= \frac{\text{Hispanic/Latino children with disabilities suspended/expelled in District 1}}{\text{Hispanic/Latino children with disabilities in District 1}} \times 100$$

$$= \frac{10}{35} \times 100$$

$$= 28.6\%$$

2. Calculate the district-level suspension/expulsion rate for children without disabilities in District 1 (see Rate #2 from Chapter 3). The district-level suspension/expulsion rate for children without disabilities in District 1 is 8.1%.

District rate

$$= \frac{\text{Children without disabilities suspended/expelled in District 1}}{\text{All children without disabilities in District 1}} \times 100$$

$$= \frac{75}{925} \times 100$$

$$= 8.1\%$$

3. Divide the suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 by the district-level suspension/expulsion rate for children without disabilities in District 1.

Rate ratio

$$= \frac{\text{District-level suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1}}{\text{District-level suspension/expulsion rate for all children without disabilities in District 1}}$$

$$= \frac{28.6\%}{8.1\%}$$

$$= 3.5$$

ANSWER

In District 1, the suspension/expulsion rate for Hispanic/Latino children with disabilities is 3.5 times the suspension/expulsion rate for all children without disabilities.

B4B Example #5: Interpretation

This rate ratio compares the relative size of two rates by dividing the district-level suspension/expulsion rate for children *with* disabilities from a particular racial/ethnic group by the suspension/expulsion rate for all children *without* disabilities in that same district. A state using this method would need to calculate district-level suspension/expulsion rates for children with disabilities for each racial/ethnic group and then calculate the rate ratios. The state would then compare each rate ratio to the state bar. Any district where the rate ratio for one or more racial/ethnic groups is equal to or above the bar would be identified with a significant discrepancy.

A rate ratio of 1.00 indicates no difference between the rates. A rate ratio greater than 1.00 indicates that, in that district, the suspension/expulsion rate for children with disabilities from that particular racial/ethnic group is greater than the suspension/expulsion rate for all children without disabilities. A rate ratio less than 1.00 indicates that, in that district, the suspension/expulsion rate for children with disabilities in a particular racial/ethnic group is less than the rate for all children without disabilities. To give two specific examples, a rate ratio of 2.00 for White children with disabilities indicates that, in that district, White children with disabilities are suspended/expelled at twice the rate of all children without disabilities. A rate ratio of 0.50 for Black or African American children with disabilities indicates that, in that district, Black or African American children with disabilities are suspended/expelled at half the rate of all children without disabilities.

It is up to the state to pick a rate ratio at or above which a district is identified as having a significant discrepancy. For example, if the state had chosen a rate ratio of 1.5 as its bar, then District 1 would be identified as having a significant discrepancy for Hispanic/Latino children because its rate ratio is 3.5, which is above the bar. If however, the state had chosen a rate ratio of 4.0 as its bar, then District 1 would not be identified as having a significant discrepancy for Hispanic/Latino children because its rate ratio is below the bar.

B4B Example #5: Considerations

This method has the advantage of being familiar to the many states that are using risk ratios to address Indicators B9 and B10. Mathematically, it differs because it is comparing the district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group to the suspension/expulsion rates for all children without disabilities in that same district.

All methods using B4B Comparison Option 2 identify districts within the state that suspend/expel children with disabilities from particular racial/ethnic groups at a higher rate than they suspend/expel all children without disabilities. They say nothing about how either of these rates compare with the corresponding rates in the state's other districts. To use the example above, our calculations tell us that in District 1, Hispanic/Latino children with disabilities are 3.5 times as likely to be suspended/expelled as are children without disabilities—but they tell us nothing about whether Hispanic/Latino children with disabilities in District 1 are more likely to be suspended/expelled than children with disabilities in other districts.

Rate Difference

Another way to compare suspension/expulsion rates using Comparison Option 2 is to determine the difference between the district-level suspension/expulsion rates for children with disabilities from each racial/ethnic group and the rate for all children without disabilities in that same district. This comparison shows how far apart the two rates are from each other.

B4B Example #6: Using a Rate Difference to Compare the District-Level Suspension/Expulsion Rates for Children with Disabilities from Each Racial/Ethnic Group to the Suspension/Expulsion Rate for All Children without Disabilities in That Same District

The equation for the rate difference is:

$$\text{Rate difference} = \text{(District-level suspension/expulsion for children with disabilities from a racial/ethnic group)} - \text{(District-level suspension/expulsion rate for all children without disabilities)}$$

QUESTION

What is the difference between the suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 and the suspension/expulsion rate for all children without disabilities in District 1?

1. Calculate the district-level suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 (see Rate #5 from Chapter 3). The district-level suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 is 28.6%.

District rate

$$\begin{aligned} &= \frac{\text{Hispanic/Latino children with disabilities suspended/expelled in District 1}}{\text{Hispanic/Latino children with disabilities in District 1}} \times 100 \\ &= \frac{10}{35} \times 100 \\ &= 28.6\% \end{aligned}$$

2. Calculate the district-level suspension/expulsion rate for children without disabilities for District 1 (see Rate #2 from Chapter 3). The district-level suspension/expulsion rate for all children without disabilities in District 1 is 8.1%.

District rate

$$\begin{aligned} &= \frac{\text{Children without disabilities suspended/expelled in District 1}}{\text{All children without disabilities in District 1}} \times 100 \\ &= \frac{75}{925} \times 100 \\ &= 8.1\% \end{aligned}$$

3. Subtract the district-level suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 from the district-level suspension/expulsion rate for all children with disabilities in District 1. The rate difference is 20.5 percentage points.

Rate difference

$$\begin{aligned} &= \text{(District-level suspension/expulsion for Hispanic/Latino children with disabilities)} - \text{(District-level suspension/expulsion rate for all children without disabilities)} \\ &= 28.6\% - 8.1\% \\ &= 20.5 \end{aligned}$$

ANSWER

The difference between the suspension/expulsion rate for Hispanic/Latino children with disabilities in District 1 and the suspension/expulsion rate for all children without disabilities in District 1 is 20.5 percentage points.

B4B Example #6: Interpretation

Rate difference tells us how much one rate differs from another—how many percentage points would need to be added to the lower rate to get to the higher rate. A state using this method would need to calculate district-level suspension/expulsion rates for children with disabilities for each racial/ethnic group and then calculate rate differences. The state would then compare these rate differences to the state bar. Any district where the rate difference for one or more racial/ethnic groups is at or above the bar would be identified with a significant discrepancy.

A rate difference of 0 would indicate no difference between the two rates. A positive rate difference indicates how many percentage points greater the district-level suspension/expulsion rate for children with disabilities from a particular racial/ethnic group is as compared to the suspension/expulsion rate for all children without disabilities in that same district. A negative rate difference indicates how many percentage points less the district-level suspension/expulsion rate for children with disabilities from a particular racial/ethnic group is as compared to the suspension/expulsion rate for all children without disabilities in that same district.

It is up to the state to pick a rate difference to set the bar. For example, if the state had chosen a rate difference of 5 percentage points as its bar, then District 1 would be identified as having a significant discrepancy for Hispanic/Latino children with disabilities because its rate difference (20.5 percentage points) is above the bar. If however, the state had chosen a rate difference of 25 percentage points as its bar, then District 1 would not be identified as having a significant discrepancy for Hispanic/Latino children with disabilities because its rate difference is below the bar.

District A suspends/expels:
 16.0% of American Indian or Alaska Native children with disabilities
 8.0% of children without disabilities

District B suspends/expels:
 2.0% of American Indian or Alaska Native children with disabilities
 1.0% of children without disabilities

The rate ratios are:
 District A: $16/8 = 2.0$
 District B: $2/1 = 2.0$

The rate differences are:
 District A: $16.0\% - 8.0\% = 8$ percentage points
 District B: $2.0\% - 1.0\% = 1$ percentage point

B4B Example #6: Considerations

Rate difference describes how much two rates differ from each other. As described in the previous section, the rate ratio compares the relative size of the two rates. For example, suppose in District A, the suspension/expulsion rate for American Indian or Alaska Native children with disabilities is 16%, and the suspension/expulsion rate for children without disabilities is 8.0%. In District B, the suspension/expulsion rate for American Indian or Alaska Native children with disabilities is 2.0%, and the suspension/expulsion rate for children without disabilities is 1.0%. The rate ratios would be the same (2.0) in both cases (i.e., $16.0\%/8.0\% = 2.0$ and $2.0\%/1.0\% = 2.0$). However, the rate differences would be 8 percentage points (i.e., $16.0\% - 8.0\% = 8.0$) and 1 percentage point ($2.0\% - 1.0\% = 1.0$). The rate difference distinguishes those districts that have high suspension/expulsion rates from those that have low suspension/expulsion rates even though the rate ratios are the same. States might want to consider using both of these methods in conjunction since they answer different questions.

All methods using B4B Comparison Option 2 identify districts within the state that suspend/expel children with disabilities from particular racial/ethnic groups at a higher rate than they

suspend/expel all children without disabilities. They say nothing about how either of these rates compare with the corresponding rates in the state's other districts. To use the example above, in District 1, the suspension/expulsion-rate difference between Hispanic/Latino children with disabilities and all children without disabilities is 20.5 percentage points—but these calculations tell us nothing about whether Hispanic children with disabilities in District 1 are more likely to be suspended/expelled than children with disabilities in other districts.

Chapter 6 Small Cell Sizes

Introduction

Any of the measures discussed in this TA guide can be unreliable if the number of children included in the analysis is small. Unreliable analyses caused by small cell sizes may result in districts being inappropriately identified with a significant discrepancy. The most common method states use to address this problem is to identify a minimum number of children to be included in the analysis, called a minimum n-size or a minimum cell size.

When deciding to implement a minimum cell size, it is important for states to realize that there is no perfect value; any minimum cell size has trade-offs and limitations. On one hand, small cell sizes may produce unreliable results. On the other hand, if the state implements a large minimum cell size, many districts may be completely eliminated from the analysis, leaving no objective way to identify significant discrepancies in these districts. According to the SPP/APR Measurement Table, states are required to report on the number of districts excluded from the calculations as a result of the state's minimum cell size requirements. States need to balance the possibility of inappropriately identifying districts because of small cell sizes against the possibility of not identifying districts because of large minimum cell sizes that eliminate large numbers of districts from the analysis completely.

This chapter discusses small cell sizes, including choosing and implementing minimum cell sizes and reporting the minimum cell sizes in a clear manner. We also discuss using multiple years of data when identifying significant discrepancies, which is another method that states use to address the possibility of unreliable results due to small numbers.

Choosing and Implementing Minimum Cell Sizes

While, as noted above, there is no perfect minimum cell size value, states may want to consider a number of issues when choosing and implementing a minimum cell size. These issues are discussed in more detail in this section.

In general, states should note that it may not be appropriate to apply one minimum cell-size "rule" to all data sets and all analyses that are reported to the Department of Education. For example, the minimum cell size for calculating Adequate Yearly Progress (AYP) may not be appropriate for analyzing data related to Indicator B4 because the analyses are different, and the practical balance between the risk of inappropriately identifying districts versus the risk of failing to identify districts is different. States should be prepared to describe their minimum cell size requirements and provide a rationale regarding how they chose them.

For Indicator B4, states should apply one uniform minimum cell size requirement within the B4 calculation. The Department of Education has indicated that, in the context of Indicator B4B, using different minimum cell sizes for different racial/ethnic groups is a legally questionable practice. *Absent a valid justification for treating different racial/ethnic groups differently, the Department of Education has stated that this methodology is unacceptable.*¹⁰

¹⁰All federal grantees are subject to federal civil rights obligations including Title VI and the Fourteenth Amendment of the United States Constitution, which entitles all persons to equal protection under the law.

Types of Minimum Cell Sizes

There are a number of ways to define minimum cell size when analyzing data for Indicator B4; therefore, states should determine how “cell” is to be defined for their analyses. Below, we present some possible ways of defining minimum cell size for Indicator B4A and Indicator B4B.

Indicator B4A

If using Comparison Option 1, the minimum cell size may be based on the:

- Number of children with disabilities (e.g., 15 children with disabilities in the district); or
- Number of children with disabilities suspended/expelled (e.g., 5 children suspended/expelled in the district).

If using Comparison Option 2, the minimum cell size may also be based on the:

- Number of children without disabilities (e.g., 20 children without disabilities in the district); or
- Number of children without disabilities suspended/expelled (e.g., 3 children without disabilities suspended/expelled in the district).

Indicator B4B

If using Comparison Option 1, the minimum cell size may be based on the:

- Number of children with disabilities within each racial/ethnic group (e.g., 10 Black or African American children with disabilities in the district or 10 Hispanic children with disabilities in the district, etc.);
- Number of children with disabilities within each racial/ethnic group suspended/expelled (e.g., 5 Black or African American children with disabilities suspended/expelled in the district or 5 Hispanic children with disabilities suspended/expelled in the district, etc.).

If using Comparison Option 2, the minimum cell size may also be based on the:

- Number of children without disabilities (e.g., 20 children without disabilities in the district); or
- Number of children without disabilities suspended/expelled (e.g., 3 children without disabilities suspended/expelled in the district).

Choosing a Minimum Cell Size

When deciding whether to implement a minimum cell size requirement, states should consider the impact such a decision will have on their analyses. As noted in the introduction, small cell sizes can result in unreliable analyses that may inappropriately identify districts as having a significant discrepancy, but implementing a large minimum cell size may result in a large number of districts being excluded from the analyses. States need to balance these two concerns, that is, the potential for unreliable results versus exclusion of too many districts, when making these decisions.

While states may choose to use different types of minimum cell sizes, they should note that it is the denominator of the suspension/expulsion rate calculation that determines reliability. Consider the following example that uses data for Indicator B4A for District 3 and District 4 in State A.

If the number of children with disabilities in the district is large enough, the district-level suspension/expulsion rate will tend to be fairly stable. According to Exhibit 1, District 3 has 50 children with disabilities, and 2 of these children were suspended/expelled. That means that the suspension/expulsion rate for children with disabilities in District 3 is 4.0% (see Exhibit 5 in Chapter 3). If one additional child with disabilities was suspended/expelled in this district (i.e., 3 children instead of 2 children), the suspension/expulsion rate for District 3 would increase by 2 percentage points, from 4.0% to 6.0%:

Rate

$$\begin{aligned}
 &= \frac{\text{Children with disabilities suspended/expelled in the district}}{\text{All children with disabilities in the district}} \times 100 \\
 &= \frac{3}{50} \times 100 \\
 &= 6.0\%
 \end{aligned}$$

On the other hand, if the number of children with disabilities in the district is small, the district-level suspension/expulsion rate will be less stable. For example, according to Exhibit 1, District 4 has four children with disabilities, none of whom were suspended/ expelled. That means that the suspension/expulsion rate for District 4 is 0.0% (see Exhibit 5). However, if one of the four children with disabilities in District 4 was suspended/expelled, the suspension/expulsion rate would go from 0.0% to 25.0%:

Rate

$$\begin{aligned}
 &= \frac{\text{Children with disabilities suspended/expelled in the district}}{\text{All children with disabilities in the district}} \times 100 \\
 &= \frac{1}{4} \times 100 \\
 &= 25.0\%
 \end{aligned}$$

Therefore, when calculating district-level suspension/expulsion rates for children with disabilities, states wanting to address reliability issues due to small cell sizes should consider basing their minimum cell size on the denominator of these rate calculations. That is, for Indicator B4A, they should consider basing their minimum cell size on the number of children with disabilities in the district (i.e., there must be a certain number of children with disabilities in the district in order for the district to be included in the analyses), and for Indicator B4B, they should consider basing their minimum cell size on the number of children with disabilities from the racial/ethnic group in the district (i.e., there must be a certain number of children with disabilities from the racial/ethnic group in the district in order for the racial/ethnic group to be included in the analyses).

Some states may choose to base their minimum cell sizes on the numerators of the rate calculation, which for Indicator B4A is the number of children with disabilities suspended/expelled in the district (i.e., there must be a certain number of children with disabilities suspended/expelled in the district in order for the district to

District 3 has 50 children with disabilities

- Each child suspended/expelled raises the rate by .02 (1/50 = .02)

District 4 has 4 children with disabilities

- Each child suspended/expelled raises the rate by .25 (1/4 = .25)

be included in the analyses), and for Indicator B4B is the number of children with disabilities from the racial/ethnic group suspended/expelled in the district (i.e., there must be a certain number of children with disabilities from the racial/ethnic group suspended/expelled in the district in order for the racial/ethnic group to be included in the analyses). Because the numbers of children being suspended/expelled in any given district are often small, this type of minimum cell size has the potential for eliminating a large number of districts from the analyses. Some of these districts may, in fact, have suspension/expulsion rates of 0.0% (which is acceptable), while others may have rates that are lower than the state bar; meaning that, had these districts been included in the analyses, they would not have been identified as having a significant discrepancy. States choosing to implement this type of minimum cell size, therefore, should exercise caution.

Each of the methodologies using Comparison Option 1 or Comparison Option 2 relies on district-level suspension/expulsion rates for children with disabilities (Indicator B4A) or district-level suspension/expulsion rates for children with disabilities by race/ethnicity (Indicator B4B). In addition, methodologies using Comparison Option 1 rely on state-level suspension/expulsion rates or distributions for children with disabilities, and methodologies using Comparison Option 2 rely on district-level rates for children without disabilities. Both of these suspension/expulsion rates are typically based on larger numbers of children, so they tend to be more stable than district-level rates for

children with disabilities, and therefore, are usually less of a concern with respect to small cell issues.

States should note that changing minimum cell size requirements from year-to-year can potentially have a dramatic impact on the results of their analyses, making it difficult to compare results across years and determine whether progress has been made toward reducing significant discrepancies.

Implementing a Minimum Cell Size

If a state decides to implement a minimum cell size, then the state should apply that minimum cell size to its analysis dataset, removing any districts from the dataset that do not meet the minimum cell size requirement. For example, suppose State A decides to use one of the methodologies described under Comparison Option 1 or Comparison Option 2 and implements a minimum cell size requirement stating that there must be at least 10 children with disabilities in a district for Indicator B4A. Under these circumstances, District 4, which has only 4 children with disabilities, would be removed from the dataset. State A would then proceed with analyzing each of the remaining districts to determine if they have a significant discrepancy.

When entire districts (Indicator B4A) or specific racial/ethnic groups within districts (Indicator B4B) are eliminated from the analyses based on minimum cell sizes, states may want to consider other ways of evaluating significant discrepancy for those districts or groups. For example, if a state uses a rate ratio for Indicator B4B and sets a minimum cell size of 10 children with disabilities from the racial/ethnic group enrolled in the district, and a district has 9 Black or African American children with disabilities, a rate ratio would not be calculated for that racial/ethnic group in that district. However, if most or all 9 of those Black or African American children are suspended/expelled, then the state may want to further examine this district's suspension/expulsion rates, even though a rate ratio was not calculated.

Clarity in Reporting Minimum Cell Sizes

States should ensure that their reporting on minimum cell sizes is clear. For example, as discussed previously, states may choose to use different types of minimum cell sizes. Therefore, it is important for states to be clear with regard to how they are defining their cell sizes when presenting their minimum cell size requirements. An example where the cell size is not clear is:

- Rates are calculated for districts with a minimum of 30 children.

This statement should be revised so it is clear what type of minimum cell size the state is using. For example, for Indicator B4A:

- Significant discrepancy calculations were made only for districts that had at least 30 children with disabilities; or
- Significant discrepancy calculations were made only for districts that had at least 30 children with disabilities and 30 children without disabilities (if using Comparison Option 2).

Or, for Indicator B4B:

- Significant discrepancy calculations were made only when there were at least 30 children with disabilities from the racial/ethnic group in the district.
- Significant discrepancy calculations were made only when there were at least 30 children with disabilities from the racial/ethnic group and 30 children without disabilities in the district (if using Comparison Option 2).

Some states use a combination of minimum cell size requirements (e.g., there must be 30 children with disabilities in the district AND there must be at least 5 children with disabilities who were suspended/ expelled in the district). States using multiple minimum cell size requirements should be especially careful to ensure that it is clear how they are defining the various cells that make up their requirements.

States should also describe their minimum cell size requirements separately from their definitions of significant discrepancy. Two examples where the state's minimum cell size requirement is hard to distinguish from the state's definition of significant discrepancy are:

- Districts with at least 15 children with disabilities that had a suspension/expulsion rate of 4.0 or higher.
- Within a district, a minimum of 10 children with disabilities that are suspended/expelled at 2 times the rate of children without disabilities suspended/expelled.

These statements should be revised to clearly separate cell size from measurement. For example, for Indicator B4A:

- In order for a district to be included in the analyses, there needed to be at least 15 children with disabilities in the district. The state defined significant discrepancy as any district that had a suspension/expulsion rate for children with disabilities that was greater than 4.0%.
- In order for a district to be included in the analyses, there needed to be at least 10 children with disabilities and 10 children without disabilities in the district. The state defined significant discrepancy as any district that had a suspension/expulsion rate for children with disabilities that was more than 2 times the rate for children without disabilities in that same district.

Or, for Indicator B4B:

- In order for a racial/ethnic group to be included in the analyses, there needed to be at least 15 children with disabilities from the racial/ethnic group in the district. The state defined significant discrepancy as any district where the suspension/expulsion rate for children with disabilities from one or more racial/ethnic groups was greater than 4.0%.
- In order for a racial/ethnic group to be included in the analyses, there needed to be at least 10 children with disabilities from the racial/ethnic group in the district; there also had to be at least 10 children without disabilities in the district. The state defined significant discrepancy as any district where the suspension/expulsion rate for children with disabilities from one or more racial/ethnic groups was more than 2 times the rate for children without disabilities in that same district.

Calculating the Percentage of Districts with Significant Discrepancy

According to the 2011 measurement table, if states use a minimum cell size requirement, they must report the number of districts excluded from the calculation as a result of this requirement.

An example of how states might report this information for Indicator B4A is:

- In order for a district to be included in the analysis, there needed to be at least 15 children with disabilities in the district. This minimum cell size requirement eliminated 25 of the state's 150 districts from the analysis.

For Indicator B4B, states should consider a district to be eliminated from the analyses for not meeting the cell size requirement if significant discrepancy was not calculated for at least one racial/ethnic group in the district. In other words, a district should be counted as eliminated if every racial/ethnic group was removed from the significant discrepancy calculations due to small cell sizes.

An example of how states might report this information for B4B is:

- In order for a district to be included in the analysis, there needed to be at least 15 children with disabilities from the racial/ethnic group in the district. Of the state's 150 districts, 25 were eliminated from the analyses because a suspension/expulsion rate could not be calculated for any racial/ethnic group because of this minimum cell size requirement.

When determining the percentage of districts that the state identified as having a significant discrepancy, states have the option of using the total number of districts in their state OR the number of districts that met the state's minimum cell size requirements as the denominator in the calculation.

Continuing with the example from above, this state has a total of 150 districts, and 25 of them do not meet the state’s minimum cell requirement. Suppose this state identified 20 districts of its 150 districts as having a significant discrepancy. The state could calculate the percentage of districts with a significant discrepancy in one of two ways:

1. If the state chooses to use all districts in the percentage denominator, the percentage is calculated as:

Percentage

$$= \frac{\text{Number of districts with a significant discrepancy}}{\text{Total number of districts}} \times 100$$

$$= \frac{20}{150} \times 100$$

$$= 13.3\%$$

2. If the state chooses to use the number of districts that met the state’s minimum cell size requirements in the percentage denominator, the percentage is calculated as:

Percentage

$$= \frac{\text{Number of districts with a significant discrepancy}}{\text{Number of districts meeting minimum cell size requirement}} \times 100$$

$$= \frac{20}{125} \times 100$$

$$= 16.0\%$$

As shown above, removing districts that do not meet the state’s minimum cell size requirements from the denominator increases the percentage of districts identified with a significant discrepancy for the state. The more districts that are removed from the denominator, the more pronounced the difference between the two percentages will be. It should also be noted that removing these districts will have the greatest impact on states with the smallest numbers of districts. States should take these implications into consideration when deciding how to report on the percentage of districts identified with a significant discrepancy for Indicator B4.

Multiple Years of Data

Another approach to addressing small cell sizes is to require that a district’s suspension/expulsion rate meet the state’s definition for significant discrepancy for multiple consecutive years (e.g., 2 or 3 years) before it is identified as having a significant discrepancy. Smaller districts with unexpectedly high rates in one year are unlikely to have similarly high rates for multiple years in a row unless there is a larger underlying issue. Larger districts with more stable high rates will probably have similarly high rates year after year unless they address the underlying issues leading to those high rates. To implement this approach, the state will need to analyze the data for the current year and then data from previous years. States considering using this approach should note that it will take multiple years to identify a significant discrepancy in any particular district, meaning that an issue may exist for several years before steps are taken by either the state or the district to address the issue.