Chapter 5 Calculating Alternate Risk Ratios and Alternate Total Removals Per Child Ratios

Introduction

Calculating risk ratios and TRPC ratios can sometimes be difficult at the district level. States, particularly those with smaller districts, may run into several issues:

- In some districts, there may be small numbers of children. When risk ratios and TRPC ratios are based on small numbers, minor variations in the number of children in either the racial/ethnic group or the comparison group can produce dramatic changes in the size of the risk ratio or the TRPC ratio. States may want to use a minimum cell size requirement and not calculate a risk ratio or TRPC for these districts (see Chapter 10 for a more detailed discussion of small cell sizes and minimum cell size requirements).
- There may instances where there are large enough numbers of children to calculate the risk or TRPC for the racial/ethnic group, but the numbers are too small to reliably calculate the risk or TRPC for the comparison group. In some instances, there may be no children in the comparison group so the risk or the TRPC for the comparison group cannot be calculated.
- There may also be instances where the risk or the TRPC for the comparison group is zero. In these instances, the risk ratio or TRPC ratio cannot be calculated.

States, therefore, may want to consider calculating an alternate risk ratio or an alternate TRPC ratio. The alternate risk ratio uses the *district-level* risk for the racial/ethnic group in the numerator and the *state-level* risk for the comparison group in the denominator. For example, "The risk for Black or African American children for receiving special education and related services for intellectual disabilities in District 3 is 2.69 times the risk for all other children in State A." Or, to say the same thing in a different way, "Black or African American children in District 3 are 2.69 times as likely to receive special education and related services for intellectual disabilities as all other children in State A." In this chapter, we provide examples of how to calculate the alternate risk ratio for identification (Example 5.1) using all other children as the comparison group. We also provide examples of how to calculate the alternate risk ratio for placement (Example 5.2) and suspension/expulsion (Example 5.3) using all other children with disabilities as the comparison group.

Similarly, the alternate TRPC ratio uses the *district-level* TRPC for the racial/ethnic group in the numerator and the *state-level* TRPC for the comparison group in the denominator. We provide an example of the alternate TRPC (Example 5.4) using all other children with disabilities as the comparison group.

It should be noted that the examples in this chapter focus on applying a specific methodology to one disability category, one educational environment category, and two discipline categories; as noted in Chapters 1 and 2, states will need to do more than analyze the data in these four categories in order to meet the requirements for B9 and B10 and significant disproportionality.

Example 5.1 Identification

The general equation for the risk ratio for identification is:

$$\textbf{Alternate risk ratio} = \frac{\text{District-level risk for racial/ethnic group for disability category}}{\text{State-level risk for comparison group for disability category}}$$

In this example, the alternate risk ratio answers the question, "What is a specific racial/ethnic group's district-level risk of receiving special education and related services for a particular disability as compared to the state-level risk for all other children?"

QUESTION
What was the risk for Black or African American children receiving special education and related services for ID in District 3 as compared to the risk for all other children in State A?

In this example, District 3 had no children in the comparison group who received special education and related services for ID. Therefore, it is not possible to calculate a risk ratio, but it is possible to calculate an alternate risk ratio.

1. First, using the data for District 3, calculate the district-level ID risk for Black or African American children:
   - Using child count data, find the number of Black or African American children in the ID category in District 3. Using Exhibit 1, District 3 has 189 Black or African American children in the ID category.
   - Using enrollment data, find the total number of Black or African American children enrolled in District 3. Using Exhibit 1, District 3 has 4,697 enrolled Black or African American children.
   - Calculate the risk by dividing the number of Black or African American children in the ID category by the total number of Black or African American children in the district and then multiply by 100 to convert the result to a percent (do not round the results):

District Risk

$$= \frac{\text{Black or African American children in ID category}}{\text{Enrolled Black or African American children}} \times 100$$

$$= \frac{189}{4{,}697} \times 100$$

$$= 4.023845\%$$

2. Next, using the data for State A, calculate the state-level ID risk for all other children:
   - Using child count data, calculate the number of all other children in the ID category in State A. In this example, all other children are all children who are not Black or African American. Calculate this number by adding together all of the children in the ID category in State A who are not Black or African American. Using Exhibit 1:

All other children

= Hispanic/Latino children in ID category + American Indian or Alaska Native children in ID category + Asian children in ID category + Native Hawaiian or Other Pacific Islander children in ID category + White children in ID category + children reported as two or more races in ID category

= 780 + 47 + 161 + 45 + 3,935 + 132

= 5,100.

- Using enrollment data, calculate the number of all other enrolled children in State A. Calculate this number by adding together all of the enrolled children in State A who are not Black or African American. Using Exhibit 1:

  All other children

  = Hispanic/Latino enrolled children + American Indian or Alaska Native enrolled children + Asian enrolled children + Native Hawaiian or Other Pacific Islander enrolled children + White enrolled children + enrolled children reported as two or more races

  = 69,672 + 1,991 + 13,934 + 1,424+ 238,875 + 15,287

  = 341,183.

- Calculate the risk by dividing the number of all other children in the ID category in State A by the total number of all other enrolled children in State A and then multiply by 100 to convert the result to a percent (do not round the results):

$$\textbf{State Risk} = \frac{\text{All other children in ID category}}{\text{All other enrolled children}} \times 100$$

$$= \frac{5{,}100}{341{,}183} \times 100$$

$$= 1.494799\%$$

3. Calculate the alternate risk ratio by dividing the district-level ID risk for Black or African American children by the state-level ID risk for all other children:

Alternate risk ratio

$$= \frac{\text{District-level ID risk for Black or African American children}}{\text{State-level ID risk for all other children}}$$

$$= \frac{4.023845\%}{1.494799\%}$$

$$= \mathbf{2.691897}$$

ANSWER

Black or African American children in District 3 were 2.69 times as likely as all other children in State A to receive special education and related services for ID.

Example 5.2 Placement

The general equation for the alternate risk ratio for placement is:

$$\textbf{Alternate risk ratio} = \frac{\text{District-level risk for racial/ethnic group for educational environment category}}{\text{State-level risk for comparison group for educational environment category}}$$

In this example, the alternate risk ratio answers the question, "What is a specific racial/ethnic group's district-level risk of receiving special education and related services in a particular educational environment category as compared to the state-level risk for all other children with disabilities?"

QUESTION

What was the risk for Hispanic/Latino children with disabilities receiving special education and related services inside the regular classroom < 40% of the school day in District 10 as compared to the risk for all other children with disabilities in State A?

In this example, District 10 has small numbers of children in the comparison group, so the state may want to calculate an alternate risk ratio instead of a risk ratio.

1. First, using the data for District 10, calculate the *district-level* < 40% educational environment risk for Hispanic/Latino children with disabilities.
   - Using educational environment data, find the number of Hispanic/Latino children in the < 40% educational environment category in District 10. Using Exhibit 2, District 10 has 229 Hispanic/Latino children in the < 40% educational environment category.
   - Using child count data, find the total number of Hispanic/Latino children with disabilities in District 10. Using Exhibit 2, District 10 has 742 Hispanic/Latino children with disabilities.
   - Calculate the risk by dividing the number of Hispanic/Latino children in the < 40% educational environment category by the total number of Hispanic/Latino children with disabilities and then multiply by 100 to convert the result to a percent (do not round the results):

$$\textbf{District Risk} = \frac{\text{Hispanic/Latino children in < 40\% category}}{\text{All Hispanic/Latino children with disabilities}} \times 100$$

$$= \frac{229}{742} \times 100$$

$$= 30.862534\%$$

2. Next, using the data for State A, calculate the *state-level* < 40% educational environment risk for all other children with disabilities:
   - Using educational environment data, calculate the number of all other children in the < 40% educational environment category in State A. In this example, all other children are all children who are not Hispanic/Latino. Calculate this number by adding together all of the children in the < 40% educational environment category in State A who are not Hispanic/Latino. Using Exhibit 2:

All other children

= American Indian or Alaska Native children in < 40% category + Asian children in < 40% category + Black or African American children in < 40% category + Native Hawaiian or Other Pacific Islander children in < 40% category + White children in < 40% category + children reported as two or more races in < 40% category

= 31 + 168 + 1,443 + 23 + 2,365 + 126

= 4,156.

   - Using child count data, calculate the number of all other children with disabilities in State A. Calculate this number by adding together all of the children with disabilities in State A who are not Hispanic/Latino. Using Exhibit 2:

All other children

= American Indian or Alaska Native children with disabilities + Asian children with disabilities + Black or African American children with disabilities + Native Hawaiian or Other Pacific Islander children with disabilities + White children with disabilities + children with disabilities reported as two or more races

= 190 + 1,308 + 10,052 + 124 + 20,886 + 1,895

= 34,455.

   - Calculate the risk by dividing the number of all other children in the < 40% educational environment category in State A by the total number of all other children with disabilities in State A and then multiply by 100 to convert the result to a percent (do not round the results):

$$\textbf{State Risk} = \frac{\text{All other children in <40\% category}}{\text{All other children with disabilities}} \times 100$$

$$= \frac{4,156}{34,455} \times 100$$

$$= 12.06211\%$$

3. Calculate the alternate risk ratio by dividing the district-level < 40% educational environment risk for Hispanic/Latino children with disabilities by the state-level < 40% educational environment risk for all other children with disabilities:

ANSWER

Hispanic/Latino children with disabilities in District 10 were 2.56 times as likely as all other children with disabilities in State A to receive special education and related services inside the regular classroom < 40% of the school day.

Alternate risk ratio

$$= \frac{\text{District-level < 40\% educational environment risk for Hispanic/Latino children}}{\text{State-level < 40\% educational environment risk for all other children}}$$

$$= \frac{30.862534\%}{12.06211\%}$$

$$= \mathbf{2.558635}$$