Visualizing Equity Gaps: Examples from Oklahoma & Tennessee

April 22, 2015
Communities of Practice

- Policy and Programs
  Rashidah Lopez Morgan

- Data Use and Analysis
  Dr. Andy Baxter

- Stakeholder Engagement
  Dr. Ellen Sherratt

- Rural Access Issues and Support
  Dr. Rose Honey
Webinar Objectives

Attendees will:

• View specific data visualizations designed to diagnose equity gaps and monitor their amelioration.

• Learn from the process used in Oklahoma and Tennessee for selecting measures, conducting analyses, and visualizing the gaps.
Agenda

• Examples from Oklahoma
• Examples from Tennessee
• Q&A
Facilitators and Presenters

- Monica Young, Equitable Access Support Network
- Andy Baxter, Southern Regional Education Board
- Megan Clifford, Oklahoma State Department of Education
- Mary Batiwalla & Michael McWeeney, Tennessee Department of Education
Examples from Oklahoma
Megan Clifford is a Strategic Data Fellow at the Center for Education Policy and Research at Harvard University and Data Scientist at the Oklahoma State Department of Education.

Ms. Clifford’s research focuses predominately on postsecondary measures of teacher effectiveness and equitable distribution. She is currently completing research on the validity and reliability of value-added models in Oklahoma. Prior to this work, she served on the evaluation team of a Gates-funded, multi-year study on the implementation of a new evidence-based teacher evaluation rubric at the RAND Corporation. Ms. Clifford is a doctoral candidate at the Pardee RAND Graduate School where she is expected to complete a Ph.D. in Policy Analysis with a focus on quantitative and econometric methods in May 2015.
Oklahoma’s Use of Data Visualizations

- Oklahoma uses several types of visualizations:
  - Maps
  - Scatterplots
  - Bar charts
  - Tables
- The selection of visualization type depends on the type of data, relationships identified in the data, and intended audience.
Maps

Benefits
• Can help stakeholders identify geographic trends in data

Disadvantages
• Difficult to identify exact values of areas on maps
  o Providing a supplementary table with detailed statistics is helpful
• May not be appropriate for certain types of data
  o Showing total counts rather than percentages, for example, may misrepresent data

Options for Creating
• ArcGIS
• Tableau
Example: The Percent of Inexperienced Teachers by District
Scatterplots

Benefits

• Can help stakeholders identify overall and sub-group trends
• Can help stakeholders identify outliers
• Exact data values are reasonably identifiable
• Multiple data dimensions can be displayed through color, size, and shape

Disadvantages

• Difficult to display labels for all points
• Not very useful when no relationship exists between x and y variables

Options for Creating

• Statistical software like STATA, SAS, etc.
• Excel
• Tableau
Example: Comparing Rural and Urban Schools
Example: Disaggregating Trend Lines

School Poverty Rate by First Year Teacher Population for Rural and Urban Schools

- Location
  - City
  - Rural

- Percent of First Year Teachers
- Percent of Student in Poverty
Example: Teacher Characteristics Also Varied by School Population
Bar Charts

Benefits

- Can provide exact data values for all observations
- Good at displaying equity gaps

Disadvantages

- Not very good at displaying certain types of relationships or trends
- Difficult to display a large amount of data

Options for Creating

- Excel
- Tableau
Income Gaps and Teacher Qualifications

Percent of classes taught by teachers who are not highly qualified
- All: 0.5%
- Lowest Poverty Quartile: 0.2%
- Highest Poverty Quartile: 0.3%

Percent of teachers without certification or licensure
- All: 0.3%
- Lowest Poverty Quartile: 0.1%
- Highest Poverty Quartile: 0.2%
Tables

Benefits
• Can provide exact data values for all observations
• Can supplement other visualizations

Disadvantages
• Not very good at displaying relationships
• May be very large

Options for Creating
• Excel
• Tableau
## Example: Table of Equity Variables

<table>
<thead>
<tr>
<th>District</th>
<th>School</th>
<th>Percent of Teachers with Fewer than Four Years of Experience</th>
<th>Percent of First Year Teachers</th>
<th>Percent of Teachers with Standard Certification</th>
<th>Poverty Percent</th>
<th>IEP Percent</th>
<th>African American Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norman</td>
<td>Irving MS</td>
<td>27%</td>
<td>5%</td>
<td>77%</td>
<td>60%</td>
<td>16%</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Jackson ES</td>
<td>29%</td>
<td>14%</td>
<td>93%</td>
<td>65%</td>
<td>16%</td>
<td>7%</td>
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<tr>
<td></td>
<td>Jefferson ES</td>
<td>17%</td>
<td>4%</td>
<td>91%</td>
<td>50%</td>
<td>14%</td>
<td>5%</td>
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<tr>
<td></td>
<td>Kennedy ES</td>
<td>43%</td>
<td>17%</td>
<td>90%</td>
<td>87%</td>
<td>13%</td>
<td>13%</td>
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<tr>
<td></td>
<td>Lakeview ES</td>
<td>38%</td>
<td>8%</td>
<td>85%</td>
<td>59%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Lincoln ES</td>
<td>35%</td>
<td>18%</td>
<td>76%</td>
<td>55%</td>
<td>17%</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Longfellow MS</td>
<td>19%</td>
<td>6%</td>
<td>86%</td>
<td>55%</td>
<td>19%</td>
<td>5%</td>
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<tr>
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<td>Madison ES</td>
<td>15%</td>
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<td>7%</td>
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<tr>
<td></td>
<td>McKinley ES</td>
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<td>17%</td>
<td>89%</td>
<td>32%</td>
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<td>3%</td>
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<td>Monroe ES</td>
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<td>23%</td>
<td>91%</td>
<td>57%</td>
<td>13%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Norman HS</td>
<td>33%</td>
<td>13%</td>
<td>80%</td>
<td>45%</td>
<td>18%</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Norman North HS</td>
<td>14%</td>
<td>5%</td>
<td>71%</td>
<td>34%</td>
<td>17%</td>
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<tr>
<td></td>
<td>Ronald Reagan ES</td>
<td>56%</td>
<td>7%</td>
<td>78%</td>
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<tr>
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<td>Roosevelt ES</td>
<td>24%</td>
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<td>82%</td>
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<tr>
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<td>Truman ES</td>
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<td>95%</td>
<td>35%</td>
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<td>89%</td>
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<td>13%</td>
<td>3%</td>
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<tr>
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<td>Washington ES</td>
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<td>0%</td>
<td>77%</td>
<td>33%</td>
<td>11%</td>
<td>3%</td>
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<tr>
<td></td>
<td>Whittier MS</td>
<td>36%</td>
<td>11%</td>
<td>83%</td>
<td>31%</td>
<td>16%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>Wilson ES</td>
<td>33%</td>
<td>0%</td>
<td>87%</td>
<td>85%</td>
<td>22%</td>
<td>6%</td>
</tr>
<tr>
<td>North Rock Creek</td>
<td>North Rock Creek Public School</td>
<td>15%</td>
<td>3%</td>
<td>80%</td>
<td>53%</td>
<td>14%</td>
<td>1%</td>
</tr>
<tr>
<td>Norwood</td>
<td>Norwood Public School</td>
<td>8%</td>
<td>0%</td>
<td>92%</td>
<td>93%</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>Nowata</td>
<td>Nowata ES</td>
<td>31%</td>
<td>6%</td>
<td>91%</td>
<td>73%</td>
<td>11%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Nowata HS</td>
<td>11%</td>
<td>5%</td>
<td>89%</td>
<td>49%</td>
<td>13%</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Nowata MS</td>
<td>14%</td>
<td>14%</td>
<td>71%</td>
<td>64%</td>
<td>15%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Q&A

Share Your Thoughts!

Please type your question for Megan in the chat box.
Examples from Tennessee
Mary Batiwalla
Research and Policy Analyst
Tennessee Department of Education

Mary conducts internal research and works on accountability at the Tennessee Department of Education (TDOE). She is a former high school Spanish teacher. Before joining the TDOE, Mary assisted in education research at the National Center on Scaling Up Effective Schools, the State Collaborative on Reforming Education (SCORE), and a project studying the effectiveness of mentoring for beginning middle school math teachers. She completed a Master of Public Policy at Vanderbilt University.

Michael McWeeney
TEAM Program Analyst
Tennessee Department of Education

Michael is from Cincinnati, OH and graduated from Ohio State University in 2010. After graduating, he taught 4th, 5th and 6th grade Math in Sunflower, Mississippi for three years. He is currently finishing up his Masters in Public Policy at Vanderbilt University, and he works on the teacher evaluation team with the Tennessee Department of Education.
Tennessee’s Approach

- A highly effective teacher is defined as a teacher who received a value-added score indicating that his or her students tended to show more growth than expected in the year prior to assignment (TVAAS level 4 or 5).

- We define “effective teaching gap” as the difference in the percent of students in one subgroup who receive highly effective teachers compared to the percent of students in a comparison group who receive highly effective teachers.

- We determine the size of each district’s equity gap and the amount of the gap that is explained by within- and between-school differences.

- Differences we examine include:
  - Prior achievement (advanced vs. below basic, proficient vs. non proficient, top vs. bottom quartile students)
  - Minority vs. non-minority students
  - Economically disadvantaged vs. non-economically disadvantaged students
  - Economically disadvantaged vs. non-economically disadvantaged students, controlling for achievement
Students scoring below basic on reading achievement in 2012 were more likely to score at a higher achievement level in 2014, if they were placed with a highly effective reading teacher in 2013 and 2014.
Across the state in 2014, 60% of advanced math students in grades 4-8 received a highly effective math teacher. 53% of below basic students had a highly effective math teacher.

**Advanced students**
- Highly Effective
- Not Highly Effective

**Below Basic students**
- Highly Effective
- Not Highly Effective

7% gap
The size of the gap between the percent of advanced students receiving highly effective teachers and the percent of their below basic peers receiving highly effective teachers varies by district.

Each bar represents the effective teaching gap (ETG) in a district.

ETG = percentage of advanced students in highly effective teacher classrooms
    – percentage of below basic students in highly effective teacher classrooms
In 2014, 67 districts had an effective teaching gap larger than zero.

In this district, the effective teaching gap between advanced and below basic students is 20% percentage points. An advanced student in grades 4-8 has a 6 in 10 chance of receiving a highly effective teacher. A below basic student has a 4 in 10 chance. Over the course of a five year period, we expect the advanced student to have three years of highly effective teachers while the below basic student only receives two years of highly effective teachers.

Each bar represents the effective teaching gap in a district that has an effective teaching gap greater than zero.
Effective teaching gaps are a result of within- and between-school gaps.
In districts where below basic students are assigned to less effective math teachers than advanced students, the gap is explained by both within- and between-school gaps.
Sample District Data Reports
Subject: Reading/Language Arts
Grades: 4-8

Each bar in the above graph represents a district in the state. The height of the bar represents the size of the district's RLA equity gap. The district's equity is calculated by subtracting the percent of students who scored advanced on the prior year’s RLA TCAP and receive a highly effective RLA teacher from the percent of students who scored below basic on the prior year’s RLA TCAP and receive a highly effective RLA teacher.

The above graph displays the size of the state RLA equity gap, as well as your district’s RLA equity gap. Your district has a positive RLA equity gap. This means a smaller percentage of below basic students in your district receive a highly effective RLA teacher compared to advanced students.

The above graph displays the portions of your RLA equity gap that are explained by within- and between-school placement. When a positive equity gap is mostly explained by within-school placement it means that highly effective RLA teachers in the district are located throughout the schools in the district but placement decisions within schools lead to smaller percentages of below basic students receiving highly effective RLA teachers.
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Please type your question for Michael and Mary in the chat box.
Wrap Up
Contact the EASN

Please visit the EASN website or email the EASN to join an EASN Community of Practice, find relevant resources, or request targeted support.

https://easn.grads360.org/
easn@aemcorp.com
Thank You!