Multilevel Modelling of the Government’s New School Performance Tables

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Context

• Each year the Government publishes school performance tables which report the achievement and progress of all pupils in English state secondary schools.

• In January 2012, the Government introduced major changes to these tables:

  1. New school performance measures, reported separately by pupil groups.
  2. ‘Floor standards’ target in achievement and progress measures.
  3. ‘Narrowing the gap’ priority to reduce rich-poor achievement gap.

• Important implications for schools:

  – ‘Underperforming’ schools risk take-over by academies or closure.
### KS4 Exam Results

<table>
<thead>
<tr>
<th>School name</th>
<th>School type</th>
<th>% of pupils making expected progress</th>
<th>% achieving 5+ A*-C GCSEs (or equivalent) including English and maths GCSEs</th>
<th>% achieving the Baccalaureate</th>
<th>% achieving grades A*-C in English and maths GCSEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>England - state funded schools only</td>
<td></td>
<td></td>
<td>68.0%</td>
<td>68.7%</td>
<td>58.8%</td>
</tr>
<tr>
<td>Local Authority</td>
<td></td>
<td></td>
<td>68.0%</td>
<td>61.6%</td>
<td>51.6%</td>
</tr>
<tr>
<td>Ashton Park School</td>
<td>Foundation School</td>
<td>50%</td>
<td>43%</td>
<td>43%</td>
<td>49%</td>
</tr>
<tr>
<td>Bedminster Down School</td>
<td>Community School</td>
<td>62%</td>
<td>47%</td>
<td>40%</td>
<td>46%</td>
</tr>
<tr>
<td>Bridge Learning Campus - Secondary</td>
<td>Foundation School</td>
<td>64%</td>
<td>43%</td>
<td>45%</td>
<td>40%</td>
</tr>
<tr>
<td>Brislington Enterprise College</td>
<td>Foundation School</td>
<td>44%</td>
<td>54%</td>
<td>37%</td>
<td>38%</td>
</tr>
<tr>
<td>Bristol Brunel Academy</td>
<td>Academy Sponsor Led</td>
<td>63%</td>
<td>57%</td>
<td>45%</td>
<td>41%</td>
</tr>
</tbody>
</table>
Objective 1

- **Review** the new school performance measures and how they relate to other major changes made to the tables since their introduction in 1994

  - No such review exists, despite high-stakes natures of these changes
  
  - Describe the move away from statistical model based measures and the return to traditional descriptive statistic measures
  
  - Discuss the increased emphasis on progress compared to achievement
  
  - Explain the new focus on reporting results by pupil sub groups
  
  - Detail the different users and uses of the new performance measures
Objective 2

- Examine the importance of **statistical uncertainty** when judging whether schools pass the new ‘floor standards’ target

  – Use a multilevel modelling approach to examine the precision with which we can describe schools as performing above or below the minimum ‘floor standards’ and as ‘narrowing the gap’ or not between ‘rich’ and ‘poor’ students

  – Explore graphical alternatives to confidence intervals which have been applied in hospital comparisons by medical statisticians as a way to communicate this uncertainty

  – Secondary analyses of the DfE’s National Pupil Database (NPD)
Objective 3

- Investigate whether presenting results by low, middle and high age 11 attainment groups may lead to *spurious comparisons* between schools

  - The government now report the different effects that schools have on different pupil groups: low, middle and high age 11 attainers

  - However, what is meant by a low attainer varies from school-to-school and so comparing two schools on the performance of their low attainers is not a fair comparison

  - A statistically superior approach is to model schools’ performances as a flexible function of their actual age 11 attainment scores

  - We can then contrast the two approaches to examine whether the Government’s approach leads to spurious comparisons
Objective 4

- *Further develop my research skills* in Bayesian statistical modelling
  - Follow a programme of reading guided by Centre for Multilevel Modelling colleagues Bill Browne and Harvey Goldstein
  - Attend training workshops using the WinBUGS software
  - Continue to implement learnt methods in our ESRC funded Stat-JR software
  - One-week academic mobility visit to David Spiegelhalter, expert on Bayesian statistical modelling and institutional performance comparisons

- Attend University of Bristol and ESRC *training courses* on knowledge exchange, media and public engagement
Objective 5

• *Disseminate and knowledge exchange on statistical modelling of school performances measures with non-academic researchers*

  – Write **research briefings** in publications aimed at non-academics (CMPO bulletin, ESRC Britain and Society Now magazines, Significance magazine)

  – Give **presentations** at meetings attended by non-academic researchers (BERA, DfE funded PLUG, Royal Statistical Society Social Statistics meetings)

  – Write **training materials** for non-academic researchers (to be added to our ESRC funded LEMMA online multilevel modelling course)

  – One-week knowledge exchange placement at **Fischer Family Trust**

  – Run one-day training and research workshop at the **Royal Statistical Society**
Secondary school league tables in Bristol

### Compare secondary schools in your area

Enter full postcode to find area or search by local authority

#### Click on a column below to sort by results, or check names to compare schools

<table>
<thead>
<tr>
<th>School name</th>
<th>Five good GCSEs or equivalents (%)</th>
<th>English Bacc (%)</th>
<th>Value Added</th>
<th>A/AS-level points per pupil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashton Park School</td>
<td>43</td>
<td>10</td>
<td>973.6</td>
<td>671.8</td>
</tr>
<tr>
<td>Bedminster Down School</td>
<td>40</td>
<td>4</td>
<td>995.2</td>
<td>NA</td>
</tr>
<tr>
<td>Bridge Learning Campus - Secondary (SHUT)</td>
<td>45</td>
<td>0</td>
<td>979.5</td>
<td>NA</td>
</tr>
<tr>
<td>Brislington Enterprise College</td>
<td>37</td>
<td>1</td>
<td>966.2</td>
<td>NA</td>
</tr>
<tr>
<td>Bristol Brunel Academy (AC)</td>
<td>45</td>
<td>8</td>
<td>1012.1</td>
<td>555.3</td>
</tr>
<tr>
<td>Bristol Cathedral Choir School (AC)</td>
<td>81</td>
<td>25</td>
<td>1005.3</td>
<td>682.8</td>
</tr>
<tr>
<td>Bristol Metropolitan Academy (AC)</td>
<td>34</td>
<td>4</td>
<td>1016.2</td>
<td>482.9</td>
</tr>
<tr>
<td>The City Academy Bristol (AC)</td>
<td>40</td>
<td>2</td>
<td>1011.2</td>
<td>572.8</td>
</tr>
<tr>
<td>Colston’s Girls’ School (AC)</td>
<td>84</td>
<td>57</td>
<td>1017.2</td>
<td>753.2</td>
</tr>
<tr>
<td>Cotham School</td>
<td>56</td>
<td>18</td>
<td>1012.9</td>
<td>823.5</td>
</tr>
</tbody>
</table>