

# **Progress to date on the review of the benchmarking approach**

## **UKPISG 16/03**

### **Issue**

1. In response to the 2013 fundamental review of the UK performance indicators (UKPIs) for higher education (HE), a review of the benchmarking approach for UKPIs was agreed. The review is intended to effect change in the 2016 publications of UKPIs and experimental statistics. UKPISG are invited to consider the progress made by the UK Performance Indicators Technical Group (UKPITG).

### **Recommendations**

2. It is recommended that UKPISG consider the updates provided, and identify any omissions or requirements of them that may arise from the next steps in each of the four work strands.

### **Discussion**

3. The UKPIs provide information on the performance of the HE sector in the UK. The benchmarks included in the UKPIs mean that the measures can be used for comparative and contextualising purposes.

4. In response to the 2013 fundamental review of UKPIs, a review of the benchmarking approach for UKPIs was agreed. Four strands were established, focussing on:

- (a) Independent assessment of the statistical approach to the benchmarking
- (b) Review of the principles employed in the selection of factors to include in benchmarking calculations
- (c) Review of the methodology used to define groupings used within benchmarking factors
- (d) User consultation with regards to the benchmarking approach used within UKPIs

### **Update on (a) Independent assessment of the statistical approach to the benchmarking**

5. Having confirmed their availability to undertake an assessment of the statistical approach to the benchmarking, the ONS methodology unit are expected to begin this work at the beginning of July 2016. This strand of work was delayed on account of the ONS' work with BIS in relation to reviewing the data sources being used in the Teaching Excellence Framework (TEF), which had developed in recent months. Following an interim report published in May 2016, a short piece of further work was being undertaken by ONS which would include an initial look at the benchmarking methodology.

6. ONS and UKPITG have therefore considered that any work for UKPITG's benchmarking review should wait until the TEF-related report was complete: the shared scope and remit of the two pieces of review work was currently unclear. As such, an assessment of the sufficiency of ONS' work to date for UKPITG's purposes, and UKPITG's requirement for any additional stages of work, needed to be made before any

such work commences. HESA will be keeping UKPITG up to date as to ongoing discussions with the ONS in relation to their contribution to the benchmarking review. In particular, around the scope and costs of their contribution.

### **Update on (b) Review of the principles employed in the selection of factors to include in benchmarking calculations**

7. In December 2015 UKPITG members proposed set of principles for the selection of factors to include in benchmarking calculations. The group are currently in the process of undertaking an assessment of the fit of the existing benchmarking factors with those principles, and expect to report the outcomes of this assessment to the next meeting of UKPISG. The assessment is also expected to be included as a component of the wider evidence base reporting the benchmarking review outcomes more generally.

#### **Proposed guiding principles for UKPI benchmarking factors**

1. The selection of benchmarking factors should adhere to the same principles as the indicators themselves.
2. In addition, benchmarking factors should:
  - a. Be correlated with what is being measured.
  - b. Be material, in that they should vary significantly from one institution to another. Materiality should be considered in the context of an ambition to minimise the risk of an institution having a significant impact on their own benchmark.
  - c. Be outside of the institutions' control, or otherwise undesirable for them to control for.
  - d. Not be uniformly distributed across institutions, rather the factor should differentially affect institutions' benchmarks.
  - e. Be a direct measure rather than a proxy.

8. Other work on this strand has focussed on a desk-based literature review of benchmarking in UK public sector. It has been considered that this would be the most efficient way to find out whether HE sector practice on benchmarking is mirrored by other public sector practice. The full report is available at Appendix 1, and UKPITG's interpretation is that UKPIs' approach to benchmarking already employs much of the good practice that the literature review has identified. In some areas, it is felt that UKPIs are already operating one of the most sophisticated and comprehensive approaches. There are minimal concerns that the UKPIs need to adopt significant change in practice. Work in the coming months will focus on honing the report to capture the key questions as succinctly as possible in order to inform this strand of the review process most effectively.

**Update on (c) Review of the methodology used to define groupings used within benchmarking factors**

9. A review of UKPISG and UKPITG historical minutes of meetings since 1998, and documents relating to the original development of the indicators and set up of the UKPISG, was conducted and is reported at Appendix 2. The emerging set of principles proposed for defining groupings used within benchmarking factors remain subject to

The groupings used within benchmarking factors should:

- 1) have as few categories as possible;
- 2) be homogeneous with respect to the indicator to which they refer;
- 3) make practical sense;
- 4) be relatively evenly spread;
- 5) be used consistently across all UKPIs where possible, allowing other UKPIs to act as context statistics;
- 6) be determined empirically;
- 7) be reviewed periodically to ensure they continue to be homogeneous, make practical sense and are relatively evenly spread.

some minor refinement to wording and are provided below.

10. As with work strand (b) an assessment of the fit of the existing benchmarking factor groupings with the principles proposed will be undertaken by UKPITG. The assessment is also expected to be included as a component of both the user consultation strand (d) and the wider evidence base reporting the benchmarking review outcomes more generally.

**Update on (d) User consultation with regards to the benchmarking approach used within UKPIs**

11. In consultation with colleagues across the UK administrations a number of routes for stakeholder engagement have been identified. These routes seek to exploit existing groups and mechanisms for engagement, considered to be the most efficient and effective way to communicate with relevant interested organisations. The table below outlines those groups/fora currently in place.

<b>Name of group</b>	<b>Who they are</b>	<b>What they do</b>	<b>When they do it</b>
<b>Wales</b>			
HEFCW data workshop	Welsh HE sector (HEIs and FEIs)	Covers use of data, data collection, HESA data etc can include a discussion about the PIs	Once a year  Next meeting: likely July 2016

Universities Wales Student Returns Group	Welsh HEIs, Universities Wales, HEFCW, HESA, plus others depending on the content of the meeting	To discuss data returns, discussion of PIs would be covered	Twice a year  Next meeting: 22 April 2016
<b>England</b>			
Higher Education Strategic Planners Association  <a href="http://www.hespa.ac.uk/">http://www.hespa.ac.uk/</a>	Membership organisation representing planners working in Higher Education across the UK	Primarily interested in factors influencing PIs, rather than underlying approach.	Regular Executive Meetings – every 2 months or so  Next meeting: 9 <sup>th</sup> March 2016 26 May 2016
TEF governance and implementation	No specific group set up, but potential route through to relevant parties.		Spring/summer 2016
<b>Scotland</b>			
Institutional Group on Statistics for SFC (IGS-SFC)	All 19 HEIs in Scotland (including OU), can send a representative to the group meetings. Representatives typically involved in compiling their institution's SFC Early Statistics Return and/or their HESA Student Returns. Usually come from registry or planning departments at their institution.	Consult on matters relating to data collections and interpretation of data. The group is given updates on matters relating to the UKPIs. The group meetings would be an appropriate forum for discussing technical matters relating to the UKPIs.	The group usually meets twice a year.  Next meeting: TBC - around April 2016.  If response needed prior to this then we could consult the group by correspondence.

	Also contains representatives from the Scottish Government Lifelong learning Statistics Branch, Universities Scotland and HESA.		
Scottish Universities Planners Group	TBA	Potential suitable group for consulting on matters relating to the UKPIs.	TBC
<b>Northern Ireland</b>			
TBA			

### ***Recommendation***

It is recommended that UKPISG consider the updates provided, and identify any omissions or requirements of them that may arise from the next steps in each of the four work strands.

### **Further information**

12. For further information contact Alison Brunt (Phone: 0117 931 7166; e-mail: [a.brunt@hefce.ac.uk](mailto:a.brunt@hefce.ac.uk)) or Mark Gittoes (Phone: 0117 931 7052; email: [m.gittoes@hefce.ac.uk](mailto:m.gittoes@hefce.ac.uk)).

## Appendix 2 – Review of documentation relating to the definition of groupings within benchmarking factors

1. HEFCW undertook a review of existing documentation available on the HESA and HEFCE website, and held in paper form at HEFCE. It should be taken into consideration that paperwork covering the entire history of the UKPIs was not available, particularly paperwork relating to the model which was subsequently adopted, an adaptation of work developed by Dr. N. G. McCrum of the University of Oxford, and papers between 2009 and 2010.
2. Throughout the following discussion it is assumed that the reader is familiar with the method for calculating the HESA UKPI benchmarks, and the terms factor, group and category within that method. Reference to deciding the overall method, and how to select the factors is avoided as this forms part of work areas (a) and (b).

### There should be as few categories as possible

3. The factor groups in the arithmetic method used to calculate the UKPI benchmarks are used to explain some of the variation between institutions, if there are not enough factor groups, or there are too many factor groups this could affect the robustness or usefulness of the method.
4. If there are not enough groups then less of the variation is explained, however having too many groups could result in a model with sparse data, many blank cells and many cells with small values, adding volatility to the model. A single group would simply provide the sector average, while the maximum number of groups, i.e. one cell per student, would provide an institution's own value of the UKPI.

*'...there should be as few categories as possible.'* PISG 03/08

*'At the extremes a single group would not take account of any variation between institutions, while a system that put each student into a separate group would account for all the variation.'* HEFCE 2006/34

*'For example, if the number of benchmarking groups was increased to the extreme, there would be the same number of benchmarking categorisations as individual students, with each categorisation containing one student. A feature of the benchmarking approach is that where differences exist between the indicator and the benchmark, this may be due to the institution's performance, or due to some other factor which is not included in the benchmark. If each benchmarking categorisation contained only one student, the benchmark would then be the same as the indicator in all cases: all variation would have been explained and the notion that differences may be due to the institution's performance would be lost.'* PISG12/01

*'...the increase in small numbers in benchmarking categorisations demonstrates an increased potential for the information provided by the benchmarks to be reduced unnecessarily. A second effect is that the proportion of an institution's benchmark that will be determined by itself is likely to increase.'* PISG12/01

*'Larger numbers of benchmarking groups leads to groups being smaller in size and increased potential for volatility within the PI benchmarks as a result.'* PISG12/01

Groups should be homogeneous with respect to the indicator to which they refer

Groups should make practical sense

Groups should be relatively evenly spread

*'...groupings have been chosen so that as far as possible the students within each group are relatively homogeneous.'* HEFCE99/66

*'...each category should be homogeneous with respect to the indicator(s) to which they refer.'* PISG03/08

*'... they were combined provided that that also made practical sense (so A-level points categories, for example, were only combined if they were contiguous.)'* PISG 03/08

*'...it was also necessary to define relevant groupings for each factor. In general this was done pragmatically by considering the spread of values of the indicator for different factor values, and grouping together those with similar values. The aim was to produce as small a set of groups as possible, where each group was homogeneous with respect to the characteristic being measured.*

*'In some cases, the original factor groupings combined areas which at the time appeared to show similar characteristics. Some such areas have now been split because they later became more diverse, or because there was a perception that the two areas should be kept separate. For example, initially the subjects of mathematics and computing were combined into one category, but by the time the new JACS codes were introduced it seemed more sensible to keep them separate.'* HEFCE 2006/34

5. Paper PISG 09/07 particularly demonstrates where choosing groupings should make practical sense and be more evenly spread. The paper examined the possibility of extending the coverage of the retention UKPI to include part-time first-degree entrants. Analysis of factor groups showed that using the existing groups for full-time entrants was not appropriate for part-time entrants.

6. The majority (94%) of part-time students fell into the mature age group as defined for the full-time entrants UKPI (young and mature are under 21 or 21 and over for full-time). Analysis of age of part-time students showed that age was mostly evenly spread, and in terms of the indicator 'Absent from HE' there was no consistency across any potential age groups. The age group proposed (30 and under, over 30) was decided upon as it mirrored the HEIPR, and the data were more evenly spread.

7. Similarly with the entry qualification groupings, almost half of part-time entrants were found to hold 'HE qualifications' on entry so the spread across the data was not very even. It was proposed that the HE qualifications group was split, and for some of the existing full-time groups with small numbers of part-time entrants it was proposed that they be aggregated.

8. It was also proposed that some full-time subject groups with small numbers of part-time entrants be aggregated to form an 'Other subjects' group.

9. It could be argued that in this case although the data were evenly spread with respect to age, there was no homogeneity with respect to the indicator 'Absent from HE' and therefore including age as a factor does not add any explanation of the variation amongst institutions. The analysis of spread for subject and qualifications on entry in this paper, did not appear to consider the value of the indicator, and therefore it is not possible to say if the groupings chosen exhibited homogeneity.

10. Paper UKPITG 14/04 discussed bringing the qualification on entry groups for indicator E1 into line with the other UKPIs. Table E1 uses more benchmark factors than the other UKPIs (ethnicity and gender) and therefore has fewer qualifications on entry groups in order to not significantly increase the number of categories. The paper discusses merging groups defined by specific A level grade combinations and groups defined with similar tariff scores but achieved from a wider range of qualifications. Merging this data would have resulted in a much bigger top entry qualification group than used for the other PIs and compared to the other groups to be used with E1, and would also have resulted in treating students with the same tariff score but different A level grade combinations differently. The proposal which was agreed upon created groups for A level grade combinations separately from groups with similar tariff scores achieved from a wider range of qualifications. The number of groupings decided upon evened up the spread of the data across the groups, whilst retaining the same number of categories.

The same groups should be used across all UKPIs where possible allowing other UKPIs to be context statistics

11. Both supplementary data and context statistics are provided to facilitate the understanding of the UKPIs. Context statistics currently provided are:

- a. the average number of HE providers in the adjusted sector benchmark comparison
- b. the average proportion which the HE provider's own students contribute to the benchmark

12. However, the UKPIs themselves can be context statistics to each other.

*'For both access and student progression indicators, it is proposed that adjusted sector indicators are derived for comparison. If possible, the intention is to use the same grouping of subjects and entry qualifications to calculate adjusted sector averages for the access and student progression measures. This is partly to make it easier to appreciate what is being done, and partly to facilitate the use of access indicators as a context for the progression indicators, and vice-versa.'* HEFCE 99/11

13. This criteria should be applied after testing for the first four criteria, as it wouldn't make sense to use groupings for another UKPI should they not prove to be homogeneous, make practical sense, or be relatively evenly spread, as the amount of variation to be explained in the model would not then be being explained appropriately.

Groups need to be determined empirically

*'...the categories must be determined empirically'* PISG03/08

14. There does not appear to be any other way to choose the groups. It has already been seen that there should be as few categories as possible, they should be



homogeneous with respect to the indicator to which they refer, they should make practical sense and that they should be relatively evenly spread.

Groups should be reviewed periodically to ensure they continue to be homogeneous, make practical sense and are relatively evenly spread

15. Factor groups have been reviewed each time a change is made to the underlying data in order to determine that they still meet the above criteria. Generally this has mostly been due to changes to qualifications on entry data and subject of study data. When changes have been introduced, groups have generally been reviewed and amended to make practical sense and to ensure a relatively even spread of the data. Not so often is the homogeneity of the data examined, i.e. the values of the indicator calculated and examined to see if they are similar or different for each group, or sub groups within groups.

16. Examples where groups have been reviewed for homogeneity and changes have been recommended can be found in PISG 05/09 which reviewed the subject of study groups, and PISG 09/02 and PITG 13/05 which examined qualifications on entry groups.

17. In PISG 05/09, the access and the non-continuation indicators for young entrants to full-time degrees were calculated for JACS Subject Groups, and JACS Principal Subject groups within each JACS Subject Group. Most subjects groups were fairly homogeneous, but the paper went on to identify three subject groups that seemed more disparate and contained large enough numbers to allow a split to be viable.

18. Due to the introduction of additional qualifications on entry data in the 2007/08 HESA student record, paper PISG 09/02 considered four possible approaches to grouping the qualifications on entry for UKPIs based on entrants. For each country of the UK, the size of the groups and the indicator (state school, SEC 4-7, LPN) for each group was analysed. For the state school indicator only, the mean institutional indicator and benchmark for each country of the UK were also examined. Practical sense and number of groups was considered in developing the four approaches, whilst homogeneity and spread was considered in the analysis.

19. Paper PITG 13/05, looked at updating the qualification on entry groupings for the PIs not based on entrants. Analysis of the effect on the benchmarks for T7 was undertaken by running the UKPI with the old and the new qualification on entry groups. For each group, new and old, the number of students and the indicator were calculated.

20. When a change to groups is required this is known in advance, but data are not always available when the groups are agreed. When the data are available then homogeneity should be examined alongside making practical sense and a good spread of the data. When data are not available in advance then the groupings should be reviewed for homogeneity when it becomes available.

21. Groups should be reviewed regularly for homogeneity, practical sense and spread, as changes due to external factors and the way things are perceived or coded can change over time.

Other considerations

22. Factor groups may be changed due to changes to the data being collected. Historically this has mostly related to qualifications on entry and subject of study. Changes included moving from using A level point score, to UCAS tariff and subsequently to using QVALENT2, QVALENT3 and QVATYPE and QVAGRADE for qualifications on entry, and from HESACODE to JACS for subject of study.
23. The HEDIIP subject coding project means that it is likely that there will be a future change from JACS to HECOS, which may impact on subject of study groupings.
24. Changes in policy may impact on deciding factor groups directly in terms of what makes practical sense, or indirectly in terms of what data is collected, but the choice of factor groups still has to be determined by meeting the criteria of as few groups as possible, homogeneity, practical sense and spread.
25. Changes due to institutional factors are part of the institution's performance and are therefore part of what is being measured by the UKPI. The factors and their groups are used to remove variation assumed to be outside of the institution's control.
- 'Factors should not be in the HE providers' control, and so not be part of their performance (www.hesa.ac.uk/pis/benchmarks)*
26. It has not proved possible to find information on similar benchmarking methods via an internet search, and therefore not possible to make any observations on how factors are grouped elsewhere.