

Teacher numbers and Pupil: Teacher Ratios in Northern Ireland

Information and procedures document

1. Teacher numbers and Pupil: Teacher Ratios

- 1.1 Each year since 1992/1993, the Department of Education (DE) Statistics & Research Branch has carried out a statistical survey of the teachers working in grant-aided schools in Northern Ireland. At present, this amounts to some 1,200 schools.
- 1.2 The method and coverage of data collection has changed several times since 1992/1993, the most recent change being in 2007-2008. Annex A sets out the changes to the data collection over time.
- 1.3 The data collected is an individual (teacher) level. Annex B sets out the data items currently collected for each teacher.
- 1.4 The finalised dataset contains one record per teacher, per school. Full-time equivalent (FTE) teacher numbers are derived from this dataset. The Pupil: Teacher Ratios (PTRs) are derived by dividing the FTE teacher numbers by the numbers of full-time equivalent pupils.
- 1.5 The numbers of full-time equivalent pupils are derived from the annual schools' Census data collection.
- 1.6 FTE teacher numbers and PTRs are calculated for a single reference week in the school year. This is usually the last full school week in November.
- 1.7 Pupil: Teacher Ratios are currently designated as National Statistics. This means that they are produced to high professional standards set out in the Code of Practice for Official Statistics. They undergo regular assurance reviews to ensure that they meet customer needs, and are produced free from any political interference.
- 1.8 FTE teacher numbers are currently designated as Official Statistics, as they are used to derive the PTRs.

2. Users and uses of the Pupil: Teacher Ratio Statistical Release and underpinning data

- 2.1 Data on FTE teacher numbers are collected to enable the Department of Education (DE) and Education and Library Boards (ELBs) to fulfil their statutory duties, including meeting their requirements specified in Section 75 of the Northern Ireland Act (1998).

- 2.2 The underpinning data is used to inform DE policy and procedures, such as teacher education, school funding, and the planning of teacher demand.
- 2.3 The Pupil: Teacher Ratio, as published, is a key descriptive statistic in the accountability and auditing processes between schools and ELBs.

3. Administrative sources of data

- 3.1 Currently (2008-2009), the primary source of data for the Pupil: Teacher Ratio data collection exercise is the computerised teachers' payroll system.
- 3.2 This data is provided to DE Statistics & Research Branch by DE Information Systems Unit (ISU) on the last week of November.
- 3.3 Data for voluntary grammar schools is derived from the previous year's PTR data collection exercise, as these schools are not required to use the computerised teachers' payroll system.
- 3.4 In 2009-2010, DE Statistics & Research Branch and stakeholders C2KNI will carry out a pilot study to investigate the feasibility of collecting administrative data directly from schools via the SIMS software system.

4. Data collection

- 4.1 Administrative data is processed by DE Statistics & Research Branch, and sent by email to schools for verification in the January following the reference week.
- 4.2 Paper forms are sent to schools without the requisite technology, for instance nursery schools.
- 4.3 The data must be verified by the school principal or head teacher.
- 4.4 The deadline for receipt of verified data is the end of February, but it has been necessary to extend this informally to as late as April while clerical staff contact schools who have not responded.
- 4.5 Data is keyed in only if it has been verified by the school by signed paper return, or by email from a recognised address.
- 4.6 Data is keyed in by clerical staff. Each return is checked against the database by an Assistant Statistician.

5. Data validation and quality assurance

- 5.1 Upon receipt of administrative data, DE Statistics & Research Branch applies a set of validation and data cleaning procedures before mailing the information to schools (Annex C).
- 5.2 Upon receipt of checked data from schools, DE Statistics & Research Branch applies a further set of validation procedures (Annex D).
- 5.3 No changes are made to the dataset as a result of this second validation exercise without consultation with the school(s) in question.
- 5.4 Checking, validation and quality assurance are resource-intensive processes, but they are essential to providing reliable statistics. Annex E sets out an example of how these processes contribute to the production of final statistics.

6. Legislation

- 6.1 Legislation is in place which requires schools to provide information relating to teacher numbers.
- 6.2 The Department is registered with the Information Commissioner as a data controller under the requirements of the Data Protection Act (1998).

7. Resources

- 7.1 The Pupil: Teacher Ratio data collection is managed by one Deputy Principal Statistician, along with one Assistant Statistician.
- 7.2 Administrative support is provided by two clerical staff, who assist in the mail-out process and in the electronic capture of the data.
- 7.3 These are the minimum resources required to produce the dataset to its current standard and in its current timeframe.

8. Confidentiality

- 8.1 The Pupil: Teacher Ratio data collection exercise adheres to the Confidentiality principle set out in the Code of Practice for Official Statistics.
- 8.2 No information on private individuals or organisations is released to the public.
- 8.3 Sensitive data items, such as bank details, religion and ethnicity, are not collected from the administrative source and are therefore not held by DE Statistics & Research Branch.

8.4 Individual-level data output from the PTR exercise is held solely by DE Statistics & Research Branch. It is stored in folders which are inaccessible to third parties.

9. Publication

9.1 The Statistical Press Release on Pupil: Teacher Ratios is usually published in the June following the reference week of the data collection.

9.2 The Statistical Press Release is pre-announced on the DE Statistics & Research website in accordance with Protocol 2 of the Code of Practice for Official Statistics.

9.3 In 2008-2009, pre-release access was granted to the following individuals for operational purposes:

- Minister for Education for Northern Ireland
- DE Permanent Secretary
- DE Deputy Secretaries
- DE Head of Performance and Planning Directorate
- DE Head of Education and Training Inspectorate
- DE Head of Curriculum, Qualifications and Standards Directorate
- DE Principal Information Officer
- Special Adviser to the Minister for Education

9.4 All correspondence to those in the pre-release access list regarding restricted statistics was prefaced with the following text:

NATIONAL STATISTICS – please treat as protect, for named individuals or identified post holders only. Not for sharing with anyone else or to be used in any other documents before publication. If you think you need to discuss and share with anyone not on the circulation list, contact first the senior statistician for statistics. Any accidental or wrongful release should be reported immediately and may lead to an enquiry. Wrongful release includes indications of the content or trend of the figures, including descriptions such as “favourable” or “unfavourable”.

9.5 The pre-release access list is published on the DE Statistics & Research website at the same time as the Press Release.

9.6 Concurrent with the Statistical Press Release, data on Pupil: Teacher Ratios and FTE teacher numbers are made available online in Microsoft Excel format.

Annex A
Changes to the PTR data collection since first publication

1992/1993 – First aggregation and publication of Pupil: Teacher Ratio statistics, using survey data (for grammar schools) and raw administrative (payroll) data (for all other schools). Statistics were reported at Education and Library Board (ELB) level, but not at school level.

1999/2000 – First reporting of Pupil: Teacher Ratio statistics at school level.

2002/2003 – First capture of individual (teacher-level) data from the administrative source, for nursery, primary, secondary and special schools.

2003/2004 – First checking exercise carried out. Data for nursery, primary, secondary and special schools were checked with schools prior to publication.

2005/2006 – First capture and checking of individual (teacher-level) data for controlled grammar schools.

2007/2008 – First capture and checking of individual (teacher-level) data for voluntary grammar schools.

Annex B
Data items currently collected for the PTR publication

Variable name	Variable label	Variable type	Level	Source	Validated by DE	Checked with schools	Published
schref	School reference number	Cat. numeric 0000000	Teacher	Payroll ¹	No	Yes	Yes
trno	Teacher number	Numeric 000000	Teacher	Payroll ¹	Yes	Yes	No
name	Name	String	Teacher	Payroll ¹	Yes	Yes	No
dob	Date of birth	Date	Teacher	Payroll ¹	Yes	No ²	No ³
jobtitle	Job title	String	Teacher	Payroll	No	No	No
gender	Gender	Cat. string	Teacher	Payroll ¹	Yes	No ²	No ³
hrsperwk	Hours worked per week	Numeric 00.0	Teacher	Payroll ¹	Yes	Yes	Yes ⁴
type	Employment type (FT/PT/temp etc.)	Cat. string	Teacher	Payroll ¹	Yes	Yes	Yes ⁴
grade	Grade	Cat. string	Teacher	Payroll	No	No	No
board	Education and Library Board	Cat. string	School	DE Schools+ database	No	No	Yes
schttype	School type (phase of education)	Cat. string	School	DE Schools+ database	No	No	Yes
mggttype	School management type	Cat. string	School	DE Schools+ database	No	No	Yes
dept	Department (prep or secondary)	Cat. string	Teacher	Schools with prep depts	Yes	Yes	Yes
prephrs	Hours worked in prep dept	Numeric 00.0	Teacher	Schools with prep depts	Yes	Yes	Yes
sechrs	Hours worked in secondary dept	Numeric 00.0	Teacher	Schools with prep depts	Yes	Yes	Yes

¹ The source is the Teachers' Payroll system, but for voluntary grammar schools, the data is replaced by information provided by the school itself the previous year (which originally had been sourced from Payroll). This is because voluntary grammar schools are not required to use the Payroll system (although many do).

² Date of birth and gender of existing teachers are checked for plausibility by DE, but are not checked by schools. When schools add a new teacher, however, they are required to supply date of birth and gender.

³ Age (derived from DOB) and gender of teachers are not currently published statistics, as the majority of the figures are unchecked by schools. However, we produce publication-quality tables derived on these figures, and supply them to customers on an *ad hoc* basis. In 2009/10, we will require all schools to check DOB and gender information, and will consider publishing statistics derived from them.

⁴ Teacher hours and type are not currently published statistics, but they are used to derive the full-time equivalent (FTE) teacher figures for the PTR.

Annex C
DE validation/data cleaning procedures to PTR data prior to mailout

Item(s) checked	Check	Action
-	For teachers in voluntary grammar schools	Remove cases and replace them with data derived from previous year's exercise. (These schools are not required to use the Payroll system.)
schref, trno	For duplicate teachers within a school	Keep records where <i>hrsperwk</i> is maximum; delete others; for info to Payroll branch.
trno	For out-of-range numbers	For info to Payroll branch.
name	For incorrect formats	Change to correct format.
dob	For out-of-range dates	For info to Payroll branch.
name, gender	Identify cases where <i>name</i> and <i>gender</i> are inconsistent	Change where appropriate.
dob, gender	Identify cases where either item is missing	For info to Payroll branch; populate with previous year's figure where available.
hrsperwk, type	Identify cases where <i>type</i> is PT or pro rata and <i>hrsperwk</i> is missing	For info to Payroll branch.
hrsperwk, type	Identify cases where <i>type</i> is PT or pro rata and <i>hrsperwk</i> <2	For info to Payroll branch.
hrsperwk, type	Identify cases where <i>type</i> is PT or pro rata and <i>hrsperwk</i> >32.4	Set <i>hrsperwk</i> =32.4; for info to Payroll branch.

Annex D
DE validation procedures to PTR data received from schools

Check	Action
For missing <i>dob</i> and <i>gender</i>	Phone school.
For duplicate <i>trno</i> within schools	Check hard copy; phone school.
For duplicate <i>trno</i> in dataset	Aggregate to <i>trno</i> ; if $\text{sum}(\text{hrsperwk}) > 32.4$, check hard copy; phone school(s).
For duplicate <i>trno</i> in dataset	Aggregate to <i>trno</i> ; check that teacher details are the same for all unique <i>trno</i> .
For <i>type</i> =FT and $\text{hrsperwk} < 32.4$	Check hard copy; phone school.
For <i>type</i> =PT and $\text{hrsperwk} \geq 32.4$	Check hard copy; phone school.
For consistency between <i>hrsperwk</i> , <i>prephrs</i> and <i>sechrs</i>	If $\text{hrsperwk} = \text{prephrs} + \text{sechrs}$, OK; otherwise check hard copy; phone school.
Crosstabulation of <i>hrsperwk</i> and <i>type</i>	To check for any obvious inconsistencies. May require some recoding of <i>hrsperwk</i> .
FTE time series plausibility check	Extract each case where the FTE difference from last year is significantly different from the average year-on-year change for this school.
PTR time series plausibility check	Extract each case where the PTR difference from last year is significantly different from the average year-on-year change for this school.
Soft validation	Eyeball examination of each school which fails FTE or PTR plausibility check. May require checking of enrolment figures. May also require phoning schools to check if temporary teachers have been correctly recorded, or if new teachers have been added, or if former teachers have been deleted.

Annex E
Effect of the checking and validation processes

Pupil: Teacher Ratios at different stages of the data collection exercise, 2008/09

Statistic	Using source data	Using cleaned data (prior to mailout)	Using checked data	Using checked and wholly validated data
PTR – Belfast ELB	15.28	15.42	15.81	15.83
PTR – Western ELB	15.81	16.10	16.67	16.72
PTR – North Eastern ELB	16.26	16.25	16.67	16.72
PTR – South Eastern ELB	16.36	16.39	16.94	16.93
PTR – Southern ELB	16.70	16.63	17.06	17.12
PTR – Northern Ireland	16.11	16.18	16.65	16.68