Development of Teacher Attrition Indicator in the OECD-NESLI Network

TCG Working Group Meeting
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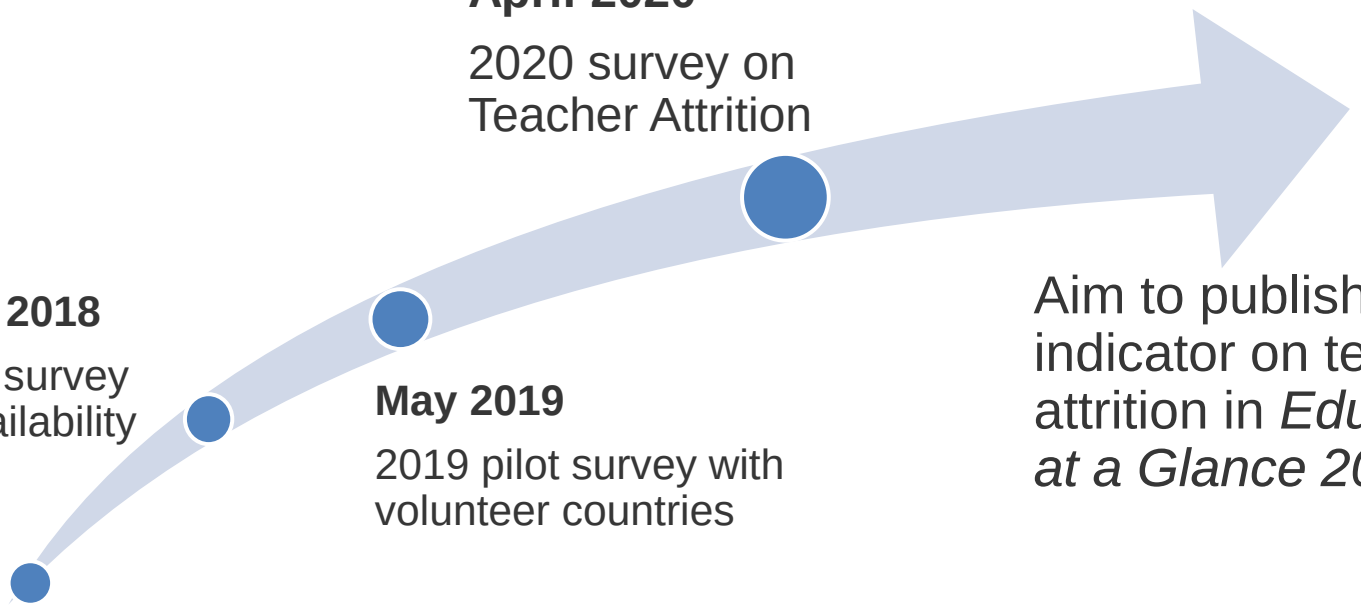
OECD
BETTER POLICIES FOR BETTER LIVES

Work on teacher attrition in the OECD-NESLI Network

Development timeline



October 2017

First discussion on the development of an indicator on teacher attrition

Indicator on teacher attrition is being developed in consultation and in collaboration with the NESLI member countries.

METHODOLOGIES EXPLORED FOR ESTIMATING TEACHER ATTRITION

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Methods reviewed with NESLI delegates

Method 1

- Proposed by UNESCO for SDG indicator on teacher attrition
- Measures teacher attrition using the number of new teacher entrants and the total number of teachers in two consecutive reference years

Method 2

- Measures attrition using the actual number of teachers leaving the profession and the total number of teachers in the reference year

Method 3

- Measures teacher attrition using data from national labour force surveys on the total number of teachers and on the number of teachers who left the teaching profession in the reference year

Difficult to use due to:
- sampling issues from labour force surveys
- data not available in most countries

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Methodologies used in the NESLI Network

Method proposed by SDG

Method 1

indirect estimation

(using the **estimated** number of teachers leaving the profession based on the number of teachers entering the profession)

Method 2

direct estimation

(using the **actual** number of teachers leaving the profession)

$$A_{(t,t+1)} = \frac{(N_t - N_{t+1}) + \boldsymbol{E_{(t,t+1)}}}{N_t} = \frac{\boldsymbol{L_{(t,t+1)}}}{N_t}$$

These two methods theoretically gives the same estimation.

However, if teachers on temporary leaves are not included in the reported total number of teachers (***N***), the estimation results from the two methods could be different (by up to 0.6%p for combined level (ISCED 02-3) in many countries)

Methodologies used in the NESLI Network

Method 1 vs Method 2

	Method 1 (indirect)	Method 2 (direct)
Number of variables	3 variables	2 variables
Limitations in methodology	• Over- or under-estimation bias from teachers on temporary leaves • Bias in FTE estimates where there are teachers with changes in workload between *t* and *t+1* • Over- or under-estimation bias from teachers moving between levels of education when estimating attrition by level of education	Over-estimation bias from teachers on temporary leaves
Data availability (out of 15 countries in the 2020 survey)	13-15 countries (HC) 11-13 countries (FTE)	10-13 countries (HC) 10-12 countries (FTE)

Method 1: preferred for an attrition estimation in head-counts as more countries can be involved.

Method 2: must be used for estimation in FTE.

Methodologies used in the NESLI Network

Method 1 vs Revised Method 1

Variables needed for estimating attrition rates:

Method 1 variables

Additional variables for Revised Method 1

- Number of teachers **entering the ISCED level**, but not new to the teaching profession between ***t*** *and* ***t+1***
- Number of teachers **leaving the ISCED level**, but not leaving the teaching profession between ***t*** *and* ***t+1***

Net number of teachers moving into the ISCED level from other ISCED levels between *t* and *t+1*

$$A_{(t,t+1)} = \frac{(N_t - N_{t+1}) + \boldsymbol{E_{(t,t+1)}} + \left(\boldsymbol{E^*_{(t,t+1)}} - \boldsymbol{L^*_{(t,t+1)}}\right)}{N_t}$$

Method 1 is sufficient to use an aggregated ISCED level (e.g. ISCED02-3 combined)

*But may introduce **bias** when estimated by ISCED level*

(by ±0.5%p in many comparable cases)

Methodologies used in the NESLI Network

Method 1 vs Revised Method 1

	Method 1	Revised Method 1
Number of variables	3 variables	5 variables
Limitations in methodology	• Over- or under-estimation bias from teachers on temporary leaves • Bias in FTE estimates where there are teachers with changes in workload between *t* and *t+1*	
	• Over- or under-estimation bias from teachers moving between levels of education when estimating attrition at individual ISCED level	
Data availability (out of 15 countries in the 2020 survey)	13-15 countries (HC) 11-13 countries (FTE)	8-10 countries (HC) 8-10 countries (FTE)

- ✓ **Method 1** preferred for estimating attrition at an aggregated level
- ✓ **Revised Method 1** preferred for estimating attrition by level of education

Methodologies used in the NESLI Network

Method 2 vs Revised Method 2

Variables needed for estimating attrition rates:

Method 2 variables

+

Additional variable for Revised Method 2

- Number of teachers **retiring from the profession** between ***t*** and ***t+1***

$$A_{(t,t+1)} = \frac{L_{(t,t+1)} - R_{(t,t+1)}}{N_t}$$

Number of teachers leaving the teaching profession due to retirement

Method 2 is sufficient to use in general,

But when there are many retirees during the reference period, it may also be interesting to leave retirees out of the attrition estimate of the oldest age group to focus more on voluntary attrition

(teacher attrition rates of all age groups: 0-3%p difference;
teacher attrition rates of the oldest age group (age 55+): 2-23%p difference)

Methodologies used in the NESLI Network

Method 2 vs Revised Method 2

	Method 2	Revised Method 2
Number of variables	2 variables	3 variables
Limitations in methodology	Over-estimation bias from teachers on temporary leaves	
Data availability (out of 15 countries in the 2020 survey)	10-13 countries (HC) 10-12 countries (FTE)	9-11 countries (HC) 9-10 countries (FTE)

- ✓ **Method 2** is sufficient.
- ✓ **Revised Method 2** can be considered for the oldest age group (which includes the typical retirement age) to exclude the impact of retiring teachers on teacher attrition.

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Summary of the methodologies

Method 1: indirect estimation
(using the **estimated** number of teachers leaving the profession)

1) Bias from **teachers returning from or leaving for temporary leaves**
2) Bias from **teachers changing workload between reference years**
3) Bias from **teachers moving between ISCED levels**

Revised Method 1
(attrition by level of education **minimising bias of teachers moving between ISCED levels**)

1) Bias from **teachers returning from or leaving for temporary leaves**
2) Bias from **teachers changing workload between reference years**

Method 2: direct estimation
(using the **actual** number of teachers leaving the profession)

Bias from **teachers leaving for temporary leaves**

Revised Method 2
(attrition (by age group) **removing impact of teachers retiring from the profession**)

Bias from **teachers leaving for temporary leaves**

Data collected by:

Teacher counting method:
Head-counts, Full-time equivalents

Type of institution:
All types of institutions (Public + Private),
Public institutions

Levels of education:
Pre-primary, primary, lower secondary, upper secondary, ISCED 2-3 combined (=secondary), ISCED 1-3 combined (=primary + secondary), ISCED 02-3 combined (= pre-primary + primary + secondary)

Gender:
Male,
Female

Age group*:
Below 25
25-34
35-44
45-54
55 and over

* Data collected for ref. yr. 2 uses age groups (Below 26, 26-35, 36-45, 46-55, 56 and over) to ensure the same group of teachers are tracked over the reference period for Method 1.

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Preferences on the methods by NESLI

Method 1 and 2 did not yield the same estimate in practice due to bias. NESLI delegates **expressed mixed views** on the preferred methodology.

Support for Method 1 (indirect estimation)	**Support for Method 2** (direct estimation)
Method used for SDG indicator on teacher attrition	More intuitive and easier to understand
More countries have data on the number of teachers entering the profession, than those leaving the profession	This method is already used in some OECD countries to estimate teacher attrition in their countries.

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Future step for improvement

Over- or under-estimation bias occurs in estimated attrition when the reported number of teachers from the source data **does not include** teachers returning from, leaving for or currently on temporary leaves.

Tentative solutions

- Identify the teachers who left their teaching position temporarily based the additional data from two years before and after the reference years.
- Use other data to estimate the extent of bias due to teachers returning from/ leaving for temporary leaves.

Suggested next step

- Draft more clear definitions and guidelines on the way to take account of teachers returning from, leaving for or currently on temporary leaves in the reported data.

Thank you for your attention.

REFERENCE:
BACKGROUND INFORMATION

Background information

Definitions of key terminologies

Teachers	Fully-qualified teachers (full-time and part-time) (as in the UOE data)
Reference year	Time point when the total number of teachers is measured annually
Reference period	Period between the two “reference years”
Teacher attrition rate	Percentage of teachers at a given level of education leaving the profession in a given reference period
Temporary leaves	Any form of leaves that leaves the teacher out of the total number of teachers at the reference time points (e.g. sick leave, maternity/paternity leaves, study leaves, personal long leaves etc.)
Teachers leaving the teaching profession	• Subject of teacher attrition indicator • Excludes teachers leaving for temporary leave
Teachers entering the teaching profession	• Teachers who has never taught before the reference period • Excludes teachers returning from temporary leave