



**NOTE ON THE TREATMENT OF HEALTH AND EDUCATION
IN THE 2017 ICP ROUND**

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Background and Conclusions

1. In 2011, domestic demand for health services accounted for nearly 8% of GDP in the Eurostat-OECD region (EUO) on average, second only to housing. Education expenditure, while less important than health still accounts for sizable portions of GDP (about 5%) not only in EUO but also in other ICP Regions. Numbers vary greatly between countries which may partly be a statistical artefact but in many cases reflects an economic reality, witness the near 15% GDP share of health in the United States (high price levels) or above 10% GDP share of education in Ghana, Kenya or Liberia (large share of population in schooling age).
2. Large shares in GDP imply that extra care should be spent on measuring PPPs for a product, given the potentially important impact of any bias on overall results. This is not facilitated by the fact that education and health services are particularly complex activities where quality differences in delivery are likely to play an important role and where there is a mix of market and non-market provision of services that varies greatly across countries. It is also in this context that the distinction between household final consumption and household actual final consumption very much comes to play, with all the advantages and disadvantages of either measure.
3. The note at hand reviews the treatment of education and health services in the ICP. It starts by recalling the approach chosen in the 2011 Round and then goes on to make several proposals how to implement the comparison for the current 2017 Round. While the basic methodology remains unchanged, a number of modifications, improvements as well as simplifications are suggested mainly to deal with changes in the available data and to reflect the unknown quality in particular of data at the basic heading level.
4. Main conclusions and proposals are:
 - The only feasible method at the global level for the comparison of unit values of non-market services remains the input-based approach that uses input prices for labour, capital and intermediates used in the production of education and health services. In particular, at the basic heading level, these input data suffer from low quality and should only be used to **construct linking factors at the level of total Actual individual consumption on education and health**, respectively.
 - For EUO countries, a **simplified weighting structure of inputs** is proposed for constructing linking factors, drawing on supplementary information from OECD-UNESCO in the case of education and drawing on the System of Health Accounts in the case of health.
 - In light of the uncertainties surrounding the national data and need to apply highly simplified expenditure weights in the construction of the linking factors, **it is recommended not to release the details at the basic heading level to researchers**. While the method should be described in detail, publication of the disaggregated data itself would provide little benefit but run the risk of over-interpretation and drawing conclusions that are not evidence-based in an area that is sensitive and greatly matters to the public.

Methodology used in the 2011 Round

Education

5. Price comparisons of non-market education services in the ICP are based on an input approach where prices or unit costs of relevant inputs, in particular compensation of employees are compared across countries. This differs from the practice at Eurostat-OECD (EUO) where an output approach is used that compares the volume of quality-adjusted teaching services across countries. This difference in approaches (similar also for health services as discussed below) does not permit direct integration of the EUO results into the ICP computations.

6. In 2011, a link between the EUO region and the other ICP regions could be established because several countries were able to implement both an input and an output approach¹. However, data availability and data quality had it that this link could only be based on 5 Latin American countries (Brazil, Colombia, Panama, Peru and Uruguay) which gives rise to questions about representativeness of the link so that results had to be interpreted with a great deal of caution.

7. The linking factors were calculated for Actual individual consumption for education (i.e. as the sum of household, NPISH and government expenditures on education) as the ratio of the geometric mean of PPPs from the output approach to the geometric mean of PPPs from the input approach in the 5 countries at hand. For each of the non-EUO regions, the linking factor was then applied to each of the 7 Basic Headings (BH) PPPs (along with a productivity adjustment) to obtain global PPPs for each of the BH. Finally, for each of the non-EUO regions, the PPPs at the level of BHs were aggregated to obtain a PPP for education as a whole.

8. Representativeness of the linking factor aside, the quality of expenditure data and PPPs at BH level for education is weak, including in the EUO region. As a consequence, a simplified weighting scheme and PPPs were used for public education services. For 2011 for education the same PPPs were reported for all basic headings and the same expenditure structure has been used for all EUO countries, rendering the use of detailed data meaningless.

Health

9. Akin to education, EUO have been using an output approach for Health PPPs by measuring quasi prices (unit costs) of comparable and representative case-mixes of medical procedures in particular for Hospital services. As with education, there was an issue of comparing EUO results with the input-based ICP data. However, in 2011, EUO countries were still in a position to produce both output and input-based results and the latter were used to link EUO data with other ICP regions.

10. This was not without problems, however. Akin to education, the poor quality of the input-based data for EUO countries (and by extension for other regions) poses a problem: quality is low both for PPPs and for expenditure data for individual BHs and raises the question how useful it is to disseminate this data, even for research purposes.

¹ The full methodology can be found in the following documents:

<http://pubdocs.worldbank.org/en/554381487262167081/05-01-ICP-TAG08-Education-ICP-New.pdf>

http://siteresources.worldbank.org/ICPINT/Resources/270056-1255977007108/6483550-1294673810982/7660863-1320877625027/131209_CoTaF05_Minutes.pdf

Conclusions on the 2011 Round

11. We conclude that, while fixes were found to process with health and education data in the 2011 comparison, many issues remain. The **single biggest issue is data weaknesses at the basic heading level** that are striking and reflect the difficulties faced by all ICP countries in reporting data according to the input approach:

- There are many gaps: some countries report data for only a few basic headings under government;
- Countries have difficulties classifying expenditures to private or public providers; as a consequence, shares and breakdown of public vs. private are difficult to understand.

12. Indeed, a key argument in adopting the output method in the EUO area was the paucity of the input based approach. The input method was developed to calculate PPPs at an aggregate level and PPPs and nominal values at BH level are not really meaningful figures. It is well understood that a move to the output method is not currently on the horizon for the ICP (and would bring with it other issues) but careful thought should be given to the level of detail at which results are published in ICP 2017².

Methodology proposed for the 2017 Round

Linking factors

Education

13. To enable more robust linking for the 2017 Round, Eurostat and OECD organised a collection of data on average compensation of employees in education in EUO countries to bridge between output-based and ICP compatible input-based approaches. However, this additional data collection did not extend to input expenditure weights and as a consequence, the “output-input” linking factor can only be compiled for Actual individual consumption on education in absence of overlap between the input and the output classifications.

14. **Choice of BH weights.** As mentioned above, EUO no longer collect weights at the BH level according to the input approach and the last available breakdown is too dated to be useful. It is therefore suggested to use for government expenditures on education a simplified weighting system for EUO countries with the same breakdown for all countries. The breakdown is based on the information about education expenditure structures in the OECD-Unesco database. In particular, the share of employee compensation represents on average a plausible 75% of education expenditure in the 27 OECD countries for which information is available. This is complemented by an estimated 20% share of intermediate consumption and 5% for gross operating surplus, i.e., depreciation³.

15. **Choice of BH PPPs.** For the three BHs under education government services the choice of the PPPs is straightforward. For compensation of employee, adjustments for productivity differences should be taken into account for the global linking. In the EUO Region, prices for education final household expenditure (tuition fees) have proven to be notoriously difficult to collect and compare (many occurrences of mixed public-private financing, highly heterogeneous services etc.). As a consequence, reference PPPs for Education from public services are to be used for PPPs for Education from final household expenditure.

² It so happened that no researcher seemed to have picked up on the 2011 BH results for education and health. But this does not imply that the detailed data has been useful and should be in the same format for 2017.

³ In this scenario, government expenditures on education are allocated only to three basic headings which was the common practice for many countries in 2011.

16. **Linking factor.** With the above PPPs and expenditures, education PPPs can be derived for the EUO Region based on both the output and input approach and the linking factor can be compiled. This is similar to the 2011 procedure, but the linking is based on a larger number of countries, which should make it more robust.

Health

17. Unlike in the 2011 Round, no supplementary input-based data are available in 2017 for EUO countries that could be used to derive linking factors at the BH level. It is therefore suggested to follow an approach that is isomorphic to the method described above for Education. In particular, in the absence of reliable input weights for EUO countries, linking factors for health would be derived for Actual individual consumption on health.

18. **Choice of weights.** The only feasible source for detailed expenditure data is the System of Health Accounts (SHA) that offers a breakdown with a significant overlap with BHs in the ICP. However, for comparison purposes it is necessary to combine the basic headings for household, NPISH and government consumption for other ICP regions as SHA data does not distinguish between these types of transactions.

19. Table 1 shows the expenditure breakdown that can be mapped to the SHA. It is apparent that for the first 6 categories, the ICP classification and the SHA can be mapped. For EUO countries, the so-called “remaining health” refers to expenditures on hospital services and residential care facilities. In terms of ICP categories, it refers to hospital services produced by the private sector (7), and health services produced by the government (hospital services being the most important component) (8-12) and all health expenditures by NPISH (13).

Table 1. PPP Basic headings and SHA expenditure breakdown

		ICP combined expenditure breakdown	SHA expenditure breakdown
1	1106111+1302111	Pharmaceutical products	Pharmaceutical products
2	1106121+1302112	Other medical products	Other medical products
3	1106131+1302113	Therapeutic appliances and equipment	Therapeutic appliances and equipment
4	1106211+1302121	Out-patient medical services	Out-patient medical services
5	1106221+1302122	Out-patient dental services	Out-patient dental services
6	1106231+1302123	Out-patient paramedical services	Out-patient paramedical services
		Health remaining	Health remaining
7	1106311+1302124	Hospital services	Hospital services
8	1302211	Compensation of employees	Nursing and residential care facilities
9	1302221	Intermediate consumption	
10	1302231	Gross operating surplus	
11	1302241	Net taxes on production	
12	1302251	Receipts from sales	
13	1202111	NPISH expenditure on health	

20. We tested this classification on data from the 2011 ICP and expenditure shares from the 2014 SHA. Overall, results seem plausible with very good consistency for some countries. The positive impression is reinforced by the fact that the SHA breakdown of expenditures seems much more plausible than some of the expenditure data provided and used in the 2011 Round.

21. Nevertheless, for the 2017, linking Eurostat-OECD was asked to provide a complete breakdown of expenditures according to the ICP basic heading classification and the following approach was proposed:

- The first six categories were broken down between private and public using the SHA breakdown and applying the private/public expenditure ratio observed for health as a whole.

- What to do for “health remaining from SHA”? The private share of Health remaining was estimated using the same key as for (1) to (6) and allocated to (7)⁴. The public share of health remaining was allocated to (8) to (12). In absence of reliable information, it was proposed to use a simplified weighting scheme for all EUO countries like for education: 75% for compensation of employees (8), 15% for intermediate consumption (9) and 5% for gross operating surplus (10).

22. This weighting scheme could apply to all EUO countries, whereas for other ICP countries, the weights as provided could be used, whereby the weight for hospital services is distributed proportionally over the input BHs.

23. **Choice of PPPs.** With this weighting scheme, determining PPPs is straightforward for all basic headings:

- PPPs are obtained from prices for the first six categories (12 ICP basic headings) ;
- reference PPPs are used for hospital services (7) as in the other regions;
- PPPs are based on salaries adjusted for productivity differences for compensation of employees (8);
- reference PPPs are used for intermediate consumption (9), gross operating surplus (10) and NPISH (13).

24. Once PPPs and expenditures are defined for all ICP basic headings, the linking can be done at the level of Actual individual consumption on health following a similar process as for education.

Health and education: the way forward for global aggregation and conclusion

25. For global aggregation purposes, for all regions, we propose for health and education to collapse all BHs under household consumption and government consumption into one, thus ending up with one BH under household consumption and one BH under government consumption for health and education as well as one BH under NPISH. The final results are linked global BH PPPs for those 3 Education and 3 health BHs, which respect regional fixity for all regions⁵.

26. Collapsing individual BHs for education and health into single numbers is reflective of data availability, the quality of the source data and the various simplifications (for instance with regard to weights) that characterise the procedure suggested above.

27. Another proposal, in light of the empirical shortcomings and the pragmatism applied in the calculations here is to not release any data to researchers below the level of Actual individual consumption on education and health.

28. Finally, while the basic methodology for the linking of education and health remains unchanged between 2011 and 2017, a number of modifications, improvements as well as simplifications are suggested mainly to deal with changes in the available data and to reflect the unknown quality, in particular of data at the basic heading level.

⁴ All health services produced by the private sector were by convention put under 1106311.

⁵ Fixity of regional results is applied in the Country Aggregation with the Redistribution (CAR)