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# Indicators for early childhood education and care

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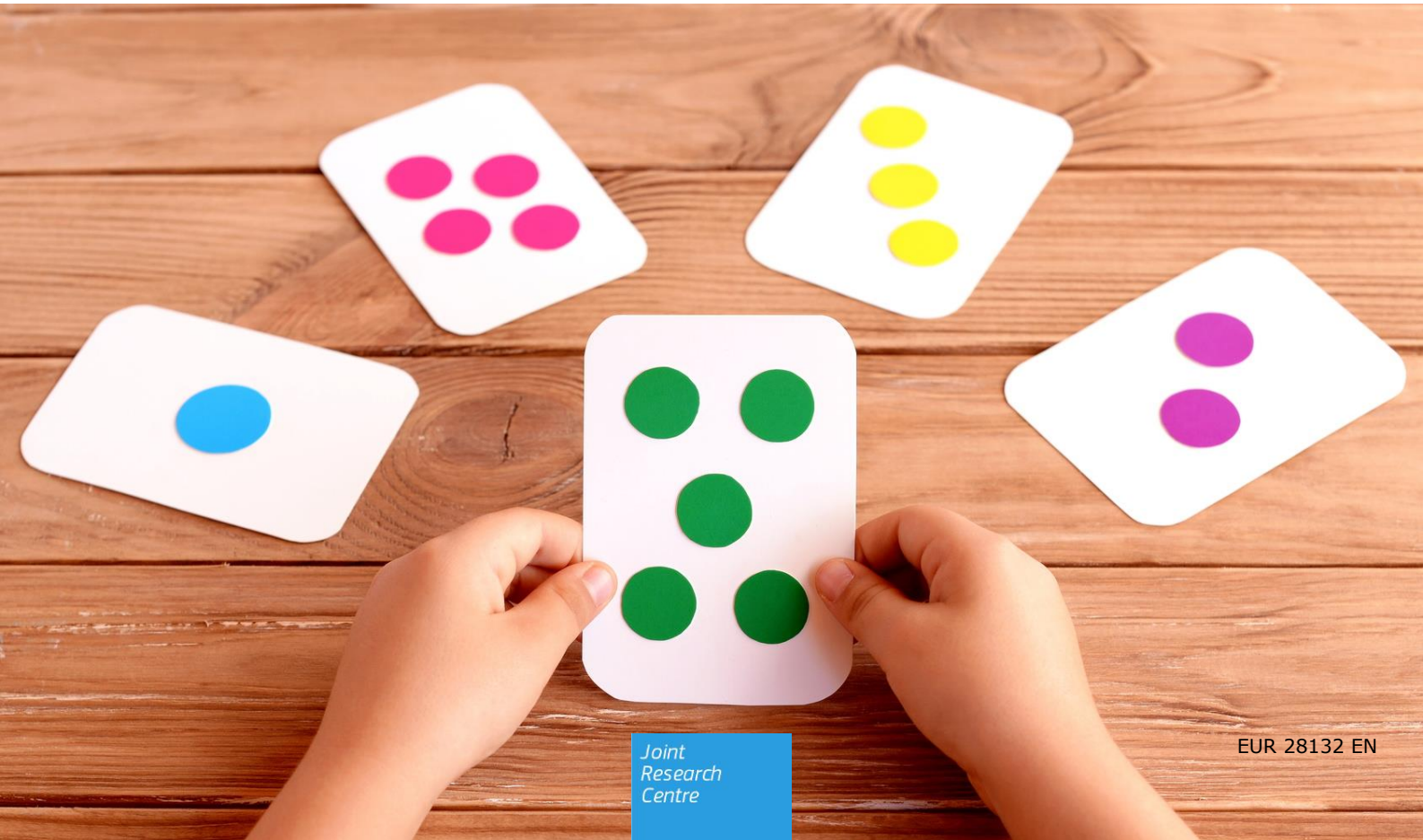
2016



Joint Research Centre

EUR 28132 EN

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JRC102774
EUR 28132 EN

PDF ISBN 978-92-79-62228-1 ISSN 1831-9424 doi:10.2791/550118

Luxembourg: Publications Office of the European Union, 2016



How to cite: Flisi, S., Meroni, E.C., Vera-Toscano, E. (2016). Indicators for early childhood education and care. EUR 28132 EN. doi:10.2791/550118

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## Abstract

The main purpose of this technical brief is to investigate the comparability between two early childhood education and care indicators currently used by the European Commission – namely the **Barcelona target** and the **early childhood education and care (ECEC) ET 2020 benchmark** – and to identify methodological differences and common traits that may have implications in their use for policy-making.

Results show that, despite being potentially similar measures of participation of children in early childhood education and care in countries, they are essentially different in their nature as they cover different groups of individuals. Additionally, the fact that they use different datasets, namely administrative data from UOE and survey data from EU-SILC, implies that they follow diverse data collection protocols.

Notwithstanding, results provided in the brief suggest that the different age composition of the two indicators could explain a consistent part of the difference in the overall shares; in the majority of countries, for age groups 4 and 5, numbers are quite similar. Thus, while still taking into account all the caveats explained in this document, we could conclude that for these age groups results could be equally used for policy support. Some suggestions for the improvement of the Barcelona target sub-indicator for the ECEC ET 2020 benchmark within the Joint Assessment Framework are also proposed.

# 1 Introduction

Early childhood education and care (ECEC) can certainly increase children well-being. A number of studies during the last decade have shown the fundamental role of early life experiences on the development of cognitive skills, the improvement of education performance and the increase of life chances (Heckman, 2008). Recent PISA 2012 results reveal that 15 year-old students who attended ECEC for more than one year tended to achieve better results in mathematics than those who attended ECEC for up to one year or not at all. Furthermore, despite the fact that disadvantaged students (those from low socioeconomic status, poorly educated and immigrant families) are less likely to attend ECEC for longer than one year, results indicate that in almost all countries, ECEC participation has a stronger effect on these children though it seems to diminish as they progress through school (OECD 2011b; OECD, 2013 and OECD 2014).

This interest in early childhood education and care has also been at the heart of EU policies for more than a decade. At the 2002 Barcelona summit, the European Council agreed that "*Member States should remove disincentives to female labour force participation and strive, taking into account the demand for childcare facilities and in line with national patterns of provision, to provide childcare by 2010 to at least 90% of children between 3 years old and the mandatory school age and at least 33% of children under 3 years of age*" (European Council, 2002). This clearly shows that the **Barcelona target** (as it was baptised) was initially established with a view to achieving equal opportunities in employment between women and men. However, as already stated above, affordable and good-quality childcare services may not only improve the reconciliation of work and family life, thereby fostering labour market participation and gender equality, but also promote the socioeconomic integration of children, and the development of their skills.

Accordingly, the ECEC benchmark was adopted in 2009 within the ET 2020 strategic framework [1] "*with a view to increasing participation in high-quality early childhood education as a foundation for later educational success, especially in the case of those from disadvantaged backgrounds*". In particular, this **ECEC benchmark** states that at least 95% of children between the age of four and the age for starting compulsory primary education should participate in early childhood education and care by 2020, simultaneously further addressing the issues of child poverty and early school leaving (headline targets of the EU 2020 strategy).

The two indicators currently co-exist within the Commission. The main purpose of this brief is to investigate the comparability between the Barcelona target (focusing on the age group between 3 and mandatory school age) and the ECEC ET 2020 benchmark so as to identify differences and common traits that may have implications in their use for policy-making.

The results of the technical brief might further offer useful suggestions for the creation or improvement of sub-indicators within the Joint Assessment Framework (JAF; see Flisi et al., 2014, for more details on the methodology), while representing the basis for additional advice on possible improvements to the ET 2020 benchmark itself. The next section presents an overview of both indicators with full details about how they are computed and the data sources used for this purpose. Results for the 28 EU countries are also provided for 2014. Given the existing differences between indicators, Section 3 is devoted to discuss the potential sources of disagreement. Section 4 presents the concluding remarks and proposes avenues for improvement in the use of these indicators.

[1] OJ 2009/C 119/02.

# 2 An overview of the Barcelona target and of the ECEC ET 2020 benchmark

## 2.1 Barcelona target

As mentioned earlier on, the European Council established in 2002 the **Barcelona target**[2]. This is a twofold target as it aims at childcare of (1) children less than three years of age, which should involve at least 33% of the children (see Table A2 for an overview of countries' achievement); but also (2) children between 3 years old and compulsory school age, which should involve at least 90% of the children. In this brief, we will only focus on the second one, since it is more comparable with the ECEC benchmark.

The indicators for monitoring the Barcelona childcare targets were agreed in 2004 by the Employment Committee, and the **EU Survey on income and living conditions (EU-SILC)** was chosen as the European statistical source for measuring them. The selected indicator is "Children cared for by *formal arrangements* other than by the family up to 30 hours a usual week / 30 hours or more a usual week as a proportion of all children in the same age group".[3]

BARCELONA TARGET

*"…provide childcare to: (1) at least 90% of children between **3** years old and the **mandatory school** age; and (2) at least 33% of children under 3 years of age."*

ECEC ET 2020 BENCHMARK

*"At least 95% of children between **4** years old and the age for starting **compulsory primary education** should participate in childhood education".*

***Formal arrangements*** include all kinds of care organised and/or controlled by a structure (whether public or private)[4]:

- ✓ pre-school or equivalent,
- ✓ compulsory education,
- ✓ centre-based services outside school hours,
- ✓ a collective crèche or another day-care centre, including family day-care, and professional certified child-minders.

## 2.2 ECEC Benchmark

The **early childhood education and care (ECEC) benchmark** was adopted in 2009 within the ET 2020 strategic framework "with a view to increasing participation in early childhood education as a foundation for later educational success, especially in the case of those from disadvantaged backgrounds"[5]. According to the benchmark, "At least 95% of children between 4 years old and the age for starting compulsory primary education should participate in childhood education".

Data for monitoring country performances in ECEC participation are provided by the **UOE database on education statistics** from the UNESCO/OECD/Eurostat data collection, compiled on the basis of national administrative sources, reported by Ministries of Education or National Statistical offices according to international standards, definitions and classifications.

[2] http://ec.europa.eu/invest-in-research/pdf/download_en/barcelona_european_council.pdf
[3] Harrison Villalba et al. (2012) discuss advantages and limitations of relying on EU-SILC to monitor childcare participation.
[4] Care provided by child-minders without any structure between the carer and the parents (direct arrangements) has been excluded from the definition of "formal care" in order to take into account only childcare recognised as fulfilling certain quality criteria.
[5] Official Journal of the European Union, 2009/C 119/02.

According to the UNESCO/OECD/EUROSTAT data collection, "early childhood education (ISCED level 0) provides learning and educational activities with a holistic approach to support children's early cognitive, physical, social and emotional development and introduce young children to organized instruction outside of the family context to develop some of the skills needed for academic readiness and to prepare them for entry into primary education" (UOE, 2015a). The inclusion or not of a programme under ISCED 0 is somewhat complicated, as the boundary between education and child care can be hard to establish, and some countries internally define early childhood education more broadly than others. In order to ensure international comparability of data, a number of criteria have been established to determine whether a programme should be classified as ISCED 0 or not. According to UOE (2015b), "along with an intentional child-development and educational focus, a key defining factor of ISCED level 0 programmes is the sustained intensity and duration of delivery of intentional educational activities. These are what differentiate ISCED level 0 from other programmes, such as childcare and occasional, after hours or vacation care". More precisely, a set of "Main" and "Subsidiary Criteria" are used to determine whether or not a programme should be classified as ISCED level 0 and included in reporting. According to the Main Criteria, for a programme to be reported as ISCED level 0 it must:

- ✓ have adequate intentional educational properties;
- ✓ be institutionalised;
- ✓ be targeted at children within the age range starting from age 0 up to the age of commencement in ISCED level 1 education;
- ✓ meet the minimum intensity/duration.

According to the Subsidiary Criteria, programmes should wherever possible also have a regulatory framework recognised by the relevant national authorities; and have trained or accredited staff as per the appropriate regulatory framework. Details for each of the criteria are provided in UOE (2015b).

It should be pointed out that despite the official classification, there is not a perfect overlap between ISCED 0 and the type of ECEC taken into account in the ECEC benchmark. ISCED 0 covers children up to the start of ***primary education*** (i.e. ISCED level 1), while the benchmark takes into account children up to the start of ***compulsory*** primary education. While these concepts overlap in many countries, in some others they do not. As a consequence, Eurostat calculates the ECEC benchmark as participation in education (ISCED levels 0, 1, 2) between 4 and the age of compulsory primary education[6]. Unlike ISCED 0, the definition of ISCED 1 and 2 are well established and it is easier to assess whether a programme falls under these categories.

## 2.3 Childcare and Early childhood education and care

The Barcelona target and the ECEC ET 2020 benchmark use a slightly different terminology: the former revolves around "childcare", while the latter refers to "education and care". This difference, i.e. the non-specification of education in the Barcelona target, is probably due to two main reasons. First, at the time the Barcelona target was introduced (2002), there was still no such a big interest in early childhood *education*; indeed, the first document issued by the Commission including the term "early childhood education and care" is from 2005, long after the introduction of the Barcelona target.[7] Second, given that the main objective of the Barcelona target is to increase participation of children in formal childcare to increase female labour force participation, we can

[6] ISCED 2011 introduced a new distinction within the ISCED 0 level when compared to ISCED 1997, creating two categories of ISCED level 0 programmes, namely ISCED 010 (early childhood educational development) and ISCED 020 (pre-primary education). According to UOE (2015b), "ISCED 010 has intentional educational content designed for younger children (typically in the age range of 0 to 2 years), whilst ISCED 020 is typically designed for children from age 3 years to the start of primary education (ISCED level 1)". While theoretically only ISCED 020 should be taken into account for the benchmark, in practice the calculations include the whole ISCED 0 level, so this distinction is not taken into account in the rest of the briefing.

[7] COM(2005) 549 final /* SEC/2005/1415

assume that less attention was devoted to the terminology used to describe childcare. Nevertheless, as reported in Section 2.1, formal childcare as defined by the Barcelona target also includes education. Despite the differences in the terminology used, the two indicators are essentially aimed at capturing the same phenomenon.

## 2.4 Results of the Barcelona target and ECEC benchmark for 2014, by country

A conceptual comparison between the indicators: searching for methodological differences

As shown in the previous Section, results from the Barcelona target significantly differ from those provided by the ECEC ET 2020 benchmark for some countries. The purpose of this section is to provide some possible explanations to this matter and to reflect the extent to which both indicators could be fully comparable for each country.

The main issue is clearly that the two indicators are computed using different data sources, namely **EU-SILC** and the **UOE administrative database on education statistics**. Inevitably, some questions emerge about how information has been recorded in a number of relevant dimensions that directly affect the computation of both indicators. These are discussed below.

plots the Barcelona target on the y-axis and the ECEC ET 2020 benchmark on the x-axis using 2014 data.[8] The two red lines represent respectively the 90% to be reached according to the Barcelona target and the 95% to be reached according to the ECEC ET 2020 benchmark. Using the intersection between the two red lines, we can distinguish between 4 groups of countries: a first group in the top right quadrant is composed by those countries that already reached both targets; a second group which met only the Barcelona target, but not the ECEC benchmark, in the top left quadrat; a third group, which reached the ECEC but not the Barcelona target, in the bottom right quadrant; and finally, the last group of countries which did not meet any of the two, in the bottom left quadrant.

Although on average there is a high correlation between these two indicators (73% for 2014 data), it is worth mentioning that significant differences exist between countries that are in the same quadrant, in particular in the bottom left one. Thus, for example, we observe how PL, RO and CZ have achieved the same level for the ECEC benchmark but only CZ is closer to reach the Barcelona target. On the contrary, the group of countries composed by SK, CY, FI, CZ, LT or LV share similar levels on the Barcelona target but significantly differ in their achievement of the ECEC benchmark. Likewise, UK, DE or NL, which already achieved the ECEC benchmark (with similar results) also differ in their achievement of the Barcelona target.

The blue line in the chart shows the points where the Barcelona target and the ECEC benchmark indicators would be the same. A conceptual comparison between the indicators: searching for methodological differences

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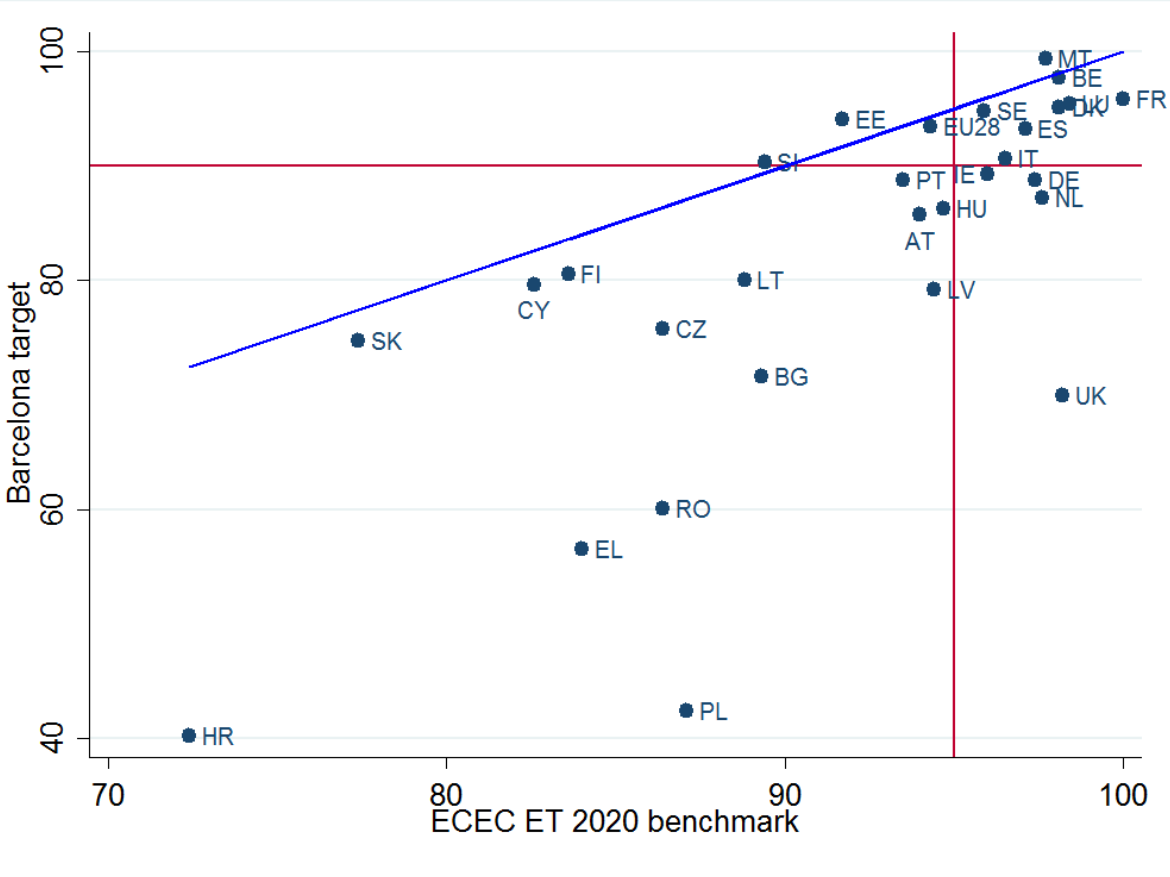
The main issue is clearly that the two indicators are computed using different data sources, namely **EU-SILC** and the **UOE administrative database on education statistics**. Inevitably, some questions emerge about how information has been recorded in a number of relevant dimensions that directly affect the computation of both indicators. These are discussed below.

[8] Numbers are presented in **Error! Reference source not found.**e A1 in the Appendix. For UOE, the reference period is the school year 2013/2014; for EU-SILC, calendar year 2014.

shows very clearly how almost all countries have on average ECEC benchmark rates that are above the Barcelona target ones, the only exception being EE, MT and SI.

Despite the fact that both indicators attempt to monitor the country's success in providing childcare/early childhood education and care, it is clear that there are some methodological issues that may affect their calculation and need to be taken into account to shed further light on the degree of comparability between the two of them. To this matter we devote the remaining of the technical brief.

**Figure 1. Scatter-plot Barcelona target and ECEC benchmark by country. 2014**




Source: Own elaboration using Eurostat special extractions from EU-SILC and UOE data.

# 3 A conceptual comparison between the indicators: searching for methodological differences

As shown in the previous Section, results from the Barcelona target significantly differ from those provided by the ECEC ET 2020 benchmark for some countries. The purpose of this section is to provide some possible explanations to this matter and to reflect the extent to which both indicators could be fully comparable for each country.

The main issue is clearly that the two indicators are computed using different data sources, namely **EU-SILC** and the **UOE administrative database on education statistics**. Inevitably, some questions emerge about how information has been recorded in a number of relevant dimensions that directly affect the computation of both indicators. These are discussed below.

## 3.1 Different nature of data

### 3.1.1 Representativeness of the population of children

The **EU Survey on income and living conditions (EU-SILC)** is the reference source for comparative statistics on income distribution and social inclusion in the EU. The **reference population**, and therefore the basic units of sampling and data collection, includes all private households and their current members residing in the territory of the countries at the time of data collection.[9] All household members are surveyed, but only those aged 16 and more are interviewed.

Since EU-SILC is meant to sample private households but not the population of children, this can create some problems in terms of representativeness. Nevertheless the Barcelona target is calculated using ad hoc weights that are supposed to adjust for the distribution of children for each year of age and ensure a correct distribution for children by age. These weights should make the distribution, according to age characteristics, of the children covered in the sample agree with the same information from some more reliable external source (age distribution of children aged 0 to 12 in private households).

Even if the use of these weights should ensure full comparability of the distribution of children for each year of age, there have been cases where problems of over and under representation of certain sub-groups of individuals may have arisen, as it seems to be the case in Germany. As shown by Hauser (2008), there is indication of misrepresentation of children by age-groups in the German EU-SILC sample: *"[...] small children up to the age of four are clearly under-represented in EU-SILC compared with the microcensus. As age is one of the variables used to calculate the weighting of persons in EU-SILC these deviations are particularly in need of explanation. And they can also clearly distort the indicators calculated"*.

In addition, even if the distribution of children for each year of age is fully representative of the population, there could also be a problem if the sampled population of children does not resemble the true population in terms of distribution into childcare.

On the contrary, the **UNESCO/OECD/Eurostat (UOE) joint administrative data collection** provides internationally comparable data (mostly at national level, with some insights at the subnational/regional level (NUTS 2)) on key aspects of formal education systems, specifically on the participation and completion of education programmes, as well as the cost and type of resources dedicated to education. The national data collection in most countries is exhaustive (i.e. covers all relevant units – for ECEC, all children attending ECEC) and is normally based on information from administrative registers, so we can only expect it to be fully reliable.

[9] Persons living in collective households and in institutions are generally excluded from the target population. Some small parts of the national territory amounting to no more than 2% of the national population and the national territories may be excluded from EU-SILC.

### 3.1.2 Counting participation

Another interesting difference emerging from the different data source is how children are counted in order to assess how many of them actually participate in early childhood education.

In UOE, if children are enrolled in more than one part-time programme the issue of double counting arises. For example, in some countries, kindergartens are only open for half a day. It is therefore possible that a child could attend kindergarten in the morning and then another type of care in the afternoon, which could over-estimate participation rates in certain countries if administrative data does not facilitate identification of the same child by the two systems.

On the other side, estimates using EU-SILC data do not present this problem: when children are reported to attend more than one childcare service, the child is only counted once in overall enrolment rates.

*The two indicators are based on very different data sources: EU-SILC is a survey sampling households; UOE is an administrative data collection.*

## 3.2 Age groups

Another systematic difference between the two indicators is in the age group considered to compute them: the Barcelona target includes children from age 3 to compulsory school age, while the ECEC benchmark accounts for children from 4 to compulsory primary school age. While there is a systematic difference in the starting age (3 vs. 4), there can also be another dissimilarity in ending age, if in some countries *compulsory education* does not coincide with *compulsory **primary** education*.

Table 1 reports, for each country, the age of starting of compulsory education and compulsory primary education, and the corresponding age groups considered under the two indicators. So, for example in HR, compulsory schooling starts at age 5, but compulsory primary education starts at age 7, so the two indicators include completely different age groups: the ECEC indicator covers the age group between 4 and 6, while the Barcelona target covers the age group between 3 and 4.

**Table 1. Starting age of compulsory primary education and compulsory education, and age considered in the two indicators (reference year 2014)**

| | COUNTRY | AT | BE | BG | CY | CZ | DE | DK | EE | EL | ES | FI | FR | HR | HU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECEC | Compulsory primary education | 6 | 6 | 7 | ***6*** | 6 | 6 | 6 | 7 | ***6*** | 6 | 7 | 6 | ***7*** | ***6*** |
| | Age considered | 4,5 | 4,5 | 4,5,6 | 4,5 | 4,5 | 4,5 | 4,5 | 4,5,6 | 4,5 | 4,5 | 4,5,6 | 4,5 | 4,5,6 | 4,5 |
| Barcelona target | Compulsory education | 6 | 6 | 7 | ***5*** | 6 | 6 | 6 | 7 | ***5*** | 6 | 7 | 6 | ***5*** | ***5*** |
| | Age considered | 3,4,5 | 3,4,5 | 3,4,5,6 | 3,4 | 3,4,5 | 3,4,5 | 3,4,5 | 3,4,5,6 | 3,4 | 3,4,5 | 3,4,5,6 | 3,4,5 | 3,4 | 3,4 |

| | COUNTRY | IE | IT | LT | LU | LV | MT | NL | PL | PT | RO | SE | SI | SK | UK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECEC | Compulsory primary education | 6 | 6 | 7 | ***6*** | ***7*** | 5 | 5 | ***7*** | 6 | 6 | 7 | 6 | 6 | 5 |
| | Age considered | 4,5 | 4,5 | 4,5,6 | 4,5 | 4,5,6 | 4 | 4 | 4,5,6 | 4,5 | 4,5 | 4,5,6 | 4,5 | 4,5 | 4 |
| Barcelona target | Compulsory education | 6 | 6 | 7 | ***4*** | ***5*** | 5 | 5 | ***5*** | 6 | 6 | 7 | 6 | 6 | 5 |
| | Age considered | 3,4,5 | 3,4,5 | 3,4,5,6 | 3 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4,5 | 3,4,5 | 3,4,5,6 | 3,4,5 | 3,4,5 | 3,4 |

Source:
http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tps00179&plugin=1.
http://ec.europa.eu/eurostat/cache/metadata/en/ilc_ca_esms.htm

**An important clarification on the ISCED classification and the ECEC benchmark.**

It is important to clarify that **no real direct link exists between the definition of the ECEC benchmark and the ISCED classification**. As a matter of fact, ISCED 0 covers children up to the start of ***primary education*** (i.e. ISCED level 1), while the benchmark takes into account children up to the start of ***compulsory*** primary education. While these concepts overlap in many countries, in some others they do not; for the academic year 2013/2014, in IE and NL, primary education starts before compulsory education; on the other hand, compulsory education starts before the beginning of primary education in CY, EL, HU, LV, LU and PL. More than the ISCED level, what is relevant in the computation of the benchmark is therefore the age group. As a consequence, Eurostat calculates the ECEC benchmark as participation in education (ISCED levels 0, 1, 2) between 4 and the age of compulsory primary education.

In order to assess whether discrepancies are due to the use of different age groups for the computations, we recalculate the share of children enrolled in care by single year of age (i.e. children aged 3 only, 4 only, and so on) in the two different data sources.

In Table 2 we report the share of children enrolled in early childhood education and care in 2014, by age, according to the two different data sources.

For the sake of comparison, we report here all years of age included in either of the two indicators. As a consequence, even if the ECEC benchmark includes only children from age 4 onwards, since UOE data are available also for children aged 3, the relative figures are reported in the table. The same is true for the higher age groups for the EU-SILC data, which even when not included in the calculation for the Barcelona target indicator, are presented for the sake of comparison when relevant for the computation of the ECEC benchmark indicator. The figures referred to years of age not included in the respective indicator (i.e. the whole age 3 column for the ECEC benchmark, and age 5 for CY, EL, HR, HU, LV, NL, PL for the Barcelona target) are presented in orange.

We also report the difference in shares between EU-SILC and UOE in each country in each age group, highlighting in red differences greater than 10 percentage points (p.p.), and in yellow differences between 5 and 10.

Table 2 clearly shows that participation to early childhood education and care increases with age for both indicators. While in some countries the level of participation is already high even among younger children (e.g. in BE or DK), in others the increase for each year of age is quite sharp (see for example CY or PL). In virtually all countries where the ECEC indicator is at least 5 p.p. higher than the Barcelona target one, the levels of participation among children aged 3 is consistently lower than among older kids, and particularly so for the Barcelona target. In 6 of the 8 countries that have ECEC rates above 90% for this age group, the negative gap with the Barcelona target indicator is already considerable. On the opposite side, as highlighted above in 7 countries (CY, EL, HR, HU, LV, NL, PL) the upper age bound considered in the calculation of the ECEC indicator is higher than for the Barcelona target, which also contributes to explaining the higher levels of the overall ECEC benchmark: with the only exception of age 5 for HR, in all these countries the ECEC rates for those aged at or above compulsory schooling, but below compulsory primary education (and therefore not taken into account in the Barcelona target, but included in the ECEC indicator) are well above 90%.

A first conclusion that can be drawn is therefore that the age composition of the two indicators explains a consistent part of the difference in the overall shares.

It is however interesting to compare the levels of the two indicators for all years of age, to see whether systematic differences arise. We can notice the following:

- ✓ Greater differences exist among those **aged 3**, where in most of the countries UOE numbers are much larger than EU-SILC numbers (significant exceptions being CY, IE and LU, where UOE rates are lower than EU-SILC ones; but also AT, BE, EE, EL, NL, where rates are very close).
- ✓ For age groups **4 and 5** differences are contained, with 10 countries out of 28 having a difference larger than 5 p.p. for the age group 4 years old and 7 out of 28 for the age group 5 years old.
- ✓ Countries where we observe systematic big differences between the two surveys, with higher rates from UOE data, are BG, PL, RO and UK (and partially HR, EL and SK). Systematic differences but with the opposite sign, to the advantage of Barcelona target rates, are found in CY and EE.
- ✓ Only in very few countries are the differences limited in all age groups. Those countries are AT, BE, HU, MT, NL, PT and SI.

Thus, the differences we notice between the two indicators are not entirely explained by the fact that they consider different age groups; otherwise we should find very similar figures when considering rates by this single age analysis.

*The different age composition of the two indicators explains a consistent part of the difference in the overall shares.*

*However, it is worth noticing that even when rates are calculated by single year of age, significant differences still exist in some countries. Nevertheless, in the majority of the countries, for age group 4 and 5, numbers are quite similar.*

**Table 2. Percentage of children enrolled in early childhood education and care by age**

| Country | Age 3 | | | Age 4 | | | Age 5 | | | Age 6 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ECEC Benchmark | Barcelona target | Diff. | ECEC Benchmark | Barcelona target | Diff. | ECEC Benchmark | Barcelona target | Diff. | ECEC Benchmark | Barcelona target | Diff. |
| EU28 | 84.7 | 72.5 | -12.2 | 92.6 | 86 | -6.6 | 96 | 94.1 | -1.9 | 96.4 | 97.2 | 0.9 |
| AT | 72.9 | 72.2 | -0.7 | 91.9 | 87.8 | -4.1 | 96 | 97.4 | 1.4 | | | |
| BE | 97.6 | 95.2 | -2.4 | 98 | 99.5 | 1.5 | 98.2 | 98.5 | 0.3 | | | |
| BG | 74 | 58.7 | -15.3 | 80.4 | 58.1 | -22.4 | 91.8 | 80.9 | -10.9 | 96.2 | 87 | -9.2 |
| CY | 40.9 | 72.5 | 31.6 | 73.2 | 87.1 | 13.9 | 92.3 | 100 | 7.7 | | | |
| CZ | 68.4 | 53 | -15.4 | 83.6 | 80.7 | -2.9 | 89.2 | 90.2 | 1 | | | |
| DE | 92.5 | 78.7 | -13.9 | 96.7 | 91.9 | -4.8 | 98 | 95.2 | -2.8 | | | |
| DK | 96.3 | 90.8 | -5.5 | 97.5 | 97.7 | 0.1 | 98.7 | 96.3 | -2.3 | | | |
| EE | 86 | 84.1 | -1.8 | 90.8 | 96.8 | 6 | 92.1 | 97.4 | 5.3 | 92.2 | 97.9 | 5.7 |
| EL | 44 | 43 | -1 | 72.9 | 67.6 | -5.3 | 95.4 | 80.6 | -14.8 | | | |
| ES | 95.9 | 85.5 | -10.3 | 97.2 | 97.1 | -0.1 | 97.1 | 96.5 | -0.6 | | | |
| FI | 68.2 | 63.5 | -4.7 | 73.9 | 81.7 | 7.7 | 79.4 | 77.7 | -1.7 | 97.8 | 99.8 | 2.1 |
| FR | 99.6 | 87.2 | -12.5 | 100 | 98.8 | -1.2 | 100 | 99.7 | -0.3 | | | |
| HR | 53.5 | 36.9 | -16.6 | 58.2 | 43.7 | -14.5 | 62.8 | 60.2 | -2.6 | 97.5 | | |
| HU | 78.9 | 74.7 | -4.2 | 93.8 | 96.5 | 2.7 | 95.5 | 98.4 | 2.9 | | | |
| IE | 45.7 | 74 | 28.4 | 92 | 96.1 | 4.1 | 100 | 98 | -2 | | | |
| IT | 92 | 79.8 | -12.2 | 96.1 | 94.1 | -2 | 97 | 97.9 | 0.9 | | | |
| LT | 77.9 | 74.1 | -3.7 | 83.3 | 81.9 | -1.3 | 86.9 | 72.9 | -14 | 97 | 93.1 | -3.9 |
| LU | 68.9 | 74 | 5 | 97.8 | 93.2 | -4.6 | 99 | 98.6 | -0.4 | | | |
| LV | 86.1 | 71.8 | -14.3 | 90.3 | 85.9 | -4.4 | 95.7 | 92.6 | -3.1 | 97.1 | | |
| MT | 95.4 | 98.8 | 3.4 | 97.7 | 100 | 2.3 | | | | | | |
| NL | 80.6 | 79.2 | -1.4 | 96.1 | 95.1 | -1.1 | 99.2 | 99.3 | 0.1 | | | |
| PL | 57.7 | 33.1 | -24.7 | 71.5 | 51.3 | -20.2 | 94.7 | 76.7 | -18 | 95.7 | | |
| PT | 76.9 | 79.7 | 2.9 | 90.6 | 92.7 | 2.2 | 96.4 | 93.1 | -3.3 | | | |
| RO | 79.7 | 37.5 | -42.2 | 85 | 67.2 | -17.8 | 87.8 | 75 | -12.8 | | | |
| SE | 93.2 | 84.7 | -8.5 | 94.6 | 97.4 | 2.9 | 95.1 | 98.4 | 3.3 | 97.9 | 99.5 | 1.5 |
| SI | 82.9 | 86.3 | 3.4 | 88.7 | 90.3 | 1.6 | 90 | 94 | 4 | | | |
| SK | 64 | 54.5 | -9.5 | 73.8 | 80.7 | 6.9 | 81.2 | 85.2 | 4 | | | |
| UK | 83.3 | 66.3 | -17 | 98.2 | 73.9 | -24.3 | | | | | | |

Source: Own calculations on Eurostat special extractions from EU-SILC and UOE data.
Note: cells highlighted in red show differences larger than 10 percentage points (p.p.); cells highlighted in yellow show differences between 5 and 10 p.p.; white cells show differences smaller than or equal to 5 p.p.. Figures referred to years of age not included in the respective indicator are presented in orange.

## 3.3 Differences in the collection of children's age

- ✓ For EU-SILC, the algorithm calculating the variable child age uses the derived variable **Age at the date of interview** (AGE_IW). Thus,
  - All countries (except Ireland and United Kingdom): CHILDAGE = Age at the date of interview AGE_IW.
  - For Ireland and United Kingdom: CHILDAGE = Age at 31st of December of the year previous to the survey.
- ✓ For UOE data, according to the common reference point for ages, students, graduates, new entrants, teachers and academic staff are classified by their **age as of 1st January of the year in which the school or academic year ends** (e.g. 1st January 2012 for academic year 2011/2012). So, if data for ECEC 2014 refer to the school year 2013/2014, this means that children classified as age 4 are those that turned 4 in 2013 (therefore born in 2009), and are aged 4 on 1st January 2014.

Therefore, in terms of children's age collection, results are comparable between both datasets only for Ireland and the United Kingdom. There is a serious issue regarding differences between "date of the interview" and "date of birth" for the remaining countries. For example, in EU-SILC, a child born in year 2009, and interviewed in year 2013, could be classified as age 3 or 4 depending on when the child was born and when the interview took place, while the same child will be for sure classified as age 4 in UOE. Thus, statistics for a given year, e.g. 2013, are not referring to the same population.

If we look back at the numbers presented in Table 2, where we calculate rates by age group, we also notice that in the only two countries where age of the children are collected in the same way, i.e. UK and IE, rates by age are similar only for age groups 4 and 5 in IE, while are very different for 3 years old in IE and for all groups in the UK. This indicates that the way children's age is collected does not seem to be the only reason why those two indicators differ; otherwise for those two countries we should have got very similar rates by age group.

*The two indicators measure age in different ways in most of the countries.*

*However, in the only two countries where ages are fully comparable – UK and IE – we still observe differences between the two indicators, suggesting that the way age is measured does not fully explain observed differences.*

## 3.4 Definition of early childhood education and care used to compute the indicators, its intensity and duration

### 3.4.1 Definition of care

Some important conceptual and methodological issues need to be taken into consideration regarding childcare and how it is defined in the databases discussed in this technical brief.

As pointed out above, the ECEC benchmark does not coincide with ISCED 0 only, but it is calculated by Eurostat as participation in education (ISCED levels 0, 1, 2) between 4 and the age of compulsory primary education. As a consequence, no real direct link exists between the definition of the ECEC benchmark and the ISCED classification.

Nevertheless, the ISCED level which mostly capture participation to early childhood education and care is ISCED level 0, thus we devote the next paragraph to identify distinctive features of this level.

- ✓ According to **UOE** definitions (UOE 2015b), for a programme to be reported as **ISCED level 0**[10] it must:

  a) have adequate intentional educational properties; an "education programme" is defined as a coherent set or sequence of educational activities or communication designed and organised to achieve pre-determined learning objectives or accomplish a specific set of educational tasks over a sustained period. "Educational activities" are defined as deliberate activities intended to bring about learning, and they need to be "organised" in the sense that they are planned in a pattern or sequence with explicit or implicit aims, involving a providing agency (person/body) that facilitates a learning environment, and a method of instruction. Instruction typically involves a teacher or educator who is engaged in communicating and guiding knowledge and skills with a view to bringing about learning;

  b) be institutionalised; ISCED level 0 programmes are usually school-based or otherwise institutionalised for a group of children. As the institutions authorised to provide ISCED level 0 programmes vary between jurisdictions (e.g. centre-based, community-based, home-based), to be reported in the UOE collection both the programme and the mode or institution of delivery should be recognised within the respective early childhood education system;

  c) be targeted at children within the age range starting from age 0 up to the age of commencement in ISCED level 1 education; and

  d) meet the minimum intensity/duration (see Section 3.4.2).

  Programmes should wherever possible also:

  e) sit within, be recognised or approved by a regulatory framework recognized by the relevant national authorities (i.e. legislation, guidelines, standards or instructions issued or recognised by whichever relevant authority governs the provision of educational programmes to very young children, e.g. a ministry of education, other relevant ministry or affiliated institution);

[10] As mentioned above, not only ISCED 020, but the whole ISCED 0 level is taken into account in the calculation of the benchmark.

f) have trained or accredited staff as per the appropriate regulatory framework (in terms of e.g. pedagogical qualifications, training or accreditation at various staffing levels).

Early childhood programmes that fail to meet these criteria are generally not classified as ISCED 0.[11]

- ✓ **EU-SILC** survey includes four variables that refer to **formal childcare**:

  a) *Education at pre-school or equivalent*: (e.g. kindergarten, nursery school). The educational classification to be used is ISCED Level 0. Special pre-schools or equivalents for children who have special needs shall be included as far as they are considered as pre-school (level 0).

  b) *Education at compulsory education*: ''Compulsory'' school shall be understood as a mean to separate school from pre-school, but all the school hours have to be included: primary and eventually secondary schools shall be included

  c) *Child care at centre-based services outside school hours*: this variable concerns only the children who are at pre-school or at school in the childcare reference period.

  d) *Child care at day-care centre organised/controlled by a public or private structure*: This concept includes all kinds of care organised/controlled by a structure (public, private). This means that the parents and the carer are not the only persons involved in the care, that there are no direct arrangements between the carer and the parents in the sense that there is an organised structure between them (which is often the carer's employers).

  Other types of care (informal care) are also collected with the following EU-SILC survey variables, but are not included in the calculation of the Barcelona target:

  a) Child care by a professional child-minder at child's home or at child-minders' home

  b) Child care by grand-parents, other household members (outside parents), other relatives, friends or neighbours.

Definitions of childcare included in the two databases are hard to compare, and certainly UOE provides many more details and examples of the proper classification than EU-SILC does.[12]

In addition we should also mention that the classification into ISCED 0 or not is done by the data collectors in UOE, which should be experts on the topic, and the main purpose of the UOE is to collect data on children enrolment in the different levels, and thus we

[11] ISCED level 0 excludes purely family-based arrangements that may be purposeful but do not meet the UOE definition of a 'programme' (e.g. informal learning by children from their parents, other relatives or friends is not included under ISCED level 0). Also excluded are learning activities delivered from private homes or other institutionalised centres that are outside the jurisdiction of an appropriate national early childhood education authority or regulatory body, regardless of whether the activities are organised into the style of an approved early childhood education programme. An example of this would be a private citizen who of their own volition provides learning opportunities for young children, that nominally meet the ISCED level criteria around intentional education, intensity/duration and staff qualification requirements, but is not recognised by an authorising body. For a detailed description of all the requirements to be met to be classified as ISCED0 see UOE 2015b.

[12] EU-SILC has been updated with the new ISCED 2011 classification. But the purpose of the questions used to build the variable "formal care" is not to classify children into ISCED levels, but into different types of care. In the EU-SILC questionnaire the definition of care included in the formal care did not change over time, even after the introduction of ISCED 2011. Furthermore, EU-SILC and Eurostat do not report any break in series for the variables considered.

expect a greater check on the requirements to be met by single childcare facilities in order to be classified as ISCED 0. On the other side, the definition of formal care in EU-SILC is less detailed, since measuring childcare enrolment is not the main purpose of the collection, and it is left to the subjective view of the respondents to state in which kind of care their children are enrolled; for these reasons, we can expect on average greater measurement errors coming from EU-SILC data.

### 3.4.2 Intensity and duration

The number of hours per week and the number of weeks per year that young children attend early childhood education arrangements is another important dimension to consider.

- ✓ The **UOE** mentions that to be recognized as ISCED 0, a programme should "**meet the minimum intensity/duration**". This minimum is set to an **intensity** of at least 2 hours per day; and a **duration** of at least 100 days a year (UOE, 2015b). While in other ISCED 2011 levels it is possible to distinguish between part-time and full-time participation, based on e.g. study load, student participation and the academic value or progress which the study represents, such concepts are not easily applicable to ISCED level 0. Thus the share reported in the ECEC indicator refers to children enrolled in programmes that meet the minimum requirements mentioned above, without distinguishing between part-time or full-time.
- ✓ In **EU-SILC** we can clearly distinguish between different **intensity** of care (i.e. less than 30 hours per week and more than 30 hours per week), but there is no indication on the minimum number of days per year needed to be included in the calculation, but answers are based on "a normal week".

Thus, in terms of intensity the two numbers should be comparable since we consider participation to care, independently of the number of hours in EU-SILC and the minimum duration imposed by UOE is really negligible. As for duration, while for UOE it is clear that it should be a continuous participation (100 days per year), in EU-SILC we do not have this requirement, and is up to the respondent to assess what he/she understands as a "normal week". But, at least based on intensity, the two indicators should be fully comparable.

*Definition of care, intensity and duration are hard to compare between the two surveys, especially due to the nature of the data: UOE is based on official statistics and stricter requirements; EU-SILC is based on individual responses and less strict requirements.*

# 4 Concluding remarks and advice on improvement of existing indicators

The primary aim of this technical brief was to investigate the comparability between the Barcelona target and the ECEC ET 2020 benchmark so as to identify methodological differences and common traits that may have implications in their use for policy-making. Thus, relying on special extractions provided by Eurostat based on 2014 data from EU-SILC and UOE, we were able to compute both indicators and reflect on the potential reasons why some dissimilarity arises within countries between these potentially similar measures of early childhood education and care.

## 4.1 Conclusions

First of all, it is necessary to make clear that, despite being similar measures of countries' coverage of early childhood education and care, the two indicators are essentially different in their nature, as they cover partially different populations. In particular, they differ in: (1) the lower end of the age groups they include (3 vs. 4 years old); and (2) at the upper end of this age bracket, since one of them refers to beginning of *compulsory education*, and the other to *compulsory **primary** education.* Therefore, they are simply measuring participation in early childhood education and care for different populations.

However, even when we disaggregate the indicators by single years of age, results still differ, and maybe unexpectedly, the Barcelona target for 4 year-old children is still different from the ECEC benchmark for the same age group for some countries.

Explanations for such a divergence could be found in:

- ✓ Difference in children population used to compute the indicators; the Barcelona target is based on a sample of children population, while the ECEC ET 2020 benchmark is based not on a sample but on an administrative data collection.
- ✓ The different data collection protocols; especially when it comes to measure children age, evidence shows that results also differ between the datasets used.
- ✓ The respondent bias when providing information about the type of childcare used in the survey adopted for computing the Barcelona target, as the boundaries between education and childcare (formal and informal) can be hard to establish for a standard user of ECEC services.

All in all, the fact that the two indicators are based on very different data sources, with one of them being survey data, and the other one more thorough and comprehensively collected administrative data, further weakens the option of making straightforward comparisons. Nevertheless, in the majority of the countries, for age groups 4 and 5, numbers are quite similar, thus, with all the cautions discussed above, we could conclude that for these age groups results could be equally used for policy support.

## 4.2 UOE or EU-SILC?

As widely explained in the brief, despite being administrative data, and therefore in principle more reliable than EU-SILC survey data, UOE also has some drawbacks, in particular the risk of double counting, and the impossibility to know the number of hours attended by children (information which on the other hand is available for EU-SILC).

In addition, while it is true that UOE data covers children from age 0, according to the current regulation the transmission of data for ISCED 01 is optional; as a consequence, not all countries provide this information, which makes the monitoring of the second Barcelona target (children below age 3) not feasible with the UOE data currently available: for this age range, EU-SILC still remains the only viable option. This implies that, in order to monitor the two Barcelona targets using the same data source, EU-SILC should still be used to monitor the Barcelona targets.

Nevertheless, if countries would make an effort in transmitting complete data also for ISCED 01, then UOE data could become a valid substitute for the monitoring of the Barcelona target too.

## 4.3 Implications for the Join Assessment Framework (JAF)

Results presented in this technical brief provide suggestions on how to compare different indicators currently used to monitor progress in participation in early childhood education and care; with a similar perspective, it can also provide input in the context of the JAF approach. Thus, given the importance given by the European Commission to the need of affordable and good-quality childcare services to promote the socioeconomic integration of children, and the development of their skills, greater attention should be paid to younger children. Current UOE data availability for children aged 3 years old would allow monitoring ECEC at earlier stages. As a matter of fact, the gap highlighted in this brief between the ECEC ET 2020 benchmark (covering children from 4 years old) and the Barcelona target for children aged 3 and above, suggests that even more considerable discrepancies could arise between the benchmark and one of its sub-indicators used within the JAF framework, i.e. the Barcelona target for children aged under 3. This is a gap that, to our understanding, should be taken into account when focusing on this sub-indicator. Further, considering the limitation of the EU-SILC survey data, especially in relation to the representativeness of the young population and the type of service covered in it, exploratory work should be put in place to improve the quality of this sub-indicator and more effort should be put in collecting UOE data also for the younger population (aged 0-2).

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# Appendix – Additional tables

### Table A1: Barcelona target and ECEC benchmark, 2014

| Country | Barcelona target | ECEC |
|---|---|---|
| EU28 | 93.4 | 94.3 |
| AT | 85.7 | 94.0 |
| BE | 97.7 | 98.1 |
| BG | 71.6 | 89.3 |
| CY | 79.7 | 82.6 |
| CZ | 75.8 | 86.4 |
| DE | 88.8 | 97.4 |
| DK | 95.1 | 98.1 |
| EE | 94.0 | 91.7 |
| EL | 56.5 | 84.0 |
| ES | 93.2 | 97.1 |
| FI | 80.5 | 83.6 |
| FR | 95.8 | 100.0 |
| HR | 40.2 | 72.4 |
| HU | 86.3 | 94.7 |
| IE | 89.3 | 96.0 |
| IT | 90.6 | 96.5 |
| LT | 80.0 | 88.8 |
| LU | 95.5 | 98.4 |
| LV | 79.2 | 94.4 |
| MT | 99.4 | 97.7 |
| NL | 87.2 | 97.6 |
| PL | 42.4 | 87.1 |
| PT | 88.7 | 93.5 |
| RO | 60.1 | 86.4 |
| SE | 94.8 | 95.9 |
| SI | 90.4 | 89.4 |
| SK | 74.7 | 77.4 |
| UK | 70.0 | 98.2 |

Source: EU-SILC data for the Barcelona target and UOE data for the ECEC benchmark.

### Table A2: Barcelona target for children under 3 years of age, 2014

| Country | |
|---|---|
| EU28 | 29.07 |
| AT | 15.99 |
| BE | 48.77 |
| BG | 11.19 |
| CY | 25.47 |
| CZ | 4.44 |
| DE | 27.51 |
| DK | 69.61 |
| EE | 19.46 |
| EL | 12.84 |
| ES | 36.96 |
| FI | 33.25 |
| FR | 39.47 |
| HR | 17.13 |
| HU | 14.33 |
| IE | 30.13 |
| IT | 22.91 |
| LT | 22.88 |
| LU | 49.01 |
| LV | 21.57 |
| MT | 18.18 |
| NL | 44.60 |
| PL | 5.56 |
| PT | 44.95 |
| RO | 5.65 |
| SE | 56.71 |
| SI | 37.33 |
| SK | 6.51 |
| UK | 28.98 |

Source: EU-SILC data

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LF-NA-28132-EN-N

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doi:10.2791/550118
ISBN 978-92-79-62228-1