Early Childhood Education: Equity, Quality and Transitions

REPORT FOR THE G20 EDUCATION WORKING GROUP

OECD

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Foreword

High-quality early childhood education supports the social and emotional well-being of the youngest members of our societies. Children who benefit from quality early childhood education (ECE) are more likely to do well at school, and later, in the labour market. Recognising the importance of ECE for individuals and societies, the G20 countries have made it an increasingly prominent topic of their cooperation.

In 2018, the Argentinian G20 Presidency and in 2019, the Japanese G20 Presidency, highlighted the importance of prioritising investment in early childhood programmes and promoting equitable access to support more prosperous societies. Building on this work, a central topic of the G20 Education Ministerial Meeting in 2020 convened by the Saudi G20 Presidency is how to realise the potential of ECE to promote equal opportunities for all.

The focus on ECE by the Saudi G20 Presidency reflects the overarching theme of the Saudi G20 Presidency: Realizing Opportunities of the 21st Century for All. One of three core aims is to advance the agenda of human empowerment, with a view to "creating the conditions where all people - especially women and young people - can live, work and thrive". Given the central importance of education to this vision, the Saudi G20 Presidency convened - for the second time – a G20 Educational Ministerial in September 2020.

This report was developed by the OECD at the request of the Saudi Presidency of the G20 to inform the discussion at the G20 Education Ministerial Meeting. The report synthesises OECD and other international research on good practice in ECE and brings together international data to outline trends in G20 countries.

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1 Early childhood education: equity, quality and transitions

Introduction

The role of early childhood education and care in realising opportunities of the 21st century for all

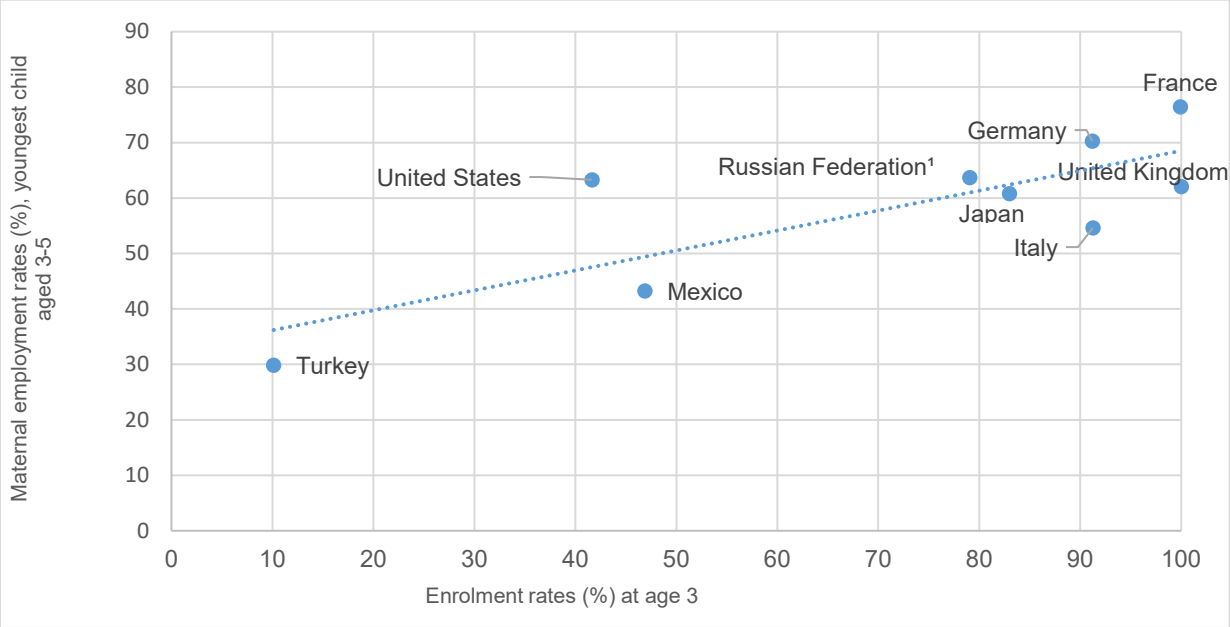
Research from neuroscience shows that during the early years of a child's life - from birth until around six years - their brain has extraordinary capacity for learning. By the time a child is six, the same time most early childhood education programmes end, their brain has already reached about 90% of its adult volume (Stiles and Jernigan, 2010[1]); (Shuey and Kankaraš, 2018[2]). Early childhood education and care therefore spans a critical window for development which sets the foundation for later success in school, career and life (UNICEF, 2019[3]).

High quality early childhood education and care has been shown to provide a wide range of benefits for individual children – especially the most disadvantaged. These benefits include supporting social and emotional well-being, lowering risks of school dropout and even contributing to higher learning and employment outcomes later in life (OECD, 2017[4]); (UNICEF, 2019[3]). Children's participation in early childhood education and care also offers greater opportunities for mothers and other caregivers to participate in the workforce (see Figure 1.1), increasing household earnings and breaking stubborn cycles of intergenerational poverty (OECD, 2017[4]) and (UNICEF, 2019[3]).

Investing in early childhood education and care and ensuring universal access to quality services is not only one of the most effective ways to reduce inequities, it is also one of the most *efficient*. Investments in early childhood education are particularly important for promoting equity. Research shows that disadvantaged children can benefit the most from high-quality early childhood education and the returns from interventions that take place during a child's "development window" are more significant than those that occur later on (OECD, 2017[4]). At a time when all G20 countries are looking for ways to strengthen the impact of public spending, early childhood education offers returns on investment for societies and economies as a whole - often more than other levels of education. When everyone is given a strong start, it helps reduce the costs needed to address poor results later on and sets children on a trajectory to stay in school and achieve their learning potential (UNICEF, 2019[3]). This is crucial since inequalities that take root early on tend to grow throughout school and life, making it increasingly difficult and expensive to address disparities.

Figure 1.1. Mothers' employment rates (2014) and enrolment rates at age 3 (2017)

Employment rates (%) for 15-64 year-old mothers whose youngest child is aged 3-5 and enrolment rates at age 3 (%) in ISCED 0



Note: For the Russian Federation, the reference age for the youngest child is 0-6 instead of 3-5.
Sources:
(OECD, n.a[5]), OECD Family Database, (accessed 02 March, 2020), www.oecd.org/els/family/database.htm
(OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02 March, 2020) https://doi.org/10.1787/f8d7880d-en.

Scope and content of this report

This report focuses on policies to improve the quality and equity of early childhood education (ECE, or ISCED 02 under the international standardised classification of education). ECE covers all forms of organised and sustained centre-based activities - such as pre-schools, kindergartens and day-care centres – designed to foster learning and emotional and social development in children with some early childhood education. These programmes are generally offered to children from the age of three until the age of primary school entry. However, in some G20 countries it is not always easy to establish the boundaries between ECE and ISCED 01 provision that is more focused on basic childcare, health and nutrition and can be less structured. In these cases, the report refers to the general category of early childhood education and care (ECEC, or ISCED 0). Box 1.1 provides an overview of the differences between these two levels of early education.

This report is organised into four sections. This section (1) provides an introduction to the topic; Section 2 focuses on participation and equity in ECE; Section 3 examines elements that matter for the quality of ECE provision; and Section 4 provides insights on children's transition from ECE to primary school. The report draws on the latest findings from the literature and uses the most recent international data to present ECE education systems across the G20 countries. Primary sources of information come from a range of OECD work on ECE, namely the *Starting Strong* series, data from *Education at a Glance*, which since 2011 has covered all G20 countries, and other OECD surveys, such as the *Programme for International Student Assessment (PISA)*, the *Starting Strong Teaching and Learning Survey* and the *International Early Learning and Child Well-being Study (IELS)*. Where country information is not available from these sources and data collections, the report draws on other international and national sources of information.

Box 1.1.International standard classification of early childhood education and care

Early childhood educational development (ISCED 01)

The educational properties of early childhood educational development are characterised by a learning environment that is visually stimulating and rich in language. These programmes foster self-expression, with an emphasis on language acquisition and the use of language for meaningful communication. There are opportunities for active play, so that children can exercise their coordination and motor skills under supervision and through interaction with staff. Programmes providing only childcare (supervision, nutrition and health) are not covered by ISCED.

Early childhood education (ISCED 02)

The educational properties of early childhood education are characterised by interaction with peers and educators, through which children improve their use of language and social skills, start to develop logical and reasoning skills, and talk through their thought processes. They are also introduced to alphabetical and mathematical concepts, and encouraged to explore their surrounding world and environment. Supervised gross motor activities (i.e. physical exercise through games and other activities) and play-based activities can be used as learning opportunities to promote social interactions with peers and to develop skills, autonomy and school readiness. ISCED 02 is the focus of this report and is referred to as early childhood education (ECE).

Source: (UNESCO-UIS, 2012[7]), International Standard Classification of Education ISCED 2011, UNESCO Institute for Statistics, Montreal, (accessed 02 March, 2020) www.uis.unesco.org.

ECE in G20 countries

Providing the opportunity for all children to participate in high quality ECE can benefit their development and learning, and economies and societies more generally (OECD, 2011[8]). The G20 Education Ministerial Meeting offers a unique opportunity for countries to collaborate and raise awareness about the importance of quality early childhood education. However, the G20 represents a diverse group of countries that are at different stages of educational and economic development. Table 1.1. provides an overview of ECE education and the transition to primary school in G20 countries, and highlights some of the key differences in ECE provision across countries.

In most high income countries, where universal schooling is well established, the provision of ECE is already widespread. These countries also tend to have relatively small populations of young children, making universal entitlement to high quality ECE a legitimate and feasible target. In contexts with large child populations and high poverty rates - where the school sector is still being built - there may be limited public resources and capacity to fully develop the ECE sector. In these contexts, one way to develop the sector is to progressively extend ECE in terms of duration and access. A further consideration when making cross-country comparisons about ECE involves governance arrangements as the governing body and responsibility for the sector differs across countries. Governance arrangements and their policy implications are discussed in the following chapters.

Table 1.1. Early childhood education programmes, starting age of primary and compulsory education

G20 countries (alphabetical order)	Early childhood education programmes (ISCED 02)				Starting age of primary education	Starting age of compulsory education
	Name of the programme in national language	Name of the programme in English	Theoretical starting age	Theoretical duration of the programme (years)		
Argentina	Jardín de infantes - Educación Especial	Special education - Kindergarden	3	3	6	5
Australia	Quality early childhood education program	Quality early childhood education program	3	2	5	6
Brazil	Educação infantil - pré-escola	Pre-school	4	2	6	4
Canada	Kindergarten	Pre-elementary education or equivalent - kindergarten	4-5	1	6	6
China	学前教育	Pre-primary education	3	3	6	6
France	Ecole maternelle	Pre-elementary education	2 - 3	3	6	3
Germany	01 Kindergärten	Kindergarten	3	3	6	6
	02 Schulkindergärten (nur in einigen Bundesländern und in der Regel für Kinder, die noch nicht "schulreif" sind)	School kindergarten (only in some Länder, for children considered not yet ready for school)	5 or 6	1		
	03 Vorklassen (nur in einigen Bundesländern und in der Regel für Kinder, die noch nicht "schulreif" sind)	Pre-school classes (only in some Länder, for children considered not yet ready for school)	5 or 6	1		
India	m	Pre-primary education	3	1-2	6	6
Indonesia	Kelompok Bermain (KB)	Playgroup	3	1-2	7	7
	Taman Kanak-kanak (TK)	Kindergarten	5	1-2	7	
	Raudlatul/Bustanul Athfal (RA/BA)	Islamic kindergarten	5	1-2	7	
	TK Luar Biasa	Special Kindergarten	5	1-2	7	
Italy	Scuola dell'infanzia	Pre-primary school	3	3	6	6
Japan	Yohorenkeigata-Nintei-Kodomo-En	Integrated centre for early childhood education and care	3-5	1-3	6	6
	Yochien	Kindergarten	3-5	1-3		
	Tokubetsu-shien-gakko Yochi-bu	School for special needs education, kindergarten department	3-5	1-3		
	Hoikusho	Day care centre	3-5	1-3		
Korea	어린이집 (3-5세) (Eorinyijip, age 3-5)	Child-care centre	3-5	1-3	6	6
	유치원 (Yuchiwon)	Kindergarten	3-5	1-3		
	특수학교 유치원 과정(Teuksu-hakgyo Yuchiwon-kwajeong)	Kindergarten course, Special school	3-5	1-3		
Mexico	Educación preescolar	Pre-primary education	3	2-3	6	3
Russian Federation	Дошкольное образование	Pre-primary education	3	3	7	7
Saudi Arabia	مرحلة رياض الأطفال	Kindergarten	2	4	6	6
South Africa	Grade R	Grade R	5	2	7	7
Turkey	Okul öncesi eğitimi (3-5 yaş)	Pre-primary education (ages 3-5)	3-5	1-3	6	5-6
United Kingdom	Reception and nursery classes in schools	Reception and nursery classes in schools	3	1-2	4-5	4-5
	Pre-school or pre-kindergarten	Pre-school or pre-kindergarten	2-4	1-2		

United States	Pre-school or pre-kindergarten	Pre-school or pre-kindergarten	2-4	1-2	6	4-6
	Kindergarten	Kindergarten	4-6	1		

Sources:
(OECD, 2018[9]), "Table X1.3 - Starting and ending age for students in compulsory education and starting age for students in primary education (2016): The typical age refers to the age of the students at the beginning of the school year." in *Annexes*, OECD Publishing, Paris, (accessed 02nd March, 2020) https://doi.org/10.1787/eag-2018-table221-en.
(OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02 March, 2020) https://doi.org/10.1787/f8d7880d-en.
(World Bank, n.a[10]), Education Statistics – All Indicators, (accessed 15 January 2020) https://databank.worldbank.org/reports.aspx?source=1159&series=UIS.CEAge.1.
(UNESCO Institute for Statistics (UIS), n.a[11])UNESCO Institute for Statistics (UIS) database, (accessed 15 January 2020) http://data.uis.unesco.org.
(UNESCO-UIS, 2012[7]), International Standard Classification of Education ISCED 2011, UNESCO Institute for Statistics, Montreal, (accessed 15 January 2020) http://uis.unesco.org/en/isced-mappings.

2 Participation and equity in early childhood education

Why focus on equity?

High quality ECE stands to benefit all children, especially those from disadvantaged backgrounds. A growing body of research recognises that quality ECE can help offset weak home learning environments for children living in poverty whose parents and other caregivers may struggle to find the time, emotional energy and confidence to create early learning opportunities. Data from the United Kingdom, for example, shows that by age five, children from the poorest families are on average 15 months behind in their vocabulary compared with children from the richest families (Finnegan and Warren, 2015[12]), highlighting the importance of providing equitable and high quality learning opportunities for young children. Countries are increasingly focusing on early years policies, not only to lift outcomes for individual children but also to support families in overcoming intergenerational poverty, for example by facilitating female labour market participation and promoting social and economic development more broadly (OECD, 2011[8]). Promoting equitable participation in ECE can also help to ensure that all children, regardless of background, can develop the competencies that they need for success in the twenty-first century.

While disadvantaged children and families stand to benefit the most from ECE, their chances of accessing quality services remain lower than their advantaged peers. The main obstacles to participation are cost, availability and organisational arrangements, such as inflexible opening hours and bureaucratic enrolment procedures (European Commission, 2014[13]). The latter can especially be a deterrent for ethnic minority families or marginalised groups who may find it difficult to sign up for waiting lists, access information and complete ECE enrolment forms (OSCE, 2010[14]). Another barrier is that ECE facilities can be unequally distributed across urban and rural areas, or affluent and poor neighbourhoods, making facilities located far from home inaccessible. Less visible barriers can also discourage participation in ECE, such as low awareness about the benefits of quality services and/or a lack of trust in professional education and care, especially when provision does not align with a family's cultural childrearing practices (Leseman, 2002[15]).

Many G20 countries have already committed to making ECE access more equitable. The SDGs provide a central reference, emphasising that all girls and boys should have access to quality early childhood development, care and pre-primary education. One concept that can help in charting a course towards the achievement of this goal is "progressive universalism", meaning that education provision should be expanded in a way that benefits disadvantaged children at least as much as their better-off peers (Education Commission, 2016[16]). This argument – which takes forward the vision of the United Nations (UN) Convention of the Rights of the Child, that the right to education should be achieved progressively and on the basis of equal opportunity – is echoed in other international commitments to which individual members of the G20 subscribe, such as the European Union (EU) Council Recommendation on High-Quality Early Childhood Education and Care Systems (2019[17]). The G20 2020 agenda provided an opportunity to further define policies that will help advance these goals to establish more equitable ECE systems in G20 countries and beyond.

What policies contribute to equitable participation in early childhood education?

Policies and plans that prioritise availability and accessibility for all

A strong public policy commitment to ECE – backed by a bold vision, strong plans and adequate funds – is important to guarantee access on an equal basis

Including ECE as a central priority in national education strategies and plans – with clear targets, indicators and ministerial leadership – can make a significant difference in terms of the political and financial importance given to the sector. Many G20 countries have made commitments to develop ECE in the recent years, for example, Saudi Arabia's strategic national documents explicitly identify ECE as a policy priority for human capital development, calling for greater investment and capacity on behalf of the ministry to reach an ambitious target of raising the kindergarten enrolment rate from 17% to 95% by 2030 (Ministry of Education of Saudi Arabia, 2019[18]). Box 2.1 provides additional examples of ECE targets.

Targets should be ambitious but also realistic, and will vary across countries depending on available resources and capacity, as well as pressures at other levels of their education system. Most advanced G20 economies, where enrolment in the year before primary school is close to universal, have set targets intended to expand participation for younger children. For example, the European Council has set targets for EU member countries to enrol at least 95% of children from age four in ECE and 90% from age three (European Union, 2019[17]).

For G20 countries where baseline access across all pre-primary levels is still low, there are two broad options for scaling up provision. First, countries can start by implementing one year of ECE education, then build down gradually to younger grades – as is the plan in Saudi Arabia. Such an approach can achieve more equitable participation in the year proceeding primary school, but usually means disadvantaged children continue to lack access in the earlier years. The second option is to expand the ECE sector as a whole. This approach can deepen inequities since wealthier families tend to be the first to enrol in ECE services, requiring special measures to prioritise the enrolment of disadvantaged children.

Box 2.1.Examples of targets for enrolment of 3-6 year olds in ECE

One of the main objectives of the United Nation's Sustainable Development Goals (SDG 4.2.2) is universal participation in at least one year of organised learning before children begin primary school. The European Commission and the European Parliament have also set this goal as a policy priority in the Europe 2020 targets.

Some G20 countries have also set national targets for ECE enrolment that focus on access to services or disadvantage. For example, in Australia, the government aims to provide access to 15 hours per week or 600 hours per year of subsidised ECE for every child in the year before they begin primary education, in order to guarantee equal access to disadvantaged and indigenous children

Sources:
(European Commission, 2019[19]), Key Data on Early Childhood Education and Care, EACEA/Eurydice, (accessed 02 March, 2020) https://eacea.ec.europa.eu/national-policies/eurydice/sites/eurydice/files/ec0319375enn_0.pdf.
(Council of Federal Financial Relations, 2019[20]), Council of Federal Financial Relations, 2019, Universal Access to Early Childhood Education – 2020, (accessed 02 March, 2020) www.federalfinancialrelations.gov.au/content/npa/education/national-partnership/2020_UANP_FINAL.pdf.

Planning for universal access is the most equitable way to expand early childhood education but it is important to ensure that disadvantaged children are first to benefit

There is broad consensus that a universal, rather than targeted approach, to expanding access to ECE is better for equity since it avoids labelling a family or child as "in need", which can have potentially negative social and psychological consequences (European Commission, 2014[13]). However, it is likewise clear that making ECE services accessible to all population groups - and making sure disadvantaged groups benefit first not last - often requires additional, adapted measures. This may require flexible and alternative approaches to provision. For example, adjusting the opening hours of ECE facilities can help to accommodate families with irregular work schedules, who are often in informal, low-paid jobs. Inclusive language policies and clear, simple enrolment procedures are other ways ECE programmes can be made more accessible to disadvantaged groups, such as migrants and ethnic minorities. In G20 countries with large remote or rural areas, community or family-based services can offer an alternative means to expand access while more structured provision is being developed. Saudi Arabia is exploring ways in which digital platforms can be used to enrich the educational resources available to children outside the formal system. Partnerships with civil society organisations and the private sector offer another way to improve both inclusivity and coverage. However, when multiple providers are involved, it is important for governments to establish a strong co-ordination and regulatory framework to guarantee basic standards and a coherent approach to the sector's development (UNICEF, 2019[3]); (OECD, 2011[8]).

Raising awareness about the benefits of early childhood education and linking its provision with other services is an effective way to encourage participation and benefits for disadvantaged families and raise greater public demand for quality ECE

As well as expanding and adapting the supply of ECE, additional outreach efforts are often needed to overcome some of the less visible barriers to equal participation, such as a lack of awareness about the benefits of ECE and possible socio-cultural reservations about sending a young child out of the home. To increase demand, parents and caregivers need to understand the advantages of participating in ECE and see that their children are included and belong. For the most marginalised families - those living in poverty, with a migrant and/or second language background, or parents and caregivers with very low levels of education themselves - outreach can be more effective and beneficial when linked with other services. Box 2.2 discusses the range of services provided by Head Start in the United States. In emerging G20 economies, barriers to ECE participation often go beyond access to include other factors, such as malnutrition and poor health. Holistic and effective ECE services can help children in these contexts develop and thrive. Providing nutritious meals and good water and hygiene facilities in preschools, for example, can encourage the participation of poor children and support their education and development, while also helping to build trust between families and ECE providers (UNICEF, 2019[3]).

Box 2.2. Head Start, an integrated approach to equitable access to ECE in the United States

Head Start is a programme implemented in the United States across child care centres, family centres and schools. The programme aims to support the learning and development of disadvantaged children aged 0 - 5 by providing a range of services:

- Health and nutrition: such as nutritious meals, health checks and oral and mental health support.
- Supporting stable family relationships and well-being: by providing access to services for mental health, substance abuse, domestic violence and affordable housing.
- Early learning: the programme provides children with opportunities to interact with adults and other children through play and structured learning in ECE settings.

Each year the Head Start programme is provided to over a million children, including around 155 tribal communities.

Source: (Office of Head Start, 2019[21]), Head Start Programmes, (Accessed 27 February 2020) https://www.acf.hhs.gov/ohs/about/head-start .

Clear rights and obligations

Clear, unambiguous legislation on the right to free or publicly subsidised early childhood education is one way to encourage equitable access

Legal entitlements are one way that governments can give adequate priority to ECE, as it sends a strong message about the fundamental importance of child development at this stage in life. Legislation and policies affirming the right to ECE can also galvanise broader efforts by civil society to help expand provision. Many G20 countries have legislation in place guaranteeing the right to universal access, though the precise nature of the entitlements varies across and sometimes within countries. In Italy, Mexico and France, all children ages 3 to 5 can benefit from free ECE services. Other countries offer more restricted entitlements, ensuring the right to a place in ECE but limiting what years are offered at no-cost to families or targeting free services based on family need, as is the case in the United Kingdom. Additional entitlements for ECE might also be set at a regional level. This is the case in Germany, where some Lander offer free provision for certain age groups, in addition to a Federal entitlement that offers a place in ECE for all children from age 1 to school entry (OECD, 2016[22]).

An increasing number of countries have moved beyond legal entitlements, to make one or more years of pre-primary education mandatory

Lowering the starting age of compulsory education is one way to achieve equitable participation. Offering compulsory and free pre-primary education has been an accelerator for raising ECE enrolment in some lower-middle income countries; however, this requires high levels of investment and capacity (UNICEF, 2019[3]). Many governments therefore choose to introduce mandatory pre-primary education only once participation rates are already high and services are widely available. France, for example, has a well-established ECE system with nearly universal enrolment for children ages three to five. Recently, the French government lowered the start of compulsory education to age three with the goal of reducing inequalities and providing all children with high quality early learning opportunities (Ministère de l'Éducation, 2019[23]).

Other countries have introduced compulsory pre-primary education as a means to drive expansion in the supply and demand for ECE. South Africa, for example, announced plans to rapidly expand ECE access with the goal of eventually making the transition year before primary school (Grade R) compulsory. This policy was announced despite low levels of participation with the aim of spurring action across the government to swiftly increase access. Countries taking such an approach need strong, well-financed plans, along with monitoring frameworks that enable governments to identify and address challenges as they emerge. Initially, South Africa's efforts to introduce Grade R resulted in a two-tier system that exacerbated learning gaps, as ECE classes in poorer districts and communities did not receive the additional resources required to ensure quality provision (Biersteker, 2010[24]; Van der Berg, Servaas, 2013[25]). This was later addressed through changes in funding allocations, highlighting the importance of considering access, equity and quality when committing to make ECE compulsory (UNICEF, 2019[3]).

Measures to ensure affordability

When feasible, a guarantee of unconditional free pre-primary education is increasingly shown in research and practice to be one of the most effective ways to ensure equitable access

Even low fees can represent a significant barrier to participation in ECE for children from disadvantaged families, suggesting that universal free access to pre-primary education is an important policy to work towards (UNICEF, 2019[3]) and (European Commission, 2014[13]). This is already a reality in several G20 countries and most OECD countries, which now offer cost-free access to all children for at least the last year before entering primary school (OECD, 2017[4]). Universal free access - with direct public funding rather than paying benefits to parents - is associated with higher participation rates, more efficient management and better quality at the national level (European Commission, 2013[26]). Moreover, the increased diversity and social mix within this context has positive effects on children's learning processes and social interactions (European Commission, 2014[13])

Where public funds are limited and fees are needed, or in contexts where there is a strong reliance on the private sector to meet demand, pro-poor policies - such as progressive fee structures or subsidies - are important to remove financial barriers that can stand in the way of disadvantaged families' access to ECE. In Indonesia, for example, the government allocates additional funding to registered ECE facilities serving poor children and those with disabilities (Kobe University, 2016[27]). In Saudi Arabia, vouchers are provided for registered, private ECE institutions to increase enrolment among disadvantaged children in rural areas. These vouchers create more ECE places, equal enrollment opportunities and encourage the private sector to enhance public education (Ministry of Education of Saudi Arabia, 2019[28]). However, targeted approaches can sometimes have unintended consequences, for example children from advantaged backgrounds may end up benefiting more than those from disadvantaged backgrounds. Careful planning and monitoring are important to address such risks.

Adequate public spending on pre-primary education is a condition for reducing cost barriers for families

Providing free or publicly subsidised access requires substantial government investment in the pre-primary education sector. Despite ECE yielding high economic returns and supporting social and educational equity, it often receives relatively limited public investment and remains more dependent on private spending compared to the school and even the tertiary sector. While there is no conclusive evidence about the amount of public spending needed to raise ECE enrolments, higher investment is correlated with higher rates of participation. One way that countries can measure the adequacy of their investments is by considering how much they spend on ECE as a share of gross domestic product (GDP). While most G20 countries spend less than 0.5 % of GDP on pre-primary education, enrolment is frequently higher in

countries that spend more (see Section 2.3). In many G20 countries, increasing public spending on ECE will require reappraising how funds are allocated within the education budget since increasing overall expenditure is often very difficult.

Mechanisms to ensure adequate and equitable funding may be required in contexts where local governments are responsible for ECE services

In many countries, the funding and delivery of pre-primary education is decentralised. In such contexts, robust governance and accountability mechanisms across decentralised levels are important to ensure efficient allocation and use of ECE resources at all levels of government. There is often a need for some redistributive role from the national government to equalise funding per child across administrative areas. Brazil has identified ways to reduce disparities in funding across municipal governments, which are responsible for pre-primary education. Municipalities pay into a state fund that is redistributed according to the number of children enrolled and additional transfers are made if there are any unanticipated shortfalls at the local level (UNICEF, 2019[3]). Figure 2.1 discusses the capacity challenges faced in South Africa at provincial levels to use central funds effectively. Regardless of how countries decide to generate and allocate funding for pre-primary education, it is important that this process is well-coordinated and aligns with broader goals to improve equity.

Box 2.3.South Africa's responsibility for funding EC

In 2001, South Africa introduced a new national pre-primary year - Grade R. In the first three years following its introduction, Grade R was funded by conditional grants to subnational levels of government. However, insufficient staff numbers and weak capacity at provincial levels meant that in 2001 less than a third of the available funds were actually spent. Efforts to improve planning and implementation at provincial levels helped to improve local capacity and by 2004, 75 % of grant funding was used.

Grade R continues to be funded centrally, by the Department of Basic Education, with provincial allocations to promote equity. Provincial allocations are provided to public primary schools (where more than 90 % of Grade R classes are placed) to employ teachers and purchase materials, and to community-based centres (where the remaining Grade R classes take place) on a per capita basis. Ensuring that provinces continue to implement the central funds for staff salaries and learning materials as intended and equitably remains a challenge.

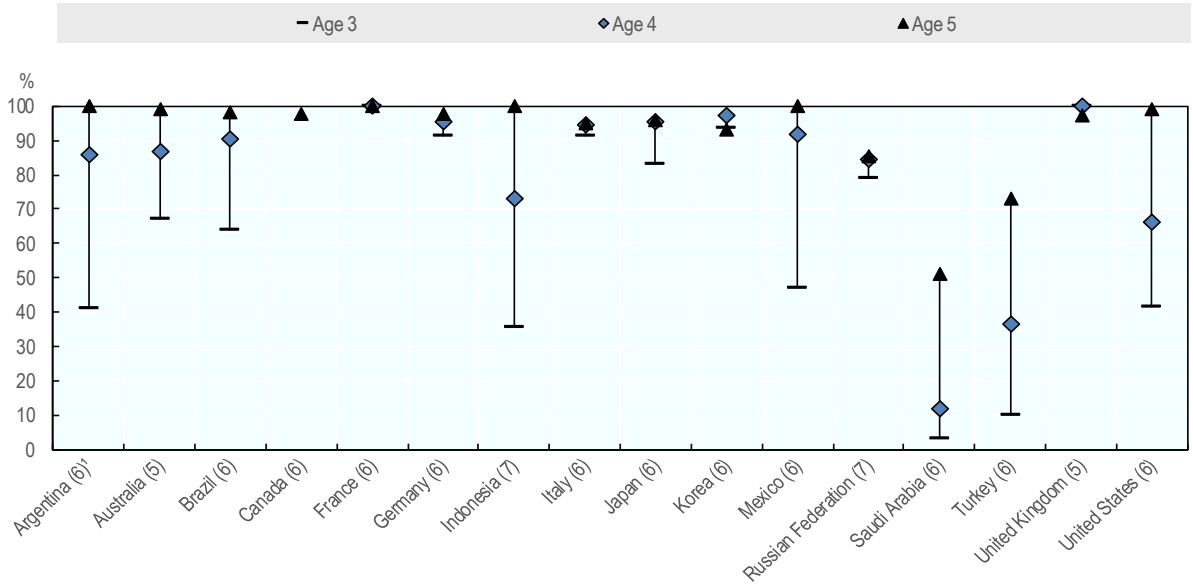
Source: (UNICEF, 2019[3]), A World Ready to Learn: Prioritizing Quality Early Childhood Education, New York, (accessed 02 March, 2020) https://www.unicef.org/media/57926/file/A-world-ready-to-learn-advocacy-brief-2019.pdf.

What do data reveal about participation and equity in ECE in G20 countries?

Universal or near-universal participation among 5 year-olds is now the norm across most G20 countries

Among G20 countries with available data, the majority have over 90% enrolment in pre-primary education for 5 year-olds. It is important to note that compulsory education begins at age five in some countries, which contributes to high enrolment levels. However, participation rates tend to be lower for younger age groups. At age 4, seven countries have a participation rate below 90%, and at age 3 this increases to 10 out of 15 countries with data (Figure 2.1). National data from China suggest that in 2019, 5 year-olds made up 39% of enrolments in pre-primary education, while the share of 3 year-olds only comprised 22% (Ministry of Education of the People's Republic of China, 2019[29]).

Figure 2.1.Enrolment by age, early childhood education and care or primary education (2017)



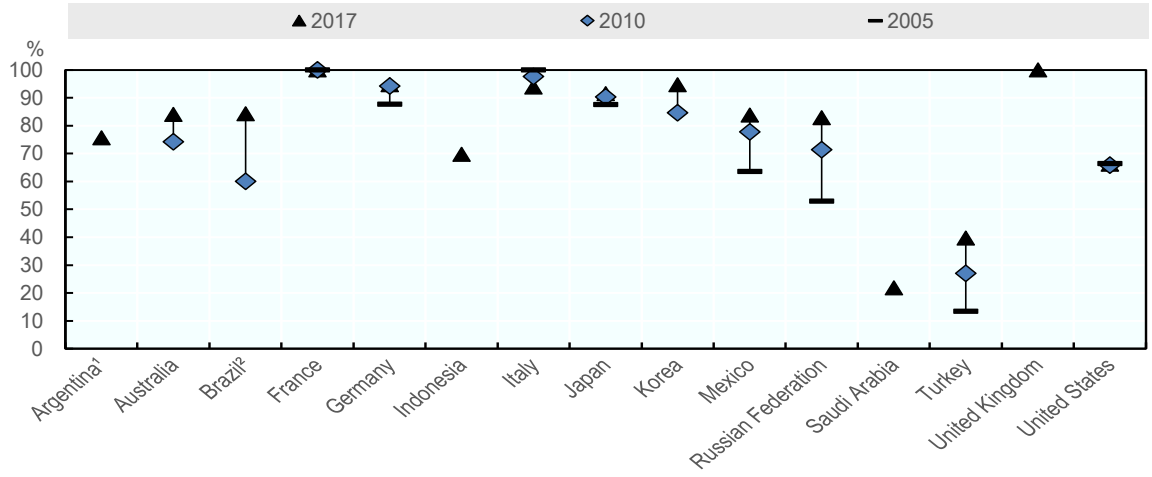
Notes: Figures in parentheses refer to the typical starting age of primary education.
[1]Year of reference 2016.
Countries are in alphabetical order.
Sources:
(OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02 March, 2020) https://doi.org/10.1787/f8d7880d-en.
(UNESCO Institute for Statistics (UIS), n.a[11])UNESCO Institute for Statistics (UIS) database, (accessed 15 January 2020) http://data.uis.unesco.org.
(UNESCO-UIS, 2012[7]), International Standard Classification of Education ISCED 2011, UNESCO Institute for Statistics, Montreal, (accessed 15 January 2020) http://uis.unesco.org/en/isced-mappings.

Enrolment has increased among 3-5 year-olds in most G20 countries

Most OECD countries have seen positive trends in the enrolment of 3 - 5 year-olds in recent years (Figure 2.2.). The fastest growth has been in countries where participation had historically been limited, driven by deliberate policy efforts and rising societal demand. In Turkey, enrolment tripled between 2005 and 2017, while in Brazil, Mexico and the Russian Federation enrolment increased by at least 20 percentage points during the same period. Similarly, national data for Saudi Arabia shows that enrolment for this age group doubled, from 11% in 2010 to around 29% by 2022. More developed economies, starting from a higher baseline, have seen more modest growth, though there is considerable variation between countries. France is the only G20 country that has maintained universal enrolment for 3 - 5 year-olds since 2005. In the United States there has been no notable change in enrolment for the past fifteen years, though for a large Federal country, the national average reveals only part of the picture.

Figure 2.2. Trends in enrolment rates of 3-5 year-olds (2005, 2010 and 2017)

Enrolment in public and private early childhood education and care (ECEC) and primary education institutions



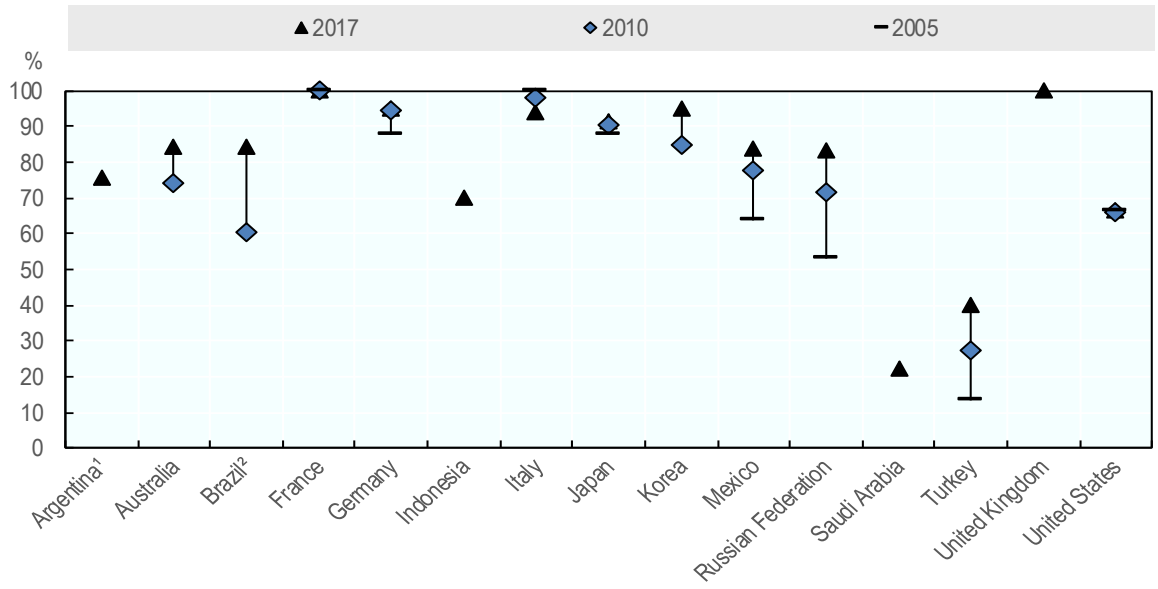
Notes: [1]Year of reference 2016 instead of 2017.
[2]Year of reference 2012 instead of 2010.
Countries are in alphabetical order.
Source: (OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02 March, 2020) https://doi.org/10.1787/f8d7880d-en.

Economically and socially advantaged students are more likely to participate in ECE than their less advantaged peers

Data from the OECD Programme for International Student Assessment (PISA) suggests that two years of ECE significantly increases the chance of reaching a good level of academic performance at age 15. However, the data also reveal that the most advantaged students - those in the top quarter of the distribution on the PISA index of economic, social and cultural status within their countries/economies – are more likely to report having participated ECE than their most disadvantaged peers (Figure 2.3) (OECD, 2018[30]). This disparity is more than 20 percentage points in Turkey and more than 10 percentage points in Australia, Brazil, Mexico, the United Kingdom and the United States. However, the socio-economic gap

in ECE participation is less than five percentage points in France, Germany, Italy, Japan, South Korea, Russia and Zhejiang and the Chinese special administrative regions of Hong Kong and Macao.

Figure 2.3.Percentage of 15-year-old students who attended early childhood education for two years and more, by student socio-economic profile (PISA 2018)

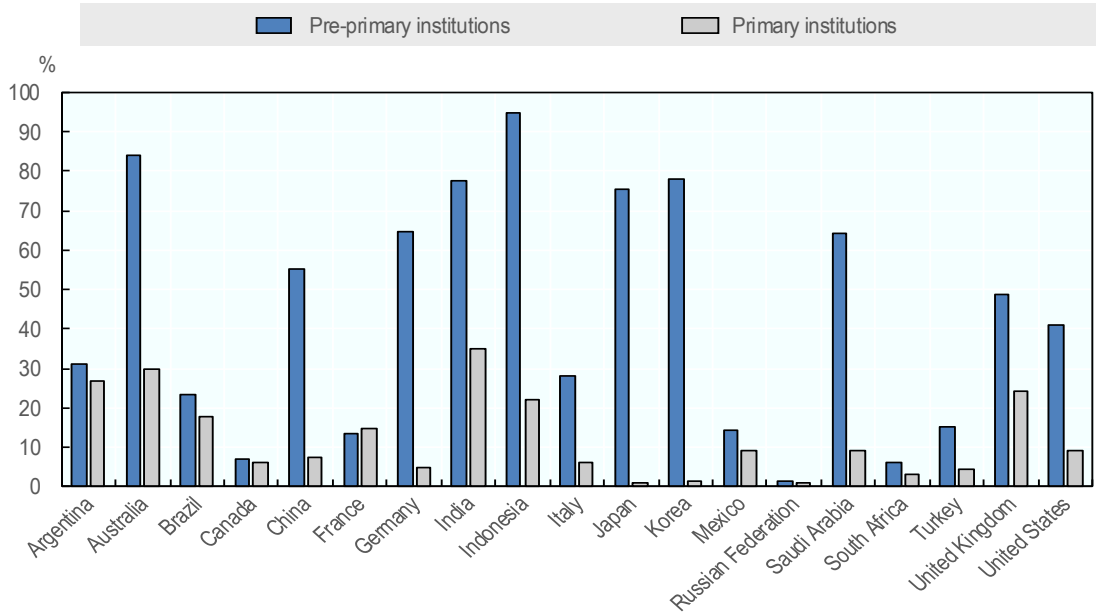


Note: Countries are in alphabetical order
Source: (OECD, 2018[30]), PISA online education database, 2018, OECD, Paris, (accessed 02 March, 2020) http://www.oecd.org/pisa/data/.

Private institutions account for a large share of pre-primary enrolment in many G20 countries, in contrast to primary schooling

The institutional context for pre-primary education tends to be more complex than for primary education, with a wider diversity of providers. In many G20 countries, the private sector accounts for a large share of pre-primary enrolments, and in all countries for which data are available, the share of children in private institutions is higher – often much higher – at the pre-primary level than at the primary level, where provision is predominantly public (Figure 2.3 and Figure 2.4.). For example, in Japan and Korea, around 75% of children enrolled in pre-primary education are enrolled in private institutions, compared with just 2% or less in primary education. In eight G20 countries, private provision accounts for more than half of all pre-primary enrolments, with more than three in four children attending private pre-primary institutions in Australia, India, Indonesia, Japan and Korea. In contrast, pre-primary provision is mostly public in Canada and the Russian Federation, with less than 10% of children participating in private pre-primary institutions. While a large private sector has been an important means to expand access for many countries, it can raise significant challenges for governments in terms of ensuring equity, as well as curricula coherence and consistent quality.

Figure 2.4. Share of children and students enrolled in private pre-primary and primary institutions (2017)

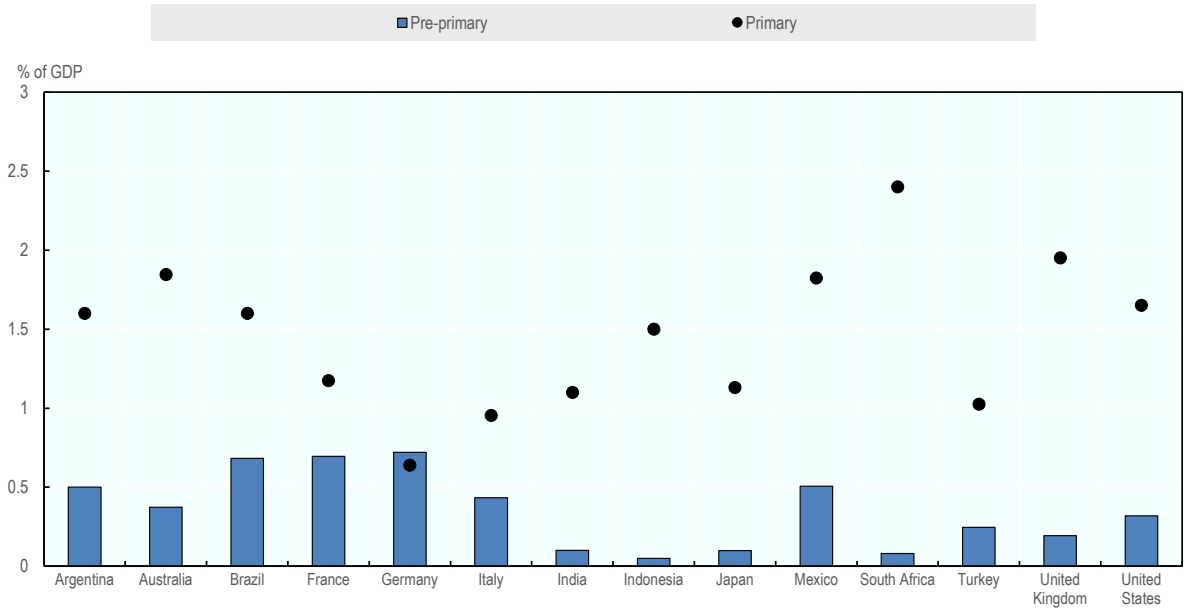


Note: Data provided is from the latest available year.
Countries are in alphabetical order.
Sources:
(OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02 March, 2020) https://doi.org/10.1787/f8d7880d-en.
(UNESCO Institute for Statistics (UIS), n.a[11])UNESCO Institute for Statistics (UIS) database, (accessed 15 January 2020) http://data.uis.unesco.org.
(UNESCO-UIS, 2012[7]), International Standard Classification of Education ISCED 2011, UNESCO Institute for Statistics, Montreal, (accessed 15 January 2020) http://uis.unesco.org/en/isced-mappings.

While higher investment is correlated with higher rates of participation, most countries spend less than 0.5 % of GDP on pre-primary education

Total expenditure on education as a percentage of GDP reveals the share of national wealth devoted to different levels of education (Figure 2.5.). Countries with the highest levels of spending on pre-primary education also have the highest enrolment rates for 4 and 5 year-olds (see Figure 2.1 and Figure 2.5.). Among G20 countries with available data, most countries (15 out of 19) spend less than 0.5% of their GDP on pre-primary education. Overall, ECE receives the lowest share of GDP expenditure across education levels in all G20 countries with data available, except for Germany, where spending on pre-primary education slightly surpasses that of primary (UIS, 2020[31]) (OECD, 2019[6]).

Figure 2.5. Expenditure on education as a percentage of GDP, by level of education (2016)



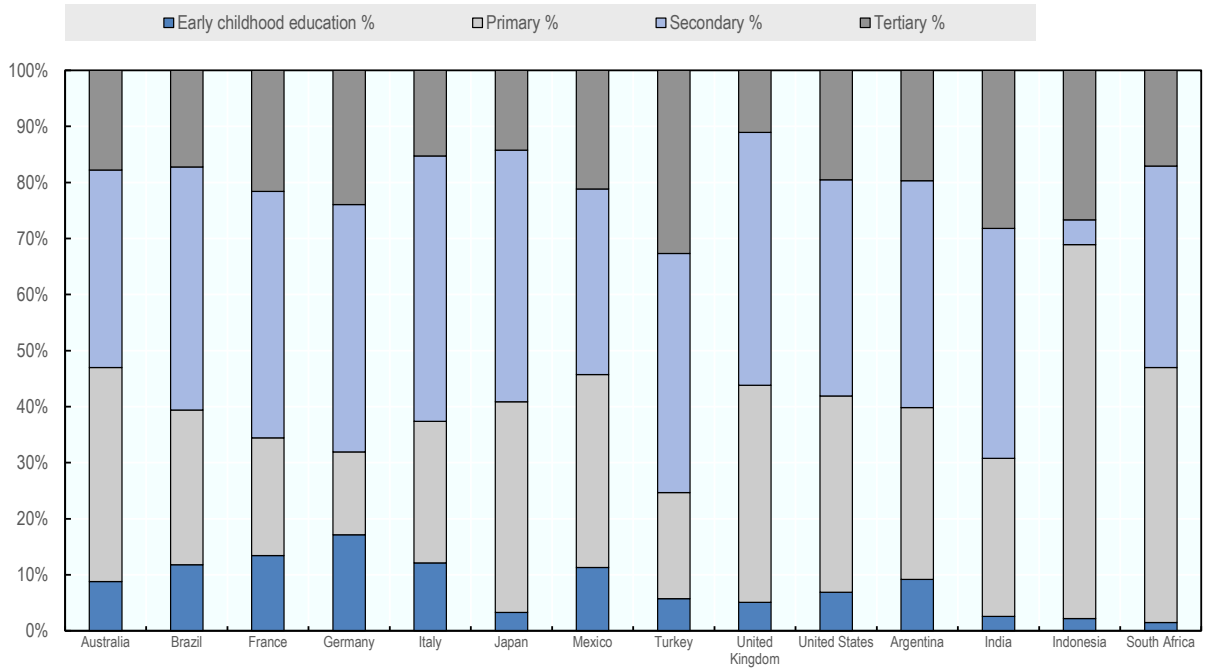
Notes: Expenditure from international sources are not included at pre-primary level.
Data provided is from the latest available year.
Countries are in alphabetical order.
Sources:
(OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02 March, 2020) https://doi.org/10.1787/f8d7880d-en.
(UNESCO Institute for Statistics (UIS), n.a[11])UNESCO Institute for Statistics (UIS) database, (accessed 15 January 2020) http://data.uis.unesco.org.
(UNESCO-UIS, 2012[7]), International Standard Classification of Education ISCED 2011, UNESCO Institute for Statistics, Montreal, (accessed 15 January 2020) http://uis.unesco.org/en/isced-mappings.

Public spending on ECE varies markedly, partially reflecting different priorities in education budgets

In both absolute terms and relative to other education levels, the importance given to pre-primary education in governments varies considerably. One way to compare expenditure across levels of education is to examine expenditure per child. In general across G20 countries, per child spending tends to increase progressively from the pre-primary to tertiary level. For example, in the United States, public spending per child (or student) is USD 6 803 in pre-primary education, USD 11 281 in primary education, USD 12 573 in secondary education and USD 14 630 in tertiary education. Despite being the foundation for later education, pre-primary education is the level receiving the lowest public investment per child.

Examining the breakdown in public expenditure by education level provides another perspective (see Figure 2.6). However, this information needs to be interpreted in relation to population size and other contextual factors. In South Africa, public spending on ECE remains low at around 1.3%, despite high levels of enrolment in public pre-primary institutions. Public allocations for ECE are also low in Indonesia (1.4%) and India (2.6%); however, private spending plays a more important role here. It is also notable that these countries allocate significantly more to the tertiary level than pre-primary education. In more advanced G20 economies, public expenditure still favours tertiary education but this difference is much smaller, reflecting decisions to increase spending in the earlier years where investment is more equitable and effective.

Figure 2.6. Distribution of public expenditure on education, by level of education (2016)



Note: Data provided is from the latest available year. It shows the total expenditure on educational institutions as a percentage of GDP, by level of education.
Countries are in alphabetical order.
Sources:
(OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02nd March, 2020) https://doi.org/10.1787/f8d7880d-en.

(UNESCO Institute for Statistics (UIS), n.a[11])UNESCO Institute for Statistics (UIS) database, (accessed 15 January 2020) http://data.uis.unesco.org.
(UNESCO-UIS, 2012[7]), International Standard Classification of Education ISCED 2011, UNESCO Institute for Statistics, Montreal, (accessed 15 January 2020) http://uis.unesco.org/en/isced-mappings

3 Quality in pre-primary education

What defines quality in ECE and why is it important?

High quality early childhood education takes a holistic approach to children's development

There is consensus across researchers that early childhood education (ECE) should take a holistic approach to children by fostering their learning, development and well-being. Areas of early learning that are of particular importance include: language and literacy; numeracy and other non-verbal cognitive skills; self-regulation; emotional health, social well-being and social and emotional skills (Shuey and Kankaraš, 2018[2]). These domains are interrelated, meaning that ECE should aim to foster children's development and learning in these multiple dimensions and lay the foundations for global competence to support positive individual and societal outcomes throughout life.

While a growing body of research suggests that the magnitude of the benefits to children of attending ECE depends on the level of quality of services, there is also evidence that low-quality ECE can be associated with no benefits or even with detrimental effects on children's development and learning (Britto, Yoshikawa and Boller, 2011[32]; Howes et al., 2008[33]). Taking steps to ensure the quality of ECE provision is therefore essential for countries investing in the development of their ECE sector.

Quality in early childhood education is influenced by structural and process factors

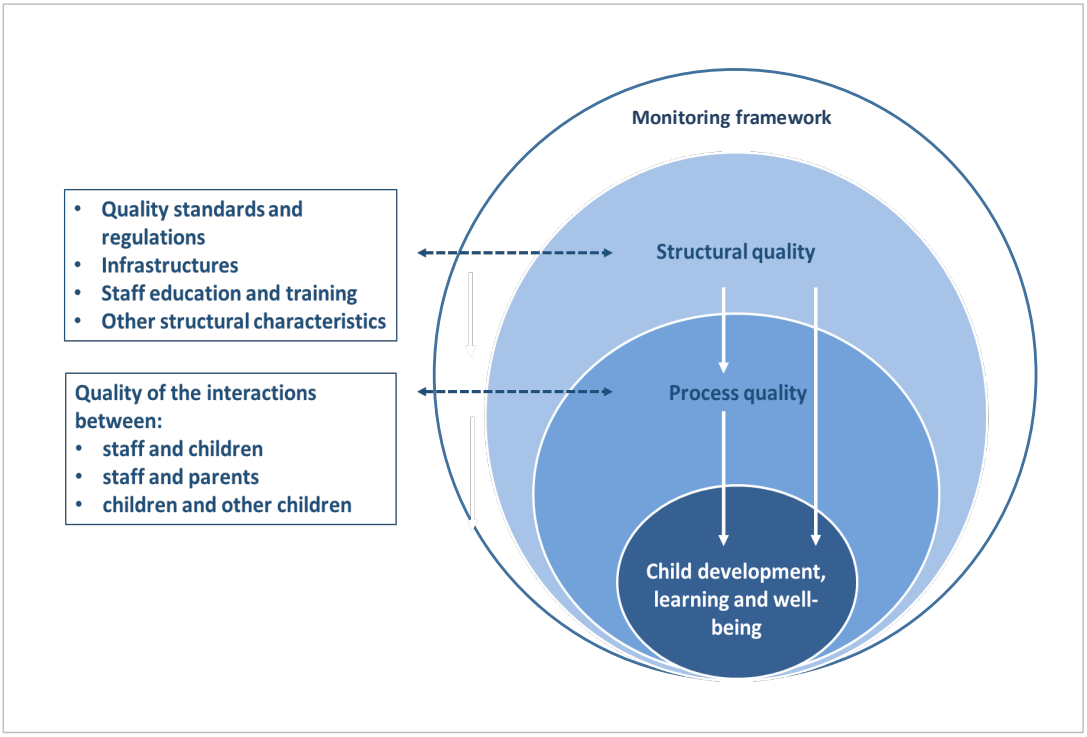
High-quality ECE encourages all children to learn and develop to their full potential along multiple dimensions, regardless of their socio-economic background, native language and other specific needs. While the definition of quality in ECE is evolving, most definitions distinguish between two aspects - structural and process - that contribute to the overall quality of outcomes in ECE for children, their families and society:

Structural aspects of quality refer to characteristics of the ECE environment, such as the number of children per staff member, group size, workforce education and training, staff turnover, programme, children's development monitoring and other structural factors.

Process quality comprises children's interactions in ECE settings with other children, staff/teachers, space and materials, their families and the wider community. These interactions result from activities proposed by staff in settings involving social, emotional, physical and instructional aspects, while building on play and routines.

There is a growing consensus that process quality is closely related to children's development and learning (Pianta, Downer and Hamre, 2016[34]). The evidence shows that, with more positive staff-child interactions or staff providing higher quality or more exposure to developmental and educational activities, children have higher levels of emerging literacy and numeracy skills in ECE settings, as well as better behavioural and social skills (OECD, 2018[35]). Structural aspects of quality can affect the interactions between staff and children, although they do not guarantee the quality of these interactions. Figure 3.1 presents a framework to understand quality in ECE.

Figure 3.1. Framework to understand quality in early childhood education and care



Source: Adapted from (OECD, 2018[35]), Engaging Young Children: Lessons from Research about Quality in Early Childhood Education and Care, Starting Strong, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264085145-en.

What policies contribute to quality?

Policies can influence both structural and process aspects of quality. There is a shared view of the main policy levers to affect quality in ECE. They include: 1) curriculum and pedagogy; 2) workforce development; and 3) monitoring, governance, and funding. However, policy makers generally face tight budget constraints and decisions in spending require that they evaluate the trade-offs of investment in the various drivers of quality.

Curriculum frameworks and pedagogy

Curriculum guidelines or frameworks can lead to a shared understanding of the goals of early childhood education

Curriculum guidelines or frameworks are a powerful tool to improve the pedagogical quality of services in which young children participate. Curriculum guidelines or frameworks are over-arching documents that articulate the vision of curricula within the context of ECE and education systems. They can be broad and general, or quite specific. Curriculum frameworks or guidelines regulate the proposed activities in ECE through the goals, learning areas and materials (e.g. pedagogical support, games) that are specified. They often provide principles to help staff organise their pedagogical work to address developmental goals or learning standards (OECD, 2018[36]). These goals, learning areas and materials affect the quality of children's interactions in the play - or classroom by promoting activities that encourage children to develop relationships with peers, ECE staff, space and materials, parents and family, and the community. In

Australia, the Early Years Learning Framework describes the principles, practices and outcomes that support young children's learning from birth to five years of age, as well as their transition to school. It is designed so that early childhood services are able to develop their own strategies to implement its objectives (Australian Government, n.d.[37]).

Curriculum guidelines or frameworks can encourage practices that place children at the centre and foster their development across multiple areas

The curriculum influences the pedagogical approaches and practices used by early childhood education providers. The OECD's work on early childhood education reflects a consensus view that can be characterised as social constructivist. This view stresses the importance of children's intrinsically motivated activity and initiative as the engine of development, but also of the role of ECE staff to develop emergent skills in language, literacy, numeracy, mathematics and science. The latter are essential for children during their early years and their first years of schooling. They also provide the foundations for later global competencies and twenty-first century skills that are important in the global economy.

Pre-service and in-service training of ECE staff are important to ensure that staff's beliefs about what is important for children are aligned with the goals of the curriculum. There is empirical evidence that the beliefs of ECE staff on what is important for children are associated with their pedagogical practices. The OECD's Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) is an international large scale survey of the ECEC workforce (see Box 3.1). TALIS Starting Strong shows that the ability to co-operate easily with others is at the top of the list of skills and abilities that ECE staff regard as important for young children to develop and that practices facilitating children's socio-emotional development are widely used (OECD, 2019[38]).

Box 3.1.The Starting Strong Teaching and Learning International Survey (TALIS Starting Strong)

The OECD TALIS Starting Strong is an international survey of staff and centre leaders working in ECEC at pre-primary (ISCED 02), and as an option for children under 3. It aims to provide internationally comparable information for policies and decision-making that better support children's learning conditions, well-being and development.

The first round of TALIS Starting Strong was undertaken in 2018 and included nine countries Chile, Denmark, Germany, Iceland, Israel, Japan, Korea, Norway and Turkey. The survey asked ECEC staff and leaders about their characteristics, the practices that they use with children, their beliefs about children's development and their views on the profession and the ECEC sector. Main findings from the data include:

- Around 70% of staff report regularly using practices that facilitate children's socio-emotional or language development.
- In pre-primary centres, the average size of the group of children that staff work with varies from 15 children to more than 20.
- ECEC staff have typically completed education beyond secondary school. Japan, Korea and Turkey have the highest rates of ECEC staff with post-secondary education.
- In all countries, a majority of staff (more than 75%) report having participated in professional development activities in the last year. Staff who are less educated tend to participate less in professional development activities.
- ECEC centres are generally stand-alone buildings. In several countries, co-location with a primary school is associated with more frequent meetings and communication with primary school staff and transition-related activities for parents and guardians.

- Monitoring activities tend to focus more frequently on assessing the facilities and financial situation of centres than on the quality of interactions between staff and children (i.e. process quality). More than 20% of leaders in Germany and Japan report that their centres have never been evaluated on process quality.

A next cycle of TALIS Starting Strong is planned for 2024 and countries are welcome to join in 2020.

Source: (OECD, 2019[38]), Providing Quality Early Childhood Education and Care: Results from the Starting Strong Survey 2018, TALIS, OECD Publishing, Paris, https://doi.org/10.1787/301005d1-en.

Guidelines and frameworks can also help ECE staff engage with parents to foster children's development

Parents play a critical role in children's learning, development and well-being. The curriculum framework should help ECE staff to engage with parents to foster children's development, for example by raising parents' awareness about the role and importance of activities in the ECE centre. ECE staff discussions with parents can also support parents in their interactions with their children so that all children benefit from the best learning and development opportunities.

Curriculum and guidelines can encourage positive staff-parent interactions by recognising the role of parents for children's development and providing guidance for ECE staff to successfully engage parents in the centre's activities. For example, in Wales (United Kingdom) the Flying Start programme supports families with young children (zero to four) in disadvantaged communities. One of the programme's core elements is parenting support and support for the development of children's speech, language and communication. Several studies have shown that this programme is positively associated with children's language skills and social and emotional development (OECD, 2017[39]).

Quality and professionalisation of the workforce

Staff are at the centre of efforts to enhance pedagogical practice and promote young children's development. Common challenges that countries face in establishing a high-quality workforce include: raising the level of qualifications of staff; recruiting, retaining and diversifying a qualified workforce; continuously up-dating the skills of the workforce; and ensuring the quality of the workforce in the private sector.

The level, type and content of pre-service training are important drivers of quality

Research shows that higher pre-service education among staff is associated with higher quality interactions between staff and children in ECE settings (Manning et al., 2017[40]; OECD, 2018[35]). The exact level of staff education required to enhance quality is unclear, however, increases in teacher training beyond secondary education (ISCED level 3) appear important for improvements in early childhood quality (OECD, 2019[38]). In most G20 countries, ECE teachers have the same minimum qualifications as primary teachers - a Bachelor's degree or equivalent (ISCED level 6) (see Table 4.1).

In many countries, the ECE workforce includes significant diversity of staff profiles, such as teachers and assistants. Staff education requirements depend on their role and the way interactions between staff and children are organised. A number of G20 countries, such as China and France make extensive use of teaching assistants. In these countries, while the child-teacher ratio is comparatively high (more than 20 children per teacher), the use of teaching assistants mean that the child-to-staff ratios are substantially lower (OECD, 2017[4]). Countries developing their ECE systems and facing shortages of ECE teachers might also consider recruiting assistants to work with teachers.

The focus and content of training for early childhood professionals also contributes to the quality of ECE settings, for example whether training focuses on early childhood or specifically prepares staff to work in ECE settings. Data from TALIS Starting Strong shows that staff with a higher level of education and trained specifically to work with children report tailoring their approach in the classroom or playroom to individual children's development and interests (OECD, 2019[38]).

Practical learning experiences, such as work-based learning, as part of pre-service training programmes can be particularly valuable for ECE staff. Such experiences can help staff learn how to manage a group of children in the classroom/playroom setting, adjust practices to children's changing needs and effectively foster children's learning, development and well-being. Work-based learning (or apprenticeships) can also provide a mechanism to attract new staff to the profession, ensure they are familiar with the day-to-day demands of the job and grow the ECE workforce as programmes involve working and studying at the same time. Finally, participants in work-based learning can help to support ECE staff by providing additional adults in the classroom/playroom, enabling staff to provide children with more individualise attention.

Staff need high quality and flexible opportunities to develop their skills and knowledge along their careers

Initial training should be complemented by in-service professional development to help staff develop their knowledge and skills throughout their careers. Professional development can also provide an alternative channel to recruit candidates into ECE which can be important in countries that do not have enough candidates that complete initial pre-service training programmes. Professional development can also help relieve some sources of stress and thereby improve staff interactions with young children.

Professional development activities that provide individualised support, such as coaching or personal feedback are found to be more effective in changing staff practices (Egert, 2015[41]). However, the effectiveness of professional development differs across countries and settings and further research is required to understand how investments in professional development can be most impactful (Slot, Lerkkanen and Leseman, 2015[42]).

Policy makers need to engage with the early childhood education workforce to identify priorities for creating attractive working conditions

In order to attract and retain the most suitable candidates to the early childhood education workforce, countries not only need to offer adequate pay but also provide an environment where leaders and other staff are given the autonomy, and have the time and space to work as professionals.

As for other jobs, the quality of ECE jobs is influenced by: labour market security; quality of the working environment; and earnings quality. Regarding labour market security, staff turnover rates are seen as a common challenge in the ECE sector but how staff fare in terms of labour market security, including their contractual status and likelihood of permanent employment, is not well understood. While little is also known about the quality of the working environment for ECE staff, the TALIS Starting Strong survey provides information on the sources of work stress that staff face (OECD, 2019[38]). Across all countries, a lack of resources is one of the top three factors that create "a lot" of stress for staff. Another common source of stress is having too many children in the classroom/playroom. Finally, earnings quality tends to be low for ECE staff and in many countries lower than in primary education.

These challenges suggest that job quality in the ECE sector can be improved by reducing child-staff ratios and group size; providing competitive wages and other benefits; setting reasonable schedules/workloads to work as professionals; providing relevant learning support and material for staff to use with children; and employing a competent and supportive centre manager. However, most countries have limited room for increased public expenditure, and ECE budgets compete with the budgets of other levels of education and

other public policies. In this context, policy makers need to engage with the profession to identify and agree policy priorities and how to implement them.

Monitoring and quality assurance framework

The monitoring framework should be comprehensive

Given the complexity of the ECE system and the high level of autonomy devolved to local authorities and centres in some countries, monitoring can play an important role in ensuring quality across early childhood services. Monitoring needs to be comprehensive and include structural and process quality, staff, as well as child development, learning and well-being. Monitoring can help policy makers steer the ECE system to help staff improve interactions in the classroom/playroom and support children's development.

An important structural factor that a government can regulate is the staff-child ratio. A smaller number of children per staff member facilitates positive staff-child relationships. Multiple studies of individual countries, including G20 countries such as China and the United States, and a meta-analysis of 17 studies from Europe and North America suggest that a smaller number of children per staff member tends to be associated with higher process quality for centres catering to children aged 3 to 5 (OECD, 2018[35]). While the association was not found everywhere, there is no evidence of any negative effects. Too many children in the group can also be an important source of stress for staff (OECD, 2019[38]). As an overall reduction of the size of groups can be costly, flexible organisation of activities and practices can ensure that staff interact with small groups of children for at least part of the day.

The monitoring and assessment framework needs to cover structural and process aspects of quality

TALIS Starting Strong shows that although participating countries have established structures and mechanisms to assess ECE centres, monitoring efforts are focused on a limited number of domains (OECD, 2019[38]). Aspects linked to the state of the facilities and financial management of the settings seem to be regularly monitored in most countries. Structural features of quality (child-staff ratio, qualification levels of staff) and process quality (e.g. interaction with children, content of activities) appear to be unevenly monitored across countries.

In addition to developing minimum standards on structural aspects of quality, countries should consider to what extent their monitoring systems are able to track the implementation of such regulations and their implications for process quality. In France for instance, inspections in *écoles maternelles* (preschools) are conducted to monitor the individual performance of teachers. After a direct observation of about two hours, the inspector interviews the teacher to analyse the practices observed. The professional quality of the teacher is also evaluated and suggestions for improvement, as well as other possible pedagogical practices, are discussed. Further training and professional development are also recommended. Monitoring curriculum implementation may offer insights into what can be improved in curriculum and pedagogical practices, or training for the curriculum, which can then enhance quality and child outcomes. At the same time, monitoring should not put a too heavy administrative burden on staff or centres' leaders.

The monitoring and assessment framework of children's development should be designed to improve staff's interactions with children

Research has shown that ECE staff who know children's level of development in specific areas, such as motor development, language development, social development, emotional development and self-regulation, adjust their practices to suit the child's needs. A concern in some cultures is that staff tend to resist child monitoring or assessment because of its associations with "schoolification". The distinction between formative and summative monitoring and assessment is important in the ECE field (Sim et al.,

2019[43]). Summative monitoring or assessment indicates the current level of functioning of the child in terms of development or learning by reviewing documentation gathered from a range of source. Formative monitoring or assessment includes a range of formal and informal child assessment or monitoring procedures conducted by ECE staff during routine activities in order to modify the environment, activities or curriculum to improve young children's learning and development. ECE staff in many countries have traditionally been supportive of formative monitoring or assessment, and most concerned with the potential misuses of summative methods.

Internationally, data on early learning can help countries to reflect on their strategies for early learning, identify goals for system improvements and learn from the policies and practices in other countries. The OECD International Early Learning and Child Well-being Study is an international survey of children at age 5 that identifies key factors that drive or hinder the development of early learning (see Box 3.2).

Box 3.2.The International Early Learning and Child Well-being Study

The OECD International Early Learning and Child Well-being Study (the Study) is an international survey that collects empirical information and in-depth insights on children's learning and development at age 5. With this information, countries will be able to share best practices and work towards the ultimate goal of improving children's early learning outcomes and overall well-being.

The Study assesses children in four developmental domains that are widely recognised as key for early learning and development: emergent literacy; emergent numeracy; self-regulation; and social-emotional skills. The Study also collects information on contextual factors such as children's socio-demographic characteristics, home learning environment and early childhood education participation.

The results from information collected from children's parents and teachers, and direct assessments of just under 7 0000 children in England, Estonia and the United States were published in March 2020. Key findings included:

- Girls have significantly stronger skills than boys in emergent literacy, prosocial behaviour, identifying others' emotions, trust and non-disruptive behaviour.
- Children from high socio-economic groups have significantly stronger skills in almost all measures of the Study, most notably in emergent literacy and numeracy.
- Most 5-year-olds use electronic devices regularly. On average, 83% use an electronic device at least once a week and 42% use a device every day.
- Children who have books at home and whose parents are involved in their ECEC centre or school have higher scores in a number of skills.

Teachers that were sampled for the Study were hugely supportive of it, with over 90% choosing to participate. Teachers stated that they participated in order to highlight the importance of children's early learning and well-being outcomes and their belief that an international study by the OECD would achieve a greater emphasis on outcomes for this age group. Preparation for the next cycle of the Study will begin in 2020.

Source: (OECD, n.a[44]), Web-page: International Early Learning and Child Well-being Study, (Accessed 06th May, 2020) http://www.oecd.org/education/school/early-learning-and-child-well-being-study/.

Data on the early childhood education sector should be developed and used to improve quality

Data can help establishing facts, trends and evidence about ECE services, staff, child development and curriculum implementation. In most countries, data on the ECE sector are lacking. An important initial step to better understand the ECE sector is to develop a list of settings that exist in the country and their different types (e.g. public versus private, age covered, whether they qualify for pre-primary education according to the ISCED classification). In some countries, the prevalence of centres that are not registered makes it difficult to establish a comprehensive view of the sector. Then data need to be collected with the view to inform policy decisions. Countries can ensure they progressively collect systematic information on the various drivers of quality to inform policy for quality improvements. International data collections, such as the OECD's TALIS Starting Strong and the Early Learning and Child Well-being Study, can provide data to better understand the ECE sector and early learning and identify better policies (see Box 3.1 and Box 3.2).

What do data reveal about the quality of pre-primary education in G20 countries?

On many aspects of the quality of pre-primary education, there are no international data and where they exist, they cover only a limited number of countries. This section presents some of these limited data.

Minimum qualifications to work in pre-primary education vary

The type of qualification, duration of training and the programme content all matter for preparing staff to work with children. The qualification awarded at the completion of teacher-training programmes varies across countries for which data are available, ranging from upper secondary education (ISCED level 3) in Brazil to a master or equivalent (ISCED level 7) in France (Table 3.1). For teachers' aides, the education requirement is lower and several countries with available data require a vocational programme.

Table 3.1.Minimum ISCED qualification required to work in pre-primary education (2017)

	Teachers	Teachers' aides
Argentina	m	m
Australia	m	m
Brazil	ISCED 3	ISCED 3
Canada	m	m
China	m	m
France	ISCED 7	ISCED 3, vocational
Germany	ISCED 6, vocational	ISCED 3, vocational
India	m	m
Indonesia	m	m
Italy	m	a
Japan[1]	ISCED 5 or 6	m
Korea	ISCED 5	m
Mexico	ISCED 6	ISCED 2 and training
Russian Federation	m	m
Saudi Arabia	ISCED 6	ISCED 4
South Africa	m	m
Turkey	m	m
United Kingdom[2]	ISCED 5 or 6	m
United States	ISCED 6	m

Notes: 1. Data on staff do not cover all ECEC services.
2. The minimum qualification of ECEC teaching staff is ISCED 6 in England and ISCED 5 in Scotland.

Countries are in alphabetical order.
Sources:
(OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02nd March, 2020) https://doi.org/10.1787/f8d7880d-en.
(Ministry of Education of Saudi Arabia, 2019[45]), دليل مدارس الطفولة المبكرة, Saudi Arabia minimum qualification is from the Early Childhood Schools Guide.

Lack of staff to compensate for staff absences is the most frequently reported barrier to participation in professional development

Participation in professional development varies greatly across and within countries (Table 3.2). TALIS Starting Strong asked pre-primary education staff in nine countries about the barriers to participation in professional development (OECD, 2019[38]). The most prevalent barrier is a lack of staff to compensate for absences followed by professional development being too expensive. Compensating for staff absences and providing release time during regular working hours for professional development activities are necessary to encourage greater engagement in ongoing training but can be difficult to implement in the context of staff shortages. Flexible forms of training, such as learning from peers and mentoring, can help staff improve their practices with children. These informal forms of professional development do not require release time from working with children, as they can be easily combined with staff's usual schedules.

The second most frequently cited barrier – professional development being too expensive - indicates that staff also need adequate financial returns to support their investments in professional development. This points to several options for policies: i) financing part of the cost of training to limit the upfront cost for participants; ii) developing flexible training programmes that enable working and training at the same time to avoid a loss of wages; and iii) developing career progressions to ensure that the cost of training is offset by higher future wages.

Table 3.2.Barriers to participation in professional development for pre-primary staff (2018)

Percentage of pre-primary education staff who "strongly agree" that the following are barriers to their participation in professional development

	I do not have the pre-requisites (e.g. qualifications, experience, seniority)	Professional development is too expensive	There is a lack of support from my employer	Professional development conflicts with my work schedule	I do not have time because of family responsibilities	There is no relevant professional development offered	There are no incentives for participating in professional development	There are not enough staff to compensate for my absence
Germany*	1	10	5	6	4	4	5	15
Japan	4	15	12	21	19	5	9	25
Korea	7	12	24	46	12	17	34	55
Turkey	1	8	7	11	9	5	11	23

Note: * Estimates for sub-groups and estimated differences between sub-groups need to be interpreted with care.
Source: (OECD, 2019[38]), Providing Quality Early Childhood Education and Care: Results from the Starting Strong Survey 2018, TALIS, OECD Publishing, Paris, https://doi.org/10.1787/301005d1-en.

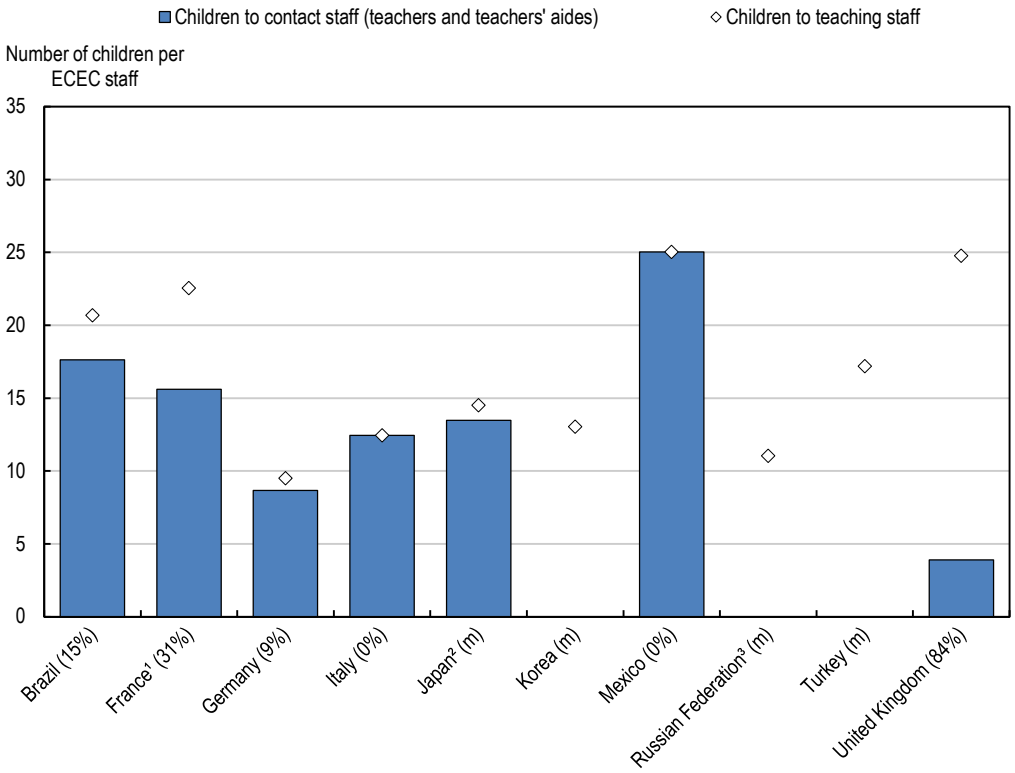
There are large variations in countries' child-to-staff ratios

The ratio of children to teaching staff is an important indicator of the resources devoted to education and the most commonly used in regulations to improve ECE quality. Staff need to be able to work with children as part of small groups to adapt to children's needs and interests and for overall high-quality interactions. There are large variations across countries with, for instance 25 children per staff in Mexico and less than

five children per staff in the United Kingdom. When only teaching staff are counted, these ratios tend to be higher (Figure 3.2).

Figure 3.2. Ratio of children to staff in pre-primary education (2017)

Public and private institutions, calculation based on full-time equivalents



Notes: Figures in parentheses show the percentages of teachers' aides among ECEC contact staff (teachers and teachers' aides).
1. Excluding independent private institutions.
2. Data on staff do not cover all ECEC services.
3. ISCED 0 instead of pre-primary education (ISCED 02).
Countries are in alphabetical order.
Source: (OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02nd March, 2020) https://doi.org/10.1787/f8d7880d-en

4 Transitions from Early Childhood Education to Primary Education

Why transitions matter?

The transition into primary school is a major milestone in the life of any young child and their family. For the vast majority of children in most G20 countries, it means transitioning from an early childhood education (ECE) setting into formal schooling, while for some it means regularly attending an institution beyond their home environment for the first time. For all children, starting school is a significant change in what and how they learn, the adults that guide them and how their day is organised. Managing this transition well is important for children's well-being and to help them achieve their potential at school (OECD, 2017[39]).

The importance of transitions for children's learning, development and the equity of educational outcomes has led to increasing research and policy interest on the quality of transitions into schooling. Transitions are an especially salient topic for governments investing in early childhood education because evidence shows that some of its benefits can fade out in the early years of schooling if transitions are not well-managed, or quality in the first years of schooling is low (OECD, 2017[39]). This is a particular concern for children from disadvantaged backgrounds, who are also less likely to benefit from high-quality ECE education in the first place.

What policies contribute to a smooth transition?

The growing policy focus on transitions has revealed that a key challenge in many countries is cooperation and collaboration. Multiple actors are involved in transitions – children and their families, pre-primary settings, primary schools, social services, national and local authorities. Policies that contribute to a smooth transition focus on promoting coherence and communication across these actors.

Provide age-appropriate pedagogical practices

Encourage pedagogical continuity across the transition years

Pedagogical continuity refers to the curricula, developmental goals and pedagogical approaches, teachers' practices, and structural aspects like staff-to-child ratios and group sizes that shape children's experiences in pre-primary and primary school (OECD, 2012[46]). How far curricula and developmental goals are aligned across pre-primary and primary significantly impact the degree of continuity that children experience as they transition across settings (Kagan, S. L., 2006[47]). Alignment has also been found to improve children's pedagogical literacy and mathematics skills (Ahtola, A., 2011[48]).

One aspect of pedagogical continuity is the curriculum framework or guidelines that cover pre-primary and primary education. The curriculum covers the contents and methods for children's development, learning and well-being. In all G20 countries, there is a curriculum framework or guidelines in place for pre-primary (ISCED 02) and primary (ISCED 1) (Shuey et al., 2019[49]) (Haque et al., 2013[50]) (UNESCO, 2011[51])

(Zhu, 2009[52]) (OECD, 2016[53]) (National Council of Educational Research and Training, 2019[54]) (UNESCO, 2005[55]) (Yudina and Bodrova, 2018[56]) (Department of Basic Education, 2015[57]). The G20 countries take different approaches to achieve curricula alignment i.e. coherence and continuity across pre-primary and primary (see Box 4.1).

Box 4.1.Approaches to curriculum alignment across countries

Countries take different approaches to organising their curricula across the last year of ECE and primary school. These approaches can be broadly categorised as:

- Integrated curricula. A single document that provides common themes, goals and perspectives for at least the last year of ECE and the first years of primary education with separate content for each age group. Examples cover a very broad age group, for example in Italy there is an integrated curriculum for ages 3 to 14 years, or a much narrower range, such as in Wales (United Kingdom) that covers 3 to 4 years.
- Explicitly aligned curricula. Countries in this category have separate documents for each level of education. Each level provides age-specific goals and perspectives that are thematically aligned to facilitate pedagogical continuity. For example, while Japan has separate curricula for pre-primary and primary education, the curricula are aligned through common goals and values.
- Curricula is not aligned or integrated. There are separate documents for each level of education, and developmental goals and themes do not intentionally or explicitly consider the transition between ECE and primary education. This is the case in Turkey.

Sources:
(OECD, 2017[39]), Starting Strong V: Transitions from Early Childhood Education and Care to Primary Education, Starting Strong, OECD Publishing, Paris, https://doi.org/10.1787/9789264276253-en .
(Shuey et al., 2019[49]), Curriculum alignment and progression between early childhood and care and primary school: A brief review and case studies", OECD Education Working Papers, No. 193, OECD Publishing, Paris, https://dx.doi.org/10.1787/d2821a65-en.

In many countries, a challenge to ensuring age - and developmentally-appropriate pedagogy across education levels is a traditional difference in pedagogical focus and perspectives. ECE has tended to emphasise a more comprehensive approach by encouraging children's cognitive, social and emotional development, while primary school has tended to be more academically-oriented (Publishing, 2017[58]). This creates the risk that efforts to promote continuity across levels leads to the 'schoolification' of ECE, when ECE curricula and pedagogy become increasingly aligned with that of primary school (Woodhead, 2007[59]); (Shuey et al., 2019[49]). To avoid this risk, countries need to ensure that curricula are age-appropriate - balancing play, self-regulation and pre-academic activities, and encourage pedagogical practices that correspond to children's developmental needs at each stage (OECD, 2017[39]). Victoria (Australia) provides an example of how the ECE curriculum can be used to inform primary school curriculum, rather than just simply extending primary school content to ECE (Shuey et al., 2019[49]).

Another important aspect of continuity are the activities and learning that children engage in. Learning activities should provide some stability, for example, stability in instructional practices can help children predict what they are expected to do and reassure them. At the same time, activities and learning respond to children's developing cognition and prior learning - so that they gradually become more self-directed and instruction becomes more complex (OECD, 2017[39]). Guidance and examples in how to deliver the curriculum can help teachers and staff adapt pedagogy to children's developmental levels, while ensuring stability for pedagogical continuity. For example, Scotland's (United Kingdom) integrated curriculum includes design principles for teachers and staff to use when creating learning experiences. These

principles allow flexibility at the level of ECE programmes and schools that can promote or limit continuity, depending on their implementation (OECD, 2017[39]).

Equip pre-primary and primary staff and leaders with knowledge and skills of transitions

Providing staff with specialised preparation on transitions seems to have a positive impact on the quality of children's transitions (OECD, 2017[39]). Professional development supports staff to develop high-quality skills overall, and can provide them with specialised content on transitions, which might not have been part of their pre-service preparation. As well as filling in gaps in staff knowledge, professional development can update staff knowledge and skills on transitions in line with recent research and best practices. Research has found that ECE staff that have received training with specific content on transitions or early childhood development are more likely to use transition practices like communicating with parents and making written records available (Rous, B., 2010[60]). Staff with ECE training were also reported to have a better understanding of developmentally-appropriate teaching and learning (Britto, 2012[61]).

Comparative data on the availability of staff training on transitions across G20 countries are limited. However, among the G20 countries that participated in the OECD's survey on transitions from ECE to primary education, Turkey is the only country where ECE staff are provided with training on transitions as part of both their pre-service and in-service training. In two other countries - Germany and Italy - ECE staff receive training on transitions during pre-service preparation, while staff in Japan are trained in transitions during in-service training (OECD, 2017[39]).

Integrated professional development programmes where teachers and staff from pre-primary and primary levels attend the same training courses together are particularly effective to help make sure that staff across the different levels share the same core knowledge on transitions. Research also suggests that joint training sessions can help to harmonise pre-primary and primary teachers' status and encourage mutual recognition (Neuman, 2005[62]).

Develop monitoring tools to help staff respond to children's individual needs

Monitoring information about children's development and learning can help ECE and school staff better understand each child's specific needs and adapt their practices in response. Sharing information about child development from ECE settings with primary schools is particularly important so that schools are fully informed about, and can prepare for, children's needs before they enter school (OECD, 2017[39]).

Across G20 countries with available data, it is a common practice to share child development information across the last year of ECE and primary schools in four countries (Germany, Italy, Japan and Turkey). In Canada, the sharing of such information is at the discretion of the individual settings (OECD, 2017[39]).

Monitoring and assessment in ECE settings should use a range of formal and informal tools to develop an holistic assessment of a child's overall development rather than just narrow testing of academic skills (Shuey et al., 2019[49]). A number of G20 countries have established a specific format for assessing children's development in ECE, which often takes the form of a child profile or descriptive report that covers multiple developmental areas. Countries have also established protocols to ensure that information is systematically shared with schools and parents. Box 4.2 provides an example of how child developmental information is developed and shared in New South Wales (Australia).

Box 4.2.Sharing child developmental information New South Wales (Australia)

In 2014, **New South Wales** (Australia) introduced the Transition to School Statement, to improve communication between early childhood services, families and schools. The statement records a child's strengths, interests and learning, in line with the Early Years Learning Framework. Its aims are to help school teachers prepare for children entering kindergarten by planning appropriate and individualised learning and teaching programmes.

An evaluation of the statement found that both parents and kindergarten teachers who had received them felt better informed about the child's strengths and interests, as well as of ways to help their transition to school, than respondents who did not receive statements. Most families surveyed felt that their children made a smooth transition to school, and felt that their child was well supported in their transition. The evaluation found that although the statement was seen as a valuable resource by early childhood educators, workload and time constraints made it challenging to complete.

Sources:
(NSW Government, 2016[63]), The Transition to School: Literature review, Centre for Education Statistics and Evaluation.
(NSW Government, 2015[64])), Evaluation of the Transition to School Statement, Centre for Education Statistics and Evaluation, www.cese.nsw.gov.au/images/stories/PDF/Transition_to_School_Report_final.pdf.

Create structural conditions that facilitate cooperation and collaboration across pre-primary and primary schools

Develop a national strategy or guidelines on transitions

In many G20 countries, the multiplicity of institutions involved in transitions - pre-primary settings, primary schools, local authorities and social services - means that responsibility for transitions is diffuse. Different institutions can also have different expectations on what constitutes a "smooth transition" and their role in supporting it. These challenges are further complicated when pre-primary and primary education are under the jurisdiction of different ministries and authorities. Pre-primary education may also include private providers.

One way to address the governance complexity of transitions is to adopt a national strategy or guidelines on transitions which defines what a "smooth transition" means from multiple perspectives, notably those of the children directly involved but also their families and pre-primary and primary teachers to promote shared expectations. National strategies can also set out the responsibilities of different institutions in managing transitions and provide guidelines on policies and practices that can help to encourage smooth transitions. Strategies or guidelines should aim to encourage national coherence while leaving space for local leadership and solutions to develop and evolve in response to local needs and the diversity of children's backgrounds.

Encourage exchange and interaction across pre-primary and primary schools

There are a number of structural challenges for transitions. Pre-primary and primary schools are often located in different places, pre-primary and primary teachers and leaders have competing demands on their time and legal restrictions can make sharing information about individual children across institutions difficult. One solution to these challenges is physically integrating pre-primary and primary settings, for example in Saudi Arabia (see Box 4.3).

Physical integration reduces disruption for children since they do not have to move locations when they start primary school. It also facilitates the sharing of information about individual students, classes and activities across staff (OECD, 2017[39]). Across the G20 countries with available data, four (Canada, Italy, Turkey and Wales, United Kingdom) commonly integrate ECE in primary schools (OECD, 2017[39]). Countries can also appoint transition coordinators or counsellors to work across different settings where physical integration is not possible.

Box 4.3.Physically integrated ECE in primary schools in Saudi Arabia

In **Saudi Arabia**, current efforts to expand ECE and improve the quality of early learning are focused centrally on ways to improve both the physical and pedagogical integration of education services. A new integrated setting has been established for children of kindergarten age (ages 4-6) and early primary age (currently ages 6-8, and in the future age 9, corresponding to primary grades 1-2 / 3). All new ECE facilities will cater to this full age range. Where appropriate, existing primary schools will be expanded or converted to integrate children of kindergarten age. Instruction resources have also been revised to support a coherent and age appropriate learning experience for children. The Saudi Early Learning Standards provide a single framework with defined stages, for children aged 0-3, 3-6 and 6-8. Accompanying staff training and resources have likewise been developed to reinforce pedagogical coherence, and initial education programmes for ECE staff and primary school teachers are being reformed to ensure more consistency in approaches.

Source: OECD Education Policy Perspective: Early Years Education in the Kingdom of Saudi Arabia, forthcoming

Another way to reduce organisational and pedagogical disruption for children is through the creation of a transition class. A transition class is a separate group, class or year for the final year of ECE or the year before primary school. Across G20 countries with available data, Canada and Germany have created transition classes (OECD, 2017[39]). For example, in 10 Canadian provinces and territories, children can participate in optional kindergarten in the year before compulsory primary education begins, and in the other three provinces, kindergarten or ‘Grade Primary’ is part of compulsory primary education (OECD, 2017[39]).

Address differences in the perspective and status of pre-primary and primary teachers

Co-operation and communication between pre-primary and primary teachers is central to the success of each child’s transition. However, countries report that a lack of understanding and different perspectives across teachers can sometimes make this cooperation difficult. Aligning the content and level of qualifications for teachers across pre-primary and primary can facilitate cooperation and promote mutual respect (OECD, 2017[39]). The content of pre-service qualifications should ensure that teachers at both levels understand the aims and activities at each level. It is important to note that alignment does not mean that content should be the same. First and foremost, teachers of all levels need to be trained in how to meet the specific needs of the age group for which they are primarily responsible.

The time that teachers have for activities that support transition planning such as preparing activities, documenting child development, sharing information and collaborating with other teachers should also be considered (OECD, 2017[39]). Countries should take steps to ensure that pre-primary teachers have an adequate amount of time to prepare transitions.

Develop policies that build wider societal support for children of transition age

Prepare children and their families for the transition to primary school

The transition to primary school is often a period of excitement but also trepidation for children. In most G20 countries where data are available, it is common to organise specific activities to prepare children and their families for the transition (OECD, 2017[39]). Activities frequently include visits to primary schools, parent information meetings and taster days (where ECE children participate in primary school activities for one or more days). These activities can help to answer some of the key questions children have about starting school such as what their new classroom and school look like. In G20 countries such as Saudi Arabia and Turkey where a large share of children start school without prior ECE participation, preparation should also be adapted to these children's needs. Children might be provided with more information about how the school day is structured and how to ask adults for help if they need it, while parents might need additional information about how to manage administrative issues like registering their child at school for their first time. In Saudi Arabia for example, children entering primary school attend a course to build their foundational literacy and numeracy skills.

Research shows that engaging parents in transitions can help children be better prepared for school and encourage greater parental involvement in ECE and school (Margetts, 2003[65]) (Van Voorhis, 2013[66]). It is particularly important to engage parents from disadvantaged backgrounds in transition preparation since disadvantaged children are less likely to have benefitted from high-quality ECE and are more vulnerable to achieving lower educational outcomes in school overall[1]. A number of G20 countries try to promote parental involvement among disadvantaged families through activities focused on broader parental engagement, often from birth. Box 4.4 describes initiatives to engage and support parents in Wales. More broadly, many G20 countries are taking measures to encourage more equitable participation in high-quality ECE (see Participation and Equity in Early Childhood Education).

Box 4.4.Engaging disadvantaged families in Wales (United Kingdom)

In **Wales (United Kingdom)** several initiatives have been developed to help raise parents' awareness about the importance of their role during their child's transition to primary school. These include:

- How is my child doing in the foundation phase?: is a document that all parents receive when their child starts the foundation stage (3 – 7 year olds). It explains to parents what they can expect from schools and ECE settings, and provides suggestions on how they can best support their children's learning and development.
- Family and Community Engagement guidance: focuses on how engagement with families can provide them with guidance to support their children's learning. Engagement is focused on families of underperforming children, children from disadvantaged background and those who receive less support for learning at home.
- Ready to learn programme: provides information and leaflets for parents of children who will soon be starting school. Information focuses on how parents can help to prepare their children for school including games and play and other more structured learning activities.

Source: Case study prepared by the Welsh Government, edited by the OECD Secretariat, (Welsh Government, 2014[67]), "How is my child doing in the Foundation Phase? A guide for parents and carers", http://gov.wales/docs/dcells/publications/140707-how-is-my-child-doing-in-the-foundation-phase-en.pdf .

[1] Children from disadvantaged backgrounds include those of low socio-economic status, being from an immigrant or indigenous family and having special learning needs.

Encourage co-ordination across community, family, health and social services

Leaders of ECE settings and primary schools can play an important role in encouraging and establishing wider collaboration around transitions. Collaboration with health services can be particularly important for children since their learning can be impaired if they have health issues such as vision or hearing problems. In a number of G20 countries, children have a health check before they start school. This is the case in 15 German Länder, where the health check is mandatory. A doctor checks the child's physical (e.g. visual, hearing or speech disorders), cognitive and socio-emotional development. If the medical assessment concludes that the child is not yet "ready" to start school, the child may be allocated additional support, such as physio or speech therapy. The results of the check-up are however confidential and are not shared with the preschool. Some G20 countries with integrated early years' programmes such as Flying Start in Wales (United Kingdom) or Head Start in the United States also include integrated health services (see Box 2.2 and Box 4.4) (OECD, 2017[39]).

Children with special learning needs, including speaking another language at home, can also benefit from coordination and collaboration with other services. In some G20 countries, children with special learning needs are provided with specific support from specialists such as psychologists or social care workers. For example, in some Canadian jurisdictions an individual education plan is developed for children with special learning needs through a consultative process involving children, parents, school/programme staff, and other professionals. It provides detailed information about each child's learning and developmental needs (e.g. actions, strategies, and accommodations). This document is intended to guide teachers, ECE pedagogical staff, support staff, and families in providing all children with opportunities for success (OECD, 2017[39]).

Develop greater understanding about how transitions can be best managed

Internationally and nationally, understanding about transitions, in particular how they can be best organised to support child development, is limited. Important gaps to address include which areas (e.g. curriculum, pedagogy, child development information and staff training) across ECE and primary should be aligned. An important input to better understanding is greater monitoring, however only three G20 countries (Canada, Japan, and Wales in the United Kingdom) routinely monitor transitions (OECD, 2017[39]). Monitoring and research also needs to draw on the views of children and their families to understand the factors that promote positive transition experiences (OECD, 2017[39]).

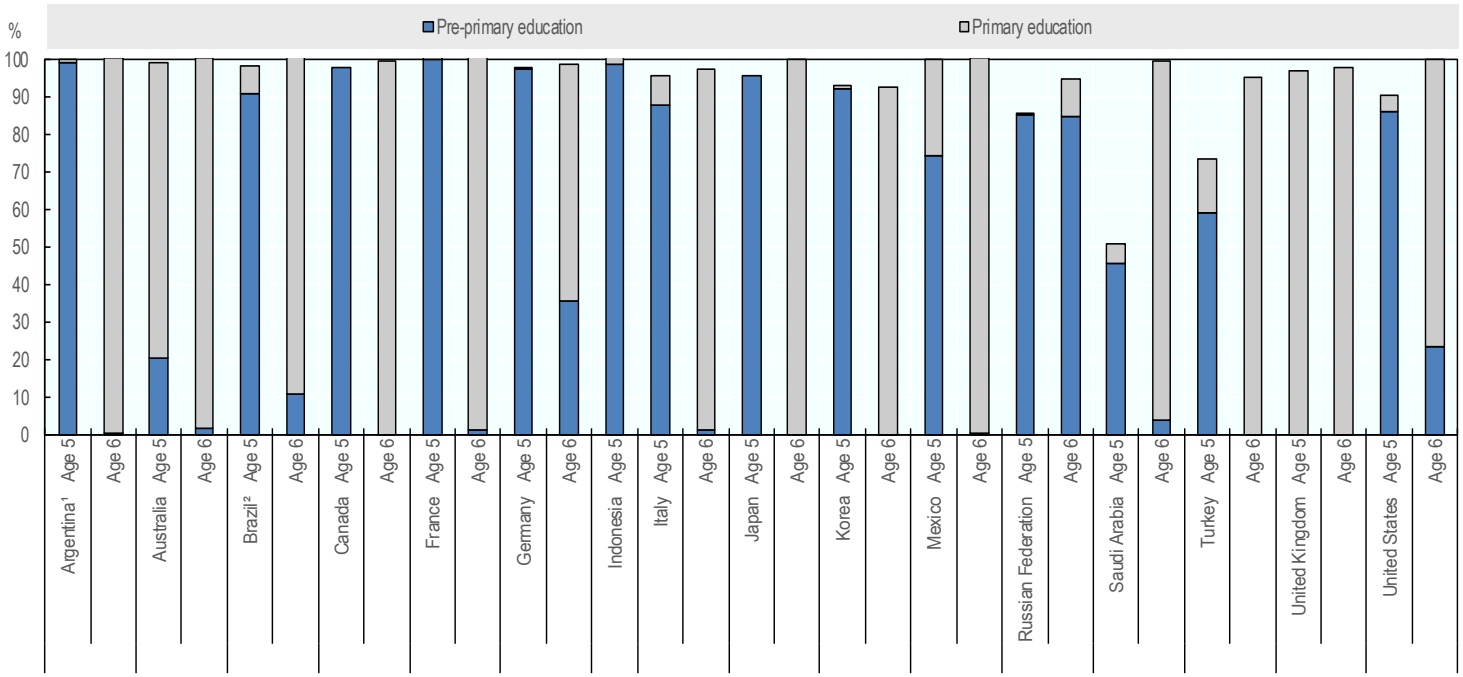
What do data reveal about transition from early childhood education to primary education in G20 countries?

Most children transition into primary school from ECE

Across G20 countries, the vast majority (over 85%) of children participate in ECE before they start school (Figure 4.1). In a few countries – Australia and the United Kingdom – most children are already in school at the age of five. The exceptions are Saudi Arabia and Turkey where only around half of children (45% in Saudi Arabia and 59% in Turkey) participate in ECE the year before they start primary school.

Figure 4.1. Enrolment rates in pre-primary and primary education at age 5 and 6 (2017)

Public and private institutions



Notes:
1. Year of reference 2016 instead of 2017.
2. Year of reference 2012 instead of 2010.
Countries are in alphabetical order.
Source: (OECD, 2019[6]), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, (accessed 02nd March, 2020) https://doi.org/10.1787/f8d7880d-en..

Pre-primary and primary teachers have the same minimum qualifications in most countries

In most (14) G20 countries, pre-primary and primary teachers are educated to the same level. In half of G20 countries, both pre-primary and primary teachers are also required to have at least a Bachelor's Degree (ISCED 6) (Table 4.1). This is important for the quality of ECE since increases in teacher preparation beyond upper secondary education (ISCED 3) appear to be associated with quality (see Quality in Pre-Primary Education).

Table 4.1. Pre-primary and primary teachers' qualifications

Minimum qualifications required by G20 countries

	Same level of qualification			Different level of qualification
	Pre-primary and primary education teachers complete education with the same degree less than a bachelor	Pre-primary and primary education teachers complete education with a Bachelor's degree	Pre-primary and primary education teachers complete education with a Master degree	Pre-primary and primary education teachers complete education with different degree levels
G20 countries				
Argentina		X		
Australia		X		
Japan		X		
Korea		X		
Mexico		X		
Saudi Arabia		X		
South Africa		X		
Turkey		X		
United States		X		
China	X			
India	X			
Russian Federation	X			
France			X	
Italy			X	
The United Kingdom (England)			X	
Brazil				X
Germany				X
Indonesia	m	m	m	m
Canada	m	m	m	m

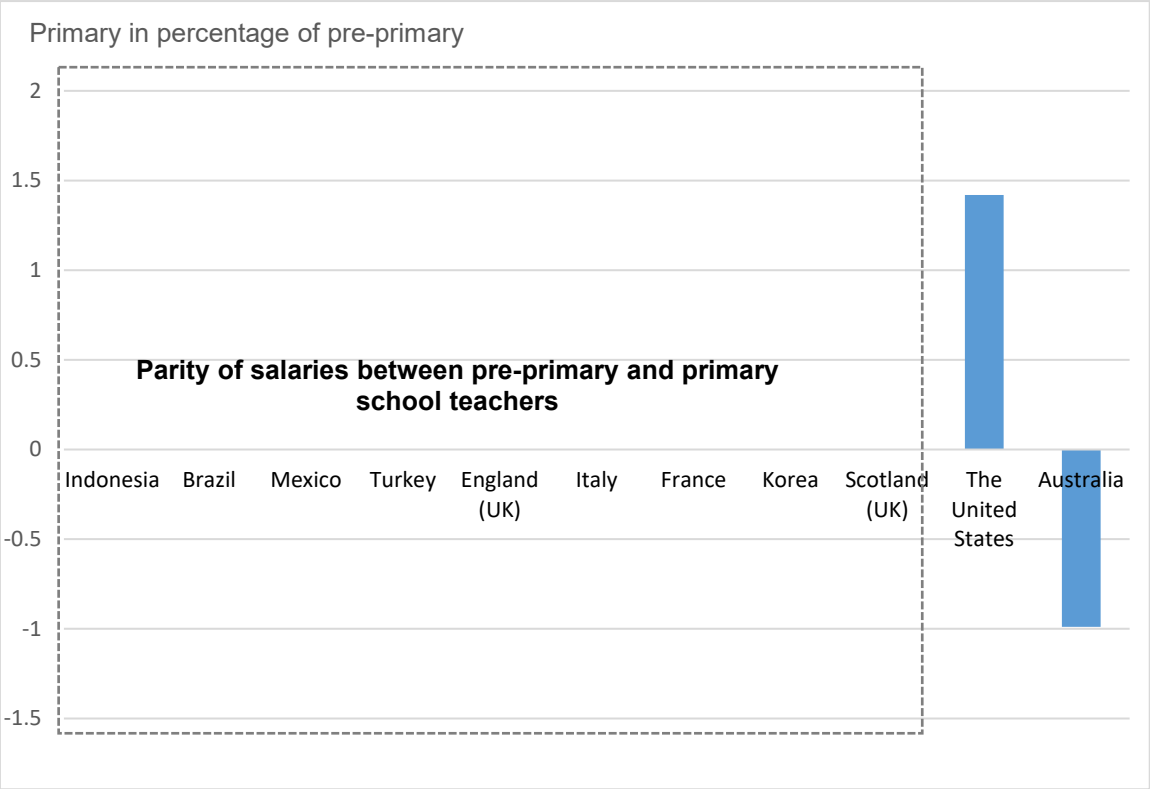
Sources:
(OECD, 2014[68]), Education at a Glance 2014. See Education at a Glance Annex 3 for notes, (accessed 02nd March, 2020) www.oecd.org/edu/eag.htm
For duration and level of pre-service education in Portugal: Ministry of Education, for duration of pre-service education of primary teachers in Austria: Ministry of Education.
For level of pre-service education of primary teachers in Korea and Japan: OECD (2017b), Starting Strong 2017: Key OECD Indicators on early childhood education and care.

Pre-primary and primary teachers' salaries are aligned in most countries

Aligning pre-primary teachers' salaries with those of primary teachers can also help to boost the status of pre-primary teachers and facilitate collaboration across the two levels. The International Labour Office recommends setting salaries in pre-primary education at the "same level as the equivalent job in primary education with similar qualifications and competency requirements" (ILO (International Labour Office), 2013[69]). This is the case across most G20 countries (Figure 4.2).

Figure 4.2. Differences in salaries between pre-primary and primary teachers

Annual statutory teachers' salaries, in public institutions, in equivalent USD converted using PPPs for private consumption and for typical qualification, 2018



Notes:
Data for Indonesia is from the year 2012, Brazil is from the year 2017.
Data refer to the starting salary.
Sources:
(OECD, 2019[70]), OECD database, 2019 (accessed 14th February 2020), https://stats.oecd.org/.
(World Bank, n.a[10]), Education Statistics – All Indicators, (accessed 15 January 2020) https://databank.worldbank.org/reports.aspx?source=1159&series=UIS.CEAge.1.

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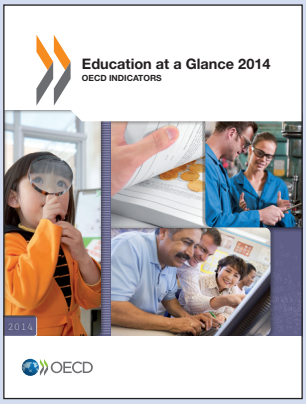

Education at a Glance 2014: OECD Indicators

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Indicator C2

How do early childhood education systems differ around the world?

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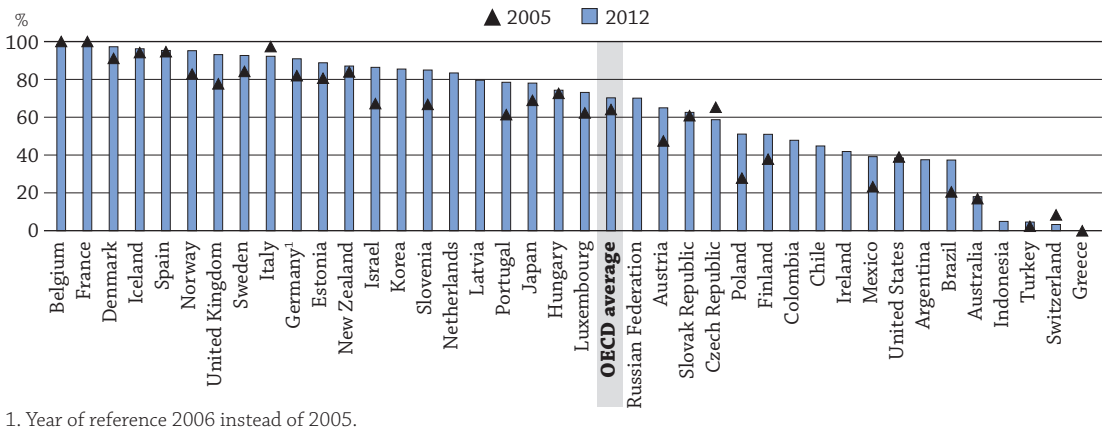
HOW DO EARLY CHILDHOOD EDUCATION SYSTEMS DIFFER AROUND THE WORLD?

- In many OECD countries, early childhood education services have expanded in tandem with the change in women's participation in the labour force. But improving access without also improving the quality of these services will not ensure good individual and social outcomes.
- Early childhood education is associated with better performance in school later on. Fifteen-year-old pupils who had attended at least one year of pre-primary education perform better on the OECD Programme for International Student Assessment (PISA) survey than those who did not, even after accounting for their socio-economic backgrounds.
- In a majority of OECD countries, education now begins for most children well before they are 5 years old. More than three-quarters of 4-year-olds (84%) are enrolled in early childhood education and primary education across OECD countries; among OECD countries that are part of the European Union, 89% of 4-year-olds are.
- In Belgium, Denmark, France, Germany, Iceland, Italy, Norway, Spain, Sweden and the United Kingdom, more than 90% of 3-year-olds are enrolled in early childhood education.

Chart C2.1. Enrolment rates at age 3 in early childhood education (2005 and 2012)



1. Year of reference 2006 instead of 2005.

Countries are ranked in descending order of the enrolment rates of 3 year-olds in 2012.

Source: OECD. Table C2.1. See Annex 3 for notes (*www.oecd.org/edu/eag.htm*).

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Context

As family structures change, so do the relative ages of parents. More women and men are waiting until later in life to begin their families. They do so for a number of reasons, including planning for greater financial security and emotional maturity, taking more time to find a stable relationship, and committing to their careers before turning their attention to having children. As parents are also more likely to be in the workforce today, there is a growing need for early childcare. In addition, there is a growing awareness of the key role that early childhood education plays in the cognitive and emotional development of the young. As a result, ensuring the quality of early childhood education and care (ECEC) has become a policy priority in many countries.

Enrolling pupils in early childhood education can also mitigate social inequalities and promote better student outcomes overall. Many of the inequalities found in education systems are already evident when pupils enter formal schooling and persist as they progress through the school system (Downey et al., 2004). Because inequalities tend to grow when school is not compulsory, earlier entrance into the school system may reduce these inequalities. In addition, pre-primary education helps to prepare pupils to enter and succeed in formal schooling (Heckman, 2000).

As countries continue to expand their early childhood education programmes, it will be important to consider parents' needs and expectations regarding accessibility, cost, programme and staff quality and accountability. When parents' needs for quality, accessibility or accountability are not met, some parents may be more inclined to send their children to private pre-primary institutions, childcare or extra-curricular activities. This can result in heavy financial burdens for parents, even when government subsidies are provided (Shin et al., 2009).

There are many different ECEC systems and structures within OECD countries. Consequently, there is also a range of different approaches to identifying the boundary between early childhood education and childcare (Box C2.1 and see *Definitions* section). These differences should be taken into account when drawing conclusions from international comparisons.

Other findings

- **Publicly-funded pre-primary education tends to be more strongly developed in the European than in the non-European countries of the OECD.** Private expenditure varies widely between countries, ranging from 5% or less in Belgium, Estonia, Latvia, Luxembourg and Sweden, to 25% or more in Argentina, Australia, Austria, Colombia, Japan, Korea, Spain and the United States.
- **As a percentage of GDP, expenditure on pre-primary education accounts for an average of 0.6% of GDP.** Differences between countries are significant. For example, while 0.1% of GDP is spent on pre-primary education in Australia, about 0.8% or more is spent in Chile, Denmark, Iceland, Latvia, Luxembourg, Slovenia, Spain and the Russian Federation.
- The ratio of pupils to teaching staff is also an important indicator of the resources devoted to pre-primary education. **The pupil-teacher ratio, excluding non-teaching staff (e.g. teachers' aides), ranges from more than 20 pupils per teacher in Chile, France, Indonesia, Israel, Mexico and Turkey, to fewer than 10 in Estonia, Iceland, New Zealand, Slovenia and Sweden.**
- **Some countries make extensive use of teachers' aides at the pre-primary level.** Twelve countries reported smaller ratios of pupils to contact staff than of pupils to teaching staff. As a result, the ratios of pupils to contact staff are substantially lower than the ratios of pupils to teaching staff (at least two fewer pupils) in Austria, Brazil, Chile, France, Germany, Indonesia, Israel and the United Kingdom.

Trends

Over the past decade, many countries have expanded pre-primary education programmes. This increased focus on early childhood education has resulted in the extension of compulsory education to lower ages in some countries, free early childhood education, universal provision of early childhood education and care, and the creation of programmes that integrate care with formal pre-primary education.

On average across those OECD countries with 2005 and 2012 data, enrolments in early childhood education programmes rose from 64% of 3-year-olds in 2005 to 71% in 2012, and similarly from 79% of 4-year-olds in 2005 to 84% in 2012. The enrolment rates of 4-year-olds in early childhood education programmes increased by 20 percentage points or more in Australia, Brazil and Poland between 2005 and 2012.

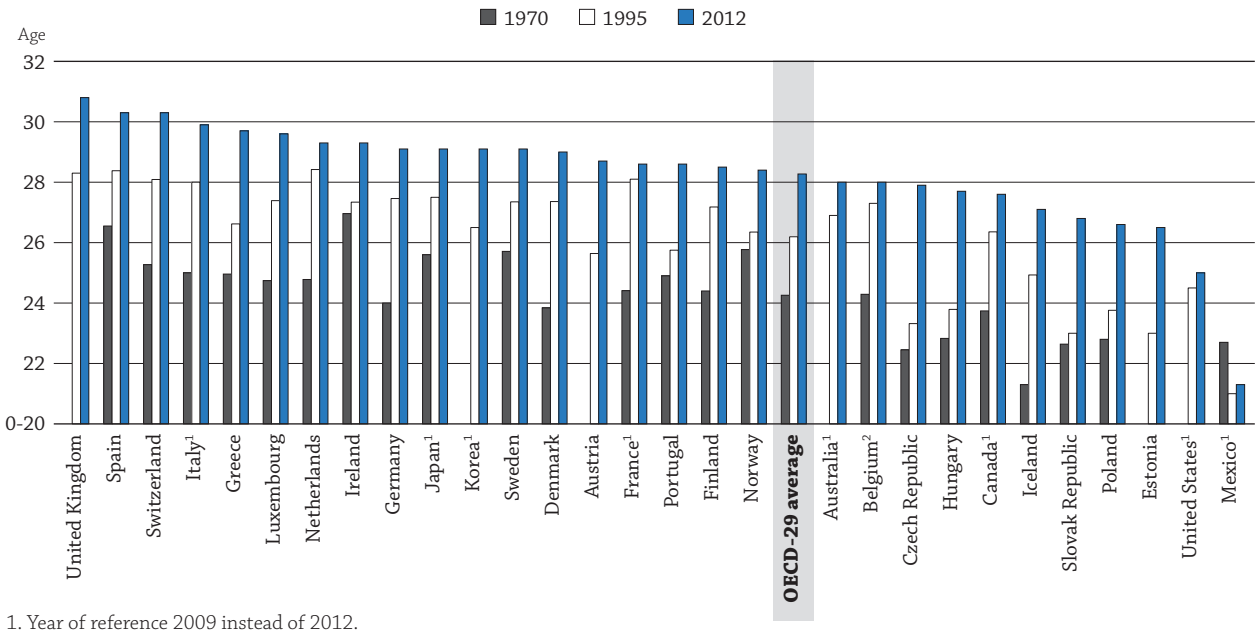
Analysis

In a majority of OECD countries, ECEC policy has paralleled the evolution of women's participation in the labour force. More and more women have become salaried employees since the 1970s, as the service- and knowledge-based economies expanded. Because economic prosperity depends on maintaining a high employment-to-population ratio, encouraging more women to enter the labour market has prompted greater government interest in expanding ECEC services. In the 1970s and 1980s, European governments, in particular, put family and childcare policies into place to encourage couples to have children and ensure that it is feasible for women to combine work and family responsibilities (OECD, 2013c; 2011a).

The average age at which mothers have their first child has risen across all OECD countries, except Mexico, over the past 40 years. In 1970, Iceland had the lowest average age of mothers giving birth to their first child: just over 21 years. But Iceland was not an outlier: of the 23 countries for which data are available, five other countries had an average age at first birth of under 23, and the average age across all countries was just over 24. By 1995, the age had risen to over 26, on average across OECD countries, and by 2012 it had risen again to 28. Despite this trend, there is still wide variation among countries. In 2012, Spain, Switzerland and the United Kingdom had the highest average age at first birth – older than 30. By contrast, Mexico had the lowest average age – just over 21 (Chart C2.2).

Chart C2.2. Trends in the age of first-time mothers (1970, 1995, 2012)

Average age at which mothers have their first child



1. Year of reference 2009 instead of 2012.
2. Year of reference 2010 instead of 2012.

Countries are ranked in descending order of the average age at which mothers have their first child in 2012.

Source: OECD (2014), OECD Family Database. See Annex 3 for notes (*www.oecd.org/edu/eag.htm*).

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Enrolment in early childhood education

Early childhood education is the initial stage of organised instruction for many children and can play a significant role in their development. While primary and lower secondary enrolment patterns are fairly similar throughout OECD countries, there is significant variation in early childhood education programmes among OECD and other G20 countries. This includes the overall level of participation in programmes, the typical starting age for children, financing and programme length.

In most OECD countries, education now begins for most children well before they are 5 years old. More than three-quarters (84%) of 4-year-olds are enrolled in early childhood education and primary education programmes across OECD countries as a whole, rising to 89%, on average, in the OECD countries that are part of the European Union.

Enrolment rates for early childhood education and primary education at this age vary from over 95% in Belgium, Denmark, France, Germany, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Spain and the United Kingdom, to less than 60% in Finland, Indonesia and Turkey. Greece and Switzerland also fall into this group, but because enrolment in integrated programmes is not reported for those countries, the true enrolment rate cannot be calculated and is likely to be higher than that reported here. In the two countries, the enrolment rates in early childhood education programmes are highest for children at the age of five (Table C2.1).

On average across OECD countries, 74% of the 15-year-old pupils assessed by the OECD Programme for International Student Assessment (PISA) survey reported that they had attended more than one year of pre-primary education. According to pupils' responses, enrolment in more than one year of pre-primary education was nearly universal about ten years ago in Belgium, France, Hungary, Iceland, Japan and the Netherlands, where over 90% of 15-year-olds reported that they had attended pre-primary education for more than one year. Pre-primary education is rare in Turkey, where fewer than 30% of 15-year-olds had attended pre-primary education for any period of time. More than one year of pre-primary education is uncommon in Australia, Chile, Ireland and Poland, where fewer than 52% of pupils had attended pre-primary education for that length of time (OECD, 2013a, Table IV.3.33).

Box C2.1. The boundary between early childhood education and childcare

There are many different early childhood education and care (ECEC) systems and structures within OECD countries. Consequently, there is also a range of different approaches to identifying the boundary between early childhood education and childcare. As the educational properties of ISCED 0 programmes can be difficult to assess directly, several proxy measures are used to come up with a technical definition. These include whether or not the programme is being delivered by qualified staff members, whether it takes place in an institutionalised setting, and the target age of children.

In order to help readers of *Education at a Glance* to interpret the early childhood education results, a number of examples of how countries define, in theory, and enforce, in practice, the boundary between early childhood education (ECE) and childcare in the data reported to the OECD are provided below.

For countries with ECE programmes that take place in institutional settings distinct from those that provide childcare, a valid reporting structure is straightforward to implement. In Belgium, for example, the different institutional settings are financed by different government ministries, which makes estimations unnecessary although the international comparability of how education is defined is still unclear (Figure 1).

For countries with programmes that combine an educational programme with childcare ("integrated" programmes), the education/childcare boundary becomes more challenging. OECD countries with integrated ECEC programmes often also have stand-alone programmes that are purely educational. Over half of OECD countries are unable, in practice, to distinguish between early childhood education and childcare in integrated programmes. Of these, most, including Italy, Denmark and the United States, choose to report all of the information under ISCED 0. A minority of countries do not include integrated programmes under ISCED 0 for reporting on personnel (Australia, Norway), expenditure (Korea) or overall reporting (Greece, Switzerland). These differences should be taken into account when drawing conclusions from international comparisons.

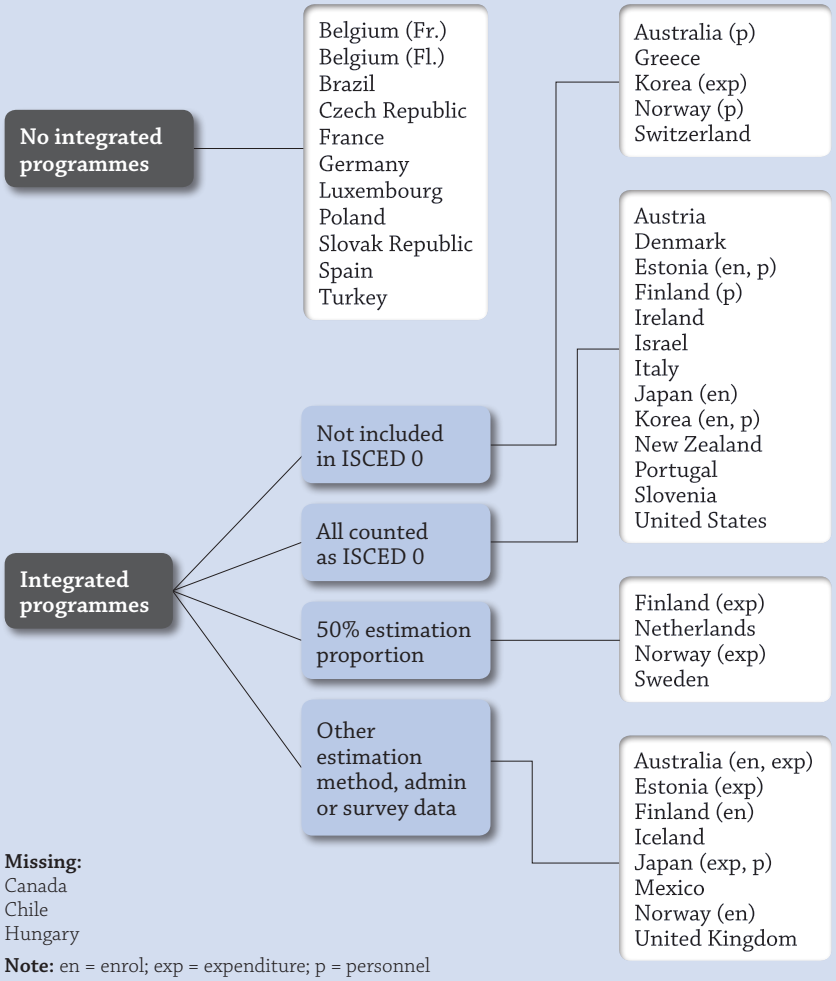
For countries with integrated programmes that do attempt to isolate the education component, a variety of estimation methods are used to isolate enrolments, expenditure and personnel. Some countries, such as the Netherlands, Norway and Sweden, choose to apply a simple 50/50 estimation method, whereby half of all enrolments, staff or expenditure are considered educational. Other countries rely on survey data, assign a different education/childcare split, or apply a more complicated estimation method. Finland, for example, weights expenditure on integrated programmes by the child's age, while Estonia uses an estimated expenditure proportion of 30%.

OECD countries are working together to improve methods of reporting statistics on early childhood education. The improvement, which will take into account the new international classification of ISCED programmes, will be implemented in *Education at a Glance* 2015.

...

Figure 1 diagrams early childhood education systems and approaches to reporting across OECD and partner countries. Country-specific information can be found in Annex 3 of this publication.

Figure 1. Diagrammatical representation of ISCED 0 systems and reporting across the OECD



Note: en = enrol; exp = expenditure; p = personnel

Notably, PISA analyses also find that in most countries, pupils who had attended at least one year of pre-primary education tend to perform better than those who had not, even after accounting for pupils' socio-economic background. PISA research also shows that the relationship between pre-primary attendance and performance tends to be stronger in school systems with a longer duration of pre-primary education, smaller pupil-to-teacher ratios in pre-primary education, and higher public expenditure per child at the pre-primary level (OECD 2013a, Table II.4.12).

Early childhood education programmes for even younger children are not as pervasive. In some countries, demand for early childhood education for children aged 3 and under far outstrips supply, even in countries that provide for long parental leave. The highest enrolment rates of 3-year-olds in early childhood education are found in Belgium, Denmark, France, Iceland, Italy, Norway, Spain, Sweden and the United Kingdom. In countries where public funding for parental leave is limited, many working parents must either look to the private market, where parents' ability to pay significantly influences access to quality services, or else rely on informal arrangements with family, friends and neighbours (Table C2.1 and *Starting Strong III* [OECD, 2011b]).

Some countries have made access to pre-primary education almost universal for children by the time they are three. The availability of early childhood education is growing quickly in most countries. On average across OECD countries with 2005 and 2012 data, enrolments rose from 64% of 3-year-olds in 2005 to 71% in 2012, and from 79% of 4-year-olds in 2005 to 84% in 2012. In Brazil and Poland, the enrolment rates among 4-year-olds increased by 20 percentage points or more during this period (Table C2.1).

Financing early childhood education

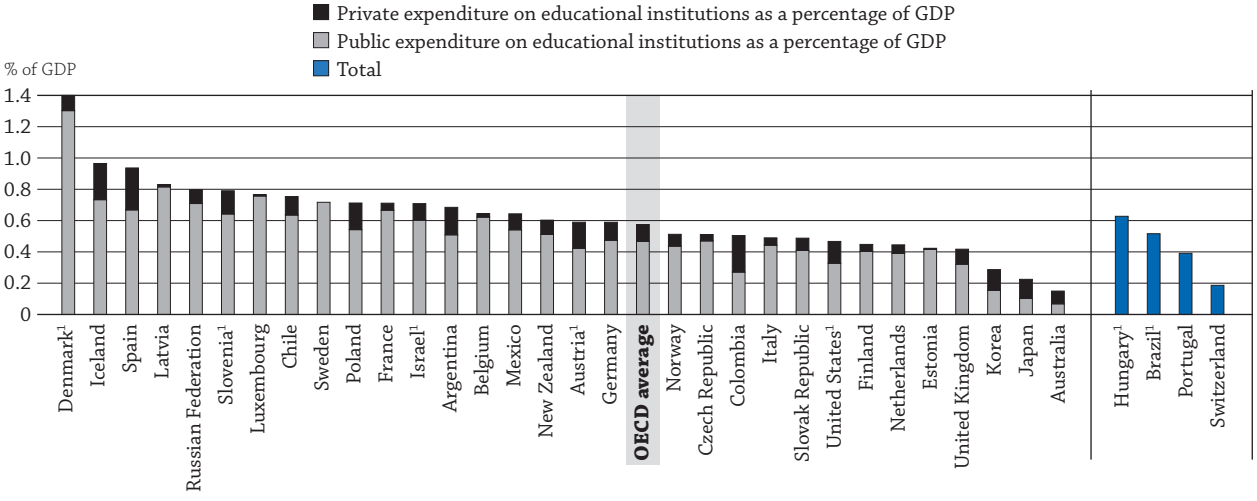
Sustained public funding is critical for supporting the growth and quality of early childhood education programmes. Appropriate funding helps to recruit professional staff who are qualified to support children's cognitive, social and emotional development. Investment in early childhood facilities and materials also helps support the development of child-centred environments for learning. In countries that do not channel sufficient public funding to cover both quantity and quality, some parents may be more inclined to send their children to private ECEC services, which implies heavy financial burdens (OECD, 2011b); others may prefer to stay home, which can hinder women's participation in the labour force (OECD, 2011a).

Public expenditure on pre-primary education is mainly used to support public institutions, but in some countries it also funds private institutions to varying degrees. On average across OECD countries, the level of public expenditure on public pre-primary institutions, per pupil, is around twice the level of public expenditure on private pre-primary institutions (USD 6 460 and USD 3 618, respectively) (see Table B3.4). At the pre-primary level, annual expenditure (from both public and private sources) per pupil for both public and private institutions averages USD 7 446 in OECD countries. However, expenditure varies from USD 2 500 or less in Argentina, Brazil, Indonesia and Turkey, to more than USD 10 000 in Australia, Denmark, Luxembourg, New Zealand and the United States (Table C2.2, and see Table B3.3 in Indicator B3).

Expenditure on pre-primary education accounts for an average of 0.6% of the collective GDP. Differences between countries are significant. For example, while 0.1% or less of GDP is spent on pre-primary education in Australia, 0.8% or more is spent in Chile, Denmark, Iceland, Latvia, Luxembourg, Slovenia, Spain and the Russian Federation (Table C2.2 and Chart C2.3). These differences are largely explained by enrolment rates, legal entitlements and costs, and the different starting age for primary education; they are also influenced by the extent to which this indicator covers private early childhood education. In Switzerland, the absence of data on integrated programmes is also likely to understate the true level of expenditure and enrolments in early childhood education programmes (see more details in Box C2.1), and may affect the comparability of the data to that of other countries. Inferences on access to and quality of ECEC should therefore be made with caution (Table C2.2 and Box C2.1).

Chart C2.3. **Expenditure on early childhood educational institutions (2011)**

As a percentage of GDP, by funding source



1. Includes some expenditure on childcare.

Countries are ranked in descending order of public and private expenditure on educational institutions.

Source: OECD. Table C2.2. See Annex 3 for notes (*www.oecd.org/edu/eag.htm*).

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Publicly-funded pre-primary education tends to be more strongly developed in the European than the non-European countries of the OECD. In Europe, the concept of universal access to education for 3-6 year-olds is generally accepted. Most countries in this region provide all children with at least two years of free, publicly funded pre-primary education in schools before they begin primary education. With the exception of Ireland and the Netherlands, such access is generally a statutory right from the age of 3, and in some countries, even before then. Compared to primary, secondary and post-secondary non-tertiary education, pre-primary institutions obtain the largest proportion of funds (19%) from private sources. However, this proportion varies widely, ranging from 5% or less in Belgium, Estonia, Latvia Luxembourg and Sweden, to 25% or more in Argentina, Australia, Austria, Colombia, Japan, Korea, Spain and the United States (Table C2.2 and *Starting Strong II* [OECD, 2006]).

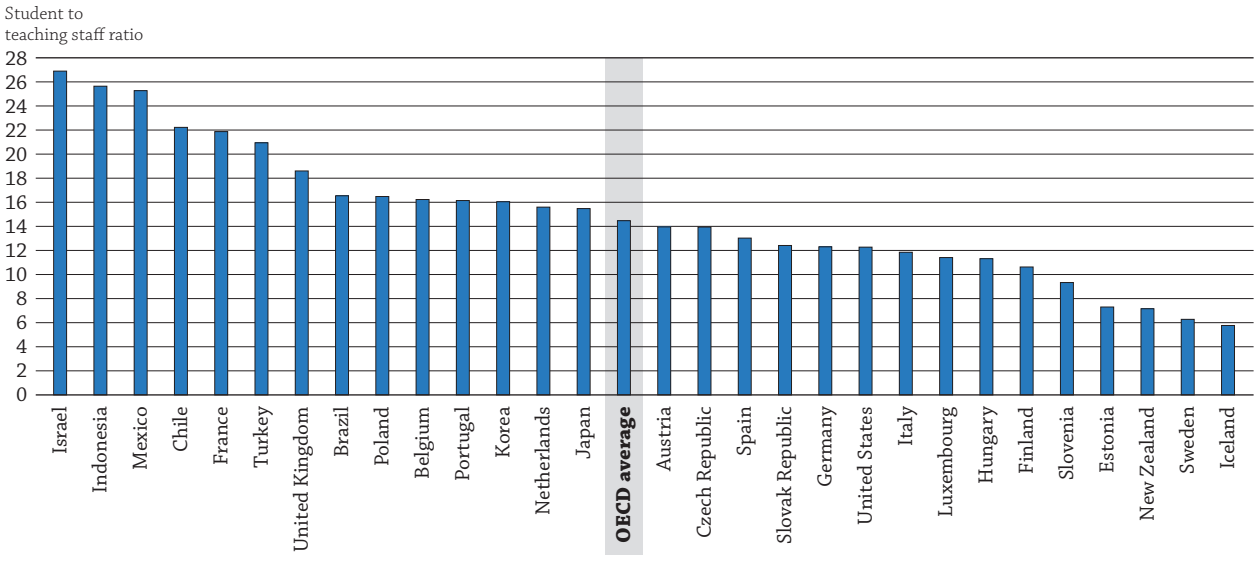
The pupil-teacher ratio varies considerably across OECD countries

Research demonstrates that enriched, stimulating environments and high-quality pedagogy are fostered by better-qualified practitioners, and that better-quality staff-child interactions facilitate better learning outcomes (Heckman, 2000; Shin et al., 2009). While qualifications are one of the strongest predictors of staff quality, the level of qualification tells only part of the story. Qualifications indicate how much specialised and practical training is included in initial staff education, what types of professional development and education are available to and taken up by staff, and how many years of experience staff have accumulated. In addition, working conditions can influence professional satisfaction, which is likely to affect the ability and willingness of professionals to build relationships and interact attentively with children (Shin et al., 2009). High turnover disrupts the continuity of care, undermines professional development efforts, lowers overall quality, and adversely affects child outcomes.

The ratio of pupils to teaching staff is also an important indicator of the resources devoted to education. That ratio is obtained by dividing the number of full-time equivalent pupils at a given level of education by the number of full-time equivalent teachers at that level and in similar types of institutions. However, this ratio does not take into account instruction time compared to the length of a teacher's working day, nor how much time teachers spend teaching. Therefore, it cannot be interpreted in terms of class size. The number of pupils per class summarises different factors, but distinguishing between these factors helps to identify differences in the quality of education systems (see Indicator D2).

Chart C2.4. Ratio of pupils to teaching staff in early childhood education (2012)

Public and private institutions, calculation based on full-time equivalents



Note: the figures should be interpreted with some caution because the indicator compares the teacher/student ratios in countries with "education-only" and "integrated education and daycare" programmes. In some countries, the staff requirements in these two types of provision are very different.

Countries are ranked in descending order of students to teaching staff ratios in early childhood education.

Source: OECD. Table C2.2. See Annex 3 for notes (*www.oecd.org/edu/eag.htm*).

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Table C2.2 shows the ratio of pupils to teaching staff and also the ratio of pupils to contact staff (e.g. teachers and non-professional staff [teachers' aides]) in early childhood education. Some countries make extensive use of teachers' aides at the pre-primary level. Twelve OECD and G20 countries reported smaller ratios of pupils to contact staff (column 4 of Table C2.2) than of pupils to teaching staff. The ratios of pupils to contact staff are substantially lower in Austria, Brazil, Chile, France, Germany, Indonesia, Israel, the United Kingdom and the United States. On average across OECD countries, there are 15 pupils for every teacher in pre-primary education. The pupil-teacher ratio, excluding teachers' aides, ranges from more than 20 pupils per teacher in Chile, France, Indonesia, Israel, Mexico and Turkey, to fewer than 10 in Estonia, Iceland, New Zealand, Slovenia and Sweden (Table C2.2 and Chart C2.4).

Definitions

Early childhood education, or pre-primary education (ISCED 0), is the initial stage of *organised instruction*, designed primarily to introduce very young children to a school-like environment.

The distinction between programmes that are classified as ISCED 0 and programmes that are outside of the scope of ISCED 0 is based primarily on the *educational properties* of the programme. As the educational properties of these programmes are difficult to assess directly, several proxy measures are used. ISCED 0 programmes:

Include early childhood programmes that

- are in a centre or are school-based;
- are designed to meet the educational and development needs of children;
- are typically designed for children at least 3 years old and not older than 6; and
- have staff that are adequately trained (i.e. qualified) to provide an educational programme for the children;

Exclude early childhood programmes that fail to meet these criteria.

Education only programmes in early childhood education are those that primarily offer education services for a short period of the day. Working parents usually have to use additional care services in the morning and/or afternoon.

Integrated programmes in early childhood education are those that provide both early childhood education and care in the same programme.

Methodology

Two methods are used to classify pupils as full-time/part-time in *Education at a Glance*:

1. Based on national definitions for early childhood education programmes.
2. A proxy method, derived from the duration of the first grade in primary education (ISCED 1).

Though the classification method used by countries differs, the issue does not affect enrolment rates (Table C2.1), as these are based on the total number of enrolments as a proportion of the population, regardless of whether pupils are full time or part time. The differences in classification methods may have some effect on expenditure per pupil and the pupil-teacher ratio, as these data are based on full-time equivalent pupil figures.

The childcare component of integrated programmes is excluded from expenditure reporting in *Education at a Glance*, since the focus of ISCED 0 is on the educational aspects of the programme. Countries that are not able to remove childcare expenditure from data reported in *Education at a Glance* have been footnoted in Table C2.2. The amount of childcare expenditure included is likely to vary between countries and care should be taken when interpreting these results (see more details in Box C2.1).

Some variations at the national level cannot be presented, and information on the "characteristics of programmes" has been simplified in some cases. For example, in some countries, the starting age of early childhood education programmes differs among jurisdictions or regions. In these instances, the information that is the most common or typical is reported.

Note regarding data from Israel

The statistical data for Israel are supplied by and are under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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Tables of Indicator C2

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Table C2.1	Enrolment rates in early childhood and primary education, by age (2005, 2012)
Table C2.2	Characteristics of early childhood education programmes (2011, 2012)
Table C2.3	Characteristics of education-only and integrated early childhood education programmes (2012)

Table C2.1 Enrolment rates in early childhood and primary education, by age (2005, 2012)

		Enrolment rates (2012)										Enrolment rates (2005)									
		Age 3	Age 4			Age 5			Age 6			Age 3	Age 4			Age 5			Age 6		
		ISCED 0	ISCED 0	ISCED 1	Total	ISCED 0	ISCED 1	Total	ISCED 0	ISCED 1	Total	ISCED 0	ISCED 0	ISCED 1	Total	ISCED 0	ISCED 1	TOTAL	ISCED 0	ISCED 1	Total
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
OECD	Australia	18	74	1	76	16	86	100	n	100	100	17	51	2	53	18	72	91	n	100	100
	Austria	65	91	n	91	96	n	96	38	59	97	47	82	n	82	93	n	93	39	57	96
	Belgium	98	99	n	99	98	1	99	5	94	98	100	100	n	100	99	1	100	6	94	100
	Canada	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Chile	45	79	n	79	88	2	90	11	80	91	m	m	m	m	m	m	m	m	m	m
	Czech Republic	59	82	n	82	90	n	90	51	48	99	65	91	n	91	97	n	97	49	51	100
	Denmark[1]	97	98	n	98	96	2	98	8	91	99	91	93	n	93	84	n	84	95	3	98
	Estonia	89	89	n	89	91	n	91	78	14	91	81	84	n	84	88	n	88	100	12	100
	Finland	51	59	n	59	68	n	68	98	1	98	38	47	n	47	56	n	56	98	1	99
	France	98	100	n	100	100	1	100	1	98	100	100	100	n	100	99	1	100	2	94	96
	Germany[2]	91	96	n	96	97	n	97	33	64	98	82	93	n	93	93	n	93	38	58	96
	Greece	a	53	a	53	94	a	94	2	96	98	a	58	a	58	83	2	84	n	100	100
	Hungary	74	93	n	93	96	n	96	71	23	94	73	91	n	91	97	n	97	74	25	99
	Iceland	96	96	n	96	98	n	98	n	98	98	94	95	n	95	96	n	96	n	98	98
	Ireland	42	58	39	97	1	99	100	n	100	100	m	m	m	m	m	m	m	m	m	m
	Israel	86	92	n	92	96	n	97	13	84	97	67	84	n	84	93	n	94	13	81	95
	Italy	92	96	a	96	89	8	97	1	97	98	97	100	a	100	94	7	100	1	100	100
	Japan	78	94	a	94	95	a	95	a	100	100	69	95	a	95	99	a	99	a	100	100
	Korea	85	87	n	87	88	1	88	1	94	95	m	m	m	m	m	m	m	m	m	m
	Luxembourg[3]	73	98	n	98	93	5	98	5	93	98	62	96	n	96	92	3	95	3	97	100
	Mexico	39	87	n	87	83	28	100	1	100	100	23	70	a	70	88	10	98	1	100	100
	Netherlands	83	100	a	100	100	a	100	a	100	100	m	m	m	m	m	m	m	m	m	m
	New Zealand	87	94	n	94	3	96	99	n	100	100	84	94	n	94	3	97	100	n	100	100
	Norway	95	97	n	97	97	n	97	1	100	100	83	89	n	89	91	n	91	1	99	100
	Poland	51	65	a	65	94	x(9)	94	76	19	95	28	38	a	38	48	m	48	98	1	99
	Portugal	78	92	n	92	98	n	98	5	96	100	61	84	n	84	87	3	90	3	100	100
	Slovak Republic	63	73	n	73	81	n	81	40	50	91	61	74	n	74	85	n	85	40	54	94
	Slovenia	85	89	n	89	92	x(9)	92	6	93	99	67	76	n	76	84	n	84	4	96	100
	Spain	95	97	n	97	98	n	98	1	97	97	95	99	n	99	100	n	100	1	99	100
	Sweden	93	94	n	94	95	n	95	97	1	98	84	89	n	89	90	n	90	96	3	99
	Switzerland	3	40	n	40	94	1	96	54	44	99	8	38	n	39	90	1	91	60	40	100
	Turkey	5	19	n	19	70	n	70	n	96	96	2	5	n	5	23	8	32	n	83	83
	United Kingdom	93	61	37	98	1	97	98	n	98	98	78	60	32	92	n	100	100	n	100	100
	United States	38	66	n	66	87	5	93	21	77	98	39	68	n	68	87	6	93	18	80	98
	OECD average	70	82	2	84	81	13	94	22	76	98	64	77	1	79	77	11	88	29	70	99
	OECD average for countries with 2005 and 2012 data	71	82	1	84	83	11	94	24	74	98	64	77	1	79	77	11	88	29	70	99
	EU21 average	79	85	4	89	84	10	94	29	68	97	73	82	2	84	83	6	89	39	61	100
Partners	Argentina	38	77	n	77	100	n	100	n	100	100	m	m	m	m	m	m	m	m	m	m
	Brazil	37	61	n	61	82	n	83	54	37	91	21	37	n	37	62	1	63	63	21	83
	China	m	m	n	m	m	n	m	n	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	48	75	1	75	65	14	79	8	65	73	m	m	m	m	m	m	m	m	m	m
	India	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Indonesia	5	25	n	25	41	4	46	24	72	97	m	m	m	m	m	m	m	m	m	m
	Latvia	80	87	n	87	96	n	96	92	5	97	m	m	m	m	m	m	m	m	m	m
	Russian Federation	70	77	a	77	80	n	80	72	12	84	m	m	a	m	m	n	m	m	23	m
	Saudi Arabia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	South Africa	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

Note: Enrolment rates at young ages should be interpreted with care; mismatches between the coverage of the population data and the enrolment data mean that the participation rates may be underestimated for countries such as Luxembourg that are net exporters of students and may be overestimated for those that are net importers.

1. Mandatory classes have been included in ISCED 1 as of 2011.

2. Year of reference 2006 instead of 2005.

3. Underestimated because a lot of resident students go to school in the neighbouring countries.

Source: OECD. Argentina, China, Colombia, Indonesia: UNESCO Institute for Statistics. Latvia: Eurostat. See Annex 3 for notes (*www.oecd.org/edu/eag.htm*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

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C2

Table C2.2. Characteristics of early childhood education programmes (2011, 2012)

		Distribution of pupils in ISCED 0, by type of institution (2012)			Ratio of pupils to teaching staff in full-time equivalents (2012)		Expenditure on educational institutions (2011)				Characteristics of early childhood education programmes						
		Public	Government-dependant private	Independent private	Pupils to contact staff (teachers and teachers aides)	Pupils to teaching staff	Total expenditure (from public and private sources) as a % of GDP	Proportion of total expenditure from public sources	Proportion of total expenditure from private sources	Annual expenditure per student (in USD)	Earliest starting age	Usual starting age	Usual duration (in years)	Usual starting age in ISCED 1	Entry age for compulsory programmes (if applicable)	Length of compulsory programmes (if applicable)	Full-time (FT)/ Part-time (PT)
		ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 0	ISCED 1	ISCED 0	ISCED 0	ISCED 0
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
OECD	Australia	22.0	78.0	n	m	m	0.1	45	55	10 734	3	4	1	5	a	a	PT
	Austria[1]	70.3	29.7	x(2)	9.6	13.9	0.6	72	28	8 933	3	3	3	6	5	1	FT
	Belgium	47.1	52.9	m	16.2	16.2	0.6	96	4	6 333	2.5	2.5	3 to 4	6	a	a	FT
	Canada[2]	m	m	m	m	m	m	m	m	m	m	m	m	6	m	m	m
	Chile	33.5	60.4	6.0	10.8	22.2	0.8	84	16	5 083	0.25	4	2	m	a	a	FT/PT
	Czech Republic	97.9	2.1	a	13.6	13.9	0.5	92	8	4 302	3	3	3	6	a	a	FT
	Denmark[1]	80.7	19.3	n	m	m	1.4	92	8	14 148	0	1	5	6	m	m	FT
	Estonia	96.7	a	3.3	m	7.3	0.4	98	2	2 618	0	3	4	7	m	m	FT
	Finland	91.5	8.5	a	m	10.6	0.4	90	10	5 700	0	a	a	7	a	a	FT
	France	87.2	12.5	0.4	14.5	21.9	0.7	94	6	6 615	2	2 to 3	3	6	a	a	FT
	Germany	34.9	65.1	x(2)	9.7	12.3	0.6	80	20	8 351	3	3	3	6	a	a	FT
	Greece	93.1	a	6.9	m	m	m	m	m	m	4	4	1 to 2	6	5	1	FT
	Hungary[1, 3]	92.6	7.4	a	m	11.3	0.6	m	m	4 564	2.5	3	3	7	5	1	FT
	Iceland	87.7	12.3	n	5.8	5.8	1.0	76	24	9 138	0	2	4	6	a	a	FT/PT
	Ireland	1.9	a	98.1	m	m	m	m	m	m	3	3	1	4 to 5	a	a	FT/PT
	Israel[1, 4]	90.9	a	9.1	12.8	26.9	0.7	85	15	4 058	3	3	3	6	3	3	FT
	Italy[3]	70.2	a	29.8	11.8	11.8	0.5	90	10	7 868	m	m	m	m	a	a	FT
	Japan	28.7	a	71.3	14.6	15.5	0.2	45	55	5 591	3	3	3	6	a	a	FT
	Korea	16.0	84.0	a	16.0	16.0	0.3	54	46	6 861	3.0	3 to 5	3.0	6.0	m	m	FT
	Luxembourg[3]	90.9	n	9.1	m	11.4	0.8	99	1	25 074	3	3	3	6	4	2	FT
	Mexico	86.1	a	13.9	25.3	25.3	0.6	84	16	2 568	3	4 to 5	3	6	3	3	FT
	Netherlands	70.1	a	29.9	14.0	15.6	0.4	88	12	8 020	3	3 to 4	2 to 3	6	5	1	FT
	New Zealand	1.4	98.6	n	m	7.2	0.6	85	15	11 088	0	3	2	5	a	a	FT/PT
	Norway	54.3	45.7	x(2)	m	m	0.5	85	15	7 283	0	1	5	6	a	a	FT/PT
	Poland[3]	84.3	1.3	14.4	m	16.5	0.7	76	24	6 409	2.5	3	4	7	6	1	FT
	Portugal[3]	53.2	30.4	16.5	m	16.1	0.4	m	m	5 674	3	3	3	6	a	a	FT
	Slovak Republic	95.9	4.1	n	12.3	12.4	0.5	84	16	4 653	2	3	3	6	a	a	FT
	Slovenia[1]	97.1	2.5	0.4	9.3	9.3	0.8	81	19	8 136	3	3	3	6	a	a	FT
	Spain	65.0	24.5	10.6	m	13.0	0.9	71	29	6 725	0	2 to 3	3 to 4	6	a	a	FT
	Sweden	82.9	17.1	n	6.2	6.3	0.7	100	n	6 915	0	2 to 3	4 to 5	7	a	a	FT/PT
	Switzerland[3, 5]	96.2	0.3	3.5	m	m	0.2	m	m	5 267	4	5	2	6	5	1	FT
	Turkey	90.5	a	9.5	m	20.9	0.2	m	m	2 412	3	5	1 to 3	6	a	a	FT
	United Kingdom	62.5	31.2	6.3	11.6	18.6	0.4	77	23	9 692	3	3	1.5	5	a	a	FT/PT
	United States[1, 6]	59.8	a	40.2	10.4	12.3	0.5	70	30	10 010	3	4	1	6	a	a	FT/PT
	OECD average	68.4	20.4	11.1	12.5	14.5	0.6	81.3	18.7	7 446							
	OECD total	-	-	-	-	-	0.5	-	-	7 047							
	EU21 average	74.6	14.7	10.7	11.3	13.1	0.6	80.3	19.7	7 933							
Partners	Argentina	68.1	24.7	7.2	m	m	0.7	74	26	1 979	m	m	m	m	m	m	FT
	Brazil[1]	71.0	a	29.0	12.2	16.5	0.5	m	m	2 349	0	1	5	6	4	2	FT
	China	50.5	49.5	x(2)	m	m	m	m	m	m	m	m	m	m	m	m	FT
	Colombia	78.5	a	21.5	m	m	0.5	54	46	3 491	m	m	m	m	m	m	m
	India	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Indonesia	2.8	a	97.2	23.0	25.6	m	90	10	205	m	m	m	m	m	m	FT
	Latvia	94.9	a	5.1	m	m	0.8	98	2	4 359	m	m	m	m	m	m	m
	Russian Federation	99.1	a	0.9	m	m	0.8	89	11	m	m	m	m	m	m	m	m
	Saudi Arabia	59.3	40.7	x(2)	m	m	m	m	m	m	m	m	m	m	m	m	m
	South Africa	93.9	6.1	x(2)	m	m	m	m	m	m	m	m	m	m	m	m	m
	G20 average	59.3	23.1	17.6	14.4	17.0	0.5	74	26	5 854	m	m	m	m	m	m	m

1. Includes some expenditure on childcare.

2. ISCED 0 programmes are available in all 13 jurisdictions, and compulsory for students in two jurisdictions. Earliest starting age, typical starting age and duration of ISCED 0 programmes vary by jurisdiction.

3. Data on expenditure refers only to public institutions.

4. By recently enacted law, ISCED 0 programmes have been made compulsory and gratuitous nationwide. Implementation will gradually commence from 2013.

5. ISCED 0 programmes are compulsory for two years in some jurisdictions and only one year in others.

6. ISCED 0 programmes are compulsory in about one third of states.

Source: OECD. Argentina, China, Colombia, Indonesia, Saudi Arabia, South Africa: UNESCO Institute for Statistics. Latvia: Eurostat. See Annex 3 for notes (*www.oecd.org/edu/eag.htm*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

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Table C2.3 Characteristics of education-only and integrated early childhood education programmes (2012)

Existence and characteristics of education-only and integrated early childhood education programs
Proportion of enrolments in Education at a Glance *from "education-only" and "integrated early childhood education" programmes*

		Education-only programmes			Integrated programmes (includes education and childcare services)			Relative proportion of enrolments reported in *Education at a Glance* (%)		
		Exist nationally	Delivered by qualified teacher	Have a formal curriculum	Exist nationally	Delivered by qualified teacher	Have a formal curriculum	Education-only programmes	Integrated programmes	Total
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
OECD	Australia	Yes	Yes	Yes	Yes	Yes	Yes	x(9)	x(9)	100
	Austria	Yes	Yes	Yes	Yes	Yes	No	3	97	100
	Belgium	Yes	Yes	Yes	No	a	a	100	a	100
	Canada	Yes	Yes	Yes	Yes	Yes	Yes	m	m	m
	Chile	Yes	Yes	Yes	Yes	Yes	Yes	x(9)	x(9)	100
	Czech Republic	Yes	Yes	Yes	No	a	a	100	a	100
	Denmark	No	a	a	Yes	Yes	Yes	a	100	100
	Estonia	No	a	a	Yes	Yes	Yes	a	100	100
	Finland	Yes	Yes	Yes	Yes	Yes	Yes	37	63	100
	France	Yes	Yes	Yes	No	a	a	100	a	100
	Germany	Yes	Yes	Yes	No	a	a	100	a	100
	Greece	Yes	Yes	Yes	Yes	m	m	100	m	100
	Hungary	No	a	a	Yes	Yes	Yes	a	100	100
	Iceland	Yes	Yes	Yes	Yes	Yes	Yes	1	99	100
	Ireland	No	a	a	Yes	a	a	a	100	100
	Israel	Yes	Yes	Yes	Yes	Yes	Yes	98	2	100
	Italy[3]	No	a	a	Yes	m	m	a	100	m
	Japan	Yes	Yes	Yes	Yes	Varies	Varies	x(9)	x(9)	100
	Korea	Yes	Yes	Yes	Yes	Yes	Yes	x(9)	x(9)	100
	Luxembourg	Yes	Yes	Yes	No	a	a	100	a	100
	Mexico	Yes	Yes	Yes	Yes	Yes	Yes	99	1	100
	Netherlands	Yes	Yes	Yes	Yes	No	Varies	70	30	100
	New Zealand	No	a	a	Yes	Yes	Yes	a	100	100
	Norway	No	a	a	Yes	Yes	Yes	a	100	100
	Poland	Yes	Yes	Yes	No	a	a	100	a	100
	Portugal	No	a	a	Yes	Yes	Yes	a	100	100
	Slovak Republic	Yes	Yes	Yes	No	a	a	100	a	100
	Slovenia	No	a	a	Yes	Yes	Yes	a	100	100
	Spain	Yes	Yes	Yes	No	a	a	100	a	100
	Sweden	Yes	Yes	Yes	Yes	Yes	Yes	25	75	100
	Switzerland	Yes	Yes	Yes	Yes	Yes	m	100	m	100
	Turkey	Yes	Yes	Yes	No	a	a	100	a	100
	United Kingdom	Yes	Yes	Yes	Yes	Varies	Yes	x(9)	x(9)	100
	United States	Yes	Varies	Varies	Yes	Varies	Varies	x(9)	x(9)	100
	OECD average									
	OECD total									
	EU21 average									
Partners	Argentina	m	m	m	m	m	m	m	m	m
	Brazil	Yes	Yes	No	Yes	Yes	No	x(9)	x(9)	100
	China	m	m	m	m	m	m	m	m	m
	Colombia	m	m	m	m	m	m	m	m	m
	India	m	m	m	m	m	m	m	m	m
	Indonesia	m	m	m	m	m	m	m	m	m
	Latvia	m	m	m	m	m	m	m	m	m
	Russian Federation	m	m	m	m	m	m	m	m	m
	Saudi Arabia	m	m	m	m	m	m	m	m	m
	South Africa	m	m	m	m	m	m	m	m	m

Source: OECD, INES Working Party special data collection on early childhood education programs. See Annex 3 for notes (*www.oecd.org/edu/eag.htm*).
Please refer to the Reader's Guide for information concerning the symbols replacing missing data.
StatLink http://dx.doi.org/10.1787/888933118390

Starting Strong IV

Early Childhood Education and Care Data Country Note

AUSTRALIA

This Data Spotlight note on Early Childhood Education and Care (ECEC) provides a summary of ECEC policy inputs, outputs and outcomes in Australia. It uses data available within the OECD Secretariat — *Education at a Glance*, the Programme for International Student Assessment (PISA) and the OECD Family Database — to make comparisons between Australia's ECEC system and the systems in other OECD countries (see Box 1 for definition and comparability issues). This note complements the 2015 OECD publication, *Starting Strong IV: Monitoring Quality in Early Childhood Education and Care*.

Key characteristics of ECEC in Australia:

Resourcing of the ECEC system

- The share of gross domestic product (GDP) devoted to ECEC (ISCED 0) is comparatively low (0.5% of GDP compared with 0.8% on average across the OECD), as children in Australia are in an ECEC program for a shorter period and transition to school earlier than in many OECD countries.
- However, overall, annual per child expenditure on ECEC (ISCED 0) in Australia is higher than the OECD average (USD 12 364 and USD 8 618, respectively). In 2013, Australia was the fifth highest spender in ECEC per child in the OECD, showing high levels of investment in early years learning, especially in pre-primary education.
- A significant share of the funding for pre-primary education comes from private sources, which are in turn partly subsidised by the Australian Government.[1]
- In pre-primary education (ISCED 02), there are about 5 children per teacher in Australia, which is 9 children fewer per teacher than the OECD average of 14 children per teacher, excluding the non-teaching staff, such as auxiliary staff.

Access and participation

- Participation of 0-2 year-olds in formal childcare (ISCED 01) is around the OECD average (33%). Similarly, participation of 3-4 year olds in pre-primary education (ISCED 02) is close to the average (e.g. for 3-year-olds rates were 69% in Australia compared with 71% across the OECD).
- Australia's participation rates at age 4 have risen dramatically since 2005 (from 53% in 2005 to 85% in 2014), representing the fourth highest increase in the OECD.

Teacher's academic qualification and working conditions

- All teachers of pre-primary education who enter the profession have a Bachelor's degree in Australia, as in most other OECD countries.
- Pre-primary teachers in Australia have an above average statutory salary, and a below average annual number of teaching hours compared to the OECD average. A pre-primary education teacher in Australia can expect to earn an annual statutory starting salary around USD 43 000, considerably higher than the average starting salary of their colleagues across the OECD (around USD 29 494).

Monitoring Quality

- Monitoring of ECEC settings is common practice in Australia where all ECEC settings are monitored by inspectors. As inspections are in part subjective in nature, it is important that inspectors have a consistent understanding of what a quality service is to ensure that ratings are consistent (see *Monitoring Quality in Early Childhood Education and Care Country Note: Australia*).

Student performance at age 15 by participation in pre-primary education

- The percentage of 15-year-olds in Australia who reported not attending pre-primary education in PISA 2012 was low (4.5% compared with 7.1% across the OECD). Notably, children from a lower socio-economic background and in socio-economically disadvantaged schools were less likely to have participated in pre-primary education. Nevertheless, after accounting for socio-economic background, the relationship between attending pre-primary education and mathematics performance of 15 year-olds is significant and similar to the OECD average (32 and 31 score points respectively – equivalent to almost one year of formal schooling).

Introduction

Participation in ECEC can have a positive effect on children's early learning and development, as well as on subsequent outcomes, such as academic success, labour market performance and socio-economic mobility. The benefits of ECEC on child outcomes, however, depend on high quality. Settings and programmes that have a high level of quality are positively associated with children's cognitive, social and behavioural development, with disadvantaged children benefitting significantly from high-quality settings (OECD, 2011; Gambaro et al., 2014). Policy outcomes are associated with both policy inputs and policy outputs.

For simplicity purposes, this note uses the term early childhood education and care (ECEC) to refer to arrangements providing care and education for children under compulsory school age. This term differs from those used by other sources in this note, including the ISCED 2011 classification (see Box 1 for the ISCED 2011 methodological distinction between childcare and pre-primary education). Because of these differences in definitions, caution is needed when comparing data presented here.

The note is structured in three sections:

- **Policy inputs**: This section presents indicators of the resources that are put into a system, the level and type of sources that finance ECEC, and the regulations of staff-child ratios to achieve outputs or results.
- **Policy outputs**: This section covers indicators that are the result of policy inputs put in place, such as enrolment rates by age. Trend data is presented to examine the changes in early childhood education in recent years.
- **Policy outcomes**: This section covers indicators on the outcomes of children that are associated with both policy inputs and policy outputs. For example, indicators on student performance at age 15 by participation in pre-primary education (drawn from PISA 2012).

Section 1. Policy inputs

Organisation of early childhood education and care services

The organisation of early childhood education and care services varies greatly from country to country in terms of structures, but also regarding the age of children attending different types of settings or the intensity of participation in different settings (see Box 1). Australia offers both education-only and integrated ECEC programmes. Early childhood educational development programmes (ISCED 01) are available for children from 0 to 3 years in a range of accredited childcare services (including long day care and family day care), with an educational programme provided by qualified early childhood educators. Pre-primary education or preschool (ISCED 02) education is offered to children from the age of 3-4 years and delivered by qualified early childhood educators in a range of accredited institutions (OECD, 2016a, Tables C2.4 and C2.5). Pre-primary education in Australia is of shorter duration to most other OECD countries as children generally transition to school aged 4-5 years.

Public funding of early childhood education and care services

In Australia, public funding responsibilities are shared between the Australian Government and the regional or state-level governments, while responsibilities for minimum standard setting, curriculum development and monitoring of ECEC settings are at the regional or state level (OECD, 2015a, Table 1.2).

Below-average expenditure on early childhood education and care as a percentage of GDP

The financial investment in ECEC settings and equipment is a key requirement for the development of good and high-quality learning environments, and indicates that political priority is being given to the care and education of young children. A sustainable level of public funding is essential to recruit competent and qualified staff, ensure the quality of educational programmes, and promote their development.

In Australia, public and private expenditure on early childhood education and care (ISCED 0) was equal to 0.5% of GDP in 2013, which is below the OECD average of 0.8%. Only Estonia, Ireland, Japan and Switzerland have lower expenditure levels on early childhood education and care (ISCED 0). Chile, Denmark, Iceland, Israel, Norway, Slovenia and Sweden spent 1.0% or more of their GDP on early childhood education and care (ISCED 0) (OECD, 2016a, Table C2.3). The shorter duration of pre-primary education in Australia and earlier transition to school has the effect of reducing Australia's total expenditure on ECEC as a percentage of GDP.

Box 1. Distinction between early childhood educational development and pre-primary education: The revised ISCED 2011 classification

There are many different ECEC systems and structures within OECD countries. Consequently, there is also a range of different approaches to identifying the boundary between early childhood education and childcare.

The International Standard Classification of Education (ISCED) defines internationally comparable levels of education. In ISCED 2011, level 0 covers early childhood education for all ages, including very young children. As the educational properties of ISCED 0 programmes can be difficult to assess directly, several criteria are used to come up with a technical definition. For a programme to be reported as ISCED level 0 it must have: adequate intentional educational properties; be delivered by qualified staff members; take place in an institutionalised setting; meet a minimum intensity/duration; and be targeted at children from age 0 until entry into ISCED level 1 (OECD, 2016).

Programmes classified at ISCED level 0 may be referred to in many ways nationally, for example: early childhood education and development, play school, reception, pre-primary, preschool, *Kindergarten*, *Kita*, *Krippe* or *educación inicial*. For programmes provided in *crèches*, day-care centres, private homes, nurseries, *Tagespflege* or *guarderías*, it is important to ensure that they meet the ISCED level 0 classification criteria specified in ISCED 2011.

In ISCED 2011, programmes are sub-classified into two categories depending on age and the level of complexity of the educational content: early childhood educational development (ISCED 01) and pre-primary education (ISCED 02). ISCED 01 programmes are generally designed for children younger than 3 (OECD, 2016). This is a new category not covered by ISCED 1997. ISCED 02 is designed for children from age 3 years to the start of primary education. It corresponds exactly to level 0 in ISCED 1997.

The comparability of programmes at ISCED level 0 depends on each country's ability to report data according to the standard international definition. Early childhood programmes that are offered in some countries do not necessarily meet the criteria or definition of ISCED 01. This is the case of Belgium (except in the Flemish Community), the Czech Republic, France, Ireland, Italy, Japan, Luxembourg, the Netherlands, Poland, Portugal, the Slovak Republic, Switzerland and the United States. On the other hand, the coverage of ISCED 02 (pre-primary education) is larger, with 32 countries reporting data on enrolment rates at ages 3 and 4. Because of these differences, caution is needed when comparing available data on ISCED 01 drawn from Education at a Glance.

The definition of ECEC in the OECD's Starting Strong series differs from the ISCED 2011 definition. The OECD definition states that "the term early childhood education and care (ECEC) includes all arrangements providing care and education for children under compulsory school age, regardless of setting, funding, opening hours or programme content" (OECD, 2001). This means that settings considered an integral part of countries' ECEC systems, but not covered by the ISCED classification, still fall under the terminology of ECEC.

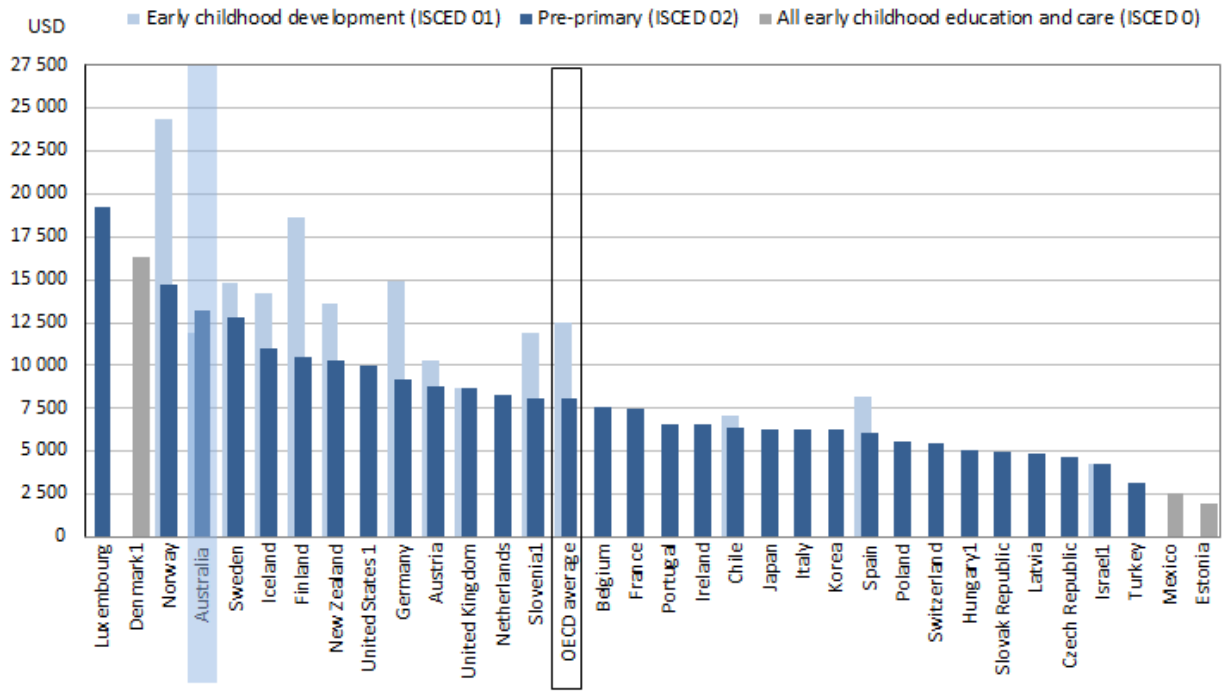
Data reported in *Education at a Glance 2016*, and presented here as ISCED level 0, use the ISCED 2011 classification (Figures 1, 2, 3 and 5). PISA 2012 uses the ISCED 1997 classification (Figure 6). The OECD Family Database definition of "formal" childcare among children aged 0-2 years includes centre-based services, organised day care, preschool and professional child-minders. That is, it includes ISCED 01 and other registered ECEC services (Figure 4).

Sources: OECD (2016), *Education at a Glance 2016: OECD Indicators,* OECD Publishing, Paris, http://dx.doi.org/10.1878/eag-2016-en; OECD (2001), *Starting Strong I: Early Childhood Education and Care*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264192829-en.

Expenditure per child in early childhood education and care is higher than the OECD average

In Australia, expenditure per child in all ECEC services (ISCED 0) was USD 12 364, significantly higher than the OECD average of USD 8 618 in 2013 (OECD, 2016a, Table C2.3). This investment placed Australia as the fifth highest spender in ECEC per child in the OECD. Expenditure was highest in pre-primary education (ISCED 02), where Australia spent USD 13 171 per child compared with USD 8 070 in a typical OECD country in 2013 (see Figure 1). By contrast, spending per child in early childhood educational development programmes (ISCED 01) in Australia was USD 11 852, somewhat lower than the OECD average of USD 12 501. The level of expenditure per child varies between countries depending on services' fees, the cost of education, the level of wealth of the country, and the coverage by private pre-primary structures.[2]

Figure 1. Annual expenditure per student by educational institutions for all services (2013)



Notes: Countries are ranked in descending order of annual expenditure per student by educational institutions for pre-primary education.
1. Includes some expenditure on childcare.

Source: OECD (2016), *Education at a Glance 2016: OECD Indicators*, Table C2.3, http://dx.doi.org/10.1787/888933398316.

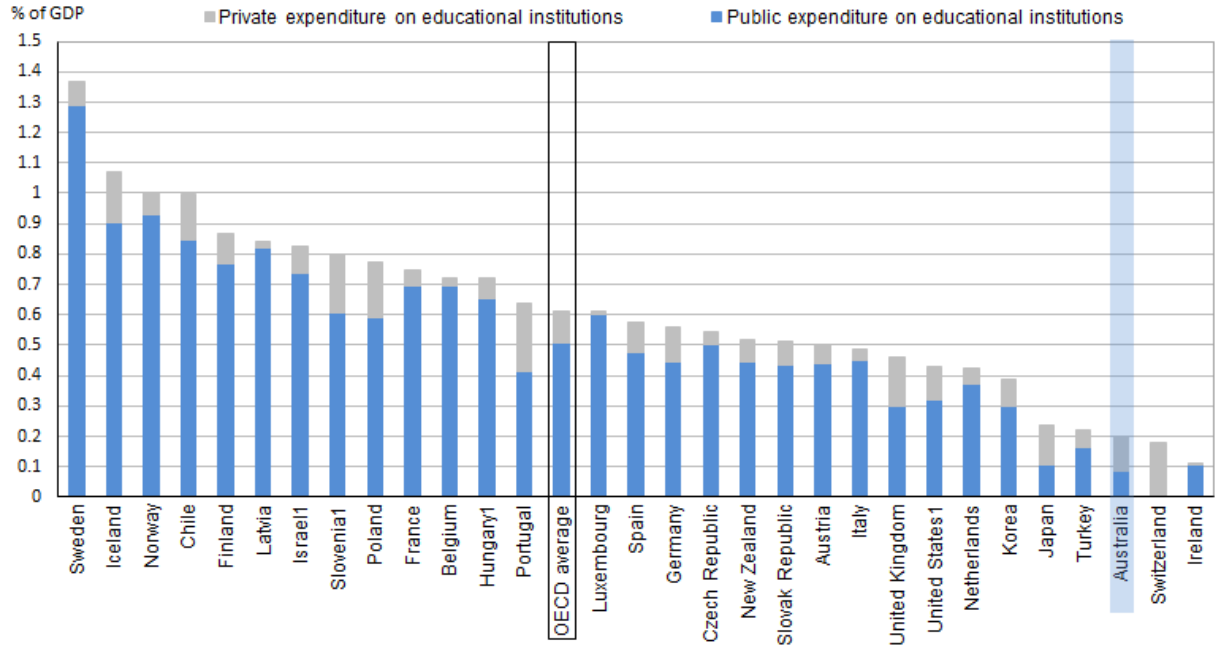
The share of private funding of early childhood education and care is comparatively high

Early childhood education and care services (like all other levels of education) are also funded by private sources[3], mainly through tuition or other fees paid by parents. Regarding the services for young children in childcare, limited comparable data does not allow for the analysis of the extent of private funding in childcare.

In Australia, 61% of funding for early childhood educational development programmes (ISCED 01) comes from Australian Government subsidies to families, 4% comes directly from other levels of government, and the rest from families' out-of-pocket expenses. All other countries with available data provide more than 60% of ISCED 01 funding directly from governments, with fewer than two percentage points of private expenditure subsidised by governments (OECD, 2016a, Table C2.3).

For pre-primary education (ISCED 02), Australia has the second highest proportion of funding from private sources, similar to that of Japan (68% and 66%, respectively) (OECD, 2016a, Table C2.3). However, 25 percentage points of private expenditure is subsidised by the Australian Government via subsidies to families. These subsidies include the Child Care Benefit and the Child Care Rebate.[4]

Figure 2. Distribution of public and private expenditure on pre-primary educational institutions (2013)



Notes: Countries are ranked in descending order of public and private expenditure on educational institutions (2013).
1. Includes some expenditure on childcare.

Source: OECD (2016), Education at a Glance 2016: OECD Indicators, Table C2.3, http://dx.doi.org/10.1787/888933398316.

Quality of early childhood education and care services

Curriculum frameworks can play a pivotal role in ensuring the quality of ECEC services. Most OECD countries have a curriculum framework in place for their ECEC settings. In Australia, the *Early Years Learning Framework* covers all children before school age and *My Time Our Place* covers school age children in outside-school-hours-care settings, although state-level regulatory authorities may approve other learning frameworks for ECEC settings in their jurisdictions. Some countries, including many German *Länder* (federal state), England and Scotland, have integrated curriculum frameworks that cover both ECEC and primary school aged children, which may foster the quality of ECEC services across age groups (OECD, 2015a, Table 1.3).

The number of children per staff member differs by age, with lower ratios for younger children

The child-to-staff ratio is an important indicator of the resources invested in early education and childcare, and also of the quality of these services. A low ratio of children to staff impacts staff working conditions, alongside other factors such as reasonable hours or workload and salary levels. These affect job satisfaction and staff retention, and through this, contribute to the quality of early childhood education and care services (OECD, 2012).

Most countries have regulations in place regarding the maximum number of children per adult in ECEC services. In Australia, ECEC settings are required to meet nationally consistent staff-to-child ratios set out under the Education and Care Services National Regulations. In pre-primary education settings (ISCED 02) there is a maximum of 11 children per staff member for children aged 3 years and above. The staff-to-child ratio for children aged between 2 and 3 is 1:5 and for children under 2 the ratio is 1:4.

Pre-primary teachers have a high level of education degree and below-average teaching hours

In OECD countries, the duration of initial teacher training varies more in pre-primary education (ISCED 02) than at any other level of education: from two years for basic certification in Korea and Japan to five years in Austria, Chile, France, Iceland and Italy. In Australia, the duration of initial ECEC teacher training is four years. All teachers of pre-primary education who enter the profession have a bachelor's degree in Australia, as in most other OECD countries. In some countries, including England, France, Iceland and Italy, initial teacher education of pre-primary teachers is at master level (OECD, 2014, Table D6.1a).

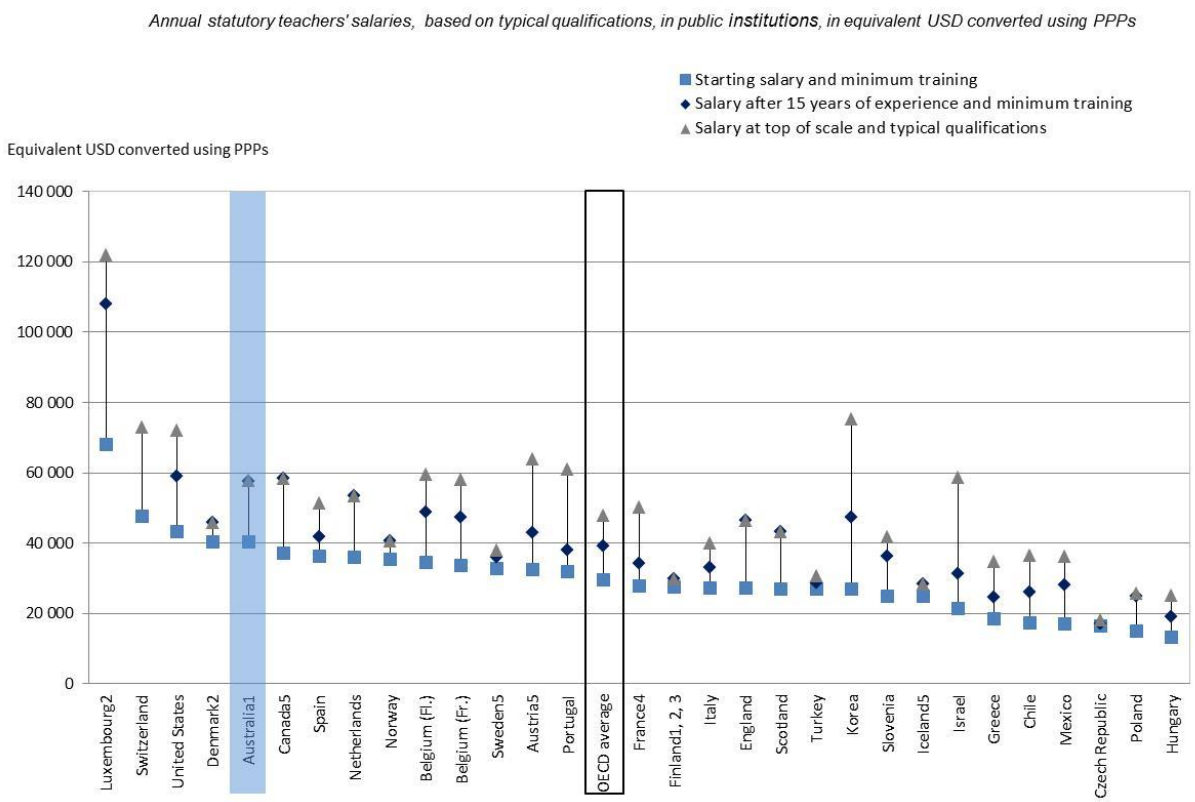
The annual number of teaching hours in Australia is below the OECD average. Australian pre-primary teachers (ISCED02) have 40 weeks of teaching per year (similar to the OECD average) and spend 885 hours in the classroom, which is around 10% below the OECD average of 1 005 hours (OECD, 2016a, Table D4.1).

Salaries of pre-primary teachers are above the OECD average in absolute and relative terms

The statutory salary of teachers in pre-primary education[5] in Australia in 2014 was significantly higher than the OECD average, both for beginning teachers (USD 40 297 against USD 29 494, on average) and for those with 10 or 15 years of experience (USD 57 445 in Australia against USD 36 491 and USD 39 245, on average). The statutory salary at the top of the scale is also above the OECD average, with a top salary of USD 57 717 in Australia against an OECD average of USD 47 826 (see Figure 3) (OECD, 2016a, Table D3.1). After including bonuses and allowances paid to teachers, the average salary of pre-primary teachers in Australia is about one third higher than the OECD average (USD 50 735 in Australia compared to an OECD average of USD 37 274) (OECD, 2016, Table D3.4). It is important to note this data was provided by state and territory governments (as a state and territory weighted average) and only relates to teachers in government sector pre-primary education.

To compare salary levels and the labour market situation between countries, teachers' pay is compared to earnings for similarly-educated workers based on teachers' attainment level (25-64 year-olds who work full time, full year). The salary for teachers in government sector pre-primary education in Australia is 82% of the earnings of workers with tertiary education, which is slightly above the OECD average of 74% (OECD, 2016a, Table D3.2).

Figure 3. Pre-primary teachers' salaries at different points in their careers (2014)



Notes: The definition of teachers' typical qualification is based on a broad concept, including the typical ISCED level of attainment and other criteria. PPP refers to the parity purchasing power.
Countries are ranked in descending order of starting salaries for pre-primary teachers with minimum training.
1. Statutory salaries do not include the part of social security contributions and pension-scheme contributions paid by the employees.
2. Statutory salaries include the part of social security contributions and pension-scheme contributions paid by the employers.
3. Includes data on the majority, i.e. kindergarten teachers only for pre-primary education.
4. Includes average of fixed bonuses for overtime hours for lower and upper secondary teachers.
5. Actual base salaries for 2013.

Source: OECD (2016), *Education at a Glance 2016: OECD Indicators*, Table D 3.1a, http://dx.doi.org/10.1787/888933398940.

Monitoring of early childhood education and care settings is a common practice

All 24 countries and jurisdictions surveyed for *Starting Strong IV: Monitoring Quality in Early Childhood Education and Care* monitor service and staff quality, but only 21 monitor child development and outcomes. Monitoring is a common practice in Australia where all ECEC settings are monitored by inspectors of each state and territory government regulatory authority. Service quality and staff qualifications and practice are monitored, assessed and rated against the National Quality Standard. The Australian Early Development Census (AEDC) has been conducted every three years since 2009 and provides a population measure of children's early development when they start full-time school. The AEDC measures five areas of early childhood development: physical health and well-being, social competence, emotional maturity, language and cognitive skills and communication skills, and general knowledge (OECD, 2015a).

In 2012, new quality standards were introduced under the National Quality Framework (NQF). The NQF is the result of an agreement between the Australian Government and state and territory governments to work together to provide better educational and developmental outcomes for children using ECEC settings. Prior to the establishment of the NQF in 2012, the ECEC sector in Australia was governed by 9 separate regulatory frameworks, which were characterised by inconsistent standards and

duplication. The NQF harmonised the separate regulatory frameworks into a single framework underpinned by nationally consistent legislation, and an NQS (a set of benchmarks) against which services are inspected (or assessed) and rated. Regulatory authorities in each state and territory inspect and rate services in their own jurisdictions. As inspections are in part subjective in nature, it is important that inspectors have a consistent understanding of what a quality service is to ensure that ratings are consistent. This is discussed in further detail in Australia's country note on Monitoring Quality in ECEC (OECD, 2016b).

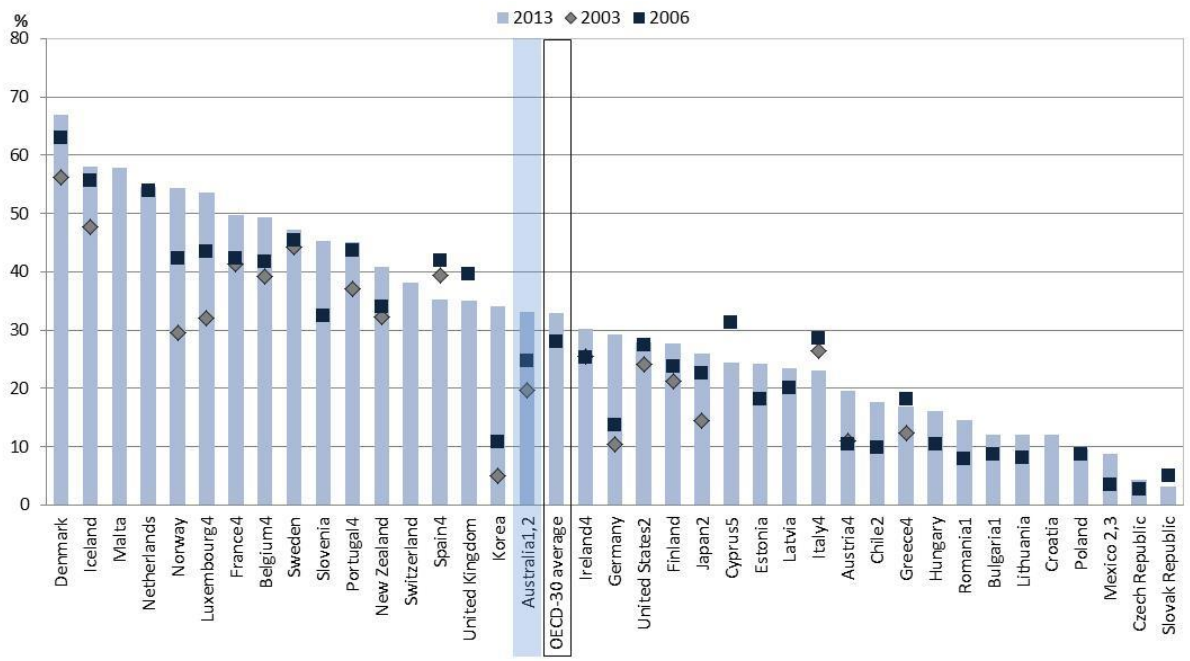
Section 2. Policy outputs

Participation in early childhood education and care services

Average participation rates of 0-2 year-olds in formal childcare[6]

In Australia, around one third of 0-2 year-olds attended some form of formal childcare (ISCED 0 and other registered ECEC services) in 2013, which is around the OECD average of 33%. Between 2003 and 2011, participation has increased in Australia by more than 13 percentage points. Denmark, Iceland, Luxembourg, Norway and the Netherlands stand out with participation rates above 50% (see Figure 4).

Figure 4. Participation rate in formal childcare (ISCED 0 and other registered ECEC services) among children aged 0-2 years (2003, 2006, 2013)



Notes: Data reflect children in day-care centres and preschool (both public and private) and those who are cared for by licensed childminders. It excludes informal services provided by relatives, friends or neighbours regardless of whether or not the service is paid for.
Countries are ranked in descending order of the percentage of children under 3-years of age in formal childcare.
1. 2006 data for Australia refer to 2005, and for Bulgaria and Romania to 2007.
2. 2013 data for Japan refer to 2010, and for Australia, Chile, Mexico, and the United States to 2011
3. Data do not include services provided by the private sector.
4. 2003 data for Austria, Belgium, Luxembourg, France, Greece, Ireland, Italy, Spain refers to 2004, and for Australia and the United States to 2002.
5. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Commission: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: OECD (2015b), OECD Family Database, Table PF3.2.A, www.oecd.org/social/family/database.

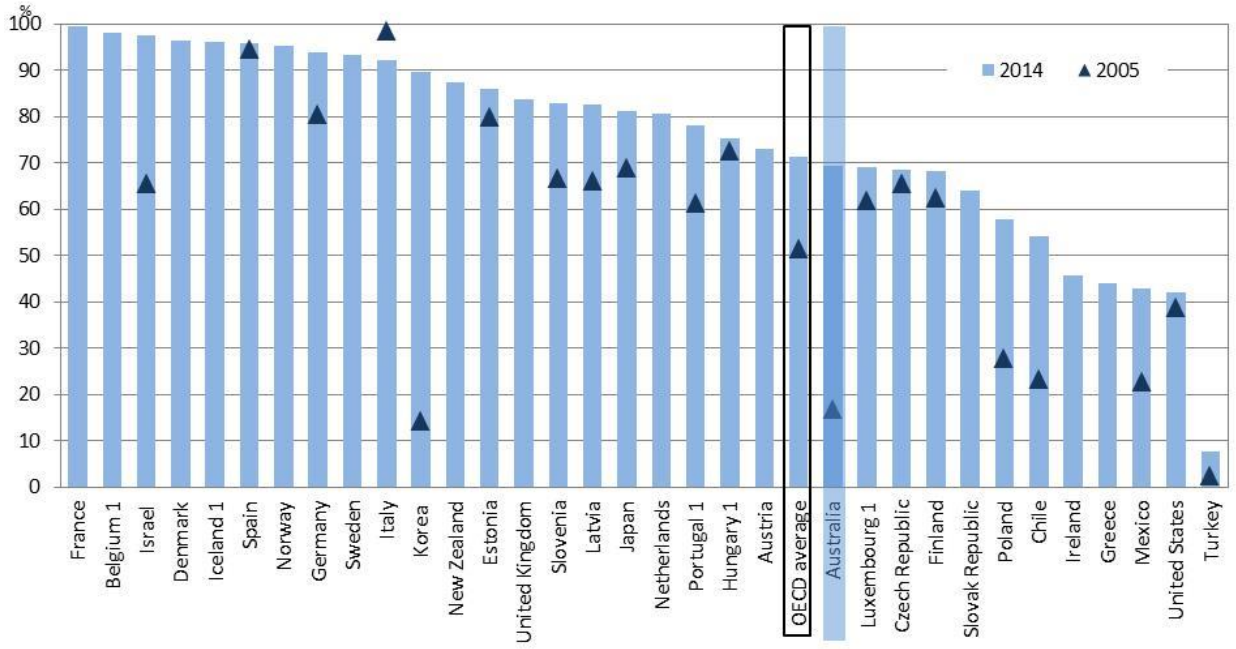
ECEC participation rates of 3 and 4 year-olds is around the OECD average

Early childhood education and care (ISCED 0)[7] is the first stage of organised instruction for many children and can, as such, play an important role in their development. While enrolment in these programmes is usually not mandatory and children can enter them at different ages, the majority of 3-4 year-olds in OECD countries is enrolled in early childhood education and care (mostly pre-primary education). On average across OECD countries, 71% of 3-year-olds and 86% of 4-year-olds attended education programmes (ISCED 0) in 2014, with wide variation across countries.

In Australia, 69% of 3-year-olds participated in early childhood education and care (ISCED 0) in 2014 (see Figure 5): 54% in early educational development (ISCED 01) and 15% in pre-primary education (ISCED 02). A higher share of 4-year-old Australians attended some form of early childhood education and care: 83% participated in pre-primary education (ISCED 02) in 2014, which is around the OECD average of 85%. Australia's participation rates at age 4 have risen dramatically since 2005, representing the fourth highest increase in the OECD.

Most OECD countries achieve full enrolment in pre-primary education for 5-year-olds. In Australia, 83% of 5-year-olds are in primary education (ISCED 1), while 18% are in pre-primary education (ISCED 02). Participation in primary education from the age of 5 is also common in Ireland, New Zealand and the United Kingdom, where nearly all 5-year-olds are enrolled in primary school (OECD, 2016a, Table C2.1).

Figure 5. Enrolment rates at age 3 in early childhood education and care (2005 and 2014)



Notes: Countries are ranked in descending order of the enrolment rates of 3-year-olds in 2014.
1. Year of reference 2013 instead of 2014.

Source: OECD (2016), *Education at a Glance 2016: OECD Indicators*, Table C2.1, http://dx.doi.org/10.1787/888933398291.

Early childhood education and care (ISCED 0), as well as primary and secondary education, is mostly organised in public institutions in OECD countries and, on average, 68% of pre-primary education pupils (3-5 year-olds) were enrolled in public institutions in 2014. Only in early childhood development programmes (0-2 year-olds) were there more children enrolled in private institutions (58%) than in public institutions (42%) in 2014. In Australia, the majority (77%) of pre-primary pupils was enrolled in government-dependent private institutions in 2013, while 23% of pre-primary pupils attended a public setting (OECD, 2016a, Table C2.2).

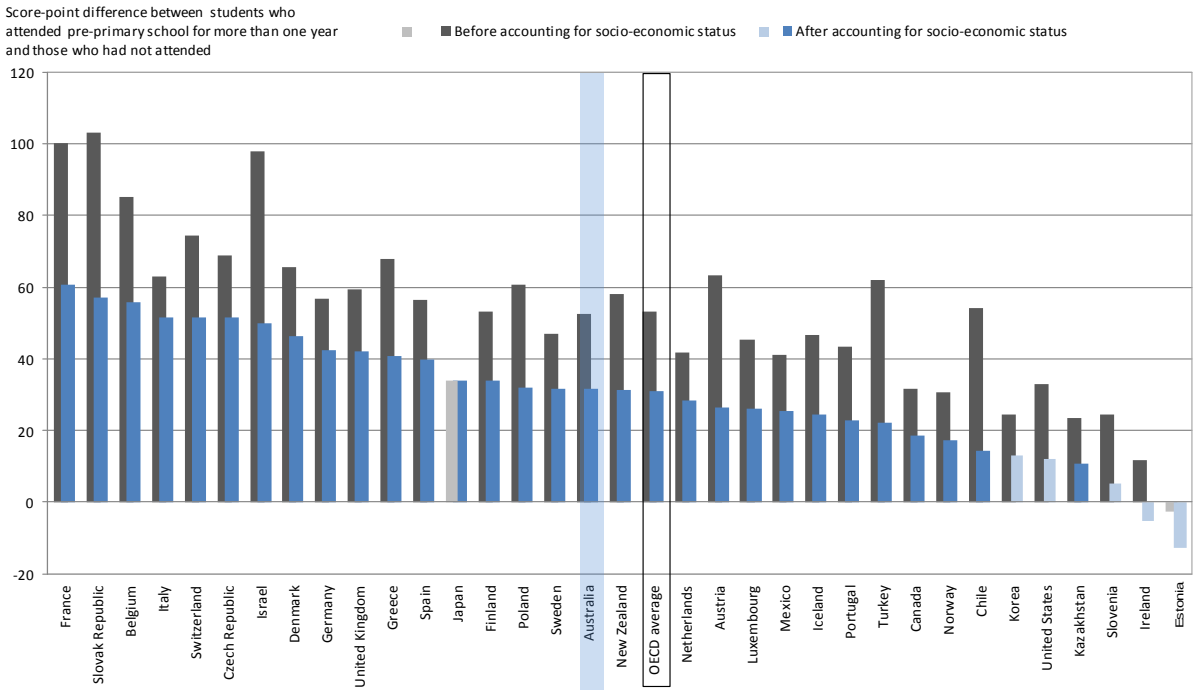
Section 3. Policy outcomes

The association between attending pre-primary education and 15-year-olds' mathematics performance is similar to the OECD average

Research in neurosciences has shown that the brain sensitivity of highly important developmental areas, such as emotional control, social skills, language and numeracy peak in the first three years of a child's life (Gambaro et al., 2014). These findings indicate that the first years of children's life are crucial for their later development and learning. High quality ECEC can stimulate the development of these skills, which highlights the importance of early development programmes and their level of quality (OECD, 2006, 2012).

A strong start in education through ECEC is associated with higher performance in adolescence. PISA results show that 15-year-olds who attended a pre-primary education programme tend to perform better than students who did not attend pre-primary education. The percentage of 15-year-olds in Australia who reported not attending pre-primary education in PISA 2012 was low (4.5% compared with 7.1% across the OECD, see Figure 6). Notably, children from a lower socio-economic background and in socio-economically disadvantaged schools were less likely to have participated in pre-primary education. Nevertheless, the benefits associated with pre-primary education remain even after accounting for students' socio-economic background. In Australia, the difference in PISA mathematics scores between 15-year-old students who had attended more than one year of pre-primary education and those who had not attended pre-primary education was 32 score points, after accounting for socio-economic background. This is the equivalent of almost one year of formal schooling[8] (similar to the OECD average difference of 31 score points) (see Figure 6).

Figure 6. Difference in mathematics performance of 15-year-olds, by attendance in a pre-primary education programme (2012)



Participation rates (%)

Pre-primary	FRA	SVK	BEL	ITA	CHE	CZR	ISR	DNK	DEU	GBR	GRE	ESP	JPN	FIN	POL	SWE	AUS	NZL	OECD	NLD	AUT	LUX	MEX	ISL	POR	TUR	CAN	NOR	CHL	KOR	USA	SVN	IRE	EST
None	1.7	6.8	2.3	4.3	1.8	3.2	2.1	1.0	3.2	4.7	4.6	5.9	0.8	2.4	2.5	8.1	4.5	9.1	7.1	2.3	1.8	4.6	9.4	2.0	14.9	70.3	9.0	7.9	9.2	4.5	1.4	14.6	13.6	7.3
<= 1 year	6.3	13.1	4.5	8.0	25.0	8.7	16.4	20.0	11.0	26.0	27.4	8.3	2.2	34.9	46.4	20.4	43.6	19.4	18.8	2.7	10.5	12.8	18.7	3.2	20.7	21.0	40.4	5.7	56.4	12.6	24.0	12.8	43.6	8.7
> 1 year	92.0	80.1	93.2	87.7	73.1	88.1	81.5	79.0	85.7	69.3	68.0	85.9	96.9	62.7	51.1	71.5	51.9	71.5	74.1	95.0	87.7	82.6	71.8	94.7	64.4	8.7	50.6	86.4	34.4	82.8	74.6	72.6	42.8	84.0

Notes: Score-point differences that are statistically significant are marked in a darker tone.
Countries and economies are ranked in descending order of the score-point difference in mathematics performance between students who reported that they had attended pre-primary education (ISCED 0) for more than one year and those who had not attended pre-primary education, after accounting for socio-economic status.
Participation rates in pre-primary education are drawn from reports of 15-year old students participating in PISA 2012.

Source: OECD (2013), *PISA 2012 Results: Excellence through Equity (Volume II): Giving Every Student the Chance to Succeed,* Figure II.4.11, http://dx.doi.org/10.1787/9789264201132-en.

PISA data also show that the correlation between enrolment in pre-primary education and performance at the age of 15 is generally stronger in education systems where participation in pre-primary education lasts more than one year, and the link is more pronounced in settings where the student-to-teaching-staff ratio and public expenditure per student are higher (OECD, 2013). In other words: input policies, such as the student-to-teaching-staff ratio, are associated with learning outcomes. However, little comparative data exists to determine under what conditions ECEC services are most beneficial for children, and what aspects are the most beneficial to the child. The OECD is currently developing a study that will provide information on the factors that support quality and equity in the early years (see Box 2).

Box 2. The development of international data on quality in early education and care

The OECD programme of work on ECEC includes a series of projects to develop the extent of available data on ECEC. These include:

The TALIS Starting Strong Survey: is an international survey of ECEC staff and the quality of the learning and well-being environment in different ECEC settings across OECD member and non-member economies. The objective is to collect data on staff characteristics, pre-service and in-service education, pedagogical practices and beliefs, organisation and management, and working conditions to give countries an internationally framed assessment of what actually happens in their ECEC settings, i.e. the quality of the learning and well-being environment children experience (instrument development and pilot study in 20116, field trial in 2017, main study in 2018 and reporting in 2019).

The International Early Learning (for Child Well-being) Study seeks to provide reliable, comparative information on the social, emotional and cognitive development of children to assist countries to improve children's outcomes. It will measure children's early learning outcomes, at approximately five years of age, in the context of their ECEC experiences and home environments. The study will include a child assessment component as well as a parent questionnaire to gather information about the home learning environment. The study will be conducted in 3-6 countries from 2016 to 2019. Results on the study will be released in 2020.

A thematic study on transitions from ECEC to primary school will analyse country policies and practices in stimulating quality transitions from ECEC to primary education. This study will be based on existing literature and country background notes, which will form the basis of a comparative analytical report in 2017.

For more information on Early Childhood Education and Care, visit www.oecd.org/edu/earlychildhood.

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NOTES

1 Australian Government spending on ECEC is primarily through subsidies to families (via the Child Care Benefit and the Child Care Rebate). In the OECD reporting of data this expenditure is treated as a transfer to the private sector and is therefore reported as 'private expenditure'. This has the effect of understating the level of public funding for ECEC in Australia.

2 For example, in the Netherlands and Switzerland, the actual level of spending and enrolment in pre-primary education is likely to be underestimated in the absence of data on integrated programmes (some caution is required before drawing conclusions about the conditions of access and quality of education and care for young children).

3 Private sources include households and other private entities, such as private businesses and non-profit organisations (e.g., religious organisations, charitable organisations, and business and labour associations).

4 Child Care Benefit (CCB) is a means tested fee subsidy, payable to eligible parents using approved and registered care. The rate of CCB depends on a number of factors. The Australian Government also provides the Child Care Rebate (CCR), which is not means tested. The CCR covers 50% of the family's out-of-pocket childcare costs up to an annual limit per child, in addition to any other childcare assistance. The annual limit for CCR payable for childcare costs in 2013-14 was AUD 7 500 per child per year (country chapter for OECD series Benefits and Wages, www.oecd.org/els/social/workincentives).

5 The data refer to pre-primary teachers who teach in pre-primary education; only in Austria do data refer to primary teachers teaching in pre-primary education.

6 The OECD Family Database definition is used here. This defines "formal" childcare services provided to children aged 0-2 years including centre-based services, organised day care, pre-school and professional child-minders.

7 ISCED 0 refers to programmes classified as ISCED 01 (early childhood development) and ISCED 02 (pre-primary education) depending on the age of the child.

8 39 score points in mathematics correspond to the equivalent of one year of formal schooling (OECD, 2013).

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Table 1. Summary of ECEC indicators, Australia and OECD average

Indicator	Australia	OECD average	Ref. year	Table	Source
Policy inputs					
Expenditure					
Total expenditure on early childhood educational development (ISCED 01) as a percentage of GDP (%)	0.3	0.2	2013	Table C2.3	OECD (2016)
Total expenditure on pre-primary education (ISCED 02) as a percentage of GDP (%)	0.2	0.6	2013	Table C2.3	OECD (2016)
Total expenditure on all early childhood education (ISCED 0) as a percentage of GDP (%)	0.5	0.8	2013	Table C2.3	OECD (2016)
Proportion of total expenditure on early childhood educational development (ISCED 01) from public sources (%)	3.9	68.6	2013	Table C2.3	OECD (2016)
Proportion of total expenditure on pre-primary education (ISCED 0.2) from public sources (%)	41.9	82.9	2013	Table C2.3	OECD (2016)
Proportion of total expenditure on early childhood education (ISCED 01 & ISCED 02) from public sources (%)	19.7*	81.2	2013	Table C2.3	OECD (2016)
Annual expenditure per student on early childhood educational development (ISCED 01) (in USD)	11 852	12 501	2013	Table C2.3	OECD (2016)
Annual expenditure per student in pre-primary education (ISCED 02) (in USD)	13 171	8 070	2013	Table C2.3	OECD (2016)
Annual expenditure per student on early childhood education (ISCED 01 & ISCED 02) (in USD)	12 364	8 618	2013	Table C2.3	OECD (2016)
Quality of early childhood education and care services					
Ratio of pupils to teaching staff (in full-time equivalents) (ISCED 02)	5	14	2014	Table C2.2	OECD (2016)
Ratio of pupils to contact staff (teachers and teachers' aides) (in full-time equivalents) (ISCED 02)	4	12	2014	Table C2.2	OECD (2016)
Teachers' salaries					
Annual starting salary, typical training of pre-primary teachers in public institutions (in USD)	40 297	29 494	2014	Table D3.1a	OECD (2016)
Annual salary after 10 years of experience, typical training of pre-primary teachers in public institutions (in USD)	57 445	36 491	2014	Table D3.1a	OECD (2016)
Annual salary after 15 years of experience, typical training of pre-primary teachers in public institutions (in USD)	57 445	39 245	2014	Table D3.1a	OECD (2016)
Annual salary at top of scale, typical training of pre-primary teachers in public institutions (in USD)	57 717	47826	2014	Table D3.1a	OECD (2016)
Pre-primary teachers' salaries relative to earnings for full-time, full-year tertiary-educated workers based on teachers' attainment level (25-64 years-old) (ratio)	0.82	0.74	2014	Table D3.2a	OECD (2016)
Teachers characteristics					
Total duration of initial pre-primary teacher education (in years)	4	m	2013	Table D6.1a	OECD (2014)
Annual net teaching time of pre-primary teachers (in hours)	885	1005	2014	Table D4.1	OECD (2016)
Number of annual days of teaching (in days)	1977	1900	2014	Table D4.1	OECD (2016)
Policy outputs					
Participation in early childhood education and care services					
Participation rate in formal care and preschool services for children under 3 years (%)	33	33	2013	Chart PF3.2.A	OECD (2015b)
Participation rate in formal care and preschool services for children under 3 years, full-time equivalent (%)	m	35	2013	Chart PF3.2.B	OECD (2015b)
Average weekly hours in childcare among children under 3 years of age (in hours per week)	m	30	2013	Chart PF3.2.B	OECD (2015b)
Participation rates for 3 year olds in pre-primary education (%)	69	71	2014	Table C2.1	OECD (2016)

Table 1. Summary of ECEC indicators, Australia and OECD average (continued)

Indicator	Australia	OECD average	Ref. year	Table	Source
Policy outcomes					
Average mathematics performance of students with					
No pre-primary education attendance (score points)	463	451	2012	Table II.4.12	OECD (2013)
Pre-primary education attendance for one year or less (score points)	500	475	2012	Table II.4.12	OECD (2013)
Pre-primary education attendance for more than one year (score points)	516	504	2012	Table II.4.12	OECD (2013)
Difference in mathematics performance between students (after accounting for students' economic, social and cultural status)					
Difference between those who reported having attended pre-primary school for one year or less and those who had not attended pre-primary education (score points)	26	15	2012	Table II.4.12	OECD (2013)
Difference between those who reported having attended pre-primary school for more than one year and those who had not attended pre-primary education (score points)	32	31	2012	Table II.4.12	OECD (2013)

Notes: a - data are not applicable because the category does not apply; m – data are not available.
* These figures are not comparable because they do not include public subsidies to the private sector.