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Study of Early Education and Development (SEED): The cost and funding of early education

Research report

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Executive Summary

Introduction

Since the late 1990s, childcare policy in the UK has developed rapidly in two directions with the introduction of free early education for pre-school children to improve early child development and school readiness at age four and with the provision of financial support for the costs of childcare to enable and encourage parents to undertake paid employment. Robust evidence on the costs of delivering early education and childcare can help improve policy design for both these strands and allow measurement of the value for money of the policies. Recent reports have presented evidence on the costs of delivery and funding levels (NLH Partnership (2015) and Ceeda (2014)) and reviewed the drivers of costs (Department for Education (2015a)). This report provides further analysis using data from a survey of 166 childcare and early years settings covering all types of providers in England. This detailed data set allows a robust examination of the relationships between costs and a broad range of setting and local characteristics. This study also contains a specific element on the cost and revenue for early education for children with special educational needs and disabilities (SEND).

This work is part of the Study of Early Education and Development (SEED), a major eight year study commissioned by the Department for Education to explore how childcare and early education can give children the best start in life and the factors which are important for the delivery of high quality provision.¹ The study is being undertaken by NatCen Social Research, the University of Oxford, 4Children and Frontier Economics and is due for completion in 2020. This report is the first output from the value for money component. The collection of cost data was originally intended only to provide information for the cost side of the value for money analysis, but was extended to a larger survey with a wider remit to address broader questions about costs and funding for early education policy.

Methodology

The sample of settings for the cost data collection was selected from a pool of 675 settings that had taken part in an earlier stage of SEED of quality assessments, which itself had been drawn from settings used by parents in the SEED longitudinal survey of families and children. The sample of settings for cost visits was selected to broadly match the quality visit sample in a number of characteristics, subject to some “over-sampling” of maintained nursery school and LA/ Children’s Centre settings. In order to adjust the statistics and analysis to match the nationally representative distribution across different

¹ Further information about the SEED study can be found at <http://www.seed.natcen.ac.uk/> and reports published to date are available at <https://www.gov.uk/government/collections/study-of-early-education-and-development-seed>.

types of providers, the data was weighted throughout this report to match the distribution of places in the most recent 2013 Childcare and Early Years Providers Survey.

A total of 214 settings were approached for a visit to collect cost data and 166 visits were completed (a response rate of 78 percent). Visits were undertaken during April to December 2015. Cost and revenue data was collected using semi-structured face-to-face interviews (usually with setting managers) in order to ensure that complete and accurate information was obtained. Data was collected on the number and age of children in each session; time use and salaries for all staff; the time use of different rooms and venue costs; all other non-staff and non-venue costs; and the revenue sources for four age groups of children. All information was collected for a typical week in the month preceding the visit or for the most recent appropriate financial period.

Derivation of an estimate of the hourly cost of delivery per child required several steps. First, monetary values were imputed for any staff or venues provided free to the setting and for any missing free early entitlement funding rates. Any salaries reported as gross or net were also adjusted to employer cost. Second, all costs were allocated to specific sessions, to core running or to an age group. Finally, the average cost for each age group was calculated using each child's session costs plus an even distribution of all core costs according to the hours of care.

Two approaches were used to obtain a measure of the additional costs and revenue for children with special educational needs and disabilities (SEND). The first was a specific addition to the visit guide for mainstream settings collecting information on the additional resources required (and revenue) for each child with SEND which were valued using the cost information collected for that setting. It should be noted that the use of additional resources was provided as a subjective estimate by the interviewee rather than directly observed measurement and should be treated with due caution. The second approach was the collection of cost and revenue data from specifically identified SEND-specialist settings. For both approaches, the samples were small (22 children in 12 mainstream settings and 6 specialist settings) and the information they provided should therefore be treated as case studies.

Delivery costs

The average total weekly cost for a setting is £4,747. Unsurprisingly, average weekly costs are lowest for childminders (£797) due to their small scale, but maintained nursery schools and LA / children's centres have higher average total weekly costs (£11,144 and £9,178 respectively) than private, voluntary or nursery class settings (£6,307, £4,116 and £3,243 respectively). An examination of the sources of costs showed that:

- On average, 32 percent of costs are for core running such as general administration and 68 percent can be allocated to specific sessions with children.

- On average, 75 percent of costs are for staff, 12 percent for venue-related costs and 12 percent for other costs.
- Some settings use resources at no direct cost: 2 percent use venues for free, 13 percent use venues partially for free or subsidised, 4 percent use Local Authority staff for free and 15 percent use college students for free. But the average value of these resources over all settings is only 2 percent of all costs. In addition, 20 percent of all settings use some free volunteer staff but the average weekly hours worked by volunteer staff is only 5 and the average value of their time across all setting is 1 percent of total costs.

The mean hourly delivery cost per child is £4.58 for children under the age of two; £4.30 for two year olds; £3.72 for three/four year olds; and £3.91 for school children (when cared for in settings with preschool children) (table 1).

Table 1: Average hourly cost per child by age of child

Age of child	Mean	95% confidence interval for mean	Median	Number of obs.
Under two years old	£4.58	£4.31 - £4.85	£4.57	90
Two years old	£4.30	£4.01 - £4.60	£3.96	140
Three/four years old	£3.72	£3.47 - £3.96	£3.32	158
School children	£3.91	£3.16 - £4.65	£2.91	49
All ages	£4.05	£3.79 - £4.31	£3.64	160

Source: SEED

Notes: School children are those aged four and older and attending regular school but receiving childcare at other times in settings which primarily deliver care to preschool children.

There is considerable variation in hourly costs across settings and the median is lower than the mean within each age group suggesting a small number of unusually high cost settings. In addition, the percentage gap in the average hourly cost between two year olds and three and four year olds (13 percent) is smaller than might be expected from statutory minimum staff:child ratios (the expected gap being between 33 and 57 percent). Part of the reason for this is that core running costs are distributed evenly across all ages of children. But the staff session-specific gap is also lower than might be expected (20 percent) which might be explained by smaller differences in the staff:child ratios between the age groups than those in statutory minimum ratios and/or staff with higher hourly cost being employed for the older age group.

The variation in mean hourly cost was tested across a variety of setting and local characteristics which are potential cost drivers. These included organisation type (captured in six provider types and whether the provider is a single or multi-site provider);

geographic area (captured in region, urbanity and deprivation level); quality of early education (captured in the SEED measure based on ITERS, ECERS and SSTEW² and whether the setting is graduate-led); economies of scale or scope (captured in setting size and child profile); and occupancy (captured in the calendar month when costs were measured).

Table 2 shows that mean hourly costs for three/four year olds are higher for maintained nursery schools, LA/children’s centres and childminders than for nursery classes, private and voluntary settings.³ These differences are statistically significant and are not explained by related differences in region, quality or age profile across provider types. The hourly cost is also statistically significantly higher for nursery classes over private settings. There is a similar pattern in hourly cost across provider types for two year olds. As shown in table 1 for all settings, the median cost is slightly lower than the mean cost for each provider type for both age groups, highlighting the presence of a small number of higher cost settings within each type of provider.

Table 2: Average hourly cost by provider type

Type of provider	Two years old			Three/four years old		
	Hourly cost		Number of obs.	Hourly cost		Number of obs.
	Mean	Median		Mean	Median	
Private	£3.80	£3.67	67	£3.12	£3.04	68
Voluntary	£4.01	£3.79	25	£3.45	£3.12	25
Nursery class	£5.09	£4.67	4	£3.96	£3.64	18
Maintained nursery school	£6.45	£6.35	7	£6.65	£6.51	10
LA / children’s centre	£5.96	£4.93	15	£5.33	£4.86	15
Childminder	£5.35	£5.03	22	£4.77	£4.61	22

Source: SEED

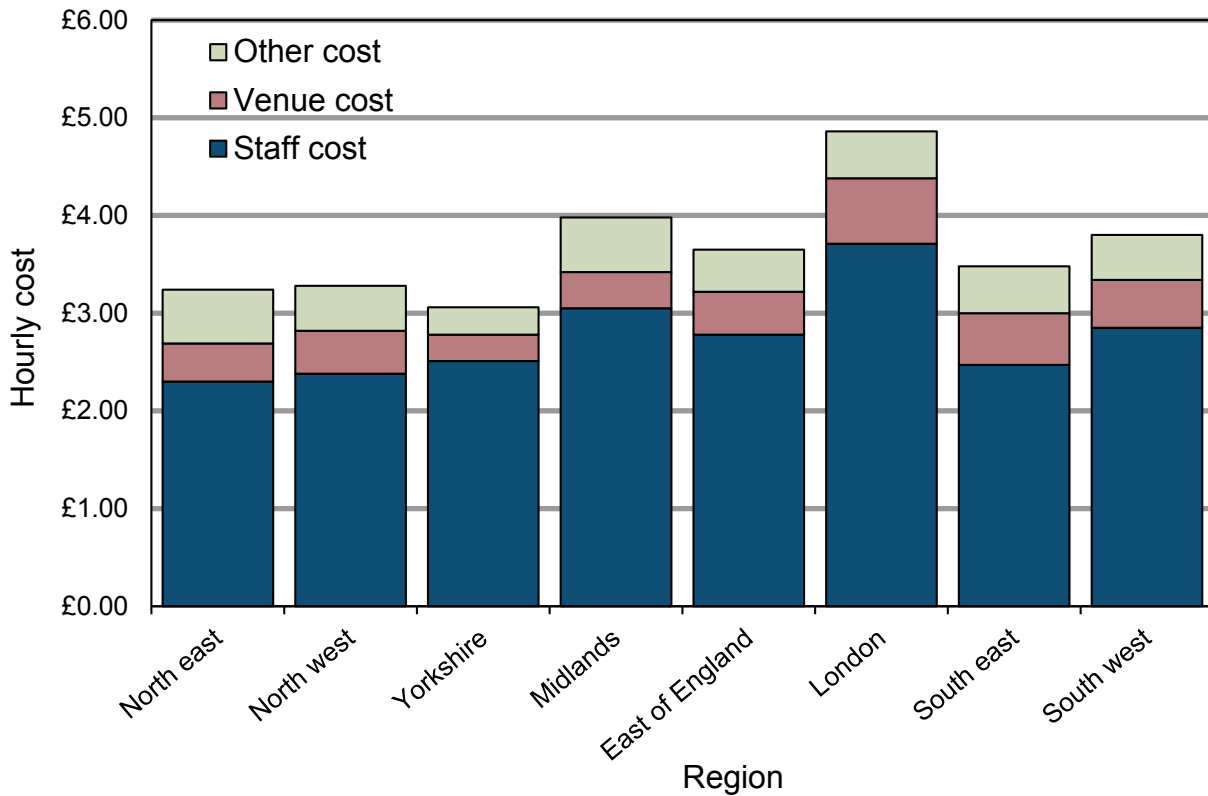
Figure 1 highlights the variation in hourly cost across the regions. The mean hourly cost for three/four year olds is substantially higher in London (£4.86) and somewhat higher in the Midlands (£3.98), South West (£3.79) and East of England (£3.65) than the other five regions (which range from £3.06 to £3.49). A similar pattern exists for the costs for two year old children. These regional differences are statistically significant and not explained

² See Annex A for a description of these quality measures.

³ A full description of the provider types is provided in Annex A, but it should be noted that a nursery class is a maintained early years class within a primary school and a maintained nursery school is a maintained school, purpose built and specifically for children in their early years, both with a qualified teacher present.

by related variations in provider types or quality levels, but appear to reflect differences in the cost of resources across the country. The division into different types of cost in figure 1 suggests these differences occur primarily in the staff and venue costs rather than other types of costs.

Figure 1: Average hourly cost by source and region for three/four year olds



Mean hourly costs are also slightly higher in urban than in rural areas and in more deprived areas over less deprived ones, but the differences are not statistically significant once allowance is made for other related factors.

Using direct measures of quality assessed within the SEED study, the mean hourly cost rises with quality level for two year olds and three/four year olds (table 3). However, these differences are not statistically significant, suggesting either that quality does not influence the hourly cost or that the differences in cost across quality level are too small to be identified in the sample analysed here. There is also little difference in cost between graduate-led settings and non-graduate-led settings.

Table 3: Average hourly cost by quality level

Quality level	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Lowest quality	£4.06	42	£3.58	53
Middle quality	£4.16	43	£3.58	49
Highest quality	£4.67	39	£4.00	42

Source: SEED

Small settings have a statistically significantly higher mean hourly cost than medium-sized or large settings for three/four year olds (£4.30 compared to £3.18 and £3.58 for medium and large settings respectively). The mean hourly cost for three/four year olds is statistically significantly higher in settings which only have preschool children aged three and four (£4.19) or only preschool children aged between two and four (£4.22) than settings which also have school children (£3.68), children under the age of two (£3.21) or children in all age groups (£3.74). A similar pattern exists for the hourly cost for two year olds. These differences are not explained by related differences in other factors including the type of provider for either age group.

Figure 2: Average hourly cost by source and month for three/four year olds

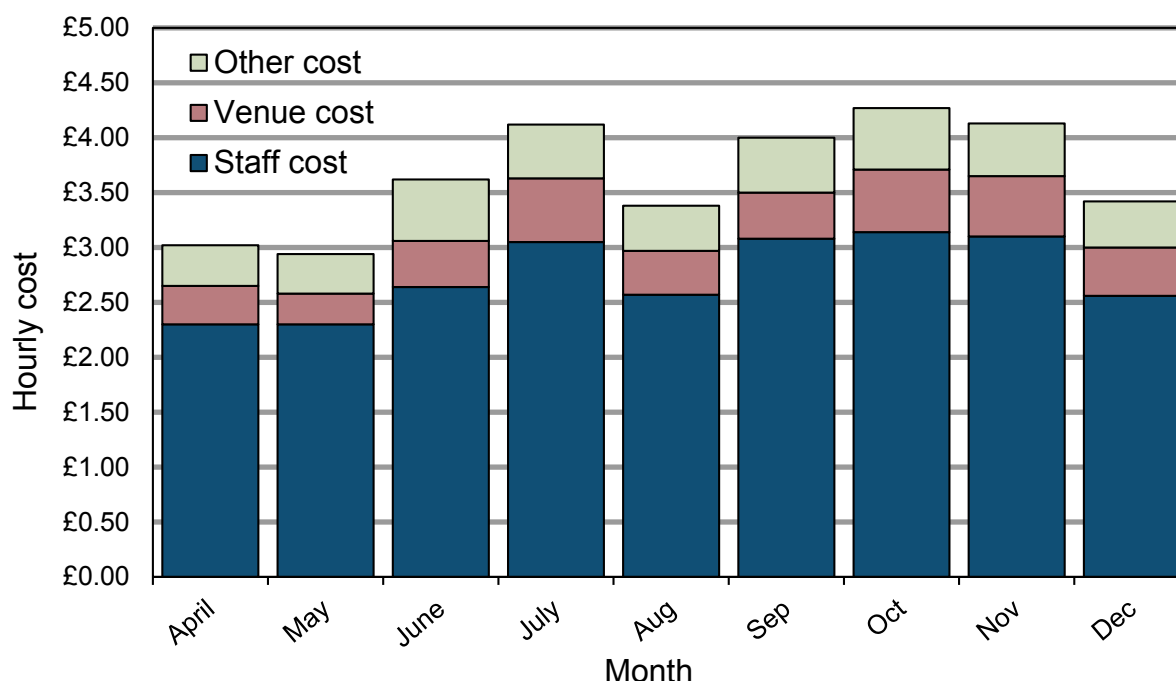


Figure 2 shows the variation in the mean hourly cost across calendar months for three/four year olds: the average hourly cost is statistically significantly higher in October

and November than in April and May.⁴ This supports the view that the departure of a cohort of children to start school in September reduces occupancy rates in the Autumn and raises average costs. There is a similar, but less marked pattern in costs across calendar months for two year old children, indicating a spillover effect on the younger age group.

The cost estimates from seven previous studies (listed in Annex B) were compared to those in this study. For PVI settings, the cost estimates in other studies are generally slightly higher than those in this study which may be explained by differences in methodological approach and sample. For other types of settings (nursery classes, LA / children's centres and childminders), the cost estimates in other studies are broadly similar to those presented in this report.

Revenue

Almost all revenue is from parental fees and the free early education entitlement (FEEE) for three/four year olds and the most disadvantaged two year olds. On average, across all four age groups of children, 48 percent of revenue is derived from parental fees, 49 percent from the FEEE and 3 percent from other sources, but most revenue comes from parental fees for private providers and childminders and most comes from the FEEE for voluntary and maintained providers.

Small proportions of settings have two year olds or three/four year olds only funded by parental fees (19 percent and 6 percent respectively) or only funded by the FEEE (6 percent and 15 percent respectively). Most settings have a mix of revenue from parental fees and the FEEE for both age groups.

Most settings (61 percent) have some other sources of revenue, but these are typically a small proportion of total revenue. Only 16 percent of settings receive more than 10 percent of their revenue from other sources and this is more likely among maintained providers. Across all settings, there are a broad range of other sources of revenue, but the most common ones received by settings are the Early Years Pupil Premium (25 percent of settings), funding for children with SEND (23 percent) and fundraising (21 percent).

Table 4 presents the average hourly parental fee and FEEE funding rate received by settings for different age groups. Interestingly, the average hourly parental fee is similar across the age groups. For two year olds, the mean hourly parental fee is £4.25 and the mean hourly FEEE rate is £4.92, indicating that, on average, settings receive £0.67 more per hour for two year olds from the FEEE than from parental fees. For three/four year olds, the mean hourly parental fee is £4.34 and the mean hourly FEEE rate is £3.90,

⁴ As data was collected during the period April to December 2015, there are no average hourly costs for January to March.

indicating that, on average, settings receive £0.44 less per hour for three and four year olds from the FEEE than from parental fees.

Table 4: Hourly parental fees and FEEE funding rates

	Under two years old	Two years old	Three/four years old	School children
All settings				
Mean hourly parental fee	£4.44	£4.29	£4.33	£4.17
Mean hourly FEEE rate	n/a	£4.93	£3.93	n/a
Settings with parental fees and FEEE				
Mean hourly parental fee	n/a	£4.25	£4.34	n/a
Mean hourly FEEE rate	n/a	£4.92	£3.90	n/a
Difference: FEEE minus average hourly fee	n/a	£0.67	- £0.44	n/a

Source: SEED

There is a perception that parental fees across age groups are structured to “smooth” some of the cost differences across age groups, with parents of younger, higher cost children paying less relative to parents with older, lower cost children. Measuring such cross subsidisation in revenue across different ages of children is complicated by the facts that both hourly costs and hourly revenue rates vary with the age of child; that settings receive sources of revenue not allocated to specific children; and that settings may be operating in overall surplus or loss. However, using a measure which compares the ratio of revenue to cost for each age group with the setting-level average, it is estimated that the average relative proportion of costs paid by children under the age of two is 86 percent, but 98 percent for two year olds, 103 percent for three/four years old and 109 percent for school children. This pattern of cross-subsidisation from older to younger children is strongest in private and voluntary settings with more mixed patterns for maintained settings and childminders, possibly reflecting a greater need for the smoothing of parental fees over the child’s age in private and voluntary settings.

The rate of surplus was analysed as the ratio between the total revenue and the total costs for each setting. The average surplus rate is 1.19 (i.e. a 19 percent surplus), but it is statistically significantly higher for private settings than for maintained nursery schools, LA / children’s centres and childminders (table 5). The average surplus rates for voluntary settings and nursery classes lie between these two groups and are statistically significantly higher than for childminders. However, it should be noted that the cost estimates in this study make no allowance for a rate of surplus to fund investments, an issue of particular importance for private, voluntary and childminder settings.

Table 5: Rate of surplus by provider type

Type of provider	Surplus rate: ratio of total revenue to total cost	Number of obs.
Private	1.30	65
Voluntary	1.18	25
Nursery class	1.17	18
Maintained nursery school	0.98	10
LA / children's centre	1.01	15
Childminder	1.01	24
All types	1.19	157

Source: SEED

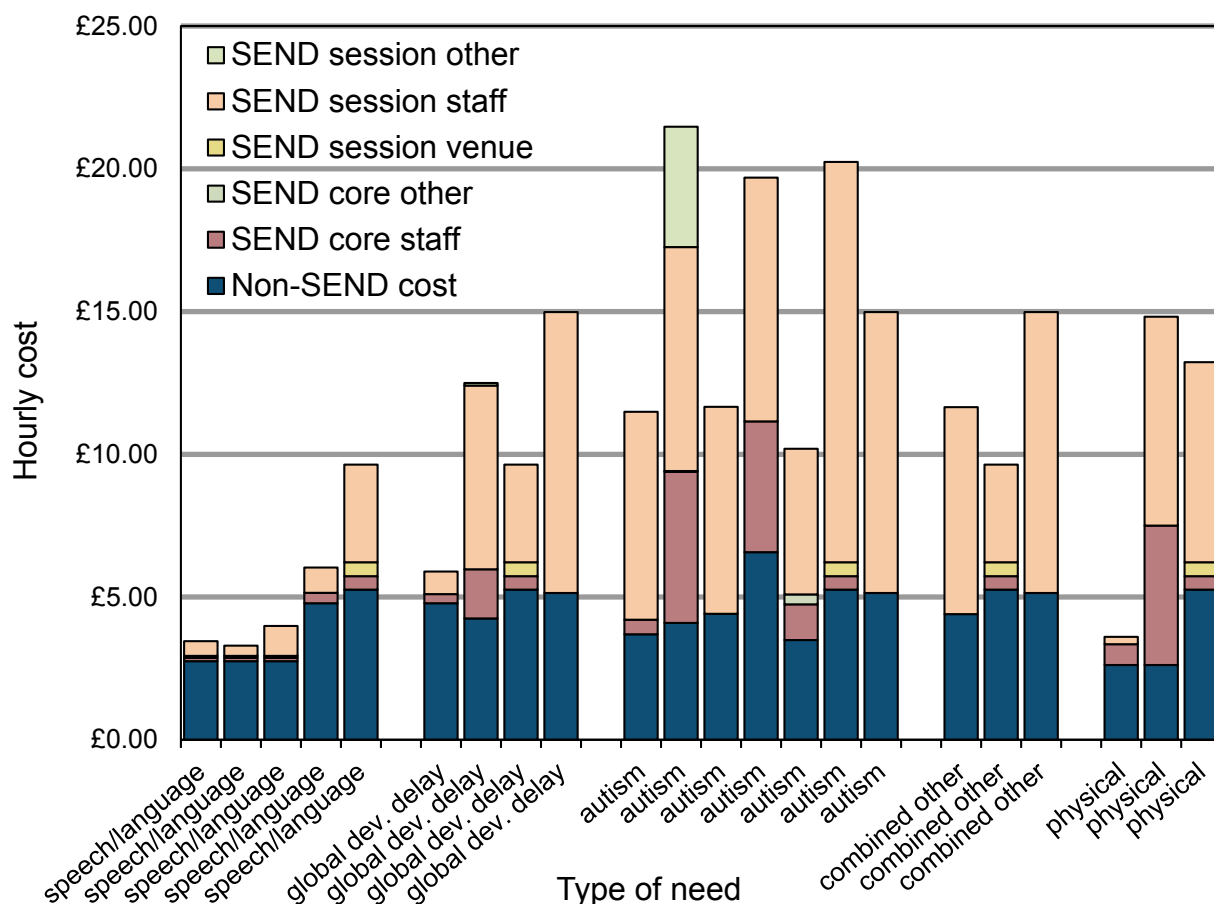
There are also statistically significant differences in the rate of surplus across region, deprivation level, size of provider and calendar month which tend to inversely mirror the patterns in hourly cost. The variation in hourly cost across these characteristics combined with much less variation in hourly revenue means that characteristics associated with lower hourly costs tend to also be associated with higher rates of surplus. For example, surplus rates tend to be higher in Yorkshire, in the least deprived quintile of areas, for middle-sized and large settings and in the months of April, May, June and August.

Costs and revenue for children with SEND

The cost of the additional resources required for children with SEND in mainstream settings were analysed for a small sample of 22 children in 12 settings who were mostly aged three or four (only three children were aged two). These costs are additional to the average amounts for all children of the same age in the setting. The analysis indicates that additional hourly costs are lower (between £1 and £4) for children with a speech/language need than those for children with autism, combined other needs or physical needs (between £5 and £17 in all but one case) (figure 3). There is also a very wide range of additional cost within these three higher cost categories. The additional costs for children in the remaining category of global delayed development⁵ are dichotomous with half having relatively low costs and the other half higher ones. Most of the additional cost is due to additional staff during sessions, although additional staff cost for core running activities is also an important factor.

⁵ Global development delay is defined as a significant delay in two or more development domains such as motor skills, speech and language development, cognitive development, social and emotional development and daily activities.

Figure 3: Hourly cost for children with SEND



In the small sample considered here, few children with SEND are funded by parental fees, but all receive FEEE funding. Just over half of the children receive some SEND-specific funding and this is more prevalent among those with needs beyond speech/language development. The hourly amount of SEND funding varies enormously, from £1 to almost £9 per hour. Across all types of need, the average hourly additional SEND cost is £6.88 and the average hourly SEND-specific funding is £2.76, leaving an average gap between SEND-related costs and SEND-related funding of just over £4.

Of the six SEND specialist settings, three of the settings (one private, one voluntary and one maintained nursery school) have cost and revenue levels which, although slightly on the high side, fit within the normal ranges for mainstream settings. The remaining three settings (two voluntary and one LA / children’s centres) have substantially higher mean hourly costs than mainstream settings of the same type, but only one (the LA / children’s centre setting) receives sufficiently high revenue for sustainability. However, all three settings receive an unusually high proportion of their revenue from other sources, suggesting that they do not operate on the same type of financial model as mainstream settings. This dichotomy in the costs and revenue of these specialist settings could reflect differences in either the proportion of children with SEND in these settings (specialist by no means implies that all children have SEND) or in the type of SEND within each setting.

The evidence from these case studies suggests both that the cost of delivering early education to children with SEND can vary considerably across the type of need and that additional funding for children with SEND either in mainstream settings or in specialist SEND settings tends to be insufficient to cover these additional costs of delivery. However, the small number of case studies and the subjective nature of the collection of information on the additional costs for children with SEND in mainstream settings means that this evidence should be treated with caution and requiring further research.

Conclusions

The analysis presented here leads to several, somewhat disparate, comments around the current discussion of early education and childcare policy:

- Designing efficient levels of FEEE funding which are financially sustainable for settings is challenging for several reasons. First, there is substantial variation in the hourly cost of delivery. Second, settings tend to operate under complex financial models involving cross-subsidisation between different ages of children and across different time periods. Third, there is a need to better understand the drivers of the surpluses in revenue over costs.
- There is some limited evidence that the current system does not adequately deliver the child-specific financial support required for children with SEND, but further, more robust, research is required on this issue.
- Exploring the reasons why delivery costs vary across provider types might offer new insights on how early education and childcare could be delivered more efficiently at lower cost. Greater efficiency in the use of staff time is a key potential option to reduce costs, but may be limited by the complexity of settings' staffing models.
- The evidence indicates that higher quality (captured in the SEED direct measures or in settings being graduate-led) does not involve substantially higher cost. Moreover, higher funding or subsidy levels provide the opportunity for providers to deliver or parents to choose higher quality, but do not guarantee that they will do so. An effective financial incentive would require higher funding or subsidy levels to be attached to higher quality provision or use.
- The variation in the cost of different options for the delivery of the FEEE suggests that some may offer better value for money than others, but these costs need to be balanced against evidence on the financial value of the impacts to draw final conclusions on value for money.

1. Introduction

Since the late 1990s, childcare policy in the UK has developed rapidly in two directions with the introduction of free early education for pre-school children to improve early child development and school readiness at age four and with the provision of financial support for the costs of childcare to enable and encourage parents to undertake paid employment. Key policies have included the introduction of free 15-hour places for all three and four year olds and for two year olds from disadvantaged families (plus the forthcoming extension to 30 hours each week for three and four year old children with working parents in 2017⁶) and work-related support in the reimbursement of childcare expenses in tax credits and employer-supported childcare (the latter to be replaced by Tax Free Childcare in 2017). These policies have been underpinned by other measures to raise the quality and availability of provision and to support the development of a high quality workforce.

Robust evidence on the costs of delivering early education and childcare can help improve policy design and allow measurement of the value for money of these policies (see House of Lords (2014)). In particular, the forthcoming extension of the free places to 30 hours for children of working parents has re-ignited the discussion over whether funding levels for free places are sufficient to cover costs and allow providers to sustainably deliver free places (for example, see NDNA (2016)). In addition, continued concerns over the ability of working parents to afford rising childcare costs has raised questions of whether and how childcare could be delivered more efficiently and at lower cost to parents (for example, see Department for Education (2015a)).

Recent reports have presented evidence on the costs of delivery and funding levels (NLH Partnership (2015) and Ceeda (2014)) and reviewed the drivers of costs (Department for Education (2015a)). This report provides further analysis using data from a survey of 166 childcare and early years settings covering all types of providers in England. This detailed data set allows a robust examination of the relationships between costs and a broad range of setting and local characteristics. This study also contains a specific element on the cost and revenue for early education for children with special educational needs and disabilities (SEND).

This work is part of the Study of Early Education and Development (SEED), a major eight year study commissioned by the Department for Education to explore how childcare and early education can give children the best start in life and the factors which are important for the delivery of high quality provision.⁷ The study is being undertaken by NatCen Social Research, the University of Oxford, 4Children and Frontier Economics and is due

⁶ See Department for Education (2015b).

⁷ Further information about the SEED study can be found at <http://www.seed.natcen.ac.uk/> and reports published to date are available at <https://www.gov.uk/government/collections/study-of-early-education-and-development-seed>.

to be completed in 2020. The aim of SEED is to provide a robust evidence base to inform the development of policy to improve children's readiness for school by:

- Providing evidence of the impact of current early years provision on children's outcomes and a basis for the longitudinal assessment of the impact on later attainment.
- Assessing the role and influence of the quality of early education provision on children's outcomes.
- Assessing the overall value for money of early education and the relative value for money associated with different types (e.g. private, voluntary, maintained) and quality of provision.
- Exploring how parenting and the home learning environment interacts with early years education in affecting children's outcomes.

To address these aims, SEED has several inter-related research elements:

- A longitudinal survey of approximately 6,000 families with preschool children from the age of two to the end of key stage 1 (age seven).
- Around 1,000 visits to early years settings and to around 100 childminders to study the quality, characteristics and process of provision.
- Case studies of good practice in early years settings.
- A value for money study involving the collection of cost data from 166 early years settings.
- Qualitative studies of childminders and of early education provision for children with special educational needs and disabilities (SEND).

This report is the first output from the fourth, value for money component. The collection of cost data for this component was originally intended only to provide information for the cost side of the value for money analysis, but was extended to a larger survey with a wider remit to address broader questions about costs and funding for early education policy.

The remainder of this report is structured in the following way:

- Chapter two describes the data collection and the methodology used to estimate an hourly delivery cost for different ages of children.
- Chapter three presents a description of the cost structure for settings and analyses hourly cost and its relationships with a broad range of setting and local

characteristics. The final section in this chapter compares these hourly cost estimates with previous sources of evidence.

- Chapter four presents a description of revenue sources and analyses the relationships between parental fee and funding levels for free places and between total cost and total revenue levels.
- Chapter five considers the costs of delivery and revenue sources for children with special educational needs and disabilities (SEND), drawing on evidence from children with SEND in mainstream settings and from specialist SEND settings.
- Chapter six provides some conclusions on the lessons from this evidence.

2. Methodology

This chapter describes the methodology used to collect the cost and revenue data and to derive estimates of the average hourly delivery cost. The first section describes the selection of the sample, while the second and third sections present the methodology used to collect the cost data and calculate average delivery costs respectively. The final section describes how data was collected on the additional costs and revenue sources for children with special educational needs and disabilities (SEND).

2.1 Selection of the sample of settings

The sample of settings for the cost data collection was selected from a pool of 675 settings that had taken part in an earlier stage of SEED of quality assessments⁸ which itself had been drawn from settings used by parents in the SEED longitudinal survey of families and children. The cost visit sample was selected to broadly match the quality visit sample in a number of characteristics.⁹ In addition, some of the quality visits to settings only assessed quality for one of the two age groups (two year olds or three/four year olds) and priority in selection was given to those settings which had quality assessments for both age groups.

Table 6 presents the characteristics for the cost visit sample of 166 settings¹⁰, together with comparative statistics from the quality visit pool. A full description of the definition of the different characteristics is presented in Annex A. The distribution of the 166 settings across most characteristics is similar to that for the quality visits. For the type of setting, the proportion of settings which are maintained nursery schools or Local Authority / Children's Centres is slightly higher than in the quality visit sample as these types were oversampled in order to obtain a reasonable number of observations in these categories. In order to adjust the statistics and analysis to match the nationally representative distribution across different types of providers, the data was weighted throughout this report to match the distribution of places in the most recent Childcare and Early Years Providers Survey¹¹.

⁸ This pool of 675 settings were those that had been visited for quality assessments by the end of October 2015.

⁹ The distribution across the three quality groups within each provider type for the cost visit sample was also selected to be similar to that for the 675 settings with quality visits.

¹⁰ The 166 settings include both the 160 settings used in the main analysis and the six SEND specialist settings used in the SEND analysis. Exclusion of the six specialist SEND settings made no tangible difference to the statistics presented in this chapter and these six are included for completeness.

¹¹ The weights adjusted the sample to a distribution of 43 percent private, 21 percent voluntary, 14 percent nursery class, 2 percent maintained nursery school, 4 percent LA / children's centres and 16 percent childminder settings. These are the proportions of places in each provider type derived from tables 4.1a, 4.7c and 4.7d in Brind et al (2014), using an assumption that one third of the number of places in primary schools with reception and nursery classes are for children in nursery classes.

Table 6: Sample statistics

Setting characteristic	Cost visit sample		Quality visit sample
	Number of settings	Percentage of settings	
Provider type:			
Private	69	42%	48%
Voluntary	28	17%	21%
Nursery class	18	11%	9%
Maintained nursery school	11	7%	2%
Local Authority / Children's Centre	16	10%	6%
Childminder	24	14%	15%
Single site provider	133	80%	73%
Multiple site provider	33	20%	27%
Region			
North east	15	9%	10%
North west	19	11%	14%
Yorkshire and the Humber	17	10%	12%
Midlands	28	17%	16%
East of England	19	11%	7%
London	22	13%	18%
South east	25	15%	18%
South west	21	13%	6%
Rural area	20	12%	9%
Urban area	146	88%	91%
Quintile of Index of Multiple Deprivation (IMD) score:			
Q1 (least deprived)	27	16%	17%
Q2	31	19%	16%
Q3	39	23%	19%
Q4	35	21%	24%
Q5 (most deprived)	34	20%	24%
Quality group:			
Lowest quality	55	33%	37%
Middle quality	54	33%	36%
Highest quality	57	34%	27%
Not graduate-led	85	51%	56%
Graduate-led	81	49%	44%

Setting characteristic	Cost visit sample		Quality visit sample
	Number of settings	Percentage of settings	
Size:			
Small (35 places or less)	59	36%	34%
Medium (35 to 60 places)	53	32%	35%
Large (more than 60 places)	54	33%	30%
Child age profile:			
Only three/four year olds	35	21%	n/a
Only two and three/four year olds	55	33%	
Plus school children	12	7%	
Plus under twos	42	25%	
Plus school children and under twos (all)	18	11%	
Other mix	4	2%	

Source: SEED

Notes: The quality measure is described in Annex A and is a continuous measure divided into three discrete categories of lowest (<4.5), medium (>=4.5 and <5.5) and highest (>=5.5). The child age profile was only measured at the cost visits. School children are those aged four and older and attending regular school but receiving childcare at other times in settings which primarily deliver care to pre-school children.

Additional points to note about this sample include:

- The category of private type providers includes three independent school providers. The number of independent providers was limited by the small number of this type of setting in the quality visit sample¹² and the achieved sample was too small to be analysed independently.
- Similarly, the number of visits to settings in the East Midlands region was limited by the number of such settings in the quality visit sample (eight were achieved) and these were combined with settings in the West Midlands to create a single Midlands region.
- The discrete categories for quality and size of setting were constructed from continuous measures in the data to achieve roughly equal proportions and a reasonable number of observations in each category.

¹² All five independent providers in the quality visit sample were approached for cost visits and complete data obtained from three.

- Although not collected as part of the quality assessment visits, information on the age profile of children in attendance at each setting was collected at the cost visits as a potentially important factor in the cost of delivery.

2.2 Data collection

A total of 214 settings were initially approached for a visit to collect cost data with an introductory letter to the setting manager and a follow-up telephone call to make an appointment for a visit. Of the 214 settings initially approached to take part in the cost collection, 29 initially declined, 15 made and subsequently cancelled visit appointments and 4 were visited but it was not possible to obtain the required data. With 166 completed visits, the response rate from the initially selected 214 settings was 78 percent. This response rate varied across different types of settings from 60 percent for independent providers to 100 percent for maintained nursery schools. Visits were completed reasonably evenly throughout the April to December 2015 period, although slightly fewer settings were visited during August and slightly more during November to compensate for an anticipated smaller number in December.¹³

Prior to the visit, settings were given a list of broad areas that would be under discussion, but were not requested to undertake any preparation for the visit. Two researchers undertook each visit and the visits lasted an average 85 minutes, with the shortest taking 20 minutes and the longest taking 190 minutes¹⁴. Interviews were conducted with a single individual for 138 of the completed visits, with two individuals for 27 visits and with three individuals in one case. Interviews were conducted with owners or owner/managers (19), managers (105), business/finance managers or accountants (10), head teachers (24), teachers or nursery staff (10), parent organisation representatives (3) and childminders (24).

The cost data was collected using semi-structured face-to-face interviews for a combination of reasons. First, it was important to ensure that complete information would be collected from each setting. Unlike more conventional surveys, any missing information could invalidate all information collected from a setting by resulting in an understated cost. Second, prior to the visits it was not clear how settings record cost information and the types of records they hold on the usage of different resources. It was also uncertain that managers would easily understand what information was being requested without face-to-face explanation. Third, the amount and detail of data required from each setting was demanding: the presence and aid of researchers was felt to be required to assist setting managers in sourcing and providing the quantity of information

¹³ There was 1 interview at the end of March (included with April throughout) and 16 in April, 16 in May, 20 in June, 15 in July, 13 in August, 19 in September, 25 in October, 31 in November and 10 in December.

¹⁴ For childminders, the average visit time was 50 minutes and ranged from 20 minutes to 85 minutes. For other types of settings, the average visit time was 90 minutes and ranged from 30 minutes to 190 minutes.

required. Finally, requesting financial information, including salary levels for individual staff, was thought to require a direct reassurance of confidentiality. Undertaking the visits confirmed most of these prior concerns and the need for face-to-face interviews. The settings were found to record their data in a variety of ways and to have differing interpretations of the information being requested. Substantial on-site explanation and encouragement was required in most cases to collect the necessary data. Moreover, the time burden on settings was greatly reduced in many cases by interviewers being able to immediately identify whether settings' records of particular information could be converted into the required data and the interviewers undertaking the sometimes considerable conversion work after the visit.

Five areas of information were collected at the visits:

- Sessions: A list of sessions (defined as periods of time when a group of children were cared for by the same staff in a particular room¹⁵); the length of the session; the number of such sessions each week; the room used for the session; and the number of children in attendance in each of four age groups (under two, two years old, three and four years old and school children¹⁶).
- Staff: A list of all individuals who work in or for the setting, including setting employees, volunteers and individuals paid or employed outside of the setting (for example, school administrative staff or head office staff in the case of multiple site settings); the time they spend on specific sessions and on "core running" (that is, activities essential to the general running of the setting but not directly attributable to a particular session such as setting administration or team meetings); salary or, if the salary was unknown, other information such as age or qualifications to impute the salary.
- Venues: A list of the different rooms and other spaces used by the setting; the approximate share of the setting floor space for each venue¹⁷; the proportion of time the space was used by the setting (in a few cases where space was shared with another organisation); the time that the space was used for specific sessions or core running; and information on total venue costs for the setting (including rent, rates, utilities, cleaning, etc.).¹⁸
- Other costs: A list of all non-staff and non-venue costs (such as those for food, stationary and other materials) paid by the setting and whether any of these costs

¹⁵ In some cases, there were some short initial or final periods in the day when children arrived or left gradually. Numbers for these sessions were estimated as the average number in the room across the session.

¹⁶ School children are those aged four or over and attending regular school.

¹⁷ This was often achieved with the help of floor plans for the setting.

¹⁸ In some cases, the setting used more than one location and the same information was collected for all locations.

were directly attributable to a specific session or age of child (such as the cost of nappies). These other costs did not include any returns to investments in the setting or business (such as interest on loans or overdrafts or payments to owners) or expenditures for ongoing investments.¹⁹

- Revenue sources: For each of the four age groups, the number of children funded by parental fees or by the free entitlement (or both); amounts received for each revenue source; and total hours covered by the amounts. Information was also collected on other sources of revenue.

Information was collected for a typical week in the month preceding the visit. This snapshot criteria was used because collecting information on numbers of children and staffing rotas would have been problematic over a longer period. It also proved valuable in capturing the effect of changing occupancy rates on costs over the school year. Many costs were recorded on an annual basis and were pro-rated to a weekly basis so that delivery in the snapshot period was matched with the share of annual costs which covered that period.

2.3 Calculation of average cost and hourly revenue rates

The key objective was to derive a measure of the cost of delivering one hour of early education for each child in the four age groups. This was undertaken in three steps.

The first step involved the estimation of missing information and conversion of the raw information to comparative metrics using a week as the period of measurement. Missing sources of information was imputed for some rental values, salaries and free early education entitlement (FEEE) funding rates. Table 7 shows the proportion of settings of different provider types which required some values to be imputed.

In order to obtain a measure of the total cost of delivery, it was necessary to impute an implicit rental cost for settings which either owned their premises or were allowed to use premises owned by another organisation at no cost. Of the 187 venues used across the 166 settings, 72 were rented and the rent amount was reported; 23 were owned and 7 were used free of charge but the interviewee reported a rental value; and the remaining 85 required the rent amount to be imputed²⁰. Most of the imputations (75) were obtained from the Valuation Office Agency's most recent rateable values for commercial

¹⁹ Interviewers checked that such expenditures were not included in the other costs. Ongoing maintenance costs were distinguished from investments as being regular outgoings to maintain the value of the setting or the business rather than one-off substantial expenditures to improve facilities or increase capacity which raised the value of the setting or business.

²⁰ Of these 85, 37 were owned, 47 were used free of charge and 1 was rented but the interviewee could not report the amount of rent paid.

properties, uprated to 2015 using growth rates in property prices²¹. Most of the buildings for venues were specifically listed, but imputed rental values for a few venues which were not listed were estimated based on floor space and rental values for listed venues in the same postcode. The remaining 10 venues were domestic properties (typically childminders) and the rent value was imputed using values of similar properties in the same area on domestic rental websites²². As shown in table 7, 46 percent of all settings had some rent imputation but the proportion was much higher for the maintained settings (nursery classes, maintained nursery schools and Local Authority / Children’s Centres) who were likely to use a Local Authority venue without any direct cost.

Table 7: Number of settings with imputations

Type of provider	Rent imputations		Salary imputations		Pension rate imputations		FEEE rate imputations	
	Num.	%	Num.	%	Num.	%	Num.	%
Private	26	38%	27	39%	13	19%	13	19%
Voluntary	8	29%	11	39%	3	11%	3	11%
Nursery class	15	83%	9	50%	3	17%	6	33%
Maintained nursery school	11	100%	3	27%	3	27%	2	18%
LA / children’s centre	10	63%	8	50%	3	19%	2	13%
Childminder	7	29%	18	75%	9	38%	4	17%
All	77	46%	76	46%	34	20%	30	18%

Source: SEED

Table 7 shows that 46 percent of settings had some salary information imputed, but few individuals within each setting had missing salary information which had to be imputed. Of the 2,623 “staff”²³ recorded across the 166 settings, only 153 (6 percent) required a salary imputation. This proportion was much higher among childminders (58 percent) because childminders tend not to pay themselves a specific salary. Of the 127 non-childminder cases, 35 were employees for whom the interviewee could not report the

²¹ The VOA rateable values are available at <http://www.2010.voa.gov.uk/rli/en/basic/find> and were uprated using the Nationwide Housing Price Index available at <http://www.nationwide.co.uk/about/house-price-index/download-data#xtab:uk-series>.

²² These domestic rental websites are available at <http://www.rightmove.co.uk/> and <http://www.zoopla.co.uk/>

²³ In some cases, small numbers of staff (typically working short hours) were grouped together in the collection of salary and time usage information and the number of specific individuals was slightly higher than this. For example, two or three volunteers or college students each working two or three hours a week might be clustered into one group.

salary (including head office and other school staff); 37 were volunteers, 9 were provided free of charge by Local Authorities and 46 were college students. Dependent upon the job description²⁴, salaries were either imputed as the ONS average for the reported qualification level (77 cases) or as the age-appropriate minimum wage rate²⁵. For non-childminder settings, these salary imputations constituted a very small proportion of total costs due to the small number of individuals involved and the shorter hours worked by these individuals²⁶. For childminders, the imputations were much more important and there was no a priori rationale for using qualification or minimum wage as the imputed rate. However, for the 19 cases where a salary was recorded for childminder staff (either as the rate the childminder reported that they implicitly earned or estimated they would earn for undertaking similar work as an employee or as the rate paid to additional staff), the average hourly salary was £6.50 and coincidentally equal to the adult minimum wage for most of the fieldwork period. For the 26 cases where no salary was recorded for childminders, the salary was therefore imputed at the minimum wage.

To measure the total cost of delivery, the employer cost for staff (including income tax and national insurance payments and pension contributions) was required. For many settings, the salary information was provided as gross (and occasionally net) amounts without these additions and the employer cost amounts were calculated for each staff member using the tax and national insurance parameters for the tax year 2015/6. However, pension contribution rates could not always be reported and had to be imputed for 14 percent of staff whose salary was reported as a gross or net amount. The pension contribution rate was imputed at the average rate by provider type (including zero amounts for settings with zero contributions). These rates were 0.4 percent for private providers; 0.4 percent for voluntary providers; 0 percent for independent providers; 10.6 percent for nursery classes; 13.8 percent for maintained nursery schools; 6.3 percent for Local Authority / children's centres and 0 percent for childminders. As shown in table 7, these imputations were only required for 20 percent of all settings (and sometimes only for a few individual staff in the setting) with no pattern in the proportion across provider types.

On the revenue side, the FEEE rate was imputed for 42 rates in 30 settings (of the 153 settings receiving FEEE funding) using the Department for Education's Benchmarking tool for FEEE funding rates²⁷. The proportion of settings with this imputation is fairly

²⁴ In general, administrative or specifically-skilled staff from other organisations were imputed at the average qualification rate, but frontline staff were imputed at the minimum wage which was more typical of the pay rate observed for that type of work.

²⁵ The ONS average by qualification level is the median hourly pay from Q1 2010 from http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/dcp171776_229888.pdf, updated to January 2015 using the ONS earnings index. The minimum wage rates are from <https://www.gov.uk/national-minimum-wage-rates>.

²⁶ Average weekly hours were 10 for staff with qualification level imputations and 24 hours for staff with minimum wage imputations.

²⁷ Available at <https://www.gov.uk/government/publications/early-years-benchmarking-tool>.

evenly distributed across setting types (table 7). For two year old FEEE rates, 18 rates were imputed using a uniform rate across all providers in the Local Authority. For three and four year olds, 1 rate was imputed using a uniform rate, 19 rates according to provider type, 3 rates with a deprivation supplement and 1 rate with quality supplement.

The second step in the calculation of the average hourly cost involved the allocation of each of the costs to specific sessions, to core running or to an age group. This involved the following complexities:

- For some staff, managers reported a list of sessions that the individual assisted and a proportion of the individual's time was allocated to each session in accordance with the session hours.
- Venue costs were divided across rooms and spaces in accordance with the relative floor space and proportion of time that the rooms and spaces were used for specific sessions or core running.²⁸
- Other (non-staff and non-venue) costs reported as being for a specific session(s) were assigned to that session(s).
- Other (non-staff and non-venue) costs reported as being for a specific age group were assigned to that age group.

The final step calculated the average cost for each age group. This involved:

- The allocation of session-specific costs across the age groups within each session according to the proportion of hours for each age group in the session.
- The summation of the session-specific cost and any age-specific other costs for each age group to produce the total session-specific cost for that age group²⁹. This was then divided by the total number of hours for all children in each age group to produce the average session-specific hourly cost per child for each age.
- The division of the total core costs by the total number of hours for all children in the setting to produce the average hourly core cost per child for the setting. By construction, this is identical for all ages of children in the setting.
- The summation of the session-specific hourly cost per child and the hourly core cost per child to produce the overall hourly cost per child for each age group.

²⁸ This implicitly means that the cost of any unused time in rooms and spaces is allocated to the sessions and core running that use those rooms or spaces at other times. This is consistent with the Green Book approach that the value of land should include the cost of retaining vacant land.

²⁹ This implicitly means that other costs reported as being for a specific age of child are treated as session-specific costs rather than core costs. There were few cases of these and the values involved were small.

As noted in the description of the data collection, the cost measure does not include any returns to investments in the setting or business (such as payments for interest on loans or overdrafts or payments to owners) or expenditures on investments which improve facilities or increase capacity and raise the value of the setting or business. This approach was taken partly to identify a measure of ongoing cost which is comparable across all types of settings and partly because the collection of consistent information on investments and returns would have extremely demanding and difficult to obtain. The implications of this limitation are discussed in the final chapter.

2.4 Collection of data for children with SEND

Two approaches were used to obtain a measure of the additional costs and funding for children with special educational needs and disabilities (SEND).

The first approach was a specific addition to the visit guide for mainstream settings capturing the additional costs and revenue sources for children with SEND attending a mainstream setting. This addition asked for a list of children attending the setting who had a formal assessment of SEND either as a statement or as an EHC plan³⁰. For each such child, information was then collected on the type of SEND, the hours of attendance and revenue sources for the child, and whether the child required any additional resources in terms of staffing, room space or other costs, either for the specific session attended or as an additional need for core running. The cost of these additional resources was then valued using the information on costs collected for the setting. This information was collected for only 22 children in 12 settings. In addition, the information was provided as a subjective estimate by the interviewee rather than directly observed measurement. Hence, the estimates should be treated as case studies of subjective measurement of the additional costs, but they can nevertheless provide some insight into the nature and magnitude of those additional costs.

The second approach used the identification of SEND-specialist settings and the collection of cost data and revenue information in the same way as for mainstream settings. These settings were identified in the previous stages of SEED, either as specialist provision by parents at the original interviews in the longitudinal study of families or by the consultants undertaking quality assessment visits on the basis of the services that were provided by the setting and the number of children with additional needs who attended the setting. Only a small number (six) of such SEND specialist settings were identified and, again, the information they provided should therefore be treated as case studies.³¹

³⁰ It should be noted that this differs from the definition of a child with SEND used in the SEED qualitative study of early education provision for children with SEND (Griggs & Bussard (2017)).

³¹ The original intention of the study was to visit 150 mainstream settings and 16 SEND specialist settings. But when only six specialist SEND settings could be identified, the supplementary section on costs for

children with SEND in mainstream settings was introduced and 10 additional mainstream settings visited (the target of 10 SEND supplementary sections achieved 12 completed).

3. Delivery costs

This chapter presents the cost of delivering early education for the 160 mainstream settings. The first section considers total costs for each setting and the division across different types of costs. The second and third sections focus on the hourly delivery cost per child for different ages of children and the following sections analyse how this hourly cost varies across different setting characteristics. The final section compares the cost estimates in this study with comparable measures from previous studies.

The key findings are:

- The average total weekly cost for a setting is just under £5,000, with around one third of costs attributable to core running activities and two thirds to specific sessions with children. On average, 75 percent of costs are for staff, 12 percent for venue-related costs and 12 percent for other costs. (Section 3.1)
- Around 20 percent of settings use free volunteer staff, but the value of this staff time averages only 1 percent of all costs. (Section 3.1)
- The mean hourly delivery cost per child is £4.58 for children under the age of two, £4.30 for two year olds and £3.72 for three/four year olds. (Section 3.2)
- The gap in the mean hourly cost between two year olds and three/four year olds (13 percent) is smaller than might be expected from statutory staff:child ratios (33 percent). This is only partly explained by core running and other non-staff costs: the staff session-specific gap (20 percent) is also lower than might be expected. (Section 3.3).
- The evidence suggests that the hourly cost is directly influenced by the type of provider, region, size of setting, child age profile and month in the school year, while hourly cost is not influenced by whether the provider is single site or multi-site, urbanity, local deprivation level or whether the setting is graduate-led. (Sections 3.5 to 3.9).
- Although hourly cost is greatest for the highest quality settings, the difference is not statistically significant, suggesting that the quality measures considered here either do not influence cost or influence cost to an insufficient degree to be robustly identified in a sample of the size used here. (Section 3.7)
- For PVI settings, cost estimates in previous studies are generally slightly higher than those in this study but this may be explained by differences in methodological approach and sample. For other types of settings, the estimates in previous studies are broadly similar to those presented in this report. (Section 3.10)

3.1 Total setting costs

Table 8 presents a summary of the total weekly costs for the 160 settings. The average weekly cost is just under £5,000, with an average of around two thirds of costs attributable to the delivery of specific sessions and around one third to the general, core running of settings. Staff costs form the majority of costs (an average of three quarters) while venue costs and other costs account for equal shares of the remaining costs.³² The maximum and minimum amounts indicate a broad range in the total weekly cost across settings, although this is not surprising given that the sample includes such a variety of types of providers from childminders with a small number of children to large, stand-alone centre-based providers. There is also notable variation in the proportions of costs attributable to core running and specific sessions and in the proportions attributable to staff, venue and other costs.³³

Table 8: Total setting costs

	Total costs per week	Percentage of cost by activity		Percentage of cost by type		
		Core running	Specific session	Staff costs	Venue costs	Other costs
Mean	£4,747	32%	68%	75%	12%	12%
Minimum	£241	11%	46%	43%	2%	2%
Maximum	£20,785	54%	89%	94%	42%	38%

Source: SEED

Notes: Other costs include, for example, expenditures for books and toys, food and other refreshments, medical and hygiene supplies, stationary, marketing materials, office equipment, postage, telephones and internet, IT support, professional fees and licences.

Table 9 explores the differences in total costs across types of providers. As might be expected, the average total cost is substantially smaller for childminders and staff costs constitute a smaller proportion of costs for childminders, both because there are fewer potential economies of scale in other costs and because childminders' actual (and imputed) salaries tend to be low (see section 2.3 above). Among the centre-based

³² Data from the DfE Provider Finances Survey 2012 shows similar proportions for staff costs (77 percent), venue costs (12 percent including 7 percent rent or mortgage payments, 2 percent utilities, 2 percent upkeep of buildings and fixtures and 1 percent business rates) and other costs (11 percent) (Brind, Norden & Oseman (2012), chart 3.2). NLH Partnership (2015) report similar proportions for staff costs (73 percent), venue costs (13 percent including 9 percent rent/mortgage and 4 percent utilities) and other costs (14 percent) (figure 2). Ceeda (2014) also report that staff costs constitute an average 76 percent for three and four year olds and an average 78 percent for two year olds (page 11).

³³ NLH Partnership (2015) also report notable variation across settings in the proportion of costs accounted for by staffing costs, with 9 percent of settings with staff costs constituting less than 60 percent of all costs and 28 percent of settings with staff costs constituting more than 80 percent of all costs (figure 1).

settings, maintained nursery schools and LA/children’s centres have the highest average total weekly cost and a higher proportion of costs attributable to core running activities.

Table 9: Total centre costs by type of provider

Type of provider	Mean total costs per week	Mean percentage of cost by activity		Mean percentage of cost by type			Number of settings
		Core running	Specific session	Staff costs	Venue costs	Other costs	
Private	£6,307	32%	68%	75%	14%	11%	68
Voluntary	£4,116	32%	68%	78%	10%	12%	25
Nursery class	£3,243	30%	70%	82%	9%	9%	18
Maintained nursery school	£11,144	38%	62%	78%	10%	12%	10
LA / children’s centre	£9,178	37%	63%	79%	11%	11%	15
Childminder	£797	30%	70%	67%	14%	20%	24

Source: SEED

Tables 10 and 11 present the value of “free resources” from the Government and from volunteer staff. These are resources which are used at no direct cost to the setting, but have been valued and included in the overall estimates of the costs of delivery. Both tables present the average value of the resources across all settings and the average value for those settings receiving the free resource to show both the general importance of these resources and to highlight how they may be important to some settings. For example, while an average of 1 percent of costs for private settings is provided free from government sources, the value is 4 percent of costs for settings which receive this help (row 1, table 10). The remaining columns of the tables indicate the proportion of settings receiving different types of support in the form of free resources.

Around 2 percent of all costs are paid by “free resources” provided from Government sources and an average of 5 percent of costs are paid by this source for settings which receive this free resource (bottom row, table 10). Maintained nursery schools and LA/children’s centre providers are more likely to receive this support than other types of providers, particularly in the form of partial support for venue costs from the Local Authority (usually a venue provided rent-free but with other venue costs paid from the provider’s budget) or the use of LA staff or college students in training (although usually only for short weekly hours). Some of the private, voluntary and childminder providers also receive some free venue resources, both from Local Authorities and also from schools and colleges where they are based, while some private and voluntary settings also use free college students acquiring work experience (although, again, typically for short weekly hours).

Table 10: Value of “free” resources from Government

Type of provider	Mean % of costs for settings:		Percentage of settings receiving:				Number of settings
	All settings	Receiving free resources	Free venue	Partial venue costs	Free LA staff	Free college students	
Private	1%	4%	3%	6%	4%	22%	68
Voluntary	2%	4%	0%	20%	0%	20%	25
Nursery class	<1%	4%	0%	0%	6%	0%	18
Maintained nursery school	6%	6%	0%	100%	10%	30%	10
LA / children’s centre	5%	6%	7%	67%	33%	13%	15
Childminder	<1%	6%	0%	8%	0%	0%	24
All types	2%	5%	2%	13%	4%	15%	160

Source: SEED

Around 1 percent of all costs are implicitly paid by “free” volunteer staff and an average of 4 percent of costs are paid by this source for settings which use volunteers (bottom row, table 11)³⁴. It should be noted that the high proportion of costs provided by this source for LA/children’s centres providers using volunteer staff (15 percent) is for a single provider and no conclusions should be drawn from this figure. Some 20 percent of all settings use voluntary staff, although this proportion is higher (30 to 40 percent) for voluntary, nursery class and maintained nursery school settings. On average, volunteer staff work only 5 hours each week which explains why the value of their time constitutes only a very small proportion of total costs.³⁵

³⁴ Just over 2 percent of all staff are volunteers which is comparable to the proportions of 2 percent for full day care and 5 percent for sessional care reported in the Providers’ Survey in 2013 (table 6.4, Brind et al (2014)).

³⁵ In addition to the use of free resources presented in tables 10 and 11, there were also two cases of free resources from private firms: a nursery class receiving breakfast from a local bakery and a childminder using another childminder’s house for one morning a week.

Table 11: Value of “free” volunteer staff

Type of provider	Mean % of costs for settings:		Percentage of settings using volunteer staff	Number of settings
	All settings	Receiving free resources		
Private	<1%	2%	7%	68
Voluntary	1%	4%	40%	25
Nursery class	1%	3%	33%	18
Maintained nursery school	1%	2%	30%	10
LA / children’s centre	1%	15%	7%	15
Childminder	1%	7%	17%	24
All types	1%	4%	20%	160

Source: SEED

Overall, while the use of venues without any cost or with a partial cost subsidy and the use of free staff from college students on work experience or voluntary is not unusual in the provision of early education, this evidence suggests that these free resources do not constitute a substantial contribution to overall costs.

3.2 Hourly delivery cost per child

The average (mean) hourly cost per child is £4.58 for children under age two; £4.30 for two year olds; £3.72 for three/four year olds and £3.91 for school children (table 12). The average hourly cost declines with age for the pre-school children and is slightly higher for school children than for three/four year olds. It should be noted that the figure for school children is only for those in settings which primarily deliver care to pre-school children and does not show the average cost of care for all school children as most are cared for in wrap-around care and holiday clubs which do not also have preschool children.³⁶

The 95 percent confidence intervals in table 12 show the range of values within which the true average cost lies with a 95 percent probability. For example, there is 95 percent certainty that the average cost for three/four year olds lies between £3.47 and £3.96. This is a broad range, reflecting the relatively small sample and the degree of variation in the cost observed in the sample. The range is considerably broader for school children

³⁶ In particular, the slightly higher cost for school children over three/four year olds in the sample analysed here may reflect that the school children were typically cared for shorter hours in wrap-around care before or after school and often in quite small numbers.

because the sample is smaller than for other age groups and because there is more variation in the costs for this age group. Table 12 also presents the median cost for each age group, showing the point where exactly half the settings have a lower (or equal) cost and exactly half have a higher (or equal) cost. For all age groups, the median is lower than the mean suggesting a small number of settings with unusually high cost³⁷.

Table 12: Average hourly cost per child by age of child

Age of child	Mean	95% confidence interval for mean	Median	Number of obs.
Under two years old	£4.58	£4.31 - £4.85	£4.57	90
Two years old	£4.30	£4.01 - £4.60	£3.96	140
Three/four years old	£3.72	£3.47 - £3.96	£3.32	158
School children	£3.91	£3.16 - £4.65	£2.91	49
All ages	£4.05	£3.79 - £4.31	£3.64	160

Source: SEED

Notes: School children are those aged four and older and attending regular school but receiving childcare at other times in settings which primarily deliver care to preschool children.

Figures 4 through 7 explicitly present the distribution of costs for the four age groups respectively, with each setting's cost rounded to the nearest £0.50. The figures for the three older age groups (figures 5 through 7) highlight a long tail to the right showing a small number of settings with unusually high costs. The figures also highlight broad ranges in the average costs, both between the minimum and maximum cases and across the parts of the distributions with a reasonable number of settings. For example, figure 6 shows the range between the extremes for three and four year olds to be from £1.50 to £13.50, but the bulk of the distribution covers an interval of £3 between £2 and £5.

³⁷ As the distributions for the three age groups are right-skewed, the regression models presented below were also estimated using a logarithmic specification for the dependent cost variable, but this did not generate any better fit (higher R-squared) for the models than with the raw variable.

Figure 4: Distribution of hourly cost for under two year olds

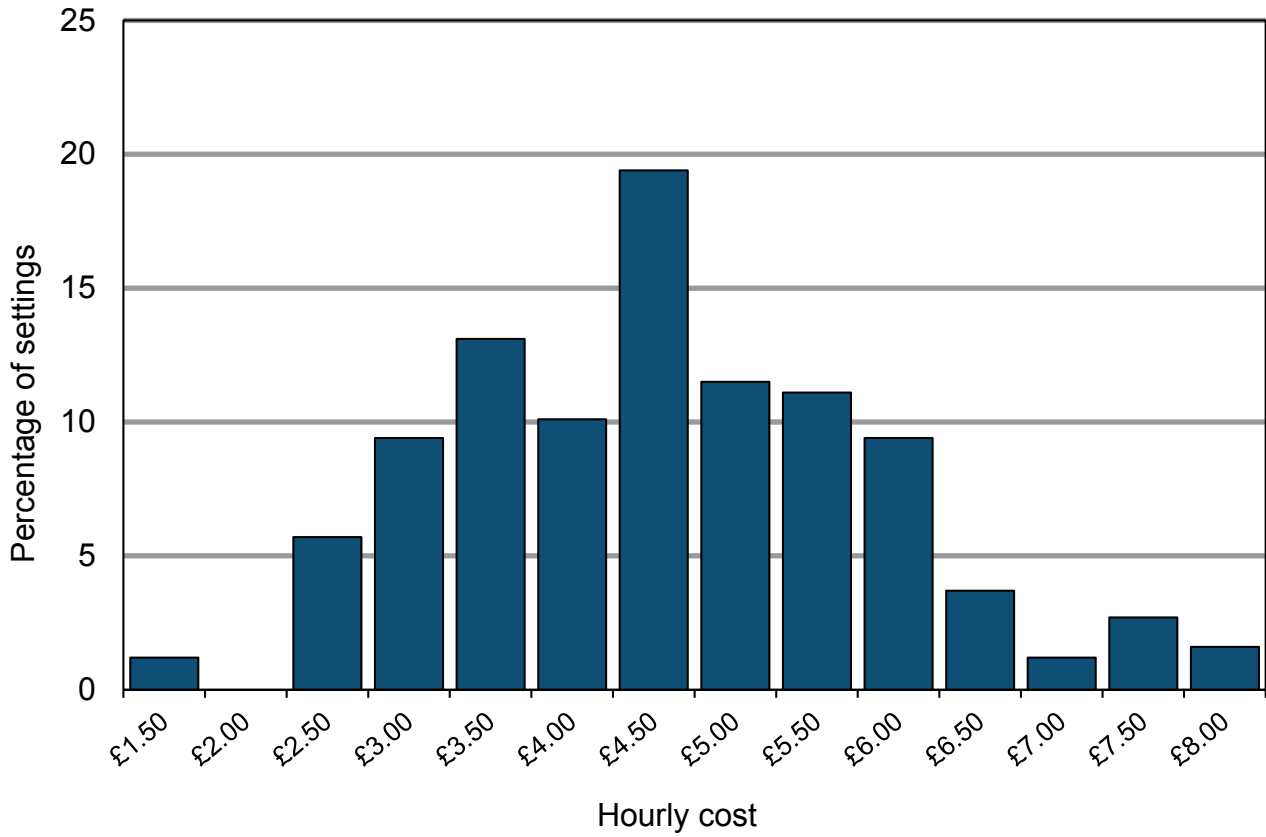


Figure 5: Distribution of hourly cost for two year olds

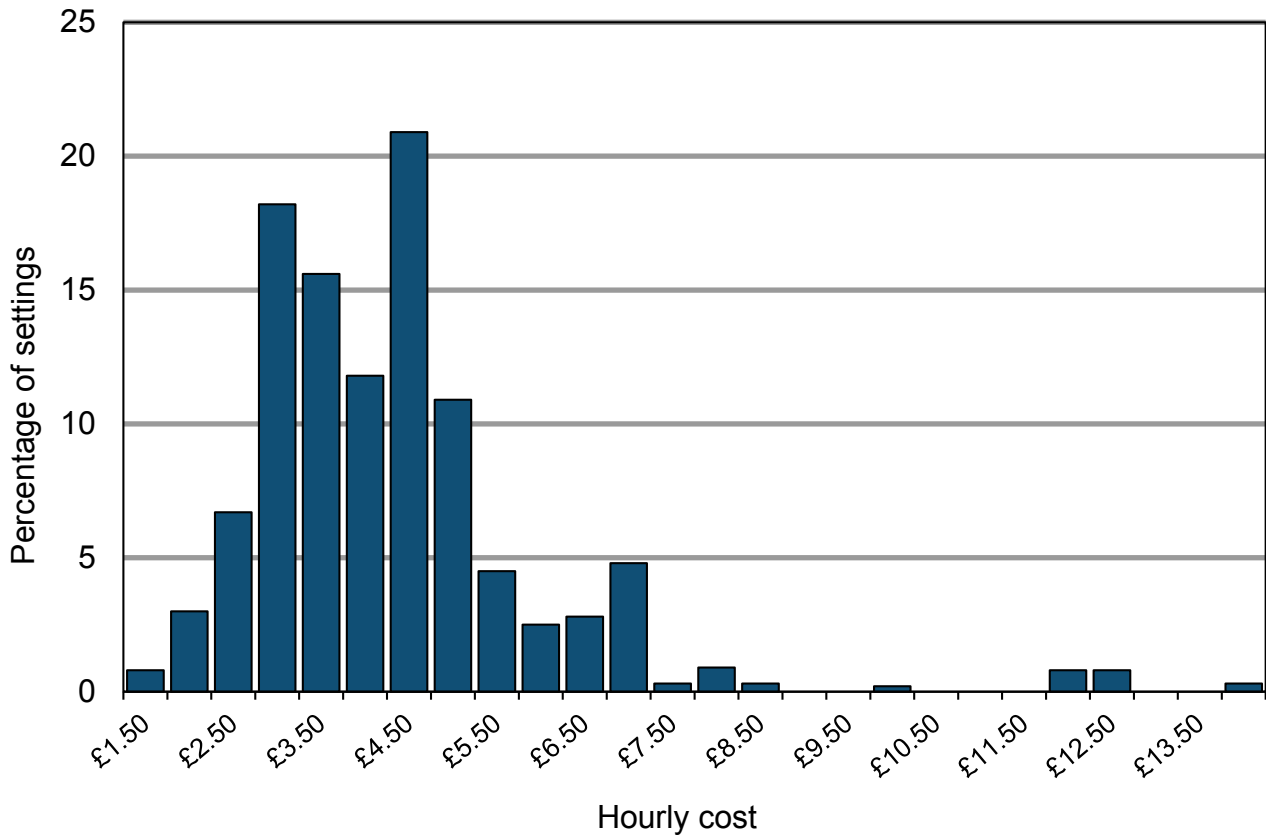


Figure 6: Distribution of hourly cost for three/four year olds

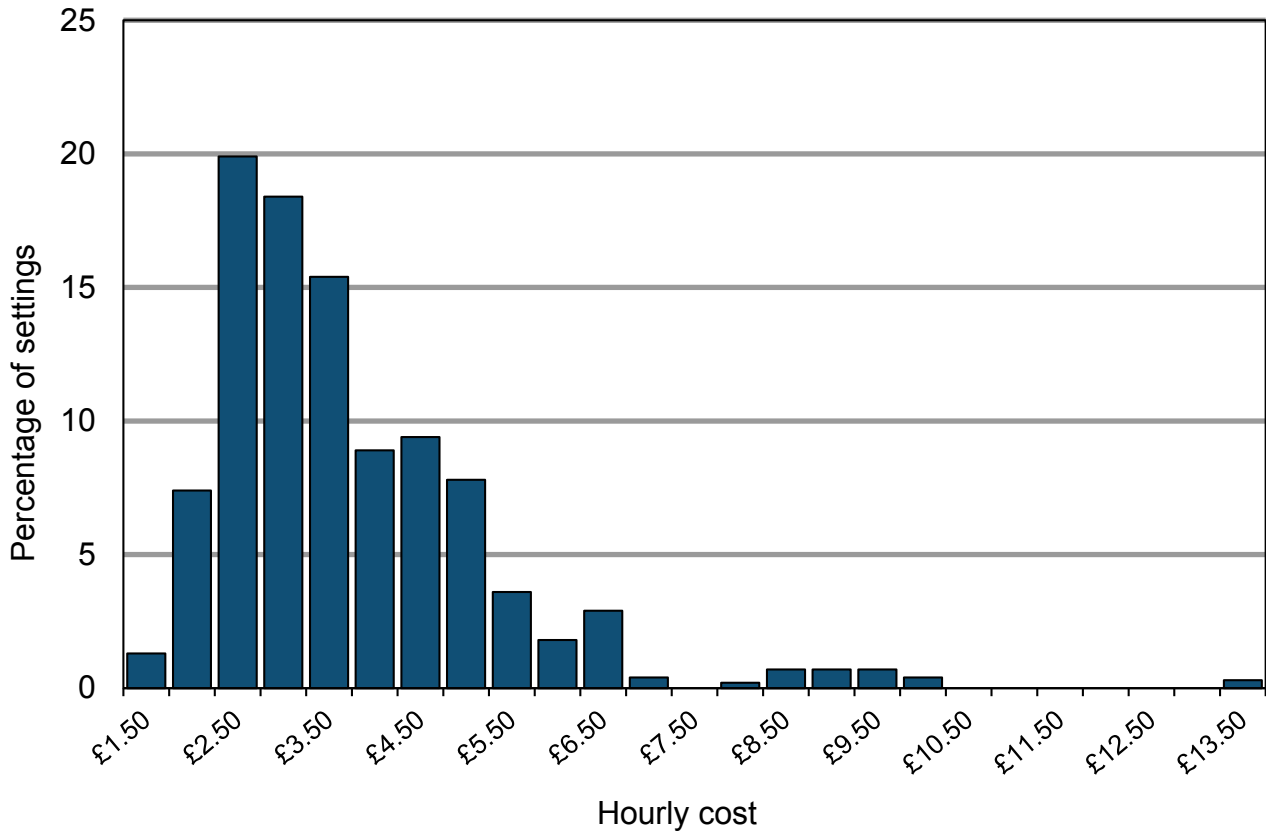
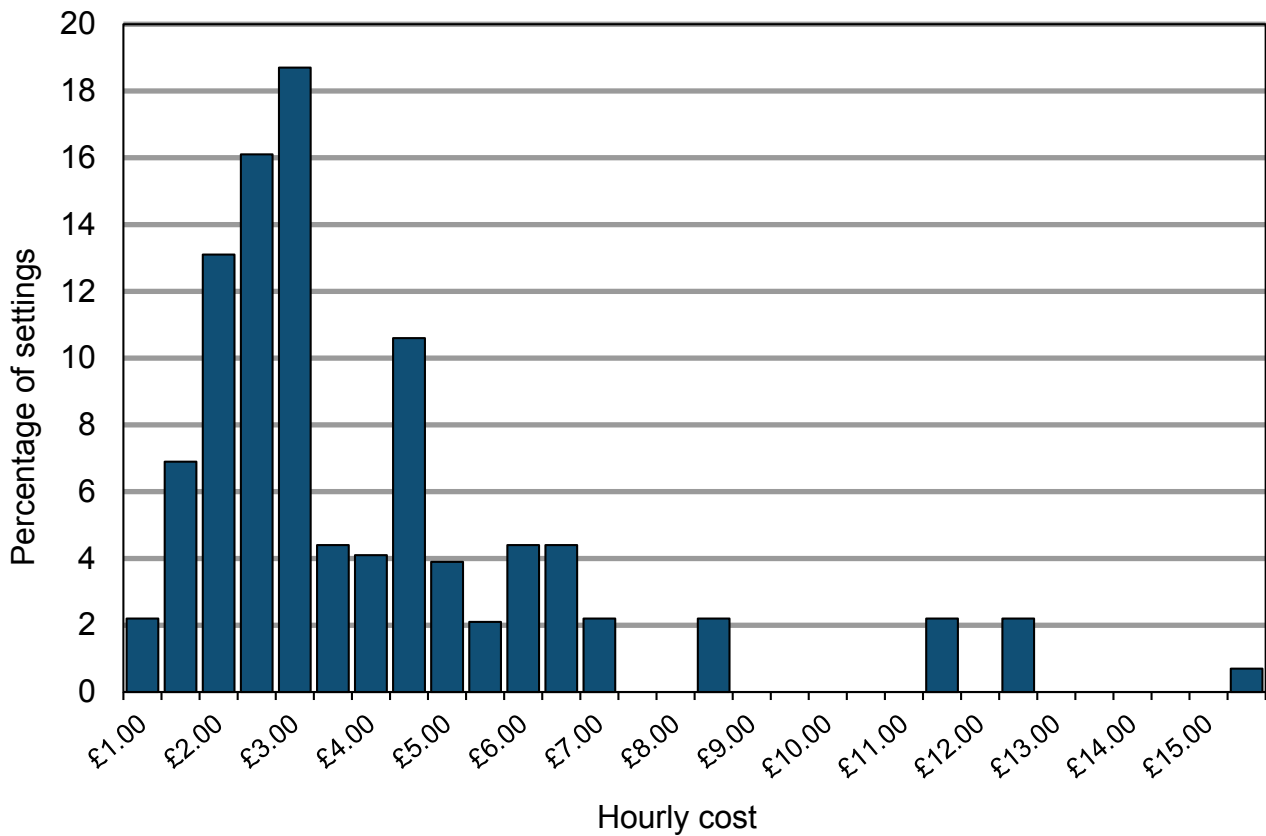


Figure 7: Distribution of hourly cost for school children



There are several potential factors driving the broad range of costs in the figures. First, it should be noted that these hourly costs reflect a snap-shot of a setting's situation at a particular point in time. Hence, some of the more extreme values may reflect something unusual in the week that the cost data was recorded, although these should balance out across the sample so that the average values reflect the true picture. Second, in some cases, the extreme values may reflect very small numbers of children within a particular age group at a setting attending at unusual times. For example, some settings had just one or two school age children at the start or the end of the day and some childminders had a single child for part of the time. Finally, the variation in costs may reflect more genuine differences in the cost of delivery, driven by the use of different types of resources (related to the quality or range of activities offered) or variation in the price of resources.³⁸ Specific patterns in this variation across different factors are explored in sections 3.4 to 3.9 below.

3.3 Hourly cost and staff:child ratios

The average hourly cost is £4.30 for two year old children and £3.72 for three/four year olds. The difference in hourly cost between these two age groups is not as high as might be expected given the difference in statutory minimum staff:child ratios which could drive the difference in cost. One possible explanation is that the difference in total cost may be tempered by the costs of non-contact staff time and other overheads which are similar across the age groups. To explore this, this section considers the differences in the hourly session-specific (contact) staff cost and the overall hourly costs.

Table 13 presents the average hourly cost per child by age of child divided into various components. The first column presents the total mean cost already seen in table 12 above. The second and third columns present this total cost divided into the core running element (costs not associated with a particular session or age of child) and a session/age specific element. This latter element mainly relates to the cost of the room space and staff contact time used for a particular session, but also includes some minor other costs for age-specific goods. The fourth column shows the amount of the session-specific staff cost which is the element directly influenced by staff:child ratios. For example, the average hourly total cost for three/four year olds is £3.72, which can be divided into £1.30 for core running and £2.42 for session/age specific costs. Of this £2.42, £2.09 is the cost of session-specific staff contact time. The bottom row of the table presents the average costs for three/four year olds as a proportion of the average cost for two year olds.

³⁸ The recent Family and Childcare Trust report (Rutter (2016)) reports that there a number of reasons why there might be large variations in prices across settings related both to the cost of local resources and to the range of activities offered, particularly noting the emergence of segmentation in the nursery market with expensive "luxury" nurseries offering additional services and other nurseries offering basic "no frills" services (see pages 17-18).

Table 13: Decomposition of hourly cost by cost source

Age of child	Mean hourly cost	Mean hourly cost divided into:		Staff session specific cost	Number of obs.
		Core	Session specific		
Under two years old	£4.58	£1.25	£3.33	£2.86	90
Two years old	£4.30	£1.30	£3.00	£2.62	140
Three/four years old	£3.72	£1.30	£2.42	£2.09	158
School children	£3.91	£1.27	£2.63	£2.16	49
Cost for three/four year olds as a proportion of cost for two year olds	87%	100%	81%	80%	

Source: SEED

The average total hourly cost for three/four year olds is 87 percent of the average cost for two year olds. The average hourly core cost in the second column is coincidentally the same for both of these age groups.³⁹ The average hourly costs for three/four year olds for the session/age specific element and for the staff session-specific element are 81 percent and 80 percent of each of these costs for two year olds. Hence, the core running and non-staff session elements of the total cost reduce the difference in total hourly cost between age groups from a 20 percent gap for staff session specific costs to a 13 percent gap for total costs.

However, this 20 percent gap in the average staff session-specific hourly cost is lower than might be expected if driven simply by the statutory minimum staff:child ratios. A staff:child ratio of 1:3 for two year olds and 1:7 for three/four year olds (the high end of difference) would be associated with a cost gap in the average staff session-specific hourly cost of 57 percent, while ratios of 1:4 and 1:6 (the low end of difference) would be associated with a gap of 33 percent.⁴⁰ The smaller gap observed for this sample might be explained by smaller differences in the staff:child ratios between the age groups and/or by staff with a higher hourly cost being employed for the older age group.

³⁹ By construction, this hourly core cost is the same across all age groups within a setting because the total core cost is simply allocated evenly across all children. But the averages across all settings can differ across age groups if some settings do not have children in all of the age groups. Indeed, the lower average hourly core costs for children aged under two and for school children is lower, showing that settings which have children of these ages have a lower average hourly core cost than those who do not.

⁴⁰ For the high end difference, the hourly per-child staff session-specific cost is 1/3 of an hour of staff time for two year-olds and 1/7 of an hour of staff time for the older age group. The fraction 1/7 as a proportion of 1/3 is 43 percent and corresponds to a gap of 57 percent. For the low end difference, the fraction 1/6 as a proportion of 1/4 is 67 percent and corresponds to a gap of 33 percent.

3.4 Drivers of variation in hourly cost

Information on several factors which may influence the hourly cost was collected as part of the SEED visits to the 160 mainstream settings. These can be organised into five types of factors which may influence the cost:

- Organisation type measured as the six types of providers and by whether the setting is a single-site provider or part of a provider delivering on more than one site. The type of provider may influence cost through the incentives for efficiency of delivery or the ability to draw on less costly sources of resources. Being a multi-site provider might influence cost through economies of scale in core administrative functions.
- Geographic area measured as eight Government regions in England, whether in a rural or urban area and whether in a more or less deprived area. Each of these factors could influence the cost of resources used in delivery.
- Quality of early education captured in the SEED measure of setting quality based on ITERS, ECERS and SSTEW and whether the setting is graduate-led. Higher quality could drive up cost if it requires more expensive inputs, in particular, if it requires better qualified and more highly paid staff.
- Setting size and child profile captured in the number of places offered by the setting and the profile of ages of children that attended the setting at the time of the visit. Size may influence cost through economies or diseconomies of scale in delivery (i.e. larger settings may have lower or higher costs per hour per child). The child age profile may influence costs for a particular age of child if delivery to other ages of children has spillover effects in the cost of delivery to the age group under consideration.
- Calendar month captured in the spread of the data collection across nine months of the year. School entry for most four-year-olds at the beginning of the school year in early September may mean that occupancy rates in the settings are lowest at this point and gradually rise across the year. Consequently, average cost per hour per child may be highest at the beginning of the school year and gradually decline through the year as the same total costs are progressively spread over more children.

While each of these factors may have a direct influence on cost, it is also possible that variation in cost across a particular factor may reflect an association with another influence. For example, larger settings might have lower costs because they are more likely to be multi-site providers rather than due to advantages of scale directly related to size. Or settings in London might tend to have higher costs because they are of higher quality rather than because the cost of resources are higher in London.

In order to help identify direct influences, initial regression models of hourly costs for two year olds and for three/four year olds containing all 10 potential influences were estimated. Half of the influences (provider type, region, quality, child age profile and calendar month) were statistically significant influences in the model for at least one of the age groups. Hence, for each potential influence, both the raw variations in cost and models containing these key factors as controls were estimated in order to identify where the relationships reflect direct influences rather than associations with other influences.

In each section below, the results for each potential influence are summarised in a table with three panels:

- The top panel presents the mean hourly cost for each category of the potential influence. It should be noted that the sample sizes for some categories are small and the figures for these categories should be treated with due caution (although the tests of statistical significance of the differences between these categories take into consideration the sizes of these samples).
- The middle panel presents the statistically significant raw differences between categories, identifying the cases where there is a 99 percent, 95 percent or 90 percent certainty (corresponding to 1 percent, 5 percent and 10 percent significance levels) that the sample estimate reflects a true difference. For each age group, these were estimated using linear regression models with dummy variables for each category (with one omitted) and t-tests of every pairwise combination of these dummy variables. Where differences are not identified as being statistically significant, this can either mean that there are no true differences or that differences are too small for the sample used here to robustly identify them.
- The bottom panel presents any changes in the statistical significance of the differences when allowance is made for other associated factors which might explain the differences. For each age group, this required the estimation of up to five further regressions which sequentially included control variables for provider type, region, quality, age profile and month respectively.⁴¹ For clarity of presentation, the tables only present changes where differences became statistically significant or became insignificant at the 10 percent level.⁴²

⁴¹ This was not estimated as a single regression with all the controls because the small sample size made it unlikely that differences would be identified at a reasonable level of significance.

⁴² There were many changes between the 1 percent, 5 percent and 10 percent levels of significance but the 10% level was selected as a reasonable cut-off point for statistical significance given the small sample sizes.

3.5 Variation in hourly cost by organisation type

The variation in the average hourly cost per child across provider type for two and three/four year olds is presented in table 14. A full description of the provider types is provided in Annex A, but it should be noted that a nursery class is a maintained early years class within a primary school and a maintained nursery school is a maintained school, purpose built and specifically for children in their early years, both with a qualified teacher present. Brackets are used in the table to show where one provider type has a higher average cost than more than one other type of provider.

The results in table 14 show that:

- The average hourly cost is statistically significantly higher for maintained nursery schools, LA / children's centres and childminders than for private and voluntary settings and statistically significantly higher for nursery classes than private settings for both age groups. In addition, the three highest cost types have statistically significantly higher costs than nursery classes for three/four year olds.
- Inclusion of the range of controls removes a few of the statistically significant relationships, but the broad pattern of differences across provider types does not appear to be explained by other related factors⁴³ which suggests that provider type has a direct influence on cost.
- As for all settings shown in table 12, the median cost is slightly lower than the mean costs for each provider type, highlighting the presence of a small number of higher cost settings within each type of provider.
- The broad range of the confidence intervals for each provider type highlights that the average cost for each provider type are estimated with limited levels of precision (but this is taken into consideration when differences across the types are tested using the regression models).

⁴³ For two year olds, the cost for nursery classes is no longer statistically significantly higher than that for private settings when controls for region, quality or age profile are included, but this may be due to the very small sample size for maintained nursery schools with two year olds reducing the likelihood of identifying a statistically significant relationship when additional variables are added to the regression.

Table 14: Average hourly cost by provider type

Type of provider	Two years old				Three/four years old			
	Hourly cost			# of obs.	Hourly cost			# of obs
	Mean	95% conf. interval	Median		Mean	95% conf. interval	Median	
Private (P)	£3.80	£3.54 - £4.06	£3.67	67	£3.12	£2.92 - £3.32	£3.04	68
Voluntary (V)	£4.01	£3.52 - £4.51	£3.79	25	£3.45	£3.01 - £3.88	£3.12	25
Nursery class (NC)	£5.09	£2.04 - £8.13	£4.67	4	£3.96	£3.28 - £4.65	£3.64	18
Maintained nursery school (NS)	£6.45	£4.56 - £8.33	£6.35	7	£6.65	£5.18 - £8.13	£6.51	10
LA / children's centre (LA)	£5.96	£4.42 - £7.51	£4.93	15	£5.33	£3.91 - £6.74	£4.86	15
Childminder (CM)	£5.35	£4.17 - £6.53	£5.03	22	£4.77	£3.83 - £5.72	£4.61	22
Statistically significant differences at 10% (*), 5% (**) and 1% (***)								
Raw differences	NC > P* NS > (P V)** LA > (P V)*** CM > (P V)***				NC > P** NS > (P V NC)*** (CM)** LA > (P V)*** (NC)** CM > (P V)*** (NC)**			
Changes in statistically significant differences (at 10% level):								
With controls for region	Not sig: NC & P				NS > LA*			
With controls for quality	Not sig: NC & P, NS & (P V)				Not sig: LA & NC			
With controls for age profile	Not sig: NC & P				Not sig: NC & P, NS & CM			
With controls for month	Same as raw				V > P* Not sig: CM & NC			

Source: SEED

Figure 8: Average hourly cost by source and provider type

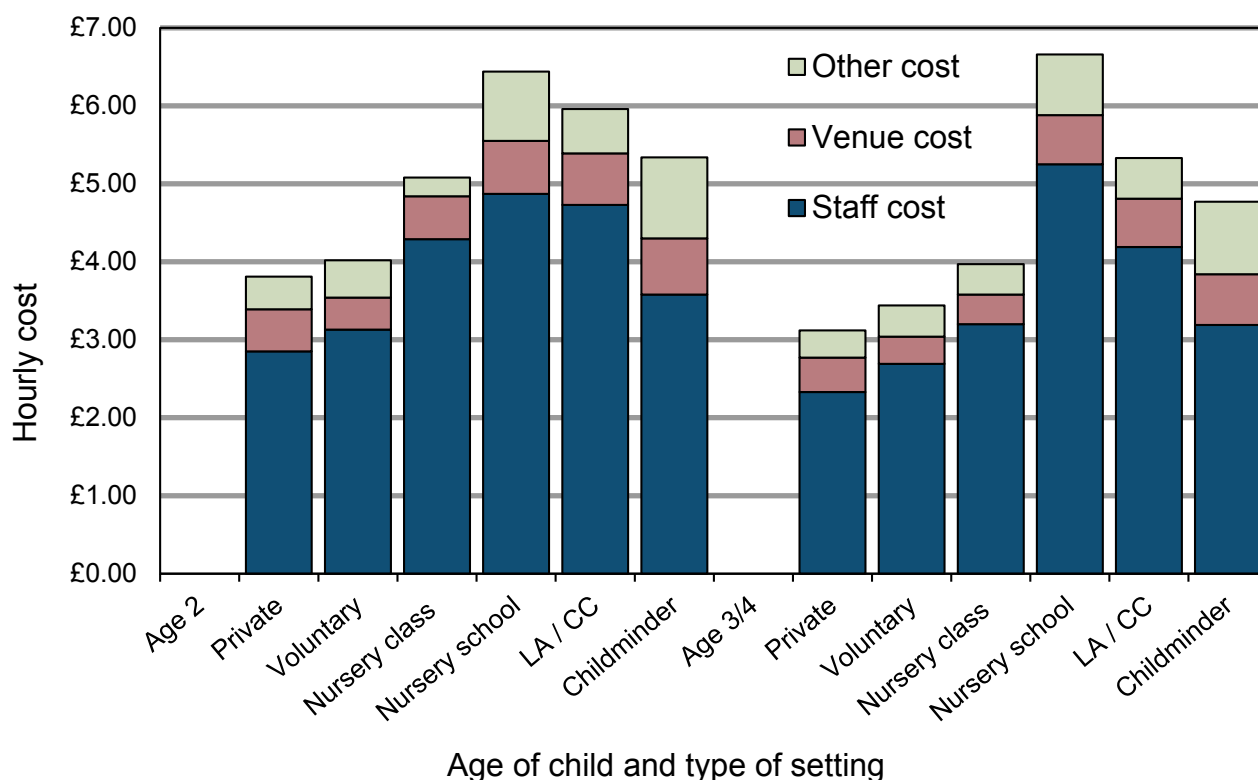


Figure 8 presents the differences in cost across provider types broken down into staff, venue and other costs showing that:

- Differences in hourly staff costs drive most of the variation in average hourly cost across provider types.
- Voluntary providers and nursery classes have slightly lower hourly venue costs than other types of providers for both age groups (noting that a venue cost has been imputed even when a setting pays no direct cost for the venue).
- Nursery classes also have lower hourly other costs, possibly reflecting economies of scale in the cost of these other resources from being part of a larger school organisation. On the other hand, averages hourly other costs are slightly higher for maintained nursery schools (possibly due to a greater educational focus) and for childminders (possibly due higher fixed costs from the smaller scale of provision).

The average hourly cost is slightly higher for single site providers than settings which are provided by a chain delivering on more than one site (table 15). However, the differences are not statistically significant and it is not possible to conclude with a reasonable degree of confidence that there is a true difference in cost between these types of providers.⁴⁴

⁴⁴ NHL Partnership (2015) also find that the average hourly cost is higher for single settings than those which are part of a larger group (table 9).

Table 15: Average hourly cost for single and multi-site providers

Type of provider	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Single site	£4.41	109	£3.79	125
Multi-site	£3.92	31	£3.44	33
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	None		None	
Changes in statistically significant differences (at 10% level):				
With controls for type or region or quality or age profile of month	Same as raw		Same as raw	

Source: SEED

3.6 Variation in hourly cost by geographic area

Table 16 presents the average hourly costs for eight geographic regions and broadly shows:

- Average hourly costs are statistically significantly higher in London than in all other eight regions for both age groups (with the exception of the South West region for two year olds). For two year olds, the average hourly cost is statistically significantly higher in the South West region than in the three most northern regions and the South East.
- However, allowance for regional variation in provider type explains the cost differences between London on the one hand and the East of England, Midlands and South West regions on the other. In addition, average costs in the Midlands, East of England and South West regions are statistically significantly higher than in the three most northern regions when allowance is made for the differences in provide type.
- For two year olds, allowance for regional differences in quality, age child profile or (in this sample) month, explains the higher cost in the South West than in the three most northern regions and the South East. In addition, the average cost in London is statistically significantly higher than in the South West region when allowance is made for the differences in any of these factors.

Table 16: Average hourly cost by region

Region	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
North east (NE)	£3.75	12	£3.24	15
North west (NW)	£3.70	16	£3.28	19
Yorkshire (Y)	£3.37	12	£3.06	16
Midlands (M)	£4.58	24	£3.98	26
East of England (EE)	£4.12	18	£3.65	19
London (L)	£5.77	16	£4.86	21
South east (SE)	£3.94	24	£3.49	24
South west (SW)	£4.85	18	£3.79	18
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	M > Y** L > (NE NW Y EE SE)*** L > M** SW > (NE* NW** Y*** SE*)		M > Y* L > (NE NW Y EM SE)*** L > (EE SW)**	
Changes in statistically significant differences (at 10% level):				
With controls for type	M > (NW SE)* EE > NW* Not sig: L & (M EE)		M > (NE NW)** EE > (NE NW Y)** SW > (NE* NW** Y**) Not sig: L & (M EE SW)	
With controls for quality	L > SW** SW > (EM SE)*		M > (NE NW)**	
With controls for age profile	L > SW* Not sig: SW & (NE NW SE)		Not sig: L & M	
With controls for month	M > NW* L > SW* Not sig: SW & (NE SE)		Not sig: M & Y	

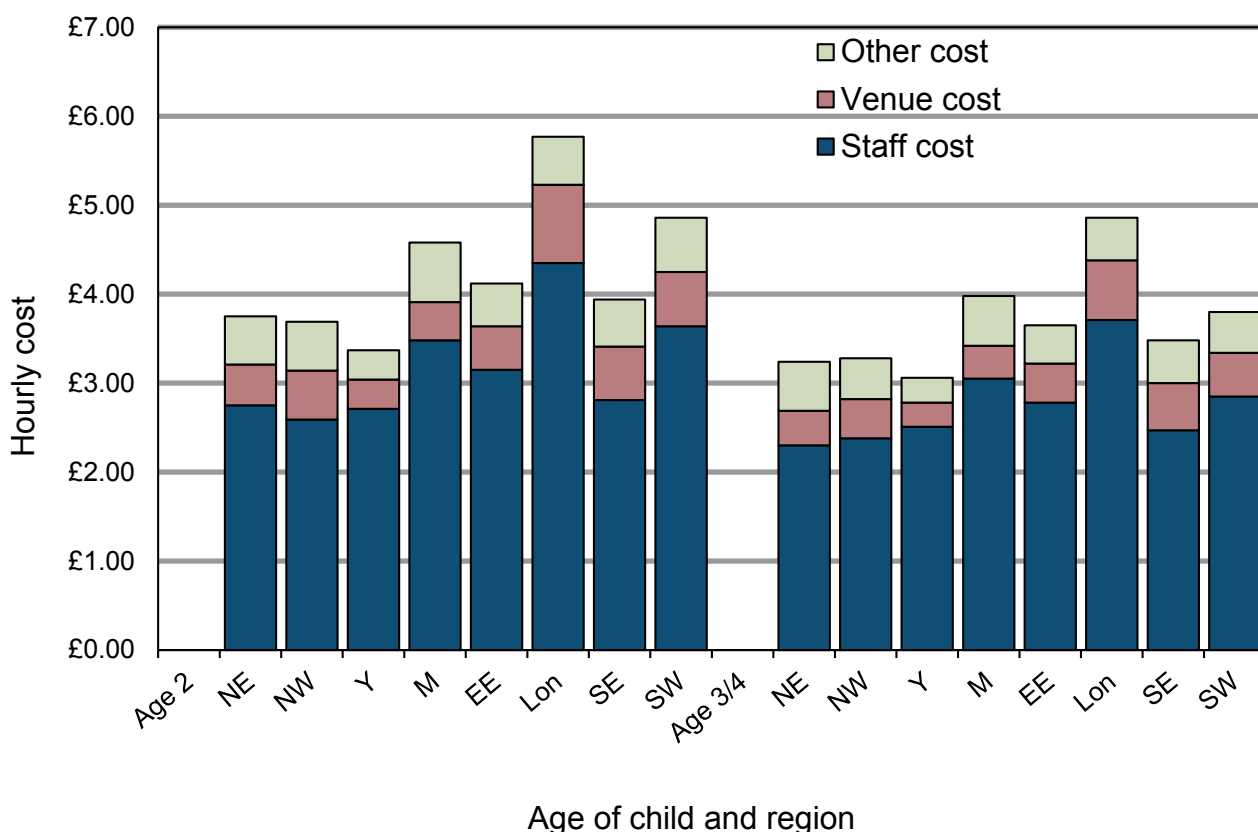
Source: SEED

Overall, this evidence suggests that region has a direct influence on costs with higher costs in London, the Midlands, the East of England and the South West than in the three most northern regions. These regional variations may reflect differences in the cost of

resources.⁴⁵ In addition, average costs in London are observed to be higher than in the Midlands, the East of England and the South West because of associated variation in provider type.⁴⁶

The regional pattern can be seen most clearly in figure 9, which decomposes the average hourly cost into staff, venue and other costs. Variation in the average hourly staff cost is the key factor driving the regional differences in average hourly cost, but a higher average hourly venue cost in London also drives some of the difference for this region, particularly for two year olds.

Figure 9: Average hourly cost by source and region



The average hourly cost is higher in urban than rural areas (table 17), but the difference is very small and not statistically significant indicating that this is not a key influence on costs.

⁴⁵ See Rutter & Lugton (2014) for further discussion of reasons for higher prices and costs in London.

⁴⁶ The regional patterns in the median hourly cost is similar to the pattern in the mean values for both ages groups indicating that the differences in means is not being driven by a small number of high cost settings in some regions.

Table 17: Average hourly cost for urban and rural settings

Area of setting	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Urban	£4.40	122	£3.72	139
Rural	£3.75	18	£3.67	19
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	None		None	
Changes in statistically significant differences (at 10% level):				
With controls for type, quality or month	Same as raw		Same as raw	
With controls for region or age profile	Urban > rural *		Same as raw	

Source: SEED

There is limited evidence that the average hourly cost is higher in areas with higher levels of deprivation (table 18). The average hourly cost in the second most deprived quintile (Q4) is statistically significantly higher than in some less deprived areas, but there are no statistically significant differences when allowance is made for differences in provider type (although other factors including quality do not appear to explain the difference). This suggests that local deprivation does not have a direct influence on cost, but areas with higher deprivation may have higher costs because of the types of providers that tend to deliver early education in these areas.

Table 18: Average hourly cost by deprivation level

Quintile for Index of Multiple Deprivation (IMD) score	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Q1 (least deprived)	£4.08	24	£3.58	26
Q2	£4.14	23	£3.82	28
Q3	£4.23	37	£3.45	37
Q4	£4.91	30	£4.18	35
Q5 (most deprived)	£4.11	26	£3.56	32
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	Q4 > Q1**		Q4 > Q3**	
Changes in statistically significant differences (at 10% level):				
With controls for type	Not sig: Q4 & Q1		Not sig: Q4 & Q3	
With controls for region	Q4 > (Q2** Q3* Q5**)		Q4 > (Q1 Q5)*	
With controls for quality	Q4 > (Q2* Q3**)		Q2 > Q1* Q4 > Q1**	
With controls for age profile	Q4 > Q2** Not sig: Q4 & Q1		Not sig: Q4 & Q3	
With controls for month	Q4 > Q5*		Q4 > Q1*	

Source: SEED

3.7 Variation in hourly cost by quality measures

Perhaps one of the most important policy questions is whether higher quality early education costs more to deliver. The key quality measure used to investigate this question here is drawn from the quality measures obtained from visits to settings in component 2 of SEED.⁴⁷ The quality measures are the age-specific average of two measures for two year olds (ITERS and SSTEW) and of three measures for three/four year olds (ECERS-R, ECERS-E and SSTEW). Further details on these measures are

⁴⁷ Quality within and across settings will be fully analysed in subsequent reports from SEED.

provided in Annex A. These continuous quality measures were divided into three discrete categories for each age group with roughly equal numbers of settings⁴⁸:

- Lowest quality defined as an average score of less than 4.5
- Middle quality defined as an average score of 4.5 or more and less than 5.5
- Highest quality defined as an average score of 5.5 or more

Average hourly cost is very similar for the lowest and middle quality groups and higher for the highest quality group (table 19), but the differences are not statistically significant. This suggests either that quality does not influence the hourly cost or that the differences in cost across quality level are too small to be identified in the sample analysed here.

Table 19: Average hourly cost by quality level

Quality level	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Lowest quality	£4.06	42	£3.58	53
Middle quality	£4.16	43	£3.58	49
Highest quality	£4.67	39	£4.00	42
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	None		None	
Changes in statistically significant differences (at 10% level):				
With controls for type or region or age profile	Same as raw		Same as raw	
With controls for month	high > low *		Same as raw	

Source: SEED

Figure 10 presents the average cost across the quality levels decomposed into staff, venue and other costs. This indicates that the higher cost for the highest quality level is due to differences in staff costs rather than venue or other costs.

⁴⁸ The regression models were also estimated using the continuous quality measure and the findings were qualitatively identical to those for the discrete models.

Figure 10: Average hourly cost by source and quality level

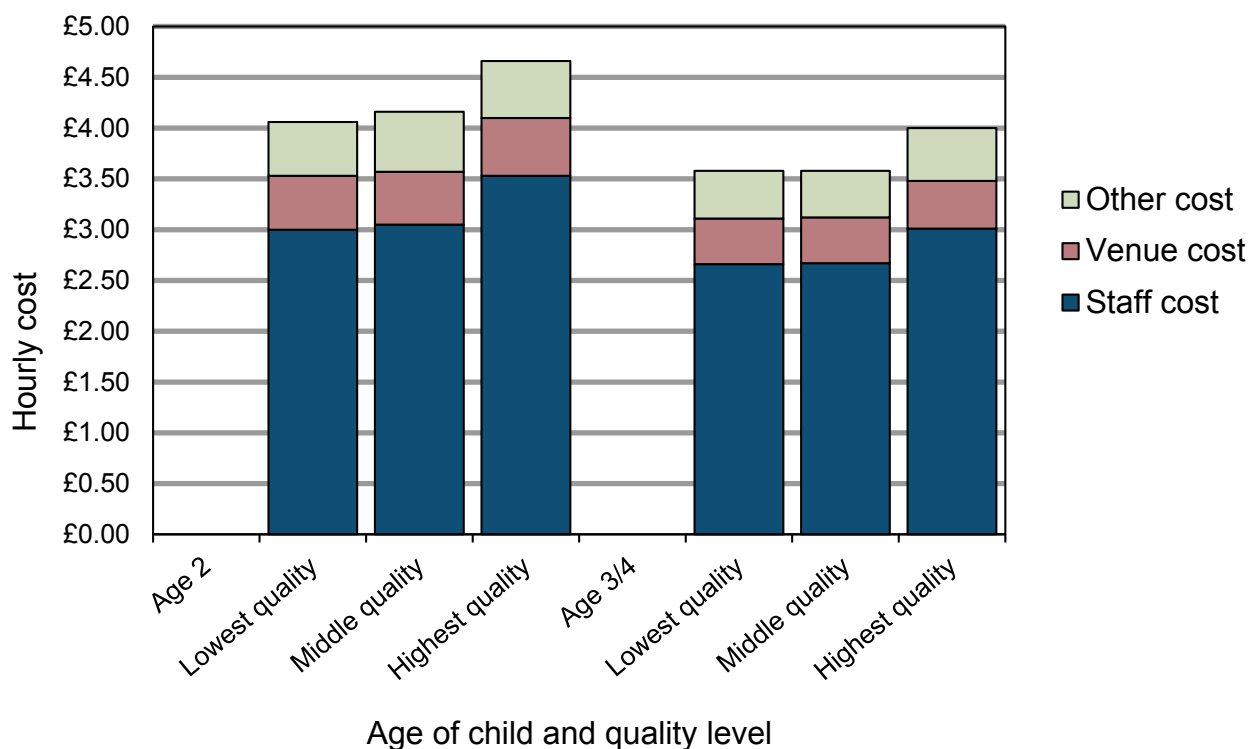


Table 20: Average hourly cost for graduate-led and non-graduate led settings

Whether graduate-led	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Not graduate-led (not grad)	£4.34	80	£3.80	82
Graduate-led (grad)	£4.25	60	£3.61	76
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	None		None	
Changes in statistically significant differences (at 10% level):				
With controls for type	Same as raw		not grad > grad **	
With controls for region or quality or age profile or month	Same as raw		Same as raw	

Source: SEED

An alternative proxy measure of quality is whether a setting is graduate led, that is, whether the manager of the setting (or childminder) has a highest qualification level relevant to working with children or young people of level 6 (degree) or above. The average hourly cost is very similar for settings which are graduate-led and those that are

not (table 20) and there are no statistically significant differences between these two types of settings⁴⁹.

3.8 Variation in hourly cost by setting size and child profile

Size of settings is measured as the number of places that the setting is registered to offer (i.e. the maximum number of children that can be in attendance at any point in time).

Table 21: Average hourly cost by setting size

Size (number of places)	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Small (35 places or less)	£4.67	47	£4.30	54
Medium (more than 35 places and no more than 60 places)	£3.85	45	£3.18	50
Large (more than 60 places)	£4.36	48	£3.58	54
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	small > medium **		small > medium *** small > large **	
Changes in statistically significant differences (at 10% level):				
With controls for type	Not sig: small & medium		Same as raw	
With controls for region	Same as raw		Same as raw	
With controls for quality	small > large *		Same as raw	
With controls for age profile	Not sig: small & medium		Same as raw	
With controls for month	Same as raw		Same as raw	

Source: SEED

Table 21 shows that for three/four year olds, smaller settings have statistically significantly higher costs than medium-sized or large settings, possibly reflecting that larger scale permits lower hourly costs.⁵⁰ For two year olds, smaller settings have

⁴⁹ NLH Partnership (2015) also find that the average hourly cost is very similar for graduate led and not graduate led settings (table 10).

⁵⁰ The higher mean cost for large settings (although not statistically significant) could reflect that the hourly cost increases once size rises above a certain point (*diseconomies of scale* rather than initial economies of scale with increasing size) or it could reflect that large settings tend to be of a more expensive type or offer a broader ranges of more expensive activities or services.

statistically significantly higher costs than medium-sized settings, but this is explained by related differences in provider type.

Table 22: Average hourly cost by setting child age profile

Setting child age profile	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
Only three/four year olds (3/4)	n/a		£4.19	18
Only two and three/four year olds (2+3/4)	£4.84	39	£4.22	39
Plus school children (+sch)	£4.16	12	£3.68	12
Plus under twos (+u2)	£3.93	53	£3.21	53
Plus school and under twos (all)	£4.09	34	£3.74	34
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	2+3/4 > (+u2*** all**)		(3/4 2+3/4) > +u2***	
Changes in statistically significant differences (at 10% level):				
With controls for type	Same as raw		(3/4 2+3/4) > all ***	
With controls for region	Not sig: 2+3/4 & all		Same as raw	
With controls for quality	Same as raw		all > +u2 *	
With controls for month	Same as raw		3/4 > all *** all > +u2 *	

Source: SEED

Table 22 presents the variation in average hourly cost across different child age profiles, that is, the range of children in attendance in the setting at the time that the cost data was collected. Five main combinations of children in the four age groups were considered.⁵¹ The average hourly cost for both age groups is statistically significantly lower in settings which also have children under the age of two. This relationship continues to hold even with allowance for related differences in other potential influences, suggesting that the child age profile has a direct influence on cost. It is not clear why the presence of children under age two may reduce costs for the older age groups, but it could possibly reflect cost benefits of caring for siblings or children being in the setting from a younger age.

⁵¹ Two observations (childminders) who had other mixtures of ages of children were each dropped from the sample for two year olds and from the sample of three/four year olds as the sample sizes were insufficient for this additional category.

3.9 Variation in hourly cost by calendar month

This section considers whether the hourly cost gradually declines over the school year as occupancy rises after a cohort of children have left to begin school in the September when they are four years old.⁵² Testing the variation in hourly cost across calendar months is more complicated than for other factors for several reasons:

- Ideally, data would be collected from all months across the year and over a long enough period to separately identify any time trends. The data period used here was not specifically designed to examine cost variation across calendar months and only covers April to December. This period does permit a comparison of the end of one school year with the beginning of the next but is not sufficiently long to robustly estimate a time trend in costs. In particular, there is a concern that higher costs in the later Autumn period may reflect generally rising costs. However, this was tested in two ways: the inclusion of a monthly time trend in the regression models and the indexation of the costs by monthly CPI. Neither qualitatively affected the results indicating that a rising time trend is not driving the findings.
- Holiday months may affect the pattern of costs in uncertain ways. For the data period considered, July and August might be expected to be unusual for this reason.
- The number of observations for each month is low. However, grouping the data into pairs of months or by season did not generate any stronger patterns.
- The inclusion of control variables into the regressions is not to allow for related differences in other factors but to test that the sample was balanced across other influences over the months. Although the selection of settings over several batches aimed to maintain an ongoing balance across provider type, region and other setting characteristics, one particular issue was that some types of settings (particularly nursery classes and maintained nursery schools) were more difficult to visit during the summer holiday period which may have affected the balance during these months.

Before examining the regression findings, figure 11 presents the pattern of hourly costs across the months of data collection (April to December). It shows:

- Average costs are notably lower in April and May and higher in the Autumn months.

⁵² Evidence from the Provider Finances Survey indicated that providers have concerns about insufficient demand for places when attendance drops dramatically in September when schools have an intake of children (page 21 in Brind, Norden & Oseman (2012)).

- Average costs in June and July lie between those for the Spring and Autumn months. This is somewhat surprising as occupancy rates would be expected to be highest at the end of the school year and the cost per child correspondingly at its lowest point. One possible explanation is that families with pre-school children may be more likely to be absent on holidays during these months, lowering occupancy rates towards the end of the school year.
- The cost for three/four year olds is low in August. This may reflect that lower cost types of providers (such as private ones) are more likely to be operating in this month.
- The pattern of costs for two year olds is similar to that for the older group. This indicates that there may be spillover effects to the younger age group when the oldest age group leave to start school, possibly through the transfer of younger children into higher age classes at this time.
- All three cost sources (staff, venue and other) tend to be higher in months when the overall average cost is higher. This suggests that the cost variation is being driven by changes in occupancy rates which affect all cost sources equally rather than seasonal variation in one particular cost source.

Figure 11: Average hourly cost by source and month

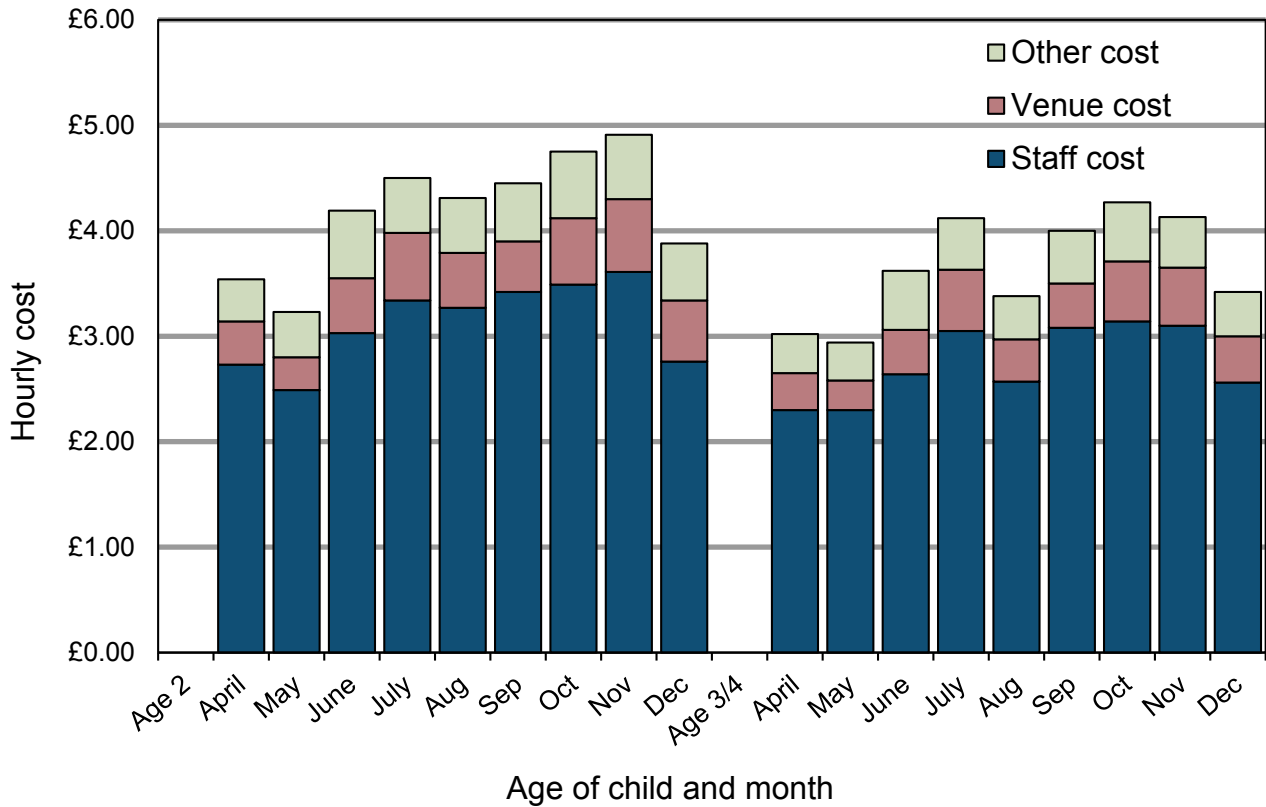


Table 23 presents the average hourly cost for each month and age group, together with the differences that are statistically significant. The picture is complicated by the larger number of categories (and corresponding sample sizes for each category) and the fact that the control variables are to allow for differences in the sample balance across months rather than related variation in other influences. Overall, average costs are statistically significantly higher in October and November than in April and May in all models, while other differences across months are affected by the particular factors included as controls for changes in sample balance in the models. This evidence supports the notion that hourly costs per child generally rise over the school year.

Table 23: Average hourly cost by calendar month

Calendar month	Two years old		Three/four years old	
	Mean hourly cost	Number of obs.	Mean hourly cost	Number of obs.
April	£3.53	16	£3.01	17
May	£3.23	14	£2.94	16
June	£4.20	15	£3.63	20
July	£4.50	12	£4.12	12
August	£4.31	12	£3.37	12
September	£4.45	14	£4.00	18
October	£4.74	24	£4.27	24
November	£4.90	28	£4.13	29
December	£3.89	5	£3.42	10
Statistically significant differences at 10% (*), 5% (**) and 1% (***)				
Raw differences	July > May* Sep > May** Oct > (April** May***) Nov > (April May)***		July > (April May)** Sep > (April* May**) Oct > (April*** May*** Aug*) Nov > (April** May**)	
Changes in statistically significant differences (at 10% level):				
With controls for type	June > May* Aug > May** Nov > June*		June > May* July > Dec* Oct > Dec** Nov > (June Dec)** Not sig: Sep & April, Oct & Aug	
With controls for region	Oct > (June July)* Nov > July* Not sig: (July Sep) & May		Oct > June* Not sig: Sep & (April May), Oct & Aug	
With controls for quality	Aug > May* Not sig: Sep & May		July > Aug* Not sig: Sep & April, Oct & Aug	
With controls for age profile	Aug > May* Not sig: (July Sep) & May		July > Dec* Oct > (June Dec)** Nov > (June* Dec**) Not sig: (July Sep) & April	

3.10 Comparisons with previous estimates of hourly cost

This section compares the estimates from this study with previous evidence on the costs of delivering early education. Seven earlier studies presenting comparable cost estimates are considered, covering a range of different age groups and different types of providers. Annex B provides a detailed comparison of the key features of these studies with this study.

A key distinction is the methodological approach:

- In three studies, current levels of average costs were estimated using detailed session-based primary data collection at the setting level (this study, Gaheer & Paull (2016) and Ceeda (2014)).
- In three studies, current levels of average costs were estimated using broader survey primary data collection at the setting level (NLH Partnership (2015), KPMG (2015) and Green et al (2015)).
- In two studies, representative benchmark figures for costs were estimated using aggregate statistics primarily drawn from secondary sources (DfE (2015b), NEF (2014)). The objective of these studies was to identify the influence of key drivers of cost rather than to precisely estimate the current level of average cost. Hence, these benchmark costs not directly comparable to the cost estimates presented in this study but are included here for completeness.

Table 24 presents the cost estimates and benchmark costs from the studies, ordered by the type of provider considered. Two benchmark costs are presented from the DfE Analytical Report, one based on average staff:child ratios and one based on statutory minimum ratios. The first one (based on observed ratios) is more directly comparable to the cost estimates in this report but the second benchmark is also presented for reasons described below.

Table 24: Comparison estimates of hourly delivery costs

	Data dates / indexation	Sample size	Mean hourly cost per child	
			2 years old	3/4 years old
Private				
This study	Mar-Dec 2015	69	£3.80	£3.12
NLH Partnership	June / July 2015	27	£4.98	£3.21
DfE Analytical Report	2014/2015	n/a	£5.87 ¹ (£5.00 ²)	£4.25 ¹ (£3.56 ²)
Voluntary				
This study	Mar-Dec 2015	28	£4.01	£3.45
NLH Partnership	June / July 2015	20	£6.09	£4.00
DfE Analytical Report	2014/2015	n/a	£5.39 ¹ (£4.54 ²)	£3.81 ¹ (£3.14 ²)
PVI				
This study	Mar-Dec 2015	97	£3.87	£3.23
NLH Partnership	June / July 2015	47	£5.39	£3.51
Ceeda	June / July 2014	100	£5.97	£4.53
PVI + childminders				
This study	Mar-Dec 2015	121	£4.15	£3.52
KPMG	2014/2015	79	£5.24	£3.86
Nursery classes				
This study	Mar-Dec 2015	18	£5.09	£3.96
Green et al	June / Aug 2014	12	£5.05	n/a
DfE Analytical Report	2014/2015	n/a	n/a	£4.37 ¹ (£3.60 ²)
LA / children's centres				
This study	Mar-Dec 2015	16	£5.96	£5.33
Gaheer & Paull	March 2014	14	£6	£6
Childminders				
This study	Mar-Dec 2015	24	£5.35	£4.77
DfE Analytical Report (a)	2014/2015	n/a	n/a	£6.12 ¹ (£3.76 ²)
DfE Analytical Report (b)	2014/2015	n/a	n/a	£5.00 ¹ (£3.07 ²)

	Data dates / indexation	Sample size	Mean hourly cost per child	
			2 years old	3/4 years old
All types				
This study	Mar-Dec 2015	160	£4.30	£3.72
NEF	2011/2012	n/a	£4.02	£2.21

Notes: ¹ Indicates DfE benchmark cost at average staff:child ratios and ² indicates DfE benchmark cost at statutory minimum ratios. DfE (a) and DfE (b) for childminders refer to the benchmark costs based on private salaries and on minimum wage levels respectively. The estimates for children's centres from Gaheer & Paull are for all ages of children.

This table shows that:

- For PVI settings, the estimates in previous studies are notably higher than those presented here. For three/four year olds, the estimates are around 10 percent higher (although 40 percent higher in the Ceeda study), but the gaps are larger for the estimates for two year olds (particularly for the NLH study).
- For nursery classes, children's centres and childminders⁵³, the cost estimates in previous studies are only slightly higher than those presented in this study.
- For all types of providers, the NEF study has lower estimated costs than in this study, but the NEF analysis was based on older data from 2011 to 2012.

There are several potential reasons why the cost estimates for PVI providers may be higher in the NLH Partnership, Ceeda and KPMG studies⁵⁴:

- All three studies only consider children using free early education entitlement (FEEE) places or providers offering FEEE places. Average costs could be higher for free places, but as most providers offer free places (92 percent of private providers and 96 percent of voluntary providers shown above), this could only explain a small part of any difference.
- All three studies allocate staff costs across children using staff:child ratios at some point in the calculation of hourly cost. This may allocate more staff time to two years olds than in this study and, in the NLH Partnership and KPMG studies, makes no allowance for differences in the mix of types of staff (and salary levels)

⁵³ The DfE Analytical Report (b) estimates for childminders are those more comparable to the estimates in this report as they are based on a similar assumption of minimum wage salary levels for childminders.

⁵⁴ These potential reasons have been identified as far as possible from the available information on data collection and derivation of average hourly costs per child in the published reports.

across ages. This could explain why the differences in the cost estimates with this study are greater for two year olds than for three/four year olds.

- It is not clear whether the cost estimates in the KPMG and NLH Partnership studies included payments for the return on investments (such as interest on bank loans or overdrafts or payments to owners) or the cost of ongoing investments, while the Ceeda study included salaries for owners and interest on bank loans or overdrafts (but excluded any dividend payments). Such expenditures were specifically excluded in this study.⁵⁵
- The KPMG study considers a sample of providers in the Birmingham. According to the estimates presented above, the average cost differential between the Midlands region and the nationwide average is approximately 7 percent, similar to the gap in cost estimates for three/four year olds between this study and the KPMG study.
- The Ceeda study collected information on gross salaries and estimated an additional salary cost of around 17 percent for pensions, sickness, training and holiday time. This could be higher than the comparable costs in this study which are captured in the inclusion of time for staff sickness, training and holiday time in the “core running” activities and, whenever possible, collection of data on employer cost including pension contributions rather than gross salaries.
- The NLH Partnership and Ceeda studies undertook data collection in June and July. The evidence presented above suggests that hourly cost per child is higher in these months than at other times of year, although the difference is only around 5 percent on average.
- The sample frame for the Ceeda study was settings with good or outstanding Ofsted ratings which could have higher costs than other settings. However, only a small proportion of settings do not have a good or outstanding Ofsted rating which would limit the impact of this selection on the mean cost estimate.⁵⁶

Overall, the higher cost estimates in these three studies may be driven by a combination of these differences in methodological approach and sample characteristics.

The DfE Analytical Report acknowledges an upward bias in its headline benchmark figures due to an assumption of no staff flexibility in response to incomplete occupancy (see Annex B). Allowance for greater staff flexibility generates a lower benchmark cost for three/four year olds in private settings of £3.49 (slide 72). Moreover, the second

⁵⁵ See section 2.2, fourth bullet point on “other costs” above.

⁵⁶ In addition, the NLH Partnership study considered mostly settings with good or outstanding Ofsted ratings (52 had good or outstanding Ofsted ratings, 1 had a rating of requiring improvement, 2 were waiting inspection and 2 were unknown (table 1)), but the hourly cost estimates were considerably lower than in the Ceeda report.

benchmark costs presented in table 24 based on statutory minimum staff:child ratios are another way of considering greater staff flexibility (if observed ratios are higher than the statutory minimums because of a lack of flexibility) and generate lower bound benchmark costs. The cost estimates for three/four year olds presented in this report fall either within or close to the range of the two benchmark numbers for each provider type in the DfE Analytical Report.

4. Revenue

This chapter analyses the revenue sources for early education in the sample of 160 mainstream settings and the relationships between revenue levels and the average costs presented in the previous chapter. The first section examines the proportions of revenue from parental fees, the free early education entitlement (FEEE) and from other sources, while the following section analyses hourly parental fees and FEEE rates. The remaining two sections combine the revenue information with the cost data to analyse the degree of cross-subsidisation between age groups and the rate of surplus for settings (defined as the ratio between total revenue and total cost)⁵⁷.

The key findings are:

- Almost all revenue is from parental fees and the free early education entitlement (FEEE). Small proportions of settings have two year olds or three/four year olds only funded by parental fees or only funded by the FEEE. (Section 4.1)
- Most settings have some other sources of revenue, but these are typically a very small proportion of total revenue. (Section 4.1)
- On average, settings receive £0.67 more per hour from the FEEE than from parental fees for two year olds. On average, settings received £0.44 less per hour from the FEEE than from parental fees for three/four year olds. (Section 4.2)
- Cross-subsidisation in revenue from older children to younger children is strongest in private and voluntary settings. (Section 4.3)
- The mean surplus rate (the ratio of total revenue to total cost) across all settings is 1.19, but is higher for private, voluntary and nursery class settings than for maintained nursery schools, LA/Children's Centres and childminder settings. (Section 4.4)
- Differences in the surplus rate across setting and local characteristic tend to inversely mirror the differences in delivery costs because there is considerably less variation in revenue rates than in delivery costs across these characteristics. (Section 4.4)

⁵⁷ It should be noted that the measure of cost does not include any returns to investments in the setting or business (such as payments for interest on loans or overdrafts or payments to owners) or expenditures on investments which improve facilities or increase capacity and raise the value of the setting or business. Any surplus in revenue over cost might be required for these purposes.

4.1 Sources of revenue

Across all four age groups of children, 48 percent of revenue is from parental fees, 49 percent is from the FEEE and 3 percent from other sources. These proportions vary by provider type with voluntary and maintained (nursery class, maintained nursery school and LA / children’s centres) settings deriving much larger proportions (over 60 percent) of their revenue from the FEEE and notable proportions also coming from other sources (figure 12). In contrast, private and childminder providers derive most of their revenue from parental fees (around 60 percent and 90 percent respectively), potentially reflecting, in part, a greater proportion of children under age two or age two but not eligible for the FEEE.⁵⁸

Figure 12: Proportions of revenue from different sources by provider type

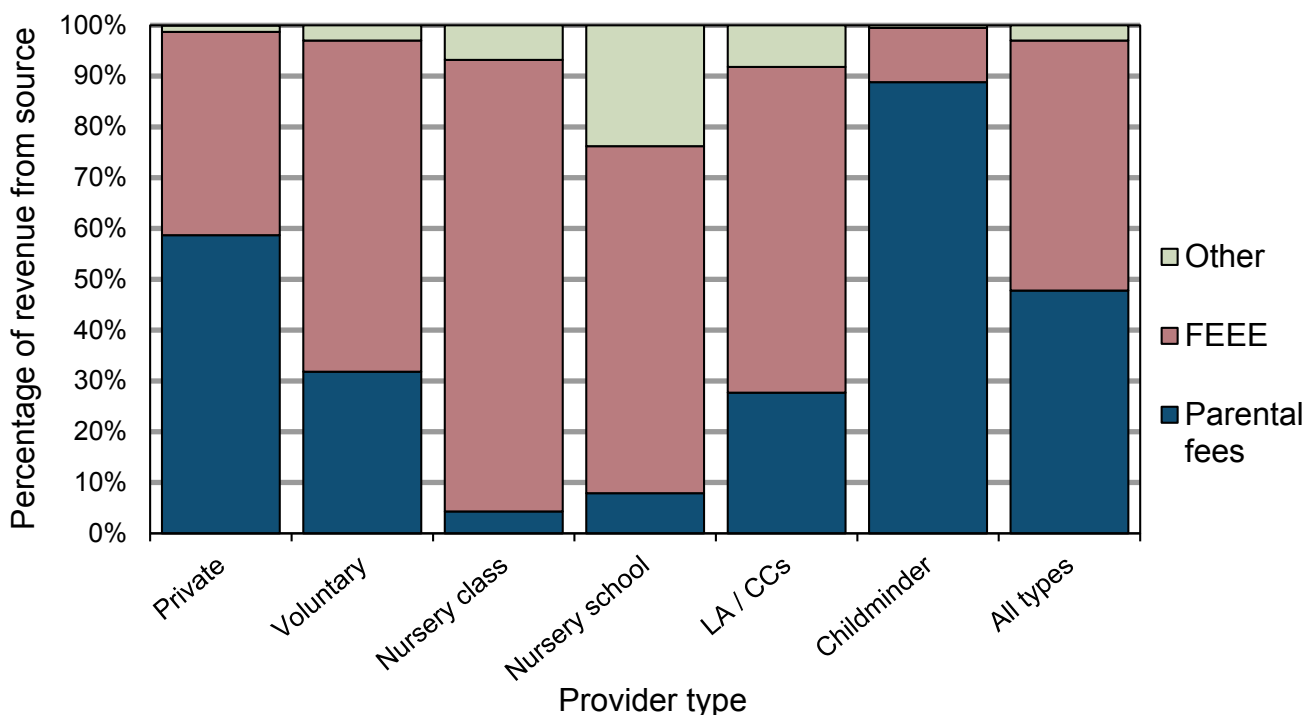


Table 25 presents the proportions of settings with two year olds and three/four year olds funded only by parental fees, only by the FEEE or by a mixture. Around three quarters of settings with two year olds have a mix of these revenue sources for that age group, while almost 80 percent of settings with three/four year olds have a mix for the older age group. Fewer settings have children only funded by parental fees (19 percent for two year olds

⁵⁸ Data from the Provider Finances Survey 2012 indicated that 87 percent of income was derived from the free entitlement and parental fees and 13 percent from other sources for group-based private settings, while the proportions were 73 percent and 27 percent for not-for-profit group-based providers and 95 percent and 5 percent for childminders (Brind, Norden & Oseman (2012), chart 4.3), indicating a similar pattern across provider type to that shown here, although the proportions of income from other sources is generally slightly higher than those shown here.

and 6 percent for three/four year olds) or only by the FEEE (6 percent for two year olds and 15 percent for three/four year olds).

Table 25: Combinations of parental fees and FEEE

Percentage of settings with revenue sources	Two years old				Three/four years old			
	Parent fees only	Parent fees + FEEE	FEEE only	# of obs.	Parent fees only	Parent fees + FEEE	FEEE only	# of obs.
Private	10%	88%	2%	64	0%	97%	3%	65
Voluntary	4%	96%	0%	25	4%	92%	4%	25
Nursery class	0%	25%	75%	4	0%	28%	72%	18
Maintained nursery school	0%	57%	43%	7	0%	70%	30%	10
LA / children's centre	7%	80%	13%	15	0%	80%	20%	15
Childminder	73%	18%	9%	22	36%	59%	5%	22
All types	19%	74%	6%	137	6%	79%	15%	155

Source: SEED

Notes: There are fewer settings than in the previous chapter because three settings did not provide revenue data.

For both age groups, nursery classes are far more likely than the other types to only have revenue from the FEEE, while a higher proportion of the other maintained providers (maintained nursery schools and LA / children's centres) than private or voluntary providers only have revenue from the FEEE. Childminders are most likely to only have revenue from parental fees, although the proportion is higher for two year olds (73 percent) than for three and four year olds (36 percent) which is not surprising given that only 40 percent of two year olds are eligible for the FEEE.

Most settings (61 percent) have some other sources of revenue in addition to parental fees and the basic FEEE payment (table 26). But these sources of other revenue generally constitute very small proportions of total revenue: other sources account for one tenth or more of all revenue in only 6 percent of settings, although 70 percent of maintained nursery schools, 17 percent of nursery classes and 14 percent of LA/children's centres receive 10 percent or more of their revenue from other sources. In addition, a much smaller proportion of childminders (21 percent) receive any income from other sources.

Table 26: Amounts of other revenue by type of provider

Type of provider	Percentage of settings receiving proportion of revenue from other sources:				Number of obs.
	None	Less than 10%	>=10% & < 50%	50% or more	
Private	40%	58%	2%	0%	65
Voluntary	20%	72%	8%	0%	25
Nursery class	33%	50%	17%	0%	18
Maintained nursery school	10%	20%	60%	10%	10
LA / children's centre	13%	73%	7%	7%	15
Childminder	79%	21%	0%	0%	24
All	39%	54%	6%	<1%	157

Source: SEED

Specific sources of other revenue are presented in table 27, disaggregated more broadly by provider type for ease of presentation into PVI (private, voluntary and independent providers), maintained (nursery classes, maintained nursery schools and LA / children's centres) and childminders.

Table 27: Specific types of other revenue sources

Percentage of settings receiving revenue from:	PVI settings	Maintained settings	Child-minders	All types
Early years pupil premium (LA)	26%	35%	4%	25%
FEEE deprivation premium (LA)	13%	10%	0%	10%
FEEE inclusion premium (LA)	1%	0%	0%	1%
FEEE high quality / Ofsted premium (LA)	3%	1%	4%	3%
FEEE flexibility premium (LA)	1%	0%	0%	1%
Sports premium (LA)	0%	12%	0%	2%
Salary subsidy (LA)	2%	1%	4%	2%
SEND (LA)	27%	31%	0%	23%
Annual grant (LA)	0%	28%	0%	6%
Rental income from LA property	0%	5%	0%	1%
Grant for specific item (LA)	6%	4%	4%	5%
Milk allowance	4%	4%	0%	4%
National government grant	1%	4%	0%	2%
College student salary subsidy	1%	4%	0%	2%
College paying parental fees	1%	1%	0%	1%
Charity grant or donation	3%	0%	4%	2%
Parental or other donation	6%	4%	0%	5%
Fundraising	24%	26%	0%	21%
Lunch or snack charges	7%	3%	0%	5%
Number of observations	90	43	24	157

Source: SEED

Notes: PVI settings include private, voluntary and independent settings. Maintained settings include nursery classes, maintained nursery school and LA / children's centres. (LA) indicates a source from a Local Authority.

There are several key points to draw from table 27:

- Providers draw on a broad range of other sources of revenue (many from local authorities, but also from the national Government, colleges, charities and parents), but many sources are only used by very small proportions of settings.
- Three sources are more commonly used: the Early Years Pupil Premium (25 percent of settings), funding for children with SEND (23 percent of settings) and fundraising (21 percent of settings).⁵⁹
- Regular “charges” to parents in addition to the basic parental fee appear relatively rare: only 5 percent of settings reported revenue from lunch or snack charges.
- Higher proportions of maintained settings than PVI settings receive revenue from the Early Years Pupil Premium and in Local Authority annual grants, but similar proportions receive revenue from other sources (including from fundraising).
- Childminders rarely receive revenue from these other sources (noting that the 4 percent figures in table 27 for childminders represent a single case).

4.2 Parental fees and free entitlement rates

Table 28 presents the mean hourly parental fee and mean hourly FEEE funding rate for each age of child⁶⁰. The hourly parental fee is presented for those not receiving the FEEE; those who are receiving the FEEE but also paying for additional hours; and as an average of the two weighted by the number of children in each category in the setting.

⁵⁹ Data from the Providers Survey 2013 indicates that 30 percent of full day care providers, 45 percent of sessional providers and 0 percent of childminders mention fundraising as a source of income (Brind et al (2014), table 10.10c), which is similar to the proportions presented here if fundraising is also taken to include donations from charities or parents.

⁶⁰ These mean hourly FEEE rates are the basic rates without premiums (including the Early Years Pupil Premium), but these premiums add little to the mean basic rate.

Table 28: Hourly parental fees and FEEE funding rates

	Under two years old	Two years old	Three/four years old	School children
All settings				
Mean hourly parental fee for children not receiving FEEE	£4.44	£4.25	£4.13	£4.17
Mean hourly parental fee for children receiving FEEE	n/a	£4.44	£4.36	n/a
Mean hourly parental for all children	£4.44	£4.29	£4.33	£4.17
Mean hourly FEEE rate	n/a	£4.93	£3.93	n/a
Settings with parental fees and FEEE				
Mean hourly parental fee	n/a	£4.25	£4.34	n/a
Mean hourly FEEE rate	n/a	£4.92	£3.90	n/a
Difference: FEEE minus average hourly fee	n/a	£0.67	- £0.44	n/a

Source: SEED

Table 28 shows:

- The average hourly parental fee (for those not also receiving the FEEE) declines with age from £4.44 for children under age two to £4.17 for school age children,⁶¹

⁶¹ The most recent average hourly fees reported by the Family Childcare Trust (FCT) use data from November 2015 for children under the age of two and children aged two and over (Rutter (2016), tables 1 and 3 for England). For children under two years old in the data used here, the average fee for group-based care (all types except childminders) is £4.46 which is very similar to the rates presented in the FCT report (£4.73 for 25 weekly hours and £4.44 for 50 weekly hours for nursery care). For childminders, the average fee in the data used here is £4.38 which is slightly higher than the rates in the FCT report (£4.21 for 25 weekly hours and £4.08 for 50 weekly hours). For children aged two or three/four years old, the average hourly fee in group-based care is £4.31 in the data used here which is slightly lower than the rate in the FCT (£4.52 for 25 weekly hours) and £4.36 for childminders which is slightly higher than the rate in the FCT report (£4.18 for 25 weekly hours). It should be noted that the data collection method for the FCT report is based on a survey of Local Authorities, asking them to estimate an average weekly cost for 25 and 50 weekly hours paid by parents for the different ages of children in different types of care. Older data for 2013 reported in the Providers Survey (Brind et al (2014)) reports average hourly fees of £4.40, £4.10 and £3.90 for children aged under two, aged two and aged three and four in full day care which shows a similar pattern over the age of children to that reported here, although the gaps across ages are slightly larger.

although the average hourly parental fee across all children (whether receiving the FEEE or not) is very similar for two year olds and three/four year olds.⁶²

- The mean hourly fee is slightly higher for children of similar age who also receive the FEEE: the difference is £0.19 for two year olds and £0.23 for three/four year olds.
- The mean hourly parental fee and the mean FEEE rate for settings receiving both sources of revenue is very similar to the mean values for all settings (indicating that the mean values are not substantially different between setting receiving revenue from both sources over those receiving revenue from only one of the sources).
- For settings receiving both parental fees and the FEEE, the mean hourly FEEE rate for two year olds (£4.92) is £0.60 higher than the average parental fee rate, while the mean hourly FEEE rate for three/four year olds (£3.90) is £0.44 lower than the average parental fee rate.

Figures 13 and 14 present mean hourly parental fees and FEEE rates across types of providers. For both age groups, hourly parental fees tend to be lower in voluntary, nursery class and maintained nursery school settings.⁶³ For two year olds, there is little difference in the mean FEEE rate across provider type: consequently, while the mean FEEE rate is higher than the average parental fee for all provider types, the gap is greatest for voluntary settings and nursery classes. For three/four year olds, the mean FEEE rate is distinctly higher for maintained nursery schools, LA/Children's Centres and childminders: the combined effect with the pattern in parental fees is considerable variation across provider types in the gap between the mean FEEE rate and average parental fee, ranging from a large positive gap for maintained nursery schools to a substantial negative one for private settings.

⁶² The mean hourly parental fee is slightly lower for two year olds than for three/four year olds. Within the 120 settings with parental fees for both age groups, 13 percent had the same hourly fee for both age groups, 40 percent had a lower fee for two year olds and 47 percent had a lower fee for three/four year olds. It should be noted that these are actual hourly fees paid (including any discounts) and not necessarily the advertised rates.

⁶³ Average hourly amounts paid by parents across different types of providers are presented in Huskinson et al (2016) using data from the Childcare and Early Years Survey of Parents in 2014 and 2015. Although these figures are for all ages of children and show the average hourly amount paid by parents averaged across all hours used (including any free hours), the patterns across types are similar to those presented here with the lowest hourly amounts paid for playgroup or pre-school, nursery classes and maintained nursery schools and the highest hourly amounts for day nurseries and childminders (table 5.4).

Figure 13: Parental fees and FEEE rate by provider type for two year olds

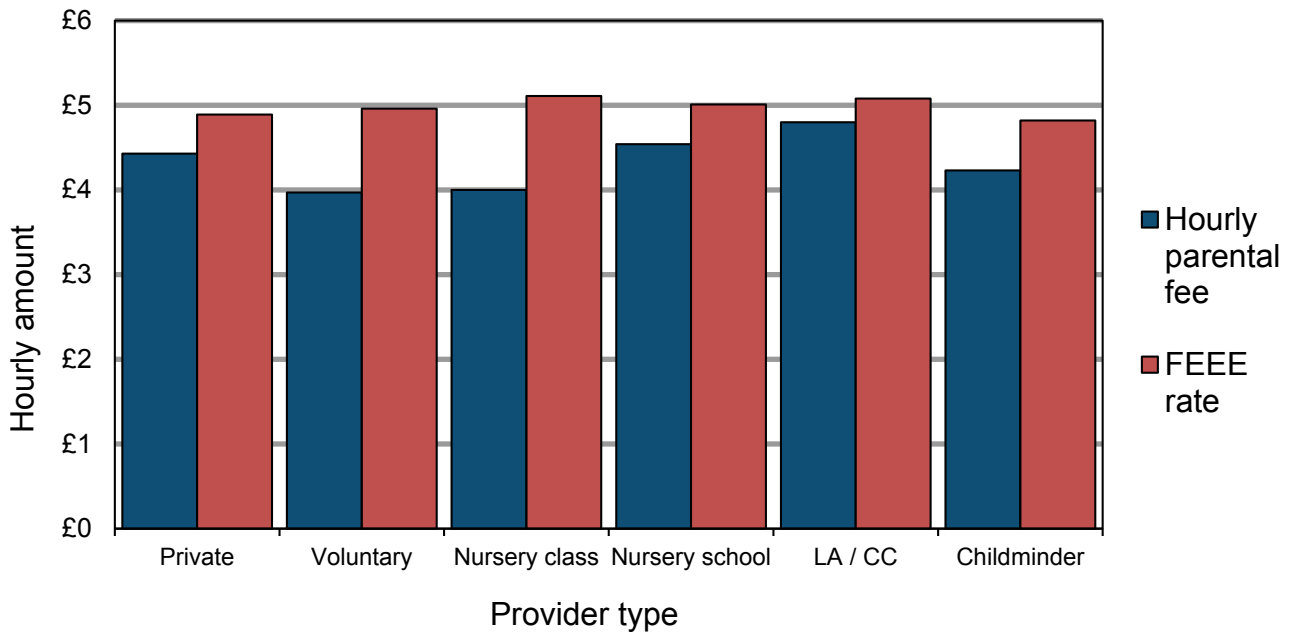
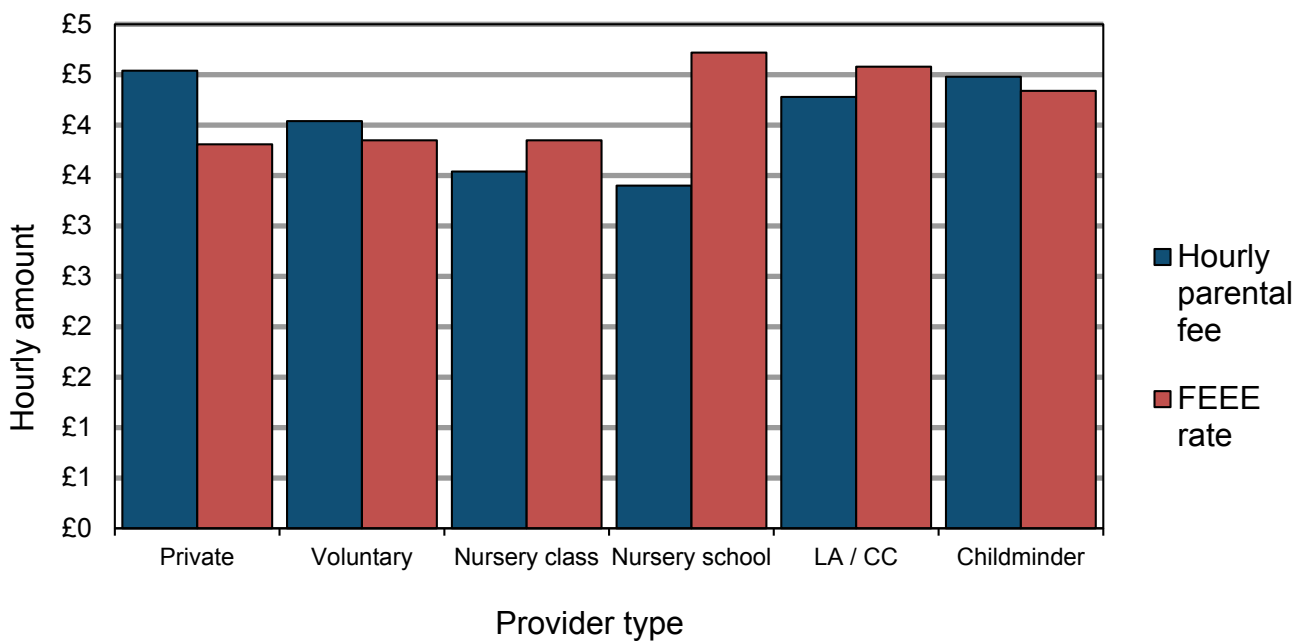


Figure 14: Parental fees and FEEE rate by provider type for three/four year olds



Figures 15 and 16 present the average hourly parental fees and mean FEEE rates across regions. For two year old children, average hourly parental fees are highest in London, the South East, the South West and lowest in the Midlands and East of England. Given the similar average FEEE rate across the regions outside of London, the three regions with the lowest parental fees also have the greatest gap between the mean FEEE rate and average parental fee, although the average FEEE rate is higher than the average hourly parental fee in all regions.

Figure 15: Parental fees and FEEE rate by region for two year olds

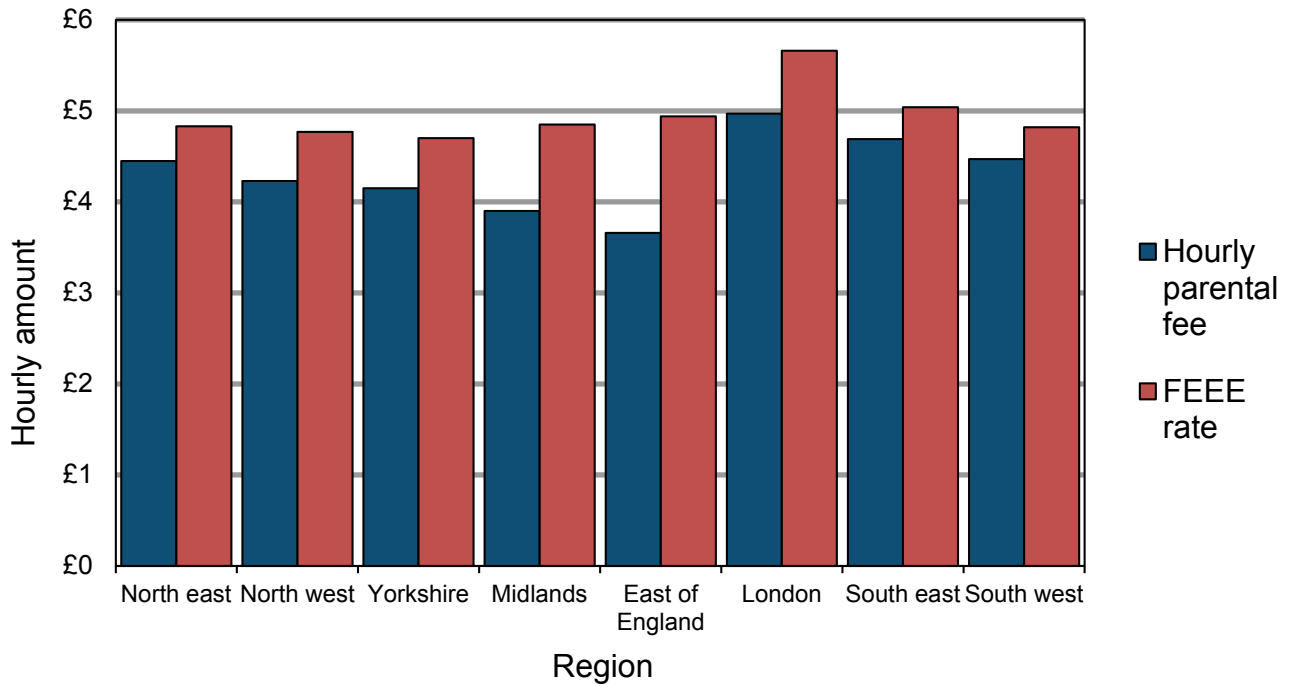
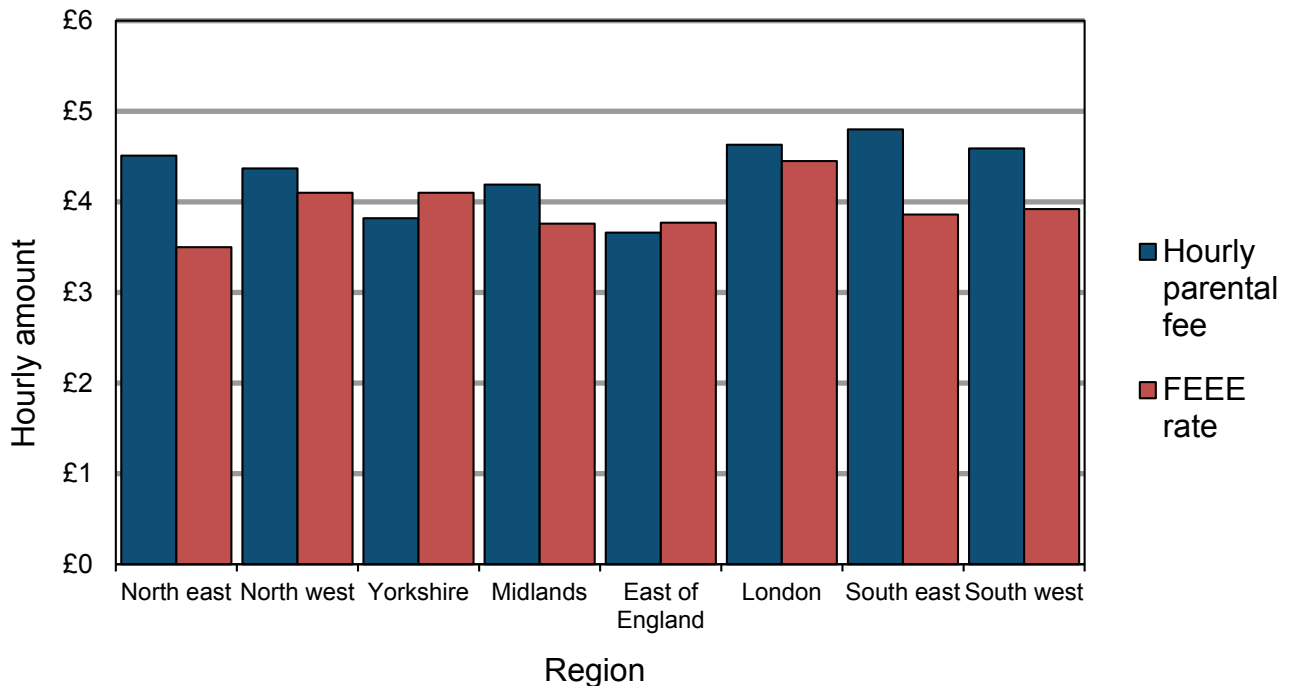


Figure 16: Parental fees and FEEE rate by region for three/four year olds

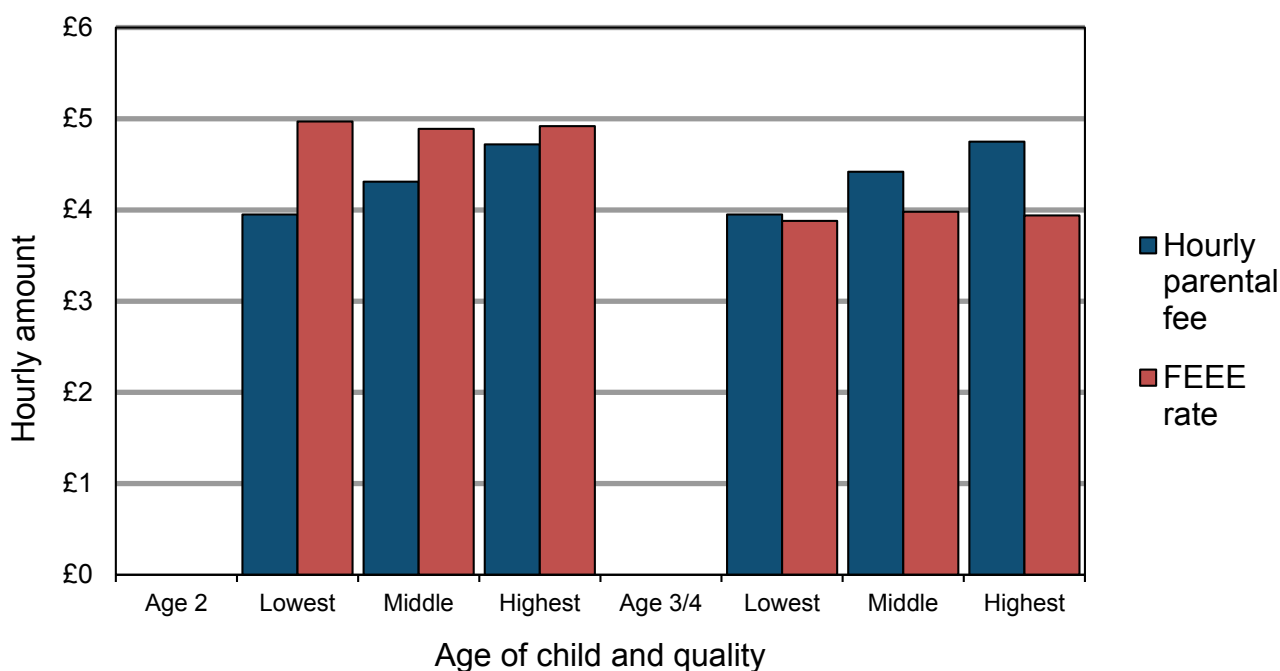


The pattern in hourly parental fees for three/four year olds is similar to that for two year olds (with the exception of a slightly higher average fee for the Midlands), but is more compressed, while there is more variation in the mean FEEE rate across regions than for the younger age group. Consequently, the gaps between the average parental fee and

the mean FEEE rate vary from small positive ones in Yorkshire and the East of England to larger negative ones in the North East, the South East and South West.⁶⁴

There are distinct patterns in the average hourly parental fee and mean FEEE rate across setting quality level (figure 17). For both age groups, the parental fee is higher for better quality levels, but the FEEE rate does not rise across quality levels. Consequently, the positive gap between the mean FEEE rate and average parental fee for two year olds declines with quality level, while the negative gap rises for three/four year olds increases with quality level.

Figure 17: Parental fees and FEEE rate by quality



4.3 Cross-subsidisation between age groups

There is a perception that parental fees across age groups are structured to “smooth” some of the cost differences across age groups, with parents of younger, higher cost children paying less relative to parents with older, lower cost children. As both hourly costs and hourly revenue rates vary by age of child, measuring rates of cross subsidisation is not straightforward. It is also further complicated by the fact that revenue may exceed costs (generating a surplus for the setting or a loss if costs exceed revenue)

⁶⁴ The Family and Childcare Trust report shows that parental fees are highest in London, South East and South West regions, but also indicates higher average fees in the East of England and the Midlands than in the three most northern regions (Rutter (2016), table 1). The differences may reflect that the fees used in this study are actual amounts paid rather than advertised prices and also cover the entire range of weekly hours used rather than 25 weekly hours. On the other hand, due caution should be given to the numbers in this report as they are based on relatively small subsamples for each region.

and that some revenue sources (many of those listed in the “other revenue” in section 4.1) are not attributable to a particular age of child.

Table 29 presents a measure of cross-subsidisation for the different age groups:

- The first column presents the mean setting ratio of hourly revenue to hourly cost for settings with children in the age group (where revenue is from all sources including parental fees, FEEE and other sources). For example, the 87 settings with children under the age of two receive on average £1.22 in revenue for every £1 of costs. This hourly revenue includes revenue for all ages of children and all other sources of revenue not attributable to a specific age of child divided by the total number of hours of care paid for by the revenue. The hourly cost analogously includes all costs divided by the total number of delivered hours of care.
- The second column presents the same ratio for the specified age group using the costs and revenue attributable to that age group. For example, for the 87 settings with children under the age of two receive on average £1.02 in revenue for children under age two for every £1 of costs for children under age two.
- The third column shows the ratio between the first two columns or, in other words, normalises the revenue to cost ratio for each age group by the average for the entire setting to provide a measure of the degree of cross-subsidisation between ages. For example, the average revenue to cost ratio of 1.02 for under two year olds is 86 percent of the average revenue to cost ratio for all ages of children in settings with children under the age of two.

Table 29: Ratio of hourly fee to hourly cost by age

Age of child	Mean setting ratio of hourly revenue to hourly cost	Mean age group ratio of hourly revenue to hourly cost	Relative percentage paid by age group	Number of obs.
Under two years old	1.22	1.02	86%	87
Two years old	1.20	1.17	98%	137
Three/four years old	1.19	1.22	103%	155
School children	1.23	1.39	109%	48

Source: SEED

There are two points to note about this measure. First, the ratios in the first column in table 29 differ by age of child only because not all settings have children in all age groups (and the sample therefore differs across child age). Second, because of the presence of “other revenue” which cannot be attributed to a specific age of child, it is possible for all age groups within a setting to pay a relative amount which is less than 100 percent, with

the remaining part paid by the “other revenue” source. Implicitly, the “relative percentage paid by age group” captures the proportion of costs for each age group and setting-specific rate of surplus that it is paid by parental fees and the basic FEEE for that age group.

On average, the relative percentage paid for children under the age of two is only 86 percent, compared to 98 percent for two year olds, 103 percent for three/four year olds and 109 percent for school children. This suggests that costs for the youngest age group are cross-subsidised by revenue for the older two pre-school age groups and that revenue for school children cross-subsidises the costs of preschool children where settings have school children.

Table 30: Relative percentage paid by age group by setting age profile

Setting child age profile	Relative percentage paid by age group				Number of obs.
	Under two years old	Two years old	Three/four years old	School children	
Only three/four year olds	n/a	n/a	91%	n/a	18
Only two and three/four year olds	n/a	96%	95%	n/a	39
Plus school children	n/a	99%	94%	90%	12
Plus under twos	82%	103%	110%	n/a	51
Plus school children and under twos	91%	95%	107%	114%	33

Source: SEED

Table 30 presents these relative percentages paid for each age group by the setting age profile. It shows that:

- Settings only with children in the three/four age group (or only with children in the two and three/four age group) have average relative percentages paid of 91 percent (96 and 95 percent) showing that an average 9 percent (around 5 percent) of the costs and surplus is funded by other sources not normally attributable to a specific age group.
- For settings which also have school age children, there is some indication that the cross-subsidisation favours older children (although based on only 12 settings).
- For settings which also have children under the age of two (with or without school children), the cross-subsidisation generally favours those aged under two, with some indication that two year olds are also favoured over three/four year olds.

Table 31 presents the relative percentages paid for each age group by provider type. Cross-subsidisation from older to younger age groups is strongest in private and voluntary settings (and also strong for childminders with the exception of the under two age group), while the patterns for the maintained settings are more mixed. This may reflect less explicit smoothing of costs in the maintained settings or that a higher proportion of revenue in the maintained sectors is drawn from “other sources” facilitating a lower relative percentage paid by the most numerous age group of three/four year olds.

Table 31: Relative percentage paid by age group by provider type

Provider type	Relative percentage paid by age group				Number of obs.
	Under two years old	Two years old	Three/four years old	School children	
Private	81%	101%	108%	115%	65
Voluntary	76%	98%	101%	120%	25
Nursery class	n/a	100%	93%	0%	18
Maintained nursery school	92%	79%	75%	86%	10
LA / children’s centre	81%	94%	91%	57%	15
Childminder	101%	95%	105%	112%	24

Source: SEED

4.4 Surplus of total revenue over total cost

This section explores the degree of surplus across different types of settings. This surplus is measured as the ratio between the total revenue for the setting (including parental fees, FEEE and the other sources) and the total costs (including the imputed values for costs not directly paid for such as venue space owned by the setting).

The average rate of surplus is 1.19 and just over two thirds of all settings (71 percent) have a surplus rate of greater than one indicating that total costs exceeds total revenue.⁶⁵ The average surplus rate is statistically significantly higher for private settings

⁶⁵ This is broadly consistent with previous estimates. Data from the Provider Finances Survey for 2012 indicates that 63 percent of group-based settings had made a surplus over the previous 12 month period (Brind, Norden & Oseman (2012), chart 6.1). Data from the Providers Survey for 2013 indicates that 37 percent of full day care providers made a surplus, 31 percent were covering costs and 15 percent were operating at a loss, although 15 percent gave no response to the question (Brind et al (2014), table 10.14a). NHL Partnership (2015) report the most recent figures that 67 percent of their sample of 51 PVI settings made a surplus in the previous financial year, 10 percent broke even and 24 percent made a loss (page 17).

(1.30) than for maintained nursery schools, LA / children’s centres and childminders (0.98, 1.01 and 1.01 respectively) (table 32). The average surplus rates for voluntary settings and nursery classes (1.18 and 1.17 respectively) are also statistically significantly higher than childminders.⁶⁶

Table 32: Rate of surplus by provider type

Type of provider	Surplus rate: ratio of total revenue to total cost	Number of obs.	Statistically significant differences at 10% (*), 5% (**) and 1% (***)
Private (P)	1.30	65	P > (NS* LA** CM***) V > CM** NC > CM*
Voluntary (V)	1.18	25	
Nursery class (NC)	1.17	18	
Maintained nursery school (NS)	0.98	10	
LA / children’s centre (LA)	1.01	15	
Childminder (CM)	1.01	24	
All types	1.19	157	

Source: SEED

Notes: The measure of cost does not include any returns to investments in the setting or business (such as payments for interest on loans or overdrafts or payments to owners) or expenditures on investments which improve facilities or increase capacity and raise the value of the setting or business. Any surplus in revenue over cost might be required for these purposes.

More broadly, differences in surplus rates across different setting and local characteristics inversely mirror the differences in average cost observed in the previous chapter: characteristics associated with lower average cost tend to be those associated with higher surplus rates. This suggests that higher costs are not associated with sufficiently higher hourly revenue to create even rates of surplus across different types of settings or in different areas.

Table 33 highlights this pattern for regional differences in the rate of surplus. The surplus rate is highest in the North East, North West, Yorkshire and the South East and lowest in

⁶⁶ The pattern in the proportion of providers making a surplus (86 percent of private providers and 76 percent of voluntary providers) is broadly consistent with previous evidence although slightly higher than previous estimates: Brind, Norden and Oseman (2012) report that 75 percent of private providers and 61 percent of voluntary providers made a surplus using data from the Provider Finances Survey for 2012 (chart 6.1), while NLH Partnership (2015) report that 81 percent of private providers and 48 percent of voluntary providers made a surplus using data reported in 2015 for the previous financial year (page 17).

the Midlands, although only Yorkshire has an average surplus rate which is statistically significantly greater than several other regions.

Table 33: Ratio of surplus by region

Region	Surplus rate: ratio of total revenue to total cost	Number of obs.	Statistically significant differences at 10% (*), 5% (**) and 1% (***)
North east (NE)	1.29	15	<p>NE > M **</p> <p>Y > (M*** EE** L** SW**)</p> <p>SE > M*</p>
North west (NW)	1.23	18	
Yorkshire (Y)	1.39	16	
Midlands (M)	1.06	26	
East of England (EE)	1.16	19	
London (L)	1.16	21	
South east (SE)	1.24	23	
South west (SW)	1.10	19	

Source: SEED

In addition, for other characteristics:

- The rate of surplus is statistically significantly higher in the least deprived quintile of areas, but there is little difference in the average rate across other levels of deprivation.⁶⁷
- The rate of surplus is statistically significantly higher for middle and large sized settings than for small ones.⁶⁸
- Although the rate of surplus is higher in settings with the lowest level of quality (1.24) compared to settings with the middle of highest level of quality (1.16 for both levels), the differences are not statistically significant.

⁶⁷ The pattern in the proportion of providers making a positive surplus across the quintiles from the least to the most deprived areas (88 percent, 57 percent, 77 percent, 58 percent and 75 percent) is broadly consistent with previous evidence: Brind, Norden & Oseman (2012) report that 66 percent of providers in the 70 percent least deprived area made a surplus compared to 51 percent in the 30 percent most deprived areas (chart 6.1) using data from the Provider Finances Survey for 2012.

⁶⁸ The proportion of settings making a positive surplus is 53 percent, 81 percent and 83 percent for small, medium and large settings respectively, similar to the pattern reported in Brind, Norden & Oseman (2012) of 56 percent, 62 percent and 66 percent (chart 6.1), although it should be noted that they use a different definition of the sizes.

- The average rate of surplus is statistically significantly higher in April, May, June and August than in September, October and November. The rates in May and June are also statistically significantly higher than in July and December.
- No statistically significant differences were identified for multi-site and single-site providers; urban and rural settings; graduate-led and non-graduate-led settings; and across settings with different child age profiles.

5. Costs and revenue for children with SEN/D

This chapter considers the additional costs of delivering early education to children with special educational needs and disabilities (SEND) using two approaches.⁶⁹ The first analyses the additional costs and revenue sources for children with SEND in mainstream settings (section 5.1). The second compares average hourly costs and revenue sources in SEND specialist settings with those for mainstream settings of the same provider type (section 5.2).

The key findings are:

- Additional costs for children with SEND in mainstream settings vary considerably across the type of need. Most of the additional cost is due to the need for additional staff during sessions, although additional staff cost for core running activities is also an important factor. (Section 5.1)
- In this sample, few children with SEND in mainstream settings are funded by parental fees, all receive FEEE funding and just over half receive some SEND-specific funding. The hourly amount of SEND funding varies enormously, from £1 to almost £9 per hour. (Section 5.1)
- Only three of the six specialist SEND settings have substantially higher costs than mainstream settings of the same provider type. Just one of these three settings receives sufficiently high revenue for sustainability. (Section 5.2)
- The evidence from both approaches suggests that the cost of delivering early education to children with SEND can vary considerably by the type of need and that additional funding for children with SEND tends to be insufficient to cover these additional costs.

However, the small number of case studies and the subjective nature of the collection of information on the additional costs for children with SEND in mainstream settings means that this evidence should be treated with caution and requiring further research.

5.1 Children with SEND in mainstream settings

Information on additional costs for children with SEND was collected in 12 mainstream settings. This information covered 52 different children, but some additional costs were aggregated across a number of children with similar conditions in two settings⁷⁰ and a

⁶⁹ Further analysis about the provision of early education for children with SEND can be found in the SEED report Griggs & Bussard (2017).

⁷⁰ These aggregated costs for groups of children were the best way in which the additional costs could be reported.

single representative child was taken from each of these groups to generate a sample of 22 children from the 12 settings.

The type of special need or disability was recorded for each child as the interviewer's description and subsequently categorised into one of five types of need:

- Speech and language problems or delayed development
- Global development delay involving speech and language problems or delayed development combined with / or some delay in social, emotional or behavioural development
- Autism
- Combination of other physical or cognitive need (including toe-walking, Downs syndrome, Williams syndrome and Triple X)
- Physical disability (including cerebral palsy)

A summary of the provider type of the settings and type of need, age and weekly hours attended for the 22 children is presented in table 34. There are only three provider types (four private settings, six voluntary settings and two LA/children's centres) and a reasonable spread of needs across the five categories. Most of the children are aged three or four and most attend for 15 hours or less each week with only three children attending for 30 hours or more each week in private settings.

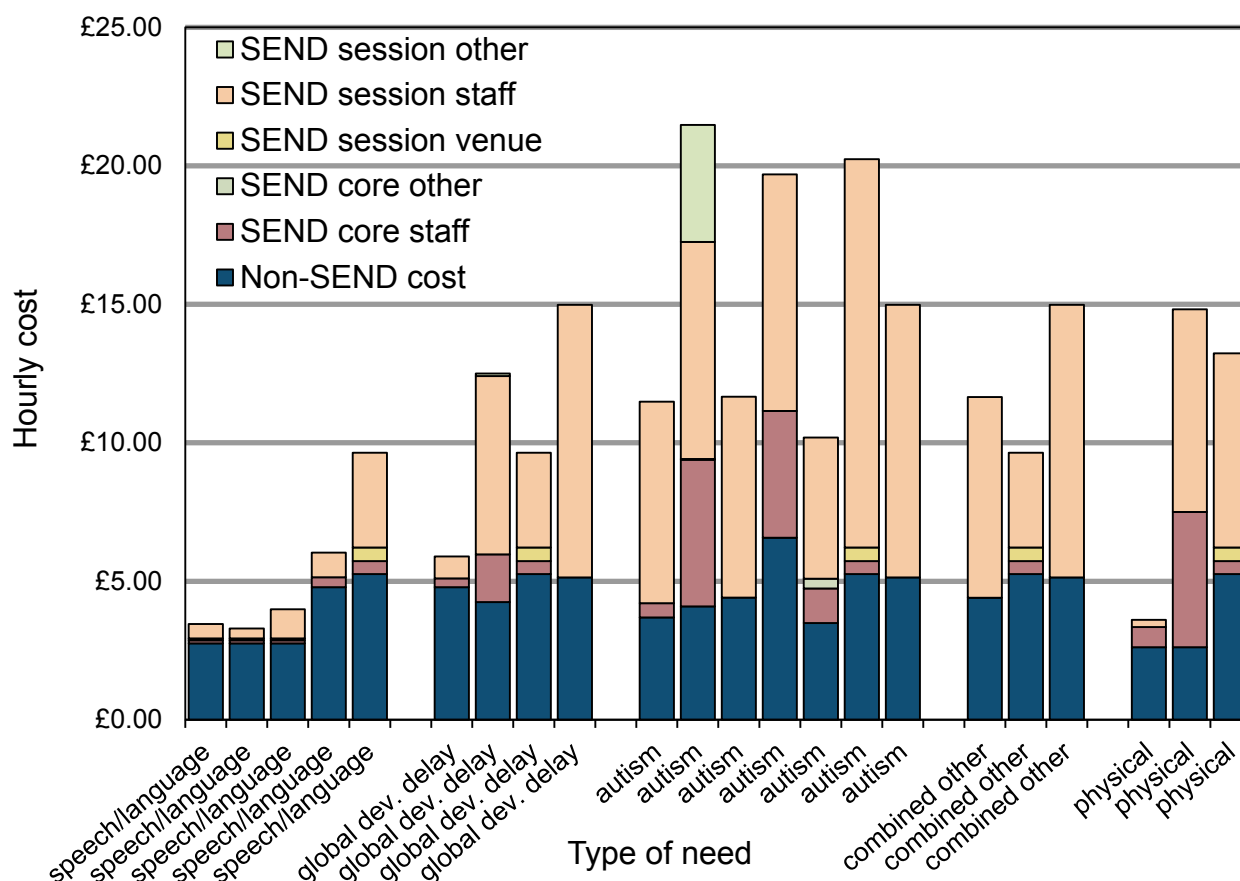
Table 34: Sample of SEND children in mainstream settings

Setting	Type	Type of need	Age	Weekly hours
A	private	speech/language delayed	3-4	30
		speech/language delayed	3-4	30
		speech/language delayed	3-4	15
B	private	autism	2	31
C	private	autism	3-4	4.5
D	private	autism	3-4	12
		other combined needs	2	9
E	voluntary	speech/language delayed	3-4	15
		global development delay	3-4	17.5
F	voluntary	global development delay	3-4	21
G	voluntary	autism	3-4	15
H	voluntary	autism	2	15
I	voluntary	physical	3-4	15
J	voluntary	physical	3-4	15
K	LA / children's centre	speech/language delayed	3-4	15
		global development delay	3-4	15
		autism	3-4	15
		other combined needs	3-4	15
		physical	3-4	15
L	LA / children's centre	global development delay	3-4	15
		autism	3-4	15
		other combined needs	3-4	15

Source: SEED

Figure 18 presents the hourly cost for delivery for each child, grouped by type of need and disaggregated by type of cost. The additional SEND cost ranges from £0.54 to £17.38 per hour. Figure 18 indicates a lower additional SEND cost for children with a speech/language need (between £1 and £4) and a much higher additional cost for children with autism, combined other needs or physical needs (between £5 and £17 in all but one case). Within these three categories, there is also a wide range of additional SEND costs. The additional costs for children in the remaining category of need (global delayed development) are dichotomous, with one half similar to the lower costs for the speech/language category and the other half at a higher level akin to the more costly other three types of need.

Figure 18: Hourly cost for children with SEND

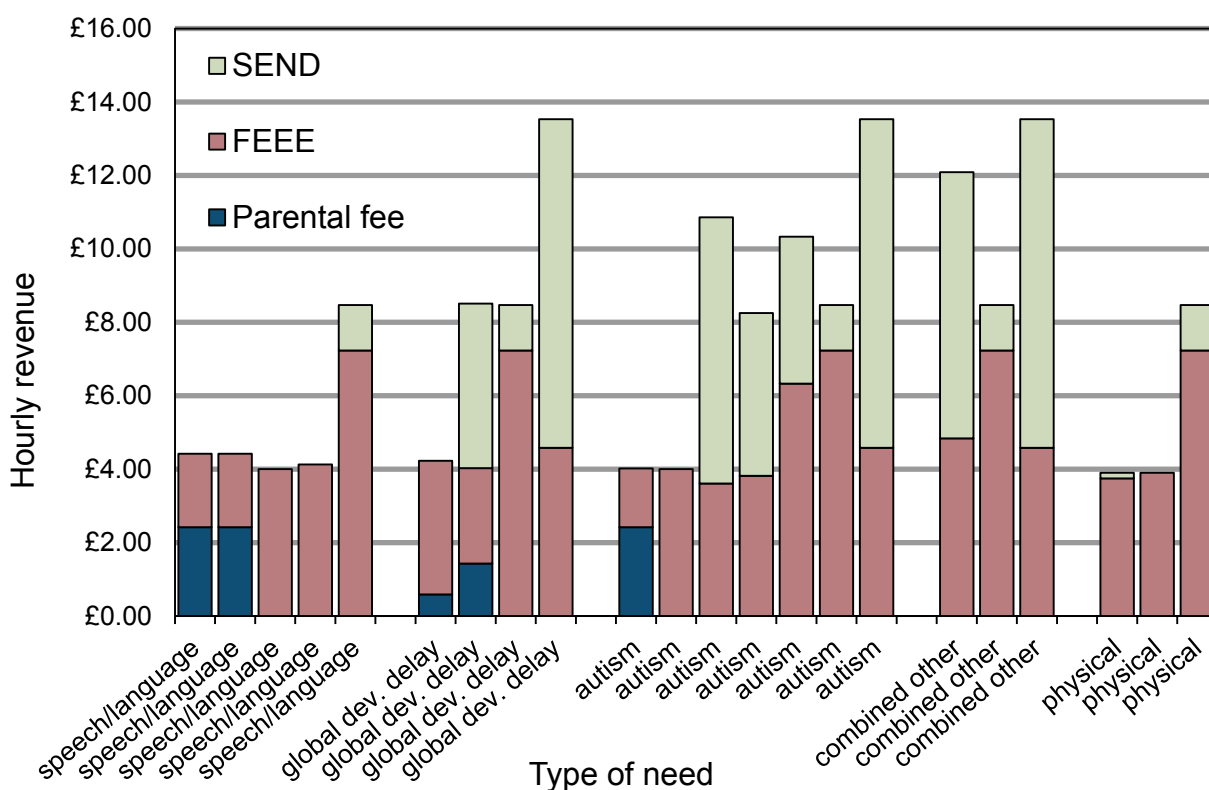


Most of the additional SEND cost is due to additional staff during sessions, but additional cost of staff for core running activities is also an important factor. Additional venue costs due to the need for additional space do not feature in any substantial way, while other costs related to core running are only significant in a few cases (and other costs related to a particular session are only important in one case). Interestingly, there is a similar pattern in the types of additional costs across all five types of need: the difference in additional costs between the types of need is one of scale rather than source. For those with speech/language types of need, higher staff costs during sessions is generally due to the need for occasional specialist language staffing, while the need for one-to-one staffing for children in the other categories of need explain the much higher sessional staff additional costs. Higher core staff costs are typically driven by the extra administration work that is required for applying for SEND funding, applying for EHCs and hiring specialist staff. For children with the particularly high needs, core staff time is also required for regular engagement with parents, specialist training and for the reporting and processing of incidents.

Figure 19 presents the revenue sources and weekly amounts from each source for the 22 children with SEND. Only five children are partly funded by parental fees (three are in private settings and two in voluntary settings), but all receive FEEE funding. In just over half of the cases, the children receive some SEND-specific funding and this is more prevalent among those with needs beyond speech/language development. The hourly

amount of SEND funding varies enormously, from as little as £1 to up to almost £9 per hour.

Figure 19: Revenue for children with SEND



The pattern of the amounts of additional SEND funding shown in the top green segments of the bars in figure 19 have some similarity with the pattern of additional SEND hourly costs presented in figure 18, but there are also some notable differences. Table 35 provides a closer examination of the relationships between additional SEND costs and funding for the different types of need and for different provider types. The table shows that:

- Across all need types and provider types, the average hourly additional SEND cost is £6.88 and the average hourly SEND-specific funding is £2.76, leaving a gap between SEND-related costs and SEND-related funding of just over £4 (final column in bottom panel in table 35).
- This gap is greatest for the autism and physical needs due to the higher hourly SEND-related cost combined with a similar or lower level of SEND-related funding in comparison to the other need types.
- Examining the costs and funding by provider type (top three panels in table 35) shows that both the hourly SEND-related costs and SEND-related funding are slightly higher in the LA / children’s centre settings than in the voluntary or private settings, leading to similar gaps between costs and funding across the different types of settings.

Table 35: Additional SEND costs and funding by type of provider and need

Provider type	Type of need					All types of need
	Speech / language	Global dev. delay	Autism	Combined other needs	Physical	
Private						
Mean SEND cost	£0.82		£10.81	£7.25		£6.02
Mean SEND funding	£0		£2.42	£7.25		£2.07
Diff: funding – cost	- £0.82		- £8.39	£0		- £3.95
Number of obs.	3	0	3	1	0	7
Voluntary						
Mean SEND cost	£1.25	£4.68	£9.90		£6.60	£6.23
Mean SEND funding	£0	£2.24	£4.22		£0.08	£1.87
Diff: funding – cost	- £1.25	- £2.44	- £5.69		- £6.52	- £4.37
Number of obs.	1	2	2	0	2	7
LA / children's centre						
Mean SEND cost	£4.38	£7.11	£12.40	£7.11	£7.97	£8.20
Mean SEND funding	£1.24	£5.10	£5.10	£5.10	£1.24	£4.13
Diff: funding – cost	- £3.14	- £2.02	- £7.32	- £2.02	- £6.73	- £4.07
Number of obs.	1	2	2	2	1	8
All types of providers						
Mean SEND cost	£1.62	£5.90	£11.81	£7.15	£7.05	£6.88
Mean SEND funding	£0.25	£3.67	£3.70	£5.81	£0.46	£2.76
Diff: funding – cost	- £1.37	- £2.23	- £7.31	- £1.34	- £6.59	- £4.13
Number of obs.	5	4	7	3	3	22

Source: SEED

Figure 20: Total hourly cost and total hourly revenue by type of SEND

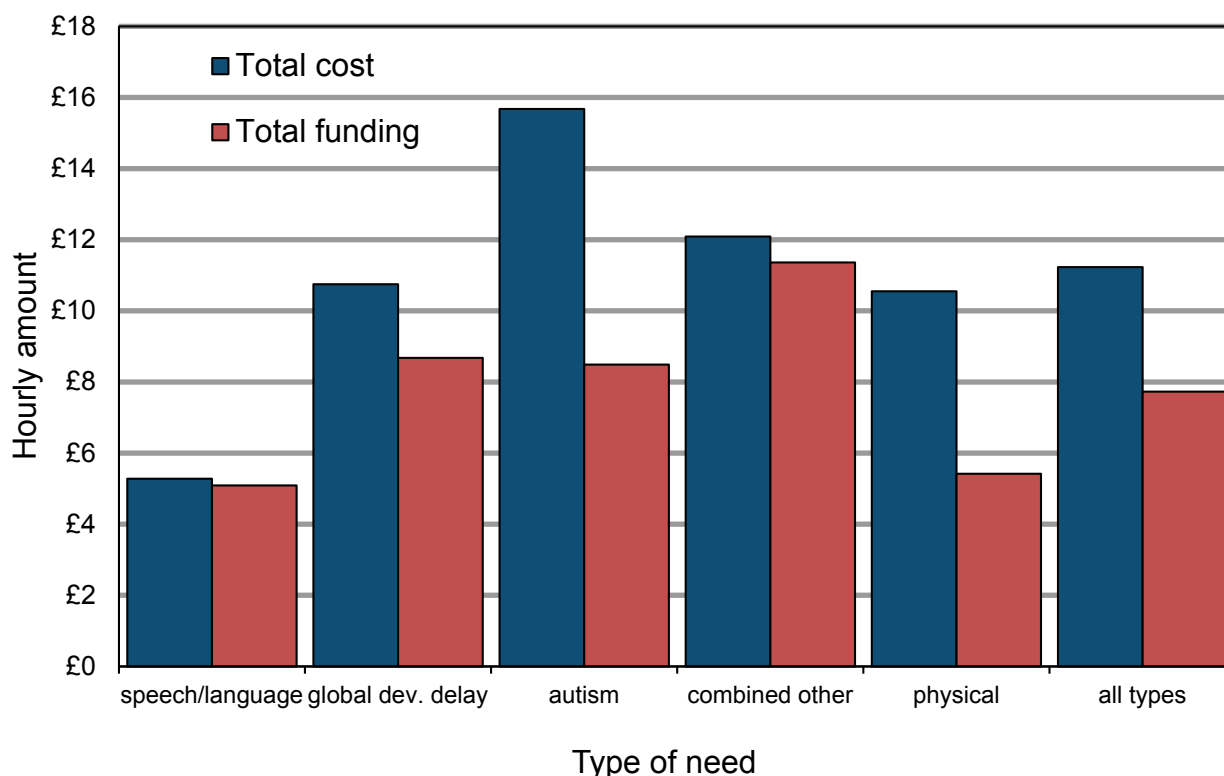


Figure 20 summarises the total cost and revenue amounts for the different types of need. The average hourly cost for all 22 children with SEND is £11.23 and average hourly revenue is £7.37, a gap between cost and revenue of £3.86, broadly in line with the gap between the SEND-specific elements of the cost and revenue. There is some indication that the gaps between costs and revenue are greater for some types of need over others: in particular, additional SEND funding falls shorter of the additional costs for children with autism and physical needs. However, this finding should be treated with caution given the small number of cases in each need type.

5.2 Specialist SEND settings

The six specialist SEND settings consisted of one private, three voluntary, one maintained nursery school and one LA / children’s centre settings. They were drawn from five different regions and evenly distributed across local deprivation levels, but all were in urban areas and were single site providers. Five were in the highest quality group and one in the lowest quality group, with four led by graduates. Three were visited in July, and one each in August, September and October. Cost and revenue information was collected and analysed in an identical manner to the mainstream settings.

The total cost for each of the six SEND specialist settings is broadly similar to the average costs for mainstream settings of similar type (table 36). The three voluntary SEND specialist settings have lower total weekly costs than other types in line with the pattern for mainstream settings, while the maintained nursery school specialist SEND setting has a substantially highest cost which is also notably higher than the average for

mainstream maintained nursery school settings. An unusual feature is the high share of core costs (69 percent) for “voluntary 2” SEND specialist setting, while the share for staff costs (60 percent) for the private SEND specialist setting is also slightly lower than the average for the mainstream settings.

Table 36: Total setting costs for SEND specialist settings

Type of provider	Mean total costs per week	Mean percentage of cost by activity		Mean percentage of cost by type			Number of settings
		Core running	Specific session	Staff costs	Venue costs	Other costs	
Specialist SEND							
Private	£6,541	47%	53%	60%	20%	20%	1
Voluntary 1	£2,407	23%	77%	77%	14%	9%	1
Voluntary 2	£4,563	69%	31%	70%	18%	12%	1
Voluntary 3	£3,054	34%	66%	83%	6%	11%	1
Maintained nursery school	£35,086	25%	75%	80%	11%	9%	1
LA / children’s centre	£6,604	31%	69%	73%	18%	9%	1
Mainstream comparisons							
Private	£6,307	32%	68%	75%	14%	11%	68
Voluntary	£4,116	32%	68%	78%	10%	12%	25
Maintained nursery school	£11,144	38%	62%	78%	10%	12%	10
LA / children’s centre	£9,178	37%	63%	79%	11%	11%	15

Source: SEED

Table 37 presents the average hourly cost for each age group of child in the six specialist SEND settings, together with the average hourly costs for the comparison mainstream settings. There is a somewhat surprising pattern in these costs. Three of the SEND specialist settings (private, voluntary 3 and maintained nursery school⁷¹) have hourly

⁷¹ For the SEND specialist maintained nursery school setting, the hourly costs for children under age two and for school children are particularly high, but maintained nursery schools typically do not have many children in these age groups and these costs are likely to reflect unusual costing structures for a small number of children.

costs which are only slightly higher than the averages for similar type mainstream settings. For the voluntary 1 SEND specialist setting, costs are notably higher than the mainstream averages for voluntary settings (by around £7), but the average hourly costs are considerably higher for the remaining two specialists settings, by around £25 per hour for voluntary 2 and by around £15 an hour for the LA / children’s centre. This suggests a high degree of variation in costs for SEND specialist settings, but strong conclusions should not be drawn from only six cases.

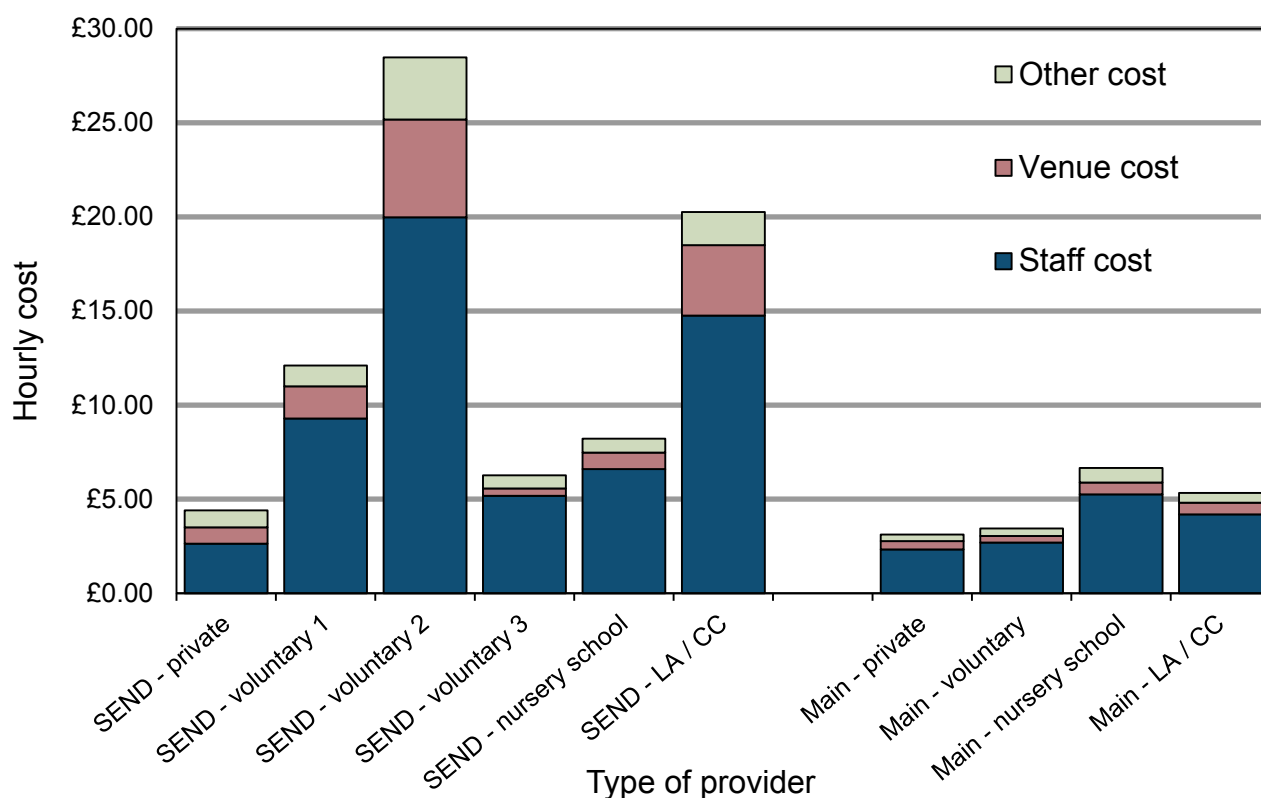
Table 37: Hourly cost for SEND specialist settings

Type of provider	Mean hourly cost				Number of settings
	Under two years old	Two years old	Three/four years old	School children	
Specialist SEND					
Private	£5.64	£5.21	£4.40	n/a	1
Voluntary 1	£11.50	£11.73	£12.10	n/a	1
Voluntary 2	n/a	£28.68	£28.46	n/a	1
Voluntary 3	n/a	£6.19	£6.27	n/a	1
Maintained nursery school	£11.41	£7.51	£8.21	£13.24	1
LA / children’s centre	n/a	£18.54	£20.26	n/a	1
Mainstream comparisons					
Private	£4.39	£3.80	£3.12	£2.90	68
Voluntary	£5.18	£4.01	£3.45	£2.40	25
Maintained nursery school	£4.30	£6.45	£6.65	£9.20	10
LA / children’s centre	£5.12	£5.96	£5.33	£4.11	15

Source: SEED

Figure 21 presents the costs divided into their sources for three/four year olds. The analogous figure for two year olds has an almost identical pattern and is not presented. This figure highlights the sheer scale of differences in hourly costs across the specialist settings. Perhaps unsurprisingly given the division of costs by source shown in table 36, the staff, venue and other costs for the specialist SEND settings simply scale up the divisions for the mainstream averages, indicating that it is not staff costs alone which raise the total costs of caring for children with SEND.

Figure 21: Hourly cost for specialist SEND settings for three/four year olds



Finally, table 38 presents the average hourly revenue amounts in each of the SEND specialist settings and the sources of revenue, again with the mainstream comparisons. This table shows:

- The pattern in the hourly revenue rates across the specialist settings is broadly similar to that for the hourly cost.
- Costs and revenue for the private, voluntary 1 and maintained nursery school specialist SEND settings are close to the averages for the comparable mainstream settings.
- The LA/children’s centre SEND specialist setting has substantially higher costs and revenue than the mainstream averages, but the revenue matches the cost and the rate of surplus is similar to mainstream settings of the same type.
- The remaining two voluntary SEND specialist settings have quite different cost and revenue patterns from mainstream voluntary settings. Both costs and revenue rates are substantially higher in the SEND specialist settings than for the mainstream averages, but costs are also notably higher than the revenue rates leading to low surplus rates (0.63 and 0.58) which are not sustainable in the long term. However, these settings were visited in July and August which could mean that occupancy was unusually low and the average costs unusually high just at this point in time. In addition, the specialist settings receive unusually high proportions of their revenue from other sources indicating that they may operate within an untypical financial model.

Table 38: Revenue for SEND specialist settings

Type of provider	Mean hourly cost	Mean hourly revenue	Surplus rate: ratio of total revenue to total cost	Percentage of revenue from:			Number of settings
				Parental fees	FEEE	Other sources	
Specialist SEND							
Private	£5.03	£5.23	1.04	80%	20%	2%	1
Voluntary 1	£11.89	£7.50	0.63	8%	51%	41%	1
Voluntary 2	£28.52	£16.67	0.58	0%	24%	76%	1
Voluntary 3	£6.26	£5.67	0.91	19%	72%	9%	1
Maintained nursery school	£8.66	£8.30	0.96	19%	48%	33%	1
LA / children's centre	£19.95	£21.63	1.08	0%	0%	100%	1
Mainstream comparisons							
Private	£3.59	£4.51	1.30	59%	40%	1%	65
Voluntary	£3.68	£4.12	1.18	32%	65%	3%	25
Maintained nursery school	£6.71	£6.62	0.98	8%	68%	24%	10
LA / children's centre	£5.57	£5.48	1.01	28%	64%	8%	15

Source: SEED

This analysis of six case studies of specialist SEND settings suggests a dichotomy in the costs and revenue of these specialist settings: half appear to be slightly more expensive mainstream settings while the other half have substantially higher costs and revenue and primarily draw revenue from unusual sources. This could reflect differences in either the proportion of children with SEND in these settings (specialist by no means implies that all children have SEND) or in the type of SEND (as seen in the previous section, costs vary considerably across the type of need).

6. Conclusions

This final chapter briefly reflects on how the evidence presented in this report might help inform the future development of early education and childcare policy. The breadth of the analysis leads to several, somewhat disparate, comments around current questions under discussion.

1. What level of funding for the FEEE can allow early education to be delivered sustainably while also minimizing the public cost?
 - The evidence has shown substantial variation in the resource cost of delivery which highlights that matching FEEE rates to costs is challenging.
 - The implicit cross-subsidisation in revenue across ages of children and across the school year highlights how settings tend to operate by matching total revenue to total costs for the setting as a whole rather than on a child-by-child basis. Simply comparing hourly costs with hourly FEEE rates cannot capture the potential sustainability of offering free places without understanding how the offer fits within the broader financial model for any specific setting.
 - Surplus rates (the ratio of total revenue over total cost) vary notably across different types of settings and it is not clear whether they reflect necessary unmeasured costs (returns to past investments and revenue for future investments) or are simply profit derived from some degree of market power. More broadly, it is not clear whether FEEE rates should cover delivery costs or the level of parental fees that they may displace.
2. Do children with SEND receive adequate support for early education?
 - The limited evidence presented here suggests that adequate and efficient support for these children requires a child-by-child assessment of the level of financial support required and, in some cases, very high levels of revenue to cover substantially higher costs.
 - This does not appear to be completely achieved under the current system, but further research is required to draw robust conclusions.
3. How can early education and childcare be delivered more efficiently at lower cost?
 - The evidence suggests that a key influence on hourly delivery cost is provider type independent of any other setting or local characteristics (including quality), but the reasons why some types appear simply more efficient than others is not clear. Further research on this might identify new sources of efficiency.
 - The key cost driver is staff cost and, but greater efficiency in the use of staff time (such as higher occupancy rates) offers greater potential to reduce costs than

reductions in already low staff salaries. However, many settings have complex staffing models and needing to address competing demands of and uncertainties in staff availability and parental needs for childcare raises substantial challenges to achieving greater efficiency in the use of staff time.

- Other influences on cost (including region, setting size and calendar month) offer fewer opportunities to identify means of improving efficiency. For example, setting size may be driven by the size of the local market or preferences for the smaller scale types of care. The changing levels of demand over the school year give rise to the classic peak-load problem from some fixed inputs which means that higher costs at some times are unavoidable.

4. Can higher funding levels and/or higher subsidies improve quality of care and child outcomes?

- The evidence indicates that higher quality (captured in the SEED direct measures or in settings being graduate-led) does not involve substantially higher cost: this suggests that achieving higher quality by these types of measures does not require substantially higher funding rates.
- Moreover, higher funding or subsidy levels alone may not drive higher quality: greater financial support provides the opportunity for providers to deliver or parents to choose higher quality, but does not guarantee that they will do so. An effective financial incentive would require higher funding or subsidy levels to be attached to higher quality provision or use.
- It should be noted that the ultimate objective is not higher quality provision per se but improved child outcomes. Further evidence is required on the extent to which the measures of quality considered here are associated with improved outcomes (to be considered in later stages of SEED).

5. How can the government obtain best value for money from its early education and childcare policies?

- The evidence presented here has shown considerable variation in the cost of different options for the delivery of the FEEE, suggesting that some may offer better value for money than others. However, this cost side needs to be balanced against the financial value of the impacts of different options to assess value for money, including the impacts in improving child outcomes (to be undertaken in SEED) and in supporting and enabling parents to work or work longer hours.
- Similarly, the value for money of other policies subsidising childcare costs requires further evaluation of the impacts and their financial value which can be balanced against the costs.

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Annex A: Description of setting characteristics

Table 39 provides a description of the definitions for the settings characteristics used throughout this report.

Table 39: Description of setting characteristics

Characteristic	Description
Type of setting	<ul style="list-style-type: none"> • Private – privately owned provision, including full day care and sessional care; ownership by an individual or by a larger organisation/chain; and that based on school sites and elsewhere. • Voluntary – provision run by a charity or voluntary management committee on a not-for-profit basis, including full day care and sessional care; unincorporated and incorporated (and registered with Charity Commission); and that based on school sites and elsewhere. • Independent – early years provision run by an Independent School and delivered on site. • Nursery Class – a maintained early years class within a primary school with a qualified teacher present. • Maintained Nursery School – a maintained school, purpose built and specifically for children in their early years with a qualified teacher present. • LA nursery – full day care or sessional provision delivered by the Local Authority with staff members employed by the Local Authority. • Children’s Centre - governed and managed in various ways by the Local Authority, by the School Governing Body (if on a school site), by a charity or by a private provider. • Childminder – a person whose job is to take care of other people’s children in his or her own home.
Multisite provider	A setting which is part of a chain of at least two settings.
Region	Government Office Region
Urbanity	Based on URINDEW Urban/Rural indicator with: <ul style="list-style-type: none"> • Rural: village, hamlet or isolated dwelling. • Urban: urban and town and fringe.
Deprivation level	Local IMD score based on postcode divided into five discrete categories.

Characteristic	Description
Quality	<p>Quality is an age-specific average based on the average of two measures (ITER and SSTEW) for two year olds and on the average of three measures (ECERS-R, ECERS-E and SSTEW) for three year-olds collected by SEED component 2, divided into three discrete categories:</p> <ul style="list-style-type: none"> • low quality (<4.5) • medium quality (>=4.5 and <5.5) • high quality (>=5.5) <p>The Early Childhood Environment Rating Scale (ECERS-R) and its extension (ECERS-E) are designed to evaluate quality of provision for children aged 2½ to 5 years in centre-based settings. The Infant Toddler Environment Rating Scale (ITERS) is the partner scale for the 0 to 2½ years age range. Both the ECERS-R and ITERS-R contain a wide range of statements or ‘indicators’ with which to evaluate the quality of the early years environment in its broadest sense.</p> <p>The Sustained Shared Thinking and Emotional Well-being (SSTEW) is a new scale which considers practice that supports children in developing skills in sustained shared thinking and emotional well-being, as well as developing strong relationships, effective communication and aspects of self-regulation.</p>
Graduate-led	<p>Highest level of qualification, relevant to working with children or young people, held by the manager of the setting (or childminder) of level 6 (degree) or above.</p>
Size of setting	<p>Number of childcare / early years places that the setting has registered with Ofsted to offer divided into three discrete categories:</p> <ul style="list-style-type: none"> • small (35 places or less) • medium (36 to 60 places) • large (more than 60 places)
Child age profile	<p>Combinations of age groups of children in attendance, based on children attending at the time of the cost visit.</p>

Annex B: Methodological approaches for previous estimates of hourly delivery cost

This Annex describes previous studies which have contained estimates of hourly delivery costs of childcare. It compares seven previous studies with this study in terms of methodological approach for estimating the average hourly cost per child and the sample considered (type of provider, regional distribution, the timing of the data collection and the sample size).⁷² The seven studies are⁷³:

- Ceeda, (2014), *Counting the cost: An analysis of delivery costs for funded early years education and childcare*, October
- Department for Education, (2015a), *Review of childcare costs: the analytical report*, DFE-00295-2015, November
- Gaheer, S. and Paull, G., (2016), *The Value for Money of Children’s Centre Services, Evaluation of Children’s Centres in England (ECCE) Strand 5*, Department for Education Research Report DfE-RR561
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- NLH Partnership, (2015), *Cost of delivering the early education entitlement*, Department for Education Research Report DFE-RR493, November
- New Economics Foundation (NEF), (2014), *The value of childcare: Quality, cost and time*, February

Table 40 provides a comparison of the key features of each of these studies with the approach presented in this report.

⁷² The KPMG study also estimates the potential impact of the introduction of pension auto-enrolment and the national living wage on average costs, while the NEF study estimates costs with the national living wage and “high quality” wages. A follow-on study by Ceeda (2015) also uses the data from the 2014 report to estimate costs in 2015/16 and 2020/21 using projected CPI inflation, projected growth in average weekly wages, implementation of the minimum wage increases, the national living wage, auto-enrolment for pensions and projected changes in Class 1 National Insurance thresholds.

⁷³ An additional study by London Councils (2013) cites an £8 hourly cost for most deprived quintile of two year olds in London, but no source is provided for this figure.

Table 40: Methodologies, samples and timing for previous delivery cost estimates

Sources, methodology, samples and timing
<p>This study (Blainey & Paull (2017)):</p> <ul style="list-style-type: none"> • Methodology: Primary data from face-to-face interviews on child numbers, staff use and salaries, room use and venue costs; and other costs for each session and core running. Calculations: salaries imputed for staff not paid directly; rents imputed for venues used at no direct cost; employer NI and pension added to gross salaries where needed; staff session costs allocated equally across children; venue session costs allocated by room size; core costs allocated by child hours, • Type of provider: separate estimates for 7 types • Regional distribution: 36% north + EM; 51% WM + EE + south; 13% London • Timing: March – December 2015 • Sample sizes: 66 private, 28 voluntary, 3 independent, 18 nursery class, 11 maintained nursery school, 16 LA/children’s centres and 24 childminder settings
<p>Gaheer & Paull (2016)</p> <ul style="list-style-type: none"> • Methodology: as this report • Type of provider: children’s centres • Regional distribution: 38% north + EM; 46% WM + EE + south; 17% London • Timing: data collected in 2012-2014 and indexed to March 2014 • Sample size: 14 children’s centres
<p>Ceeda (2014)</p> <ul style="list-style-type: none"> • Methodology: Primary data from child attendance and staff activity diaries in each room completed by staff over two weeks and pro-forma data on gross salaries and other financial expenditure. Calculations: employer NI, 1% pension and time for sickness, training and holiday added to gross salaries (approx. 16%); staff session costs allocated within session by child age; staff core costs, venue and other costs allocated by number of places in rooms; costs calculated for funded children • Type of provider: funded children in PVI nurseries and playgroups (59% private and 41% voluntary) with good or outstanding Ofsted rating • Regional distribution: 41% north + EM; 52% WM + EE + south; 7% London • Timing: June/July 2014 • Sample size: 100 settings
<p>NLH Partnership (2015) (DfE Childcare Cost Review)</p> <ul style="list-style-type: none"> • Methodology: Primary pro forma data on total hours delivered in each age group; total expenditures on staff and 6 other categories and data on staff:child ratios from interviews. Calculations: staff costs allocated by observed staff:child ratios and child hours; venue and other costs allocated by child hours; statistics weighted by region, deprivation level and ownership type • Type of provider: PVI settings from NLH network (58% private 37% voluntary 5% independent) offering funded places

Sources, methodology, samples and timing

- Regional distribution: 30% north + EM; 49% WM + EE + south; 21% London
- Timing: June/July 2015
- Sample size: 47 settings

KPMG (2015)

- Methodology: Primary data pro-forma data (checked by follow-up telephone interview where needed) on weeks and hours open; number of children in each age group; number of FTE staff; average gross hourly pay; overtime payments; all other costs. Calculations: staff costs allocated according to statutory staff:child ratios and child hours; venue and other costs allocated by child hours
- Type of provider: PVI and childminders (81% PVI 19% childminders) offering funded places
- Regional distribution: Birmingham
- Timing: 2014/2015 (collected over 5 week period)
- Sample size: 79 settings

Green et al (2015)

- Methodology: Primary pro-forma data on expenditures and take-up of places for two year olds.
- Type of provider: schools with good or outstanding Ofsted rating participating in the two-year-olds in schools demonstration project for DfE
- Regional distribution: 48% north; 10% WM; 29% London (EM, EE and south unreported)
- Timing: June and August 2014
- Sample size: 12 schools

DfE Analytical Report (DfE (2015a)) (DfE Childcare Cost Review)

- Methodology: Secondary data and some primary data by type of provider on (a) Child attendance using number of places, opening weeks and days per week, distribution by child age and occupancy rates from DfE Providers Survey 2013, Ceeda (2014), and Deloitte survey/interviews (which were at the time of writing this report unpublished); (b) Staff hours using staff:child ratios, number of contact hours and ratios of non-contact to contact hours from DfE Providers Survey 2013, NLH (2015), NAHT (2015), Ceeda (2014), DfE Providers Finances Survey 2012, and Deloitte survey/interviews; (c) Staff costs using hourly gross pay by qualification, 10% allowances for training, sickness and holidays, addition of employers' NIC and pensions from DfE Providers Survey 2013, Deloitte survey/interviews and regulations; and (d) Mark-up for non-staff costs using DfE Providers Finances Survey 2012.
- Type of provider: separate estimates for private, voluntary, nursery class and childminder settings
- Regional distribution: varies by original data sources

Sources, methodology, samples and timing

- Timing: varies by original data sources (2012 to 2015) but rebased to 2014/15 prices using GDP deflator
- Sample size: varies by original data sources

NEF (2014)

- Methodology: Secondary data on (a) Staff composition and average staff salaries for three grades of staff from DfE Providers Survey 2011 and (b) Proportion of non-contact time for staff and proportion of total costs that are non-wage costs from DfE Providers Finances Survey 2012. Calculations: employers NI and 3 percent pensions added to staff salaries and staffing assumed to be at the legal staff-to-child ratios.
- Type of provider: all types
- Regional distribution: varies by original data sources
- Timing: varies by original data sources (2011-2012)
- Sample size: varies by original data sources

Notes: The methodologies have been described as well as possible from the information provided in the published reports. The regional distributions are divided into three categories for north west, north east, Yorkshire and Humber and the East Midlands (north + EM); West Midlands, East of England, south west and south east (WM + EE + south) and London.

The studies in table 40 are arranged in order of methodological approach. The first three studies (this study, Gaheer & Paull (2016)⁷⁴ and Ceeda (2014)) used detailed session-based primary data collection at the setting level; the middle three studies (NLH (2015)⁷⁵, KPMG (2015) and Green et al (2015)) use broader survey primary data collection at the setting level; while the final two studies (DfE Analytical Report (DfE (2015a)), NEF (2014)) use aggregate statistics primarily from secondary sources (although the DfE Analytical Report also included some new primary data collection).

The first methodological approach collected session (room and time) specific data on attendance for different ages of children and specific individual staff, combined with staff-specific time spent on non-session activities and financial data on individual salaries and non-salary costs. In the case of this study and Gaheer & Paull, this information is obtained through face-to-face interviews with (typically) the setting manager and in the case of CEEDA, through the completion of room diaries by staff and the completion of pro-forma surveys on salaries and financial expenditure by the setting. But there are several differences in approach between these three studies:

⁷⁴ The methodology for the collection of the cost data used in this report is described in greater detail in Briggs et al (2012).

⁷⁵ It should be noted that the NLH report and the DfE Analytical Report were part of the DfE Childcare Cost Review.

- This study and Gaheer & Paull imputed costs for venues or staff which the setting does not directly pay for. This might raise the cost in this study and Gaheer & Paull study relative to the Ceeda study.
- This study and Gaheer & Paull collected employer costs for staff salaries wherever possible and recorded staff costs for sickness, training, holiday and maternity leave, while the Ceeda study recorded gross salaries and imputed employer NI and pension contributions and uprated salaries for sickness, training and holiday time (at approximately 16 percent). This has an uncertain impact on the differences in cost estimates between the studies.
- This study and Gaheer & Paull allocated session costs equally across children within a session, while the Ceeda study used a weighted allocation by age of child based on statutory staff:child ratios. This might raise the cost for older children relative to younger children in this study and Gaheer & Paull compared to the Ceeda study.

The second methodological approach also uses primary data collection, but collects much broader setting level data using interviews (NLH) and surveys (KPMG and Green et al). This is less precise than the first approach in several ways:

- The number of child hours in each age group is measured as an overall aggregate for each setting rather than using session specific information.
- Individual staff costs are not observed in relation to specific attendance of children, but are allocated on the basis of observed or statutory staff:child ratios for each age group. This does not allow for different mixes of types of staff for different age groups.
- Venue costs are allocated by child hours rather than the amount of space used by children in each age group.
- The aggregate numbers may contain more rounding errors than the summation of the session specific information.

The third approach used in the DfE Analytical Report element of the DfE Cost Review uses a mixture of secondary and primary data sources on industry-level aggregates. The primary objective of this modelling was not to generate an estimate of average current costs but to identify how much variation in the key cost drivers impact on the average cost. The representative benchmark costs presented in the report are based both on average values in these factors observed in the data sources and on some assumptions for factors lacking the required evidence. Two assumptions create an upward bias in these representative benchmarks:

- It is assumed that there is no flexibility in staffing in response to unoccupied places: staff costs are calculated on the basis of available places and divided by

the number of filled places (Department for Education, 2015a:slide 58). Under an alternative assumption of complete flexibility (staffing based on occupancy), the estimated hourly cost for three and four year olds in private settings is substantially lower at £3.49 (slide 72).

- It is assumed that all staff hours are paid with no allowance for paid staff working additional unpaid hours (implicitly raising the hourly staff cost) (Department for Education, 2015a:slide 75).

In addition, the multiple sources contain different sampling biases which make it difficult to identify the likely overall impact of these biases on the benchmark costs. This is further complicated by the use of data from research by Deloitte which was at the time of writing unpublished and therefore the robustness of the data collection and analysis could not be independently assessed.

The NEF report takes a similar approach to that used in the DfE Analytical Report, but only uses secondary data sources with fewer assumptions.

The studies using primary data also have important differences in the sample used which could additionally explain the variation in the estimates of average hourly delivery cost:

- Two studies consider several different types of providers (this study and the DfE Analytical Report), one considers all types (NEF), two consider only PVIs (Ceeda and NLH), one considers PVIs and childminders (KPMG), one considers only children's centres (Gaheer & Paull) and one considers only schools (Green et al). The evidence presented above has shown that cost estimates are likely to be lower for studies considering only PVI settings rather than a broader mix with maintained settings or childminders.⁷⁶
- Within the provider type considered, some of the studies using primary data also refine the sample further to settings with funded places or only costs for funded children (Ceeda, NLH, KPMG and Green et al); to settings with good or outstanding Ofsted ratings (Ceeda); to settings connected to a specific network (NLH); and to settings offering two-year-old funded places in a DfE demonstration project. The implications of these further refinements for the average cost estimate is not clear in most cases with the possible exception that the better Ofsted ratings might be associated with higher costs.
- The evidence presented above has indicated that the regional distribution within the sample may affect the estimated average cost with northern regions having

⁷⁶ Within PVI settings, this study has a slightly higher proportion of private settings (70 percent) than in the Ceeda study (59 percent) or NLH study (58 percent, although rebalanced in the cost estimates), but this difference is unlikely to be important for the overall cost estimates.

the lowest costs and the London region the highest. The regional distributions within the six studies with primary data collection are generally similar across the regions (noting that the estimates in NLH are rebalanced across regions to be nationally representative), with the exception that Green et al uses a sample overbalanced towards London (potentially raising cost estimates) and that the KPMG sample is only in Birmingham.

- Three of the studies using primary data collect information from broadly across the calendar year (this study, Gaheer & Paull and KPMG⁷⁷), while the others collect data for June and July (Ceeda) or unspecified periods of recall from June and July (NLH) and June to August (Green et al). Although the Ceeda study suggests that costs may be lowest in July when occupancy rates are highest prior to a cohort of children leaving to start school, the evidence above indicates that June and July may be higher costs month relative to the spring or earlier months, possibly because occupancy is beginning to decline with summer holidays for preschool children.
- Studies using data from older periods may have lower estimated costs if costs are rising over time. The NEF study might be expected to have lower costs as it uses data from 2011 for the critical measure of staff salaries, while Gaheer & Paull may also have lower costs using data collected in 2012 to 2014. The most recent data (and potentially highest cost) is used in this study and the NLH study.

Finally, the cost estimates from the six studies using primary data can be compared on the ground of sample size and the precision of the estimates. The Gaheer & Paull study and the Green et al study have extremely small samples and quite imprecise estimates, being more case study in design than intended for quantitative analysis. The other four studies using primary data collection have more reasonable sample sizes (ranging from 47 to 160 for cost estimates aggregated across all types).

⁷⁷ In the KPMG report, the data collection period is over a five week period but it appears that data is collected for the previous financial year.



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