Department for Education

Early years providers cost study 2018

Research report

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[1] The weighting used in this report was revised in April 2019 using data from the SCEYP 2018 to correct an issue in the original weighting based on the sampling frame.

Acknowledgements

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Introduction

There have been several important changes in childcare policy in England in the past three years. These include the introduction of 30 hours free childcare for children of working parents and Tax Free Childcare as well as ongoing expansion of support for childcare expenses in the rollout of Universal Credit to parents. In addition, the introduction of the Early Years National Funding Formula for the free early education entitlement for three and four year olds in 2017 required Local Authorities (LAs) to set a universal base rate for all types of providers by 2019-2020 at the latest. This report presents evidence on the cost of delivering childcare in England in 2018, building on and drawing comparisons with similar research using data collected in 2015[2] in order to help understand how recent policy changes and other drivers of cost have affected the delivery of early years education and childcare.

The study analyses detailed cost and income data collected from 120 early years providers during March to July 2018. As a consequence of the demanding data collection process, a major caveat to the findings is the small sample size which means that there are large margins of error around the precise cost and income estimates. However, the robustness of the findings are supported by the random sampling of settings; the rigorous data collection approach; and the use of weighted statistics and regression analysis to present findings which are as nationally representative as possible.

The weighting used in this report was revised in April 2019 using data from the SCEYP 2018 to correct an issue in the original weighting based on the sampling frame. These revisions made very little change to the findings.[3]

Methodology

Data on costs and income was collected from 120 early years settings providing childcare for children under the age of five during March to July 2018. The sample of childcare providers was randomly selected from two administrative data sources covering all providers in England. The sample was balanced across provider types and regions in

[2] Blainey, S & Paull, G. (2017), *Study of Early Education and Development (SEED): The cost and funding of early education*, DfE Research Report 552 https://www.gov.uk/government/publications/cost-and-funding-of-early-education

[3] The new weighting across provider types and regions used estimates of the national distribution of the numbers of places from the SCEYP 2018 data to replace the original weighting using the national distribution of the number of providers from the sampling frame. There were two substantive changes in the findings as a consequence of the change in weighing: being a single site setting (rather than a chain) was no longer identified as a driver of a higher hourly cost for three and four year olds and having a middle level of average staff qualification was identified as a driver of a higher hourly cost for two year olds.

order to ensure sufficient sample numbers in each region and for each provider type to analyse differences in cost by region and provider type. A total of 278 providers were approached to take part in the study and visits were completed with 132 settings, generating a response rate of 46 percent. The final sample consisted of 120 settings who provided complete data.

The bulk of the data was collected using semi-structured face-to-face interviews undertaken by two researchers in order to ensure that complete information would be collected and to assist respondents in understanding and meeting the demanding data requirements. Data was collected on the provision of childcare sessions and additional and specialist services; the amount of staff, venue and other resources used to deliver each session, service and "core running" (defined as activities for the general running of the setting which are not attributable to a specific session or additional or specialist service) and the cost of using each resource. Additional information was collected on setting characteristics; income from parent fees, free entitlement funding and other sources; and the respondents' expectations about changes to costs and income over the next 12 months. Information on childcare sessions was collected for four age groups of children:

- Children under the age of two.
- Children aged two years old.
- Preschool children aged three and four (and a very small number of five year old children who have deferred or delayed starting reception class).
- School children aged four and above (typically present in wrap around sessions before or after school).

This information was used to derive an estimate of the cost of delivering one hour of childcare for each child in each of the four age groups and an estimate of delivering one hour of each additional and specialist service (such as one-to-one Special Educational Needs and Disability (SEND) support or family bonding activities) for each user.

As in the earlier SEED study published in 2017, the measure of cost is a snapshot estimate of the operating cost. This means:

1. The snapshot approach collected cost information for a "typical" week in the three to four weeks preceding the interview because a limited period of recall was required in order to collect the detailed information needed. This meant that most of the data was collected for the summer term, when occupancy is typically at its highest and, consequently, total income at its highest and hourly delivery cost at its lowest.
2. The cost measure is an operating cost, capturing the day-to-day running costs of the resources used to deliver childcare and other activities and excludes any costs of investments. The operating cost provides comparable measure for different types of

providers with different financing models and is the more relevant measure for a service which is partially public funded.

The sample size and this approach mean that there are some caveats to the findings:

- The estimates of the cost and income measures have large confidence intervals and may differ from other sources because of the small sample size.
- The estimates of the income-to-cost ratios may be overstated because (i) occupancy and thereby total income may have been unusually high during the summer term fieldwork period and (ii) the cost measure excludes investment costs.
- Financial sustainability for childminders may be understated by the income-to-cost ratio because the cost typically includes an imputed value for their time which may not be the amount that has to be paid.
- The hourly delivery costs may understate the annual average because of high occupancy during the summer term fieldwork period.
- The hourly cost for two year olds may understate the national average because of weaknesses in the sampling and weighting of the data for this age group.

The findings specifically affected by these issues should not be cited without due warning on their robustness. Moreover, because of the small number of settings with children aged under two and with school age children in the data and because of the potential understatement of the hourly cost for two year olds, there is significantly less confidence in the hourly cost estimate and analysis for these age groups than for three and four year olds. The hourly cost estimates and analysis for these other age groups are therefore only presented in Annex A and should not be cited without these specific warnings on their robustness.

Costs and income in 2018

The average total weekly delivery cost is just under £3,500, while the average total weekly income is £4,715. Average total costs and income vary substantially by provider type, reflecting differences in provider size as well as other factors. The average ratio of total income to total cost is 1.36 and is higher for private and voluntary providers than for Maintained Nursery Schools (MNS) and childminders. However, this ratio may be overstated because (i) occupancy and thereby total income may have been unusually high during the summer term fieldwork period and (ii) the cost measure excludes investment costs.

The breakdown of total costs shows that, on average:

- 78 percent of costs are for staff, while 13 percent are venue-related and 10 percent are for other items.
- 65 percent of costs can be attributed to specific childcare sessions, while 4 percent can be attributed to specific additional and specialist services and the remaining 31 percent to core running.
- 96 percent of costs are directly or implicitly paid by the setting, while the remainder are implicitly paid by in-kind contributions from the government (2 percent), charities (1 percent) and the value of volunteer time (1 percent).

On average, 56 percent of settings' income is free entitlement funding, 38 percent is parent-paid fees and 6 percent is from other sources. Almost half (48 percent) of all income is free entitlement funding for three and four year olds. Childminders receive a much higher proportion of their income from parent-paid fees and a much lower proportion from free entitlement funding than other types of providers.

Most settings have the same hourly parent-paid fee for all ages of children. Combined with the higher average funding rate for free entitlement hours for two year olds than that for three and four year olds, this means that settings with income from both parent fees and free entitlement funding receive, on average, 6p more per hour for free entitlement hours than parent-paid hours for two year olds and 91p less per hour for free entitlement hours than parent-paid hours for three and four year olds.

A qualitative component of the study collected respondents' views on their expectations for future costs and incomes over the coming year and whether they had any plans to change their business model in response to these expected changes. Most respondents expected their hourly cost to rise and their hourly income to remain unchanged, with the most common planned response to raise parent-paid fee rates, while less common plans included making changes to staffing or to the setting's child profile or seeking other income sources.

Hourly delivery cost for three and four year olds

The mean hourly delivery cost for three and four year olds is £3.95, but there is substantial variation in the hourly cost across settings (with a wide 95 percent confidence interval around the mean of £3.48 to £4.41 reflecting both this variation and the small sample size). The variation in the hourly delivery cost for three and four year old preschool children was explored across a broad range of potential drivers including the type of provider, local area characteristics, the size of setting, the profile of children in attendance, opening hours and the quality of care. Key drivers of differences in costs (defined as factors directly associated with variation in cost but not necessarily a causal relationship) were identified using multivariate regression analysis with controls for the other potential influences.

One key driver is provider type. The hourly cost is highest for maintained nursery schools (MNS) and childminders and lowest for voluntary providers (table 1).

Table 1: Hourly delivery cost for three and four year olds by provider type

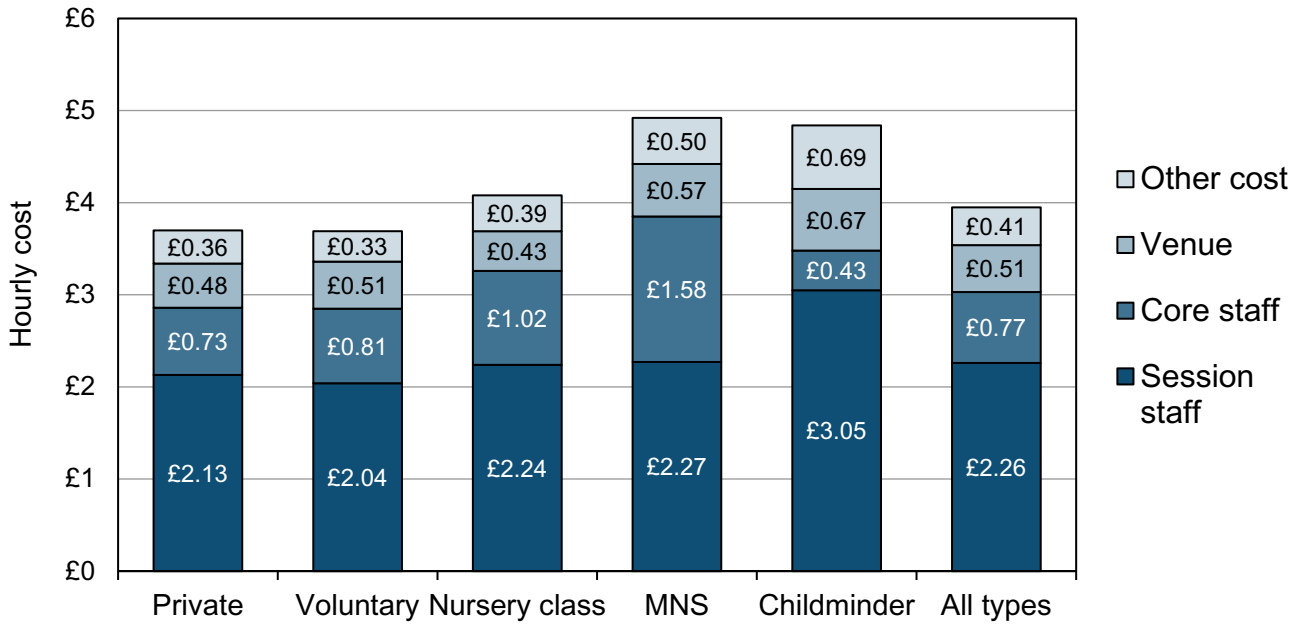
	Mean hourly delivery cost	Number of settings
Private	£3.71	24
Voluntary	£3.68	18
Nursery class	£4.08	26
MNS	£4.92	30
Childminder	£4.85	19
All providers	£3.95	117

Source: Early Years Providers Cost Study, 2018

Note: Statistics are weighted by the national distribution of places across provider type and region and the mean value for all providers is not a simple average of the mean across the five types.

Figure 1 presents a breakdown of the mean hourly cost into staff session costs (time specifically allocated to a session), staff core costs (time not directly attributable to specific sessions such as administration), venue costs and other costs.

Figure 1: Hourly delivery cost (three and four year olds) by source and provider type



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are shown in table 1.

MNS have higher hourly costs than all other provider types driven by higher hourly staff costs and greater core running time which are not offset by the cost benefits of the higher child-to-staff ratios and group sizes in MNS. Childminders have higher hourly costs than other provider types (except MNS), but this is due to their low child-to-staff ratios and small group sizes. For any specific ratio and group size, childminders have *lower* costs than all other provider types (except nursery classes).

Area characteristics explain some of the variation in hourly delivery costs:

- London has a higher hourly cost than all other regions, while the North East and the Midlands have the lowest costs.
- There are some indications that the hourly cost is higher in less deprived areas.
- But there are no substantial differences in the hourly cost between rural and urban areas.

The higher cost in London most likely reflects higher costs for resources such as staff and property rents, but could also reflect higher parental demand for childcare and ability to pay higher fees due to greater affluence. The higher cost in less deprived areas most likely also reflects higher costs for resources and a greater ability among parents to pay higher fees for higher cost care.

The size of provider is also associated with differences in the hourly cost:

- Being middle-sized (as measured by the number of registered places) is associated with a higher hourly delivery cost.

It is not clear why middle-sized settings have the highest costs, but it could reflect some discrete increases in core costs as settings initially grow followed by falling costs as size increases sufficiently to benefit from larger economies of scale.

The profile of children in a setting is a key driver of costs in the following ways:

- Having children under age two is associated with a lower hourly delivery cost for three and four year olds (even controlling for differences in provider type). The estimated difference between settings who have children under age two and settings with a youngest child aged two is £1.23 and the estimated difference between settings who have children under the age of two and settings with a youngest child aged three is £1.58.

- The hourly cost rises as the proportion of children with SEND increases with a point estimate of an average £0.05 increase for each additional percentage point. [4]

There is no obvious explanation why the presence of the youngest group of children in the setting should reduce the hourly delivery costs for older children, but the finding that costs rises with the proportion of children with SEND is not surprising given other evidence on the considerably higher costs of delivery for these children.

Opening hours also play some role in explaining the variation in hourly cost:

- More opening hours each day is associated with a lower hourly cost.

Finally, variation in staffing and group sizes are associated with differences in hourly costs: settings with higher average staff qualifications, lower child-to-staff ratios and smaller group sizes have higher costs (table 2).

The findings from the regression analysis with controls for other influences showed:

- The hourly cost is higher for settings with high average staff qualifications than for those with low or middle-level average staff qualifications.

- The hourly cost is lower for settings with higher child-to-staff ratios: the point estimate indicates that the cost falls by an average of £0.15 for each additional child.

- The hourly cost is lower for settings with larger average group sizes: the point estimates indicate that the cost falls by £0.09 for each additional child in the group.

The substantial effects of group sizes and child-to-staff ratios reflect that staff costs are a key component of total costs and shows how delivery costs are considerably lower when fewer staff resources are used for each hour of care per child.

[4] It should be noted that the average higher cost of £0.05 is for every child in the setting and not just those with SEND. This implies that there is an average higher cost of £5 an hour for every child with SEND.

Table 2: Hourly delivery cost for three and four year olds by staffing and group sizes

	Mean hourly delivery cost	Number of settings
Average staff qualification		
Low (less than 3)	£3.50	27
Middle (3 to 3.5)	£3.79	55
High (more than 3.5)	£4.81	35
Child-to-staff ratio		
Low (less than eight)	£4.80	38
Middle (exactly eight)	£3.46	41
High (more than eight)	£4.15	37
Group size		
Low (less than 20)	£4.46	45
Middle (20 to 30)	£3.87	40
High (more than 30)	£2.67	32

Source: Early Years Providers Cost Study, 2018

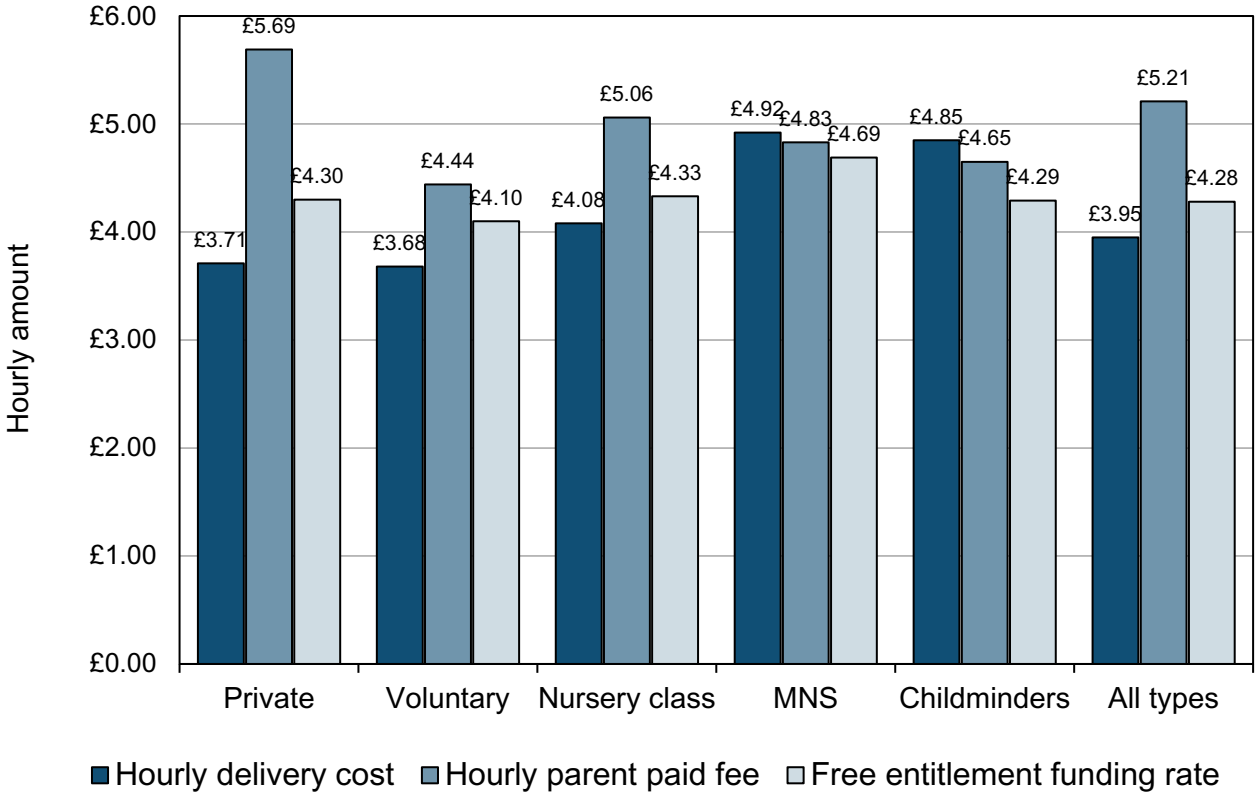
Notes: See text for a description of the measures. The average staff qualification is the mean of the NVQ levels for all staff. For example, a setting with an average level of 3.5 could have half of its staff with level 3 and half of its staff with level 4. The thresholds for the categorisation of the mean group sizes into low, medium and high were chosen to give the most reasonable sample sizes in each category within each provider type.

Figure 2 presents the mean hourly delivery cost, hourly parent paid fee and hourly free entitlement funding rate for three and four year olds. It shows:

- The mean hourly parent-paid fee is higher than both the mean funding rate and the mean hourly delivery cost for private, voluntary and nursery class providers.
- The mean hourly cost is slightly higher than both the parent-paid fee and the funding rate for MNS and childminders[5].

[5] It should be noted that the funding rate only reflects Free Early Education Entitlement funding and does not include any supplementary funding that settings, particularly MNS, may receive from other LA sources.

Figure 2: Hourly cost, parent fee and funding rate for three and four year olds



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes for the hourly cost, parent fee and funding rate are 24, 20 and 24 for private providers; 18, 15 and 17 for voluntary providers; 26, 13 and 26 for nursery classes; 30, 26 and 30 for MNS; 19, 18 and 15 for childminders; and 117, 92 and 112 for all types.

Comparisons with SEED data from 2015

The findings in this report were compared to those from a similar study using data from 2015 and published as part of the Study of Early Education and Development (SEED) in 2017 (Blainey and Paull (2017)). Where needed, some adjustments were made to the estimates in the current study to allow for differences in the fieldwork period and in the child age profile between the two studies.

There has been little change in most of the cost and income measures between the two surveys:

- Total weekly costs are slightly lower for private and voluntary providers in the current study than in 2015, but this most likely reflects differences in the two samples rather than a change in total weekly costs for these types of providers.
- The income-to-cost ratio in the current study is close to that in 2015 for most provider types, suggesting that the ratio has not changed substantially over the three years.

- The division of costs across type of cost, use and the organisation paying the cost are very similar in both studies.

- There are some small differences in the breakdown of total income, with the current study indicating higher shares of income from free entitlement funding (7 percentage points higher) and other sources (3 percentage points higher) and a lower share of income from parents fees (10 percentage points lower). This is consistent with a rise in the share of income from free entitlement funding due to the introduction of 30 hours free childcare in September 2017 and the related increase in the use of additional charges for parents which would increase the share of other income sources.

- There is a smaller positive gap between the funding rate and the parent fee for two year olds and a larger negative gap for three and four year olds than in the current study than in 2015.

The confidence intervals for the hourly cost for three and four year olds are wide for both studies and overlap between the two studies for all provider types and for all settings combined, reflecting the small sample sizes. Across all settings, because of the overlapping confidence intervals, the inferred 11 percent increase in the mean hourly delivery cost for three and four year olds over the three years is not statistically significant (table 3). In other words, there is no statistically significant change in hourly costs over the three years from comparing hourly costs across the two studies.

Table 3: Comparison of hourly costs for three and four year olds

	SEED 2015		Childcare cost study 2018			Difference between study estimates
	Mean hourly cost (95% confidence intervals)	Number of settings	Mean hourly cost	Adjusted mean hourly cost (95% confidence intervals)	Number of settings	
Private	£3.12 (£2.92 - £3.32)	68	£3.71	£3.68 (£2.98 - £4.38)	24	18%
Voluntary	£3.45 (£3.01 - £3.88)	25	£3.68	£3.68 (£2.88 - £4.49)	18	7%
Nursery class	£3.96 (£3.28 - £4.65)	18	£4.08	£4.48 (£3.81 - £5.15)	26	13%
MNS	£6.65 (£5.18 - £8.13)	10	£4.92	£5.32 (£4.70 - £5.95)	30	- 20%
Childminder	£4.77 (£3.83 - £5.72)	22	£4.85	£5.19 (£4.33 - £6.05)	19	9%
All settings	£3.72 (£3.47 - £3.96)	158	£3.95	£4.12 (£3.67 - £4.56)	117	11%

Source: Blainey & Paull (2017) & Early Years Providers Cost Study, 2018

Notes: All estimates were weighted using the sample weights. All settings include 15 LA-run and children's centres in the SEED sample. The estimated change for MNS should be treated with additional caution because the sample size for this provider type was particularly small in the 2015 data collected in the SEED study.

Expected changes in the hourly cost for three and four year olds between 2015 and 2018 were estimated using the Consumer Price Inflation (CPI) rate and simulations of the hourly cost for the sample in this study if minimum wages were at 2015 levels and there were no compulsory pension contributions opt-out. As shown in table 4, the estimated change in the mean hourly cost is slightly higher than the expected change for all provider types over the three years (13 percent compared to 10 percent). The estimated changes are notably higher than the expected changes for private providers and nursery schools and notably lower than the expected change for MNS and childminders. However, the difference for childminders is largely due to the impact of changes in the minimum wage which is a direct consequence of the imputed salary level used for most childminders in this study. In the absence of this imputation, the explained change would be around 5 percent, only slightly less the observed difference.

Table 4: Sources of difference between 2015 and 2018

	Estimated change in hourly cost due to			Percentage difference	
	Inflation	Minimum wage	Pension	Modelled from three factors combined	Difference between study estimates
Private	£0.20	£0.07	£0.02	9%	17%
Voluntary	£0.20	£0.06	£0.01	8%	6%
Nursery class	£0.22	£0.02	£0.00	6%	12%
MNS	£0.27	£0.02	£0.01	4%	- 21%
Childminder	£0.26	£0.48	£0.00	16%	8%
All settings	£0.22	£0.14	£0.00	10%	13%

Source: Early Years Providers Cost Study, 2018

Notes: All estimates were weighted using the sample weights. The three factors combined are inflation, increases to the national living wage and national minimum wage and the introduction of compulsory opt-out for a minimum pension contribution of 2 percent.

Overall, for private providers and nursery classes, this suggests that hourly costs may have risen more over the last three years than can be explained by inflation and the minimum wage and pension contribution policy changes. For voluntary providers and childminders, these factors may account for the observed increases. For MNS, there are indications of a notable reduction in the hourly cost of delivering childcare, but this finding should be treated with caution due to the particularly small number of MNS in the SEED sample in 2015.

Finally, there is no evidence that the key drivers of the hourly cost have changed over the three years. Although the SEED study considered a smaller range of potential key drivers of the hourly cost than the current study, there were no substantial changes for the common factors considered in both studies.

1. Introduction

There have been several important changes in childcare policy in England in the past three years. These include the introduction of 30 hours free childcare for children of working parents and Tax Free Childcare as well as ongoing expansion of support for childcare expenses in the rollout of Universal Credit to parents. In addition, the introduction of the Early Years National Funding Formula for the free early education entitlement for three and four year olds in 2017 required Local Authorities (LAs) to set a universal base rate for all types of providers by 2019-2020 at the latest. This report presents evidence on the cost of delivering childcare in England in 2018, building on and drawing comparisons with similar research in 2015[6] to help understand how the policy changes and other cost drivers have affected the delivery of early years education and childcare.

The study analyses detailed cost and income data collected from 120 early years providers during March to July 2018. As a consequence of the demanding data collection process, a major caveat to the findings is the small sample size which means that there are large margins of error around the precise cost and income estimates. However, the robustness of the findings are supported by the random sampling of settings; the rigorous data collection approach; and the use of weighted statistics and regression analysis to present findings which are as nationally representative as possible.

The report is structured as follows:

- Chapter two describes the data collection, the methodology used to estimate the hourly cost of delivering childcare and the caveats to the findings from this data.
- Chapter three examines settings' cost structures and sources of income and presents estimates of the ratios between total income and total cost. It also reports on providers' expectations about future cost and income changes.
- Chapter four analyses the drivers of the variation in the hourly delivery cost for three and four year olds and compare the hourly cost to hourly parent-paid fees and free entitlement funding rates.
- Chapter five draws comparisons of the findings in this study with those for 2015.

[6] Blainey, S & Paull, G. (2017), *Study of Early Education and Development (SEED): The cost and funding of early education*, DfE Research Report 552 https://www.gov.uk/government/publications/cost-and-funding-of-early-education

Annex A presents statistics and analysis for the hourly cost for all ages of children, analogous to that presented for three and four year olds in chapters four and five. Annex B presents regression results for models of the hourly cost for both age groups.

The weighting used in this report was revised in April 2019 using data from the SCEYP 2018 to correct an issue in the original weighting based on the sampling frame. These revisions made very little change to the findings.[7]

[7] The new weighting across provider types and regions used estimates of the national distribution of the numbers of places from the SCEYP 2018 data to replace the original weighting using the national distribution of the number of providers from the sampling frame. There were two substantive changes in the findings as a consequence of the change in weighing: being a single site setting (rather than a chain) was no longer identified as a driver of a higher hourly cost for three and four year olds and having a middle level of average staff qualification was identified as a driver of a higher hourly cost for two year olds.

2. Methodology

This chapter describes the methodology used to collect the cost and income data and to derive the estimates of the average hourly cost of delivering childcare and providing additional and specialist services. The methodology broadly follows that of an earlier cost data collection conducted as part of the Study of Early Education and Development (SEED) using data from 2015 and published in 2017 (Blainey & Paull (2017)).

The first section describes the sampling and the weighting of the data, while the second section presents the data collection process and the third sets out how the average hourly delivery costs for childcare and for additional and specialist services were estimated from the collected data. The final section describes some of the issues around interpreting the data and some important caveats to the findings.

2.1 Sampling and weighting

The sample of childcare providers was randomly selected from two administrative data sources covering all childcare providers in England:

1. A Freedom of Information (FOI) dataset of providers on Ofsted's Early Years Register (EYR) as of August 2017. This included all private, voluntary and Local Authority providers and childminders providing childcare for children under the age of five.

2. A dataset of all open schools from the 'Get Information about Schools' system as of January 2018. This included all maintained nursery schools (MNS), nursery classes within maintained primary schools and independent providers (early years provision run by independent schools and delivered on-site).

Settings in the twelve Local Authorities taking part in the concurrent Evaluation of the First Year of the National Rollout of 30 Hours Free Childcare were excluded from the sample to avoid overburdening these providers with requests to participate in a survey. Providers with missing telephone contact information were also excluded.[8]

The aim was to create a reasonably balanced sample across provider types and regions in order to ensure sufficient sample numbers in each region and for each provider type to analyse differences in cost by region and provider type. It was not possible to distinguish provider type in the Early Years Register and the division into private, voluntary and independent providers was made after sampling. No Local Authority settings were found

[8] This mainly affected childminders, 77 percent of which did not have this information, but is unlikely to have created any bias in the sample because the sample of childminders with the contact information was very similar to the overall population in terms of geographic spread, deprivation levels, setting size and latest Ofsted rating. In addition, there is no reason to expect that childminders' consent to disclose their contact details should be systematically related to their costs.

to have been selected into the sample. A total of 316 settings were drawn in five batches from the sampling frame: four batches were evenly split by provider type and region and the final batch was skewed towards private and voluntary settings to compensate for the lower response rate among this group. Of these 316 providers, 38 were deemed to be out of sample due to wrongly recorded telephone numbers, closures or no longer caring for children under the age of five. The remaining 278 providers were approached to take part in the study.

Visits were completed with 132 settings, a response rate of 46 percent. The response was highest among maintained nursery schools (70 percent) and lowest among private and voluntary providers (29 percent). The response rates for childminders and nursery classes were 43 percent and 44 percent respectively. Three settings that were visited only cared for children aged five and above and were therefore excluded from the sample, while a further nine visits resulted in incomplete cost information and could not be used. The final sample consisted of 120 settings.

Table 5: Sample statistics for provider type

Provider type	Early Years Providers Cost Study sample		SCEYP 2018 distribution of places
	Number of settings	Percentage of settings	
Private	24	20%	47%
Voluntary	18	15%	19%
Nursery class	26	22%	15%
Maintained nursery school (MNS)	30	25%	2%
Childminder	22	18%	15%
Unknown group-based providers	0	0%	2%
Total	120	100%	100%

Sources: Early Years Providers Cost Study, 2018, Survey of Childcare and Early Years Providers, 2018

Notes: Private settings include three independent providers and nursery classes include five academies. Unknown group-based providers are non-school and non-childminder settings in the SCEYP for which the management status was not reported. The SCEYP proportions were weighted using the survey weights.

The distribution of the 120 providers across provider type is presented in table 5, alongside the national distribution of places from the Survey of Childcare and Early Years Providers (SCEYP) undertaken between March and July 2018. The sample is roughly evenly split across the five provider types (with three independent settings included in the private category and five academies in the nursery class category), but there were no

Local Authority run settings. MNS were substantially over-sampled relative to their share of places to inform on delivery costs in a separate report on MNS.[9]

The distribution of the 120 providers across region is presented in table 6, again alongside the national distribution of places from the SCEYP. The sample was roughly evenly spread across the eight regions. As there were fewer providers in Yorkshire and the Humber and in the South East, these regions were combined with the North East and the East of England respectively (these being the closest regional neighbours both in geographical proximity and in similarity in median weekly earnings, used as a proxy for economic conditions (ONS 2017)).

Table 6: Sample statistics for region

Region	Early Years Providers Cost Study sample		SCEYP 2018 distribution of places
	Number of settings	Percentage of settings	
North East + Yorkshire and the Humber	33	28%	14%
North West	12	10%	14%
Midlands	17	14%	18%
London	15	13%	18%
South East + East of England	29	24%	27%
South West	14	12%	8%
Total	120	100%	100%

Sources: Early Years Providers Cost Study, 2018, Survey of Childcare and Early Years Providers, 2018

Notes: The SCEYP proportions were weighted using the survey weights.

In order to ensure that the findings are as nationally representative as possible, all sample statistics and analysis were weighted to rebalance the sample to the distribution of places by provider type and region in the weighted SCEYP data. The weight given to each individual setting was proportional to the relative frequency of that setting's type and region in the survey data (with 30 different weights for each of the type-region combination). This weighting takes into account differences in provider mix across regions.[10] The weights ranged from 0.02 to 5.37. MNS had very low weights (an average

[9] Paull, G. & Popov, D. (2019), *The role and contribution of Maintained Nursery Schools in the early years sector in England*, DfE Research Report 895

[10] For example, PVI settings constitute 65 percent of settings in the South West but only 43 percent of settings in the North East and Yorkshire and the Humber.

of 0.09 across the regions), reflecting the substantial over-sampling of this type of provider, while the average weights were 2.3 for private settings, 1.1 for voluntary settings, 0.7 for nursery classes and 0.8 for childminders.

The weighting used in this report was revised in April 2019 using data from the SCEYP 2018 to correct an issue in the original weighting based on the sampling frame. These revisions made very little change to the findings.[11]

2.2 Data collection

Data collection was undertaken between March and July 2018, with most visits conducted during the summer term. Settings were initially approached for a visit to collect data on costs and income with an introductory letter to the setting manager or head teacher, followed by an email reminder and a telephone call to make an appointment for the visit. Prior to the visit, settings were given a list of broad areas that would be under discussion and a pre-visit information sheet to complete with background information such as the number of children in different age groups, staff numbers, ratios and qualification levels, and the opening times of the setting.

The bulk of the data was collected using semi-structured face-to-face interviews for several 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 understated costs. Second, settings hold the required information in very different forms and respondents often require face-to-face explanation to identify the correct information being requested. Third, the amount and detail of required data was demanding and the presence of researchers was needed to assist setting managers to source and provide all the information. Finally, requesting financial information, including salary levels for individual staff, required a direct reassurance of confidentially.

Each visit was undertaken by two researchers. Visits took two hours on average, but were shorter on average for childminders (one hour) and longer on average for MNS (two and a half hours). The shortest interview took 30 minutes and the longest one took four and a half hours. Interviews were conducted with a single individual for 76 of the completed visits and with two individuals for 44 visits. Nearly all interviews in non-school

[11] The new weighting across provider types and regions used estimates of the national distribution of the numbers of places from the SCEYP 2018 data to replace the original weighting using the national distribution of the number of providers from the sampling frame. There were two substantive changes in the findings as a consequence of the change in weighing: being a single site setting (rather than a chain) was no longer identified as a driver of a higher hourly cost for three and four year olds and having a middle level of average staff qualification was identified as a driver of a higher hourly cost for two year olds.

settings involved the owner or manager, while the headteacher was present in 51 of the 56 interviews with school-based providers.

Information was collected for four age groups of children:

- Children under the age of two.
- Children aged two years old.
- Preschool children aged three and four (and a very small number of five year old children who have deferred or delayed starting reception class).
- School children aged four and above (typically present in wrap around sessions before or after school).

Eight areas of information were collected:

1. **Setting characteristics**: Background information on:
    - The number of registered places and the numbers of registered children in each age group; in receipt of free entitlement hours, 30 hours free childcare or EYPP; having fees paid using Tax Free Childcare; and with Special Educational Needs or Disabilities (SEND) or an Education, Health and Care (EHC) plan
    - Whether open year round and weekly opening hours; child-to-staff ratios for each age group; and the number of staff with each of six qualification levels.
    - For group-based settings (including private, voluntary and school-based providers but not childminders): the type of setting; whether the setting is part of a chain; whether the setting is connected to a children's centre; whether the setting has a Special Educational Needs Coordinator (SENCO), staff training plan or specific training budget; the frequency of staff Continuing Professional Development (CPD) and staff supervision; and staff turnover.
2. **Sessions:** A list of sessions (defined as periods of time when a group of children were cared for by the same staff in the same room); the length of the session; the number of such sessions each week; the room(s) used for the session; and the number of children in attendance in each age group[12].
3. **Additional and specialist services:** For group-based providers (including private, voluntary and school-based providers but not childminders): a list of activities in

[12] In some cases, there were some short initial or final periods in the day when children gradually arrived or left and numbers of children were recorded as the average across the session.

addition to the delivery of childcare; the category or type of activity[13]; the length of the activity; the number of occurrences each week; the room(s) used; the number of children or parents or other individuals served by each activity; and whether the activity is targeted at a particular group of children or parents (such as SEND children or disadvantaged groups).

The term "additional and specialist services" is used to mean any service outside the core delivery of childcare and early education and covers a range of specialist support for children, family support and system leadership. It should be noted that some providers did not view these activities as additional but as a key part of their purpose and formal remit.

4. **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, Local Authority specialist staff or head office staff in the case of multiple site settings); the time they spend on specific sessions, additional and specialist services and on "core running" (activities for the general running of the setting but not directly attributable to a particular session or activity, such as setting administration or team meetings); salary or, if the salary was unknown, other information such as age and qualifications to impute the salary.

5. **Venues:** A list of the different rooms and other spaces used by the setting; the approximate share of the setting floor space for each venue[14]; the proportion of time the space is used by the setting (occasionally space is shared with other organisations); the time that the space is used for specific sessions or activities or core running; and information on total venue costs (including rent, rates, utilities, maintenance, cleaning etc.).

6. **Other costs:** A list of all non-staff and non-venue costs (such as for food, stationery and other materials) paid by the setting and whether any of these costs 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.[15]

[13] Categories included specialist SEND child support, other specialist child support (EAL, EYPP), meetings with support professionals about children, specialist family support, general family support, family bonding, working groups and networking, training and CPD delivery.
[14] This was often achieved with the help of a floor plan for the setting.
[15] 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.

7. **Income:** The hourly parent-paid fee for each age group, average free entitlement rates and the number of hours funded by the free entitlement for the two relevant age groups; amounts of income from additional charges to parents, charitable donations and other sources; and the types of other sources.

8. **Expectations of future costs and incomes:** The interviewee's subjective assessment of whether the setting's costs and incomes were likely to change over the next twelve months; the reasons for any expected changes; and any planned changes to their business model (to be implemented within the next twelve months) in response to expected changes in costs or incomes.

For nursery classes in schools, some cost information was derived from budgets for the entire school. In these cases, the venue cost was based on square footage of space used by the nursery provision. For staff time, the allocation of hours from the school budget was based on the respondents' account of how many hours or proportion of time that they believed that individual staff contributed to the running of the nursery provision. For most other costs, items were clearly nursery specific and itemized as such.

This information was collected for a typical week in the month preceding the visit. For costs of resources recorded over longer periods (such as a month or term or year), the amounts were averaged over the period to obtain the weekly amount.

2.3 Calculation of average hourly delivery costs

The key objective of the study was to derive a measure of the cost of delivering one hour of childcare for each child in each of the four age groups. A second objective was to understand the services childcare providers offer in addition to childcare and to derive a measure of the cost of delivering one hour of each activity for each user.[16]

The calculations are explained in three steps:

1. Missing information was imputed and raw data converted to the required measures.

2. Costs were allocated to specific sessions, additional and specialist services and core running.

3. The average hourly delivery costs for childcare and activities were calculated.

The first step involved the estimation of missing information and conversion of the raw information to comparative weekly metrics.

[16] Analysis of this data on the hourly cost of additional and specialist services is presented in Paull & Popov (2019).

Four types of imputations were used to complete missing data:

- In order to obtain a measure of economic cost (the value of all resources used), 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 131 venues used by the 120 settings, 28 were owned by the setting (and the interview respondent could report the usual market rent for 15 venues) and 61 had rent paid by other organisations (and the interview respondent could report the actual or usual market rent for 8 venues). Consequently rents were imputed for 66 venues, mainly nursery classes and MNS (see table 7). Imputations for group-based settings (including private, voluntary and school-based providers but not childminders) were obtained from the Valuation Office Agency's most recent rateable values for commercial properties, uprated to 2018 using the Nationwide Housing Price Index. In most cases, the buildings used by the settings were specifically listed, but rental values were estimated using the floor space and the rateable value per square metre of the nearest listed properties in a few cases. Imputations for childminders in domestic properties were imputed using rental values of neighbouring properties on a domestic rental website, adjusted for floor size.
- Similarly, it was necessary to impute an implicit business rates cost in cases where these rates were paid by another organisation. Of the 109 venues used by group-based settings (including private, voluntary and school-based providers but not childminders who do not pay business rates), 24 had business rates paid by other organisations. In addition, interview respondents were unable to report the amount in the case of 4 venues. Consequently, business rates were imputed for 28 venues, almost half for nursery classes (see table 7). The rates were imputed based on the rent for each venue and the average business rates-to-rent ratio across providers of the same type in the sample.[17]
- Similarly, it was necessary to impute an implicit salary for staff members not directly employed by the setting (typically head office staff for settings in chains and SEND specialist staff provided by the Local Authority) or who worked as volunteers for the setting or who were childminders who did not explicitly make payments for their own time. Just under half (46 percent) of the 120 settings had some salary information imputed, but this tended to be limited to a small number of individuals within each setting. Across the 1,606 staff in the 120 settings, 190 (12 percent) required salary imputations, with the largest proportions of imputations required for voluntary providers and childminders (see table 7). Salaries for senior roles, Local Authority staff and specialist staff were imputed as the ONS average for their reported qualification level (applied to 35 staff), while

[17] These ratios were 33 percent for private providers, 30 percent for voluntary providers, 21 percent for nursery classes and 31 percent for MNS.

salaries for frontline staff and childminders were imputed using the age-appropriate minimum wage as this level was more typical of the observed pay for those in these roles (applied to 155 staff).

- Employer pension contribution rates were required to estimate the employer cost for those whose salaries were reported as net or gross amounts. This included all individuals with salary imputations (as the imputations were gross amounts) and, in addition, 12 staff (8 at two MNS setting and 4 at one childminder setting) for whom the pension rate was missing. In total, the pension rate was imputed for 3.2 percent of staff to estimate the employer cost. These were imputed at the average rate for the type of setting.[18]

Table 7: Imputations by provider type

	Rent imputations		Business rates imputations		Salary imputations			
	# of venues	% of venues	# of venues	% of venues	# of settings	% of settings	# of staff	% of staff
Private	6	25%	2	8%	9	38%	16	5%
Voluntary	2	17%	7	24%	9	50%	103	36%
Nursery class	23	89%	12	46%	7	27%	16	6%
MNS	24	80%	7	23%	9	30%	30	4%
Childminder	8	36%	n/a	n/a	21	96%	25	71%
All types	66	50%	28	21%	55	46%	190	12%

Source: Early Years Providers Cost Study, 2018

The relevant price for staff resources is employer costs which includes income tax, national insurance payments and employer pension contributions. Salary information was provided without these additions as net amounts for 5 percent of staff and as gross amounts for 53 percent of staff. All imputed salaries were also recorded as gross amounts. The hourly employer cost for these salaries were estimated using the tax and national insurance parameters for the 2018/19 tax year and the reported (or imputed) pension rates. As the rate of income tax and national insurance contributions are determined by annual salaries, all salaries were first adjusted to annual levels before the additions were applied. For the sole purpose of calculating these additions, it was assumed that all nursery class staff (maintained and independents) were full time (working for other parts of the school when not working in the nursery) and that all staff

[18] These rates were 2 percent for private and voluntary providers, 8 percent for independent providers, 13 percent for nursery classes, 7 percent for academies, 13 percent for MNS and 0 percent for childminders.

provided by other organisations (such as Local Authorities) were working full time (in other places when not working in the setting). These assumptions affected 7 percent and 1 percent of all staff respectively (and 39 percent of the nursery class staff and 100 percent of staff provided by other organisations).

The second step in the calculation of the average hourly cost involved the allocation of each cost to specific sessions, additional and specialist services and core running:

- Staff costs were allocated to each childcare session, each additional or specialist service and core running in accordance with the proportion of the total working hours each staff member spent on each task. Most (73 percent) of staff were involved in delivering at least one childcare session, while nearly half (43 percent) assisted in providing at least one additional or specialist service. Most staff (71 percent) also spent time on core running.

- Venue costs were allocated to each childcare session, each additional or specialist service and core running based on the rooms and spaces used, their share of the setting's total floor space, and the proportion of time that the rooms and spaces were used for specific sessions, activities or core running.[19] As a rule, spaces used by children not easily attributable to specific sessions (such as toilets and cloakrooms) were attributed to core running.

- Other (non-staff and non-venue) costs could be assigned to specific sessions, activities or children of specific age groups. As there was only one case where a cost was assigned to a specific age of child and only one case where it was assigned to a specific additional or specialist service, all other costs were simply assigned to core running to reduce computational burden.

The final step involved calculating the average cost of childcare delivery for each child in each of the four age groups and for each user hour of each type of additional or specialist service. This involved:

- Session-specific staff and venue costs were allocated across the age groups according to the proportion of children in each age group within the session. This was averaged across all sessions, weighted by the length of each session, to estimate the session-specific element of the hourly cost.

- Similarly, activity-specific staff and venue costs were allocated to each activity. This was averaged across all activities in the same category, weighted by the length of each activity, to estimate the activity-specific element for each user hour.

[19] This implicitly means that the cost of any unused time in rooms and spaces is allocated to the sessions, activities 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.

- Staff, venue and other costs allocated to core running were divided by the total number of childcare hours for all children in the setting and the total number of user hours for additional and specialist services to produce the average core cost per childcare and activity hour. By construction, this is identical for all ages of children and all activities in the setting.

- The hourly core cost was added to the session-specific element of the hourly childcare cost to produce the hourly childcare cost for each age group and was added to the activity-specific element of the activity cost to produce the activity cost per user hour.

Following an initial review of the information obtained for different additional or specialist service types, the eight original categories were regrouped into six categories (and all statistics recalculated for these eight categories) as described in chapter seven below.

2.4 Caveats to findings

The primary objective of this study was to estimate the average hourly cost of delivering childcare. The demanding nature of the data collection required to achieve this means that the findings have the following important caveats.

1. The main caveat is the **small sample size** from which the data is drawn. This affects all of the findings and should particularly be kept in mind when drawing comparisons with other sources of evidence. Two mitigating factors were used to help address this:

    - All estimates (including regression results) are weighted to reflect the national distribution of setting by provider type and region.

    - Values in cells with six or fewer observations are suppressed and denoted with an asterisk (*) in accordance with the Department for Education's Statistical Disclosure Control guidelines for sample survey data.[20]

2. The data on costs and income are **snapshot estimates collected during the summer term.** Cost and income information was collected for a "typical" week in the three to four weeks preceding the interview and excluded unusual weeks that may have covered school holidays or contained a bank holiday.[21] This snapshot approach limiting the period of recall to a short and recent period was required in order to collect the detailed information needed on the use of resources for different ages of children

[20] Department for Education (2019), *Statistical policy statement on confidentiality*
[21] The income measure was primarily based on the number of children in attendance and the hourly parent-paid fee or funding rate paid during that week. Amounts of income from other, more minor, sources were typically recorded and averaged to a weekly amount over a longer time period such as a term or a month.

and for different activities. Respondents' ability to recall this information over longer periods would be patchy and carry unfeasibly high burden.

For many contexts, this snapshot approach would be unproblematic as costs and income could be assumed to fluctuate randomly across the year. However, the fact that most fieldwork was undertaken during the summer term is a concern for this study because occupancy is known to systematically change across the year.[22] In particular, occupancy tends to be at a low point in September when a cohort of children has left to begin reception class in school and at a high point towards the end of the school year in the summer term. As the costs of delivery cannot always be adjusted to the changes in occupancy, this has two implications:

- While total costs measured in the summer may reflect they annual average, total income may be higher than the annual average because of the higher occupancy. This means that the income-to-cost ratio measured in the summer term may be higher than the annual average.

- The cost of delivery per hour per child may be lower in the summer term than at other times of year because the same total costs are being spread over more hours of childcare because of the higher occupancy.

A second issue with the snapshot approach is that the variation in the statistics reflects both the variation across settings and the variation over time within settings. This primarily affects the interpretation of "outliers", that is individual setting with unusually high or unusually low cost and income estimates. These outliers could reflect temporary situations for a specific setting (such as new entrants building up business or a setting just prior to expansion) rather than longer term dispersion in cost or income, but they are not a cause for concern because any sample using the snapshot approach for data collection will include such outliers and reflect the reality at any point in time.

3. The cost measure is an **operating cost**, capturing the day-to-day running costs of the resources used to deliver childcare and other activities. It excludes any costs of investments which increase the value of the provider's assets such as payment of loan interest, payments to shareholders or owners for past and ongoing investments

[22] There is also a more minor concern with the snapshot approach that some settings, particularly maintained ones, are closed during school holiday periods and information was not collected for any costs and income which are incurred when the setting is closed. It cannot either be assumed that costs and income remain unchanged or that there are no costs or income during weeks of closure. For example, staff may take paid holiday weeks during the weeks that the setting is closed, but rent may not have to be paid when the setting is closed. On the income side, payment of parent fees and free entitlement funding will cease when the setting is closed, but other sources may continue through these weeks. As far as possible, costs and income are recorded as the amounts specifically incurred or received in the term time week, but these are less likely to reflect the average annual amounts for settings which are closed for substantial parts of the year.

and expenditure on capital investments (such as building expansion). There are two reasons for this restriction. First, a focus of this study is to compare private with maintained provision but these operate with different financing models: specifically, maintained settings typically do not have explicit costs for financing investments. Hence, a restriction to operating costs permits a comparable measure. Second, in the context of public funding for a service, it is not clear that this funding should cover expenses which contribute to the value of assets which are ultimately owned by the setting and is a "recoverable" cost for the owner of the setting in the long term.

The main concern with using an operating cost measure is that the ratio of income to cost may not fully capture financial sustainability for settings. In particular, some settings may need to be able to pay for investment costs before the asset can be sold and therefore require income to exceed the operating cost in order to remain in business.

4. Cost was estimated using a resource-based principle, with information collected on the use of all resources and on the price for each of these resources. These prices were typically derived from the cost actually paid by the setting, but prices were estimated for items that the setting did not directly (or explicitly) pay for, including implicit rent for venues that settings owned or were provided free by the Local Authority and for the hourly wages for free volunteer time. The resulting cost estimate (referred to as the total cost) is therefore an **economic cost** for all resources used rather than the amount paid by the setting. This was to ensure that the cost measure reflected all delivery costs regardless of who paid for them.

   However, there are two potential concerns with using an economic cost rather than a financial one (that is, the amounts actually paid by the provider):

   - It may overstate the funding rates required for government funded provision. For example, if maintained settings are able to use Local Authority settings free of charge, the funding rate does not need to cover this venue cost. However, as will be shown, there was little difference between the economic cost and financial cost for most provider types and this is therefore not a major issue.

   - It may understate the financial viability of provision if the market price does not actually have to be paid by the setting. The primary case here is that childminders' time has been valued at the minimum wage, but the amounts they need to withdraw from the business may be less. In these cases, the business may be financially sustainable even though the economic cost exceeds income.

5. The sampling and weighting approach was designed to provide robust estimates of the hourly delivery cost for three and four year olds and is based on the distribution of all providers without regard to the age of children cared for (the sampling frame does not identify the age of children with a provider). While the overall distribution is a reasonable approximation for three and four year old children because most providers

(with the possible exception of childminders) have children in the age group, it could be a poorer approximation for other ages of children and two specific issues were identified for the estimation of the hourly cost for two year olds. First, the sample contained no settings for three provider type and region combinations, two of which were in London and two of which were for nursery classes. These "empty" cells mean that these settings make no contribution to the statistics. As settings in London and nursery classes have higher mean hourly costs than the average, this suggests a potential downward bias in the overall estimates of the hourly cost for two year olds. Second, there were substantially more mixed age sessions than in the SEED data for 2015[23], but the weighting could not allow for any possible over-representation of these mixed groups. As mean costs are averaged over all children within a session, this means that the hourly costs for two year olds may be understated.

Together, these issues suggest that **the estimate of the hourly delivery cost for two year olds may understate the national average**. However, there is no reason to believe that other statistics for two year olds were affected by this issue.

In summary, these caveats mean that:

- The estimates of the cost and income measures have large confidence intervals and may differ from other sources because of the small sample size.
- The estimates of the income-to-cost ratios may be overstated because (i) occupancy and thereby total income may have been unusually high during the summer term fieldwork period and (ii) the cost measure excludes investment costs.
- Financial sustainability for childminders may be understated by the income-to-cost ratio because the cost typically includes an imputed value for their time which may not be the amount that has to be paid.
- The hourly delivery costs may understate the annual average because of high occupancy during the summer term fieldwork period.
- The hourly cost for two year olds may understate the national average because of weaknesses in the sampling and weighting of the data for this age group.

The findings specifically affected by these issues should not be cited without due warning on their robustness. Moreover, because of the small number of settings with children aged under two and with school age children in the data and because of the potential

[23] Among the 14 voluntary providers with two year olds, just one had separate sessions containing only two year olds (all of the other settings mixed two year olds with three and four year olds in all sessions for two year olds). For the same type of providers in the SEED sample, 13 of the 25 settings had separate sessions containing only two year olds

understatement of the hourly cost for two year olds, there is significantly less confidence in the hourly cost estimate and analysis for these age groups than for three and four year olds. The hourly cost estimates and analysis for these other age groups are therefore only presented in Annex A and should not be cited without these specific warnings on their robustness.

3. Costs and income in 2018

This chapter describes the patterns and sources of costs and income. The first section presents total weekly costs and income and compares the two using income-to-cost ratios. The second section examines the breakdowns of total costs by type of cost, use and payee, while the third section presents the estimated hourly delivery cost for different ages of children. The fourth section analyses the breakdown of total income by source, while the fifth explores the patterns of hourly parent-paid fees and free entitlement funding rates. The final section reports respondents' expectations for future changes to costs and incomes and their planned responses to these expectations.

The key findings for total weekly costs and income are:

- The average total weekly delivery cost is just under £3,500, while the average total weekly income is £4,715. Average total costs and income vary substantially by provider type, reflecting differences in provider size and other factors. (section 3.1)

- The average ratio of total income to total cost is 1.36 and is higher for private and voluntary providers than for MNS and childminders. However, this ratio may be overstated because (i) occupancy and thereby total income may have been unusually high during the summer term fieldwork period and (ii) the cost measure excludes investment costs. (section 3.1)

The key findings for the breakdowns of costs are:

- On average, 78 percent of costs are for staff, while 13 percent are venue-related and 10 percent are for other items. (section 3.2)

- On average, almost two thirds (65 percent) of costs can be attributed to specific childcare sessions, while 4 percent can be attributed to specific additional and specialist services and the remaining 31 percent to core running. (section 3.2)

- On average, 96 percent of costs are directly or implicitly paid by the setting, while the remainder are implicitly paid by in-kind contributions (such as free use of venues) from the government (2 percent), charities (1 percent) and the value of volunteer time (1 percent). (section 3.2)

The key findings for the sources of income are:

- On average, 56 percent of settings' income is free entitlement funding, 38 percent is parent-paid fees and 6 percent is from other sources. Almost half (48 percent) of all income is free entitlement funding for three and four year olds. (section 3.3)

- Childminders receive a much higher proportion of their income from parent-paid fees and a much lower proportion from free entitlement funding than other types of providers. (section 3.3)

- Settings with income from both parent fees and free entitlement funding receive, on average, 6p more per hour for free entitlement hours than parent-paid hours for two year olds and 91p less per hour for free entitlement hours than parent-paid hours for three and four year olds. (section (3.4)

The key findings for expectations about future changes are:

- Thinking about the coming year, most respondents expected their hourly cost to rise and their hourly income to remain unchanged. The most common planned response was to raise parent-paid fee rates, while less common plans included making changes to staffing or to the setting's child profile or seeking other income sources. (section 3.5)

3.1 Total cost and total income

Table 8 presents the mean total weekly costs and total weekly income for different types of providers. The total cost is the amount paid by the setting, plus the value of resources provided free of charge by other organisations and volunteer time.[24] Similarly, total income is the amount received by the setting, plus the identical addition of the value of resources provided free of charge by other organisations and volunteer time (as these are both implicit costs and implicit income).[25] As shown in the table, these additions are minor and the differences between the actual amounts paid and received by the setting and the total cost and income are generally small.

The mean total weekly cost across all provider types (weighted by number of places) is just under £3,500. The substantial variation in the mean weekly cost across provider types reflects the differences in provider size (as well as other factors): MNS have mean total weekly costs of just over £13,000 on average, while childminders' total costs are just under £800 per week. The mean weekly income across all provider types (weighted by number of places) is £4,715 and the variation across provider types mirrors that of costs and the differences in setting size (and other factors).

[24] This total income is sometimes called the economic cost. It should be noted that payments by settings include the implicit (imputed) rental value of venues owned by the setting and the implicit (imputed) value of childminders' time (see chapter 2 for further details).
[25] This total income is sometimes called the economic income. The addition to both cost and income is not double-counting as the two sides should balance with costs being covered by income.

Table 8: Total weekly cost and total weekly income

	Private	Voluntary	Nursery class	MNS	Child-minders	All types
Mean weekly total cost						
Paid by setting	£4,180	£2,321	£2,972	£12,447	£782	£3,333
Total cost	£4,326	£2,465	£3,165	£13,247	£784	£3,479
Mean weekly total income						
Received by setting	£5,906	£3,574	£3,727	£13,977	£918	£4,569
Total income	£6,051	£3,718	£3,919	£14,777	£920	£4,715
Number of settings	24	18	26	30	22	120

Source: Early Years Providers Cost Study, 2018

Notes: Total costs and total income includes costs paid by other organisations and the implicit value of volunteer time.

Table 9 presents the mean income-to-cost ratios by provider type. The ratios are, by construction, very similar for costs and income paid and received by the setting as for economic costs and incomes.[26] The average ratio is 1.37 for the setting cost and income for all provider types, but is somewhat higher for private and voluntary providers and lower for MNS and childminders. The differences in the ratios between private and voluntary settings on the one hand and MNS and childminders on the other are statistically significant.[27]

The lower half of table 9 shows the proportions of providers (weighted by the number of places) with setting income-to-cost ratios below 0.8 and above 1.2. A small proportion (6 percent) has ratios below 0.8, although this proportion is higher for childminders. Most providers (64 percent) have a proportion greater than 1.2, although this proportion is notably higher for private and voluntary providers than other types.

[26] The reason for this similarity is that the economic measures add the same amounts to the cost and the income which lowers the ratio because income is greater than cost.
[27] The differences are statistically significant at the 5 percent level except for that between private providers and MNS for the setting income received and cost ratio which statistically significant at the 10 percent level.

Table 9: Ratio of total income to total cost

	Private	Voluntary	Nursery class	MNS	Child-minders	All types
Mean ratio of income to cost						
Income received and costs paid by setting	1.39	1.60	1.33	1.21	1.11	1.37
Total income and total cost	1.39	1.55	1.31	1.20	1.11	1.36
Proportion of settings with setting income-to-cost ratio:						
Less than 0.8	8%	0%	3%	8%	10%	6%
0.8 to 1.2	16%	19%	53%	40%	62%	30%
More than 1.2	76%	81%	44%	52%	28%	64%
Total	100%	100%	100%	100%	100%	100%
Number of settings	24	18	26	30	22	120

Source: Early Years Providers Cost Study, 2018

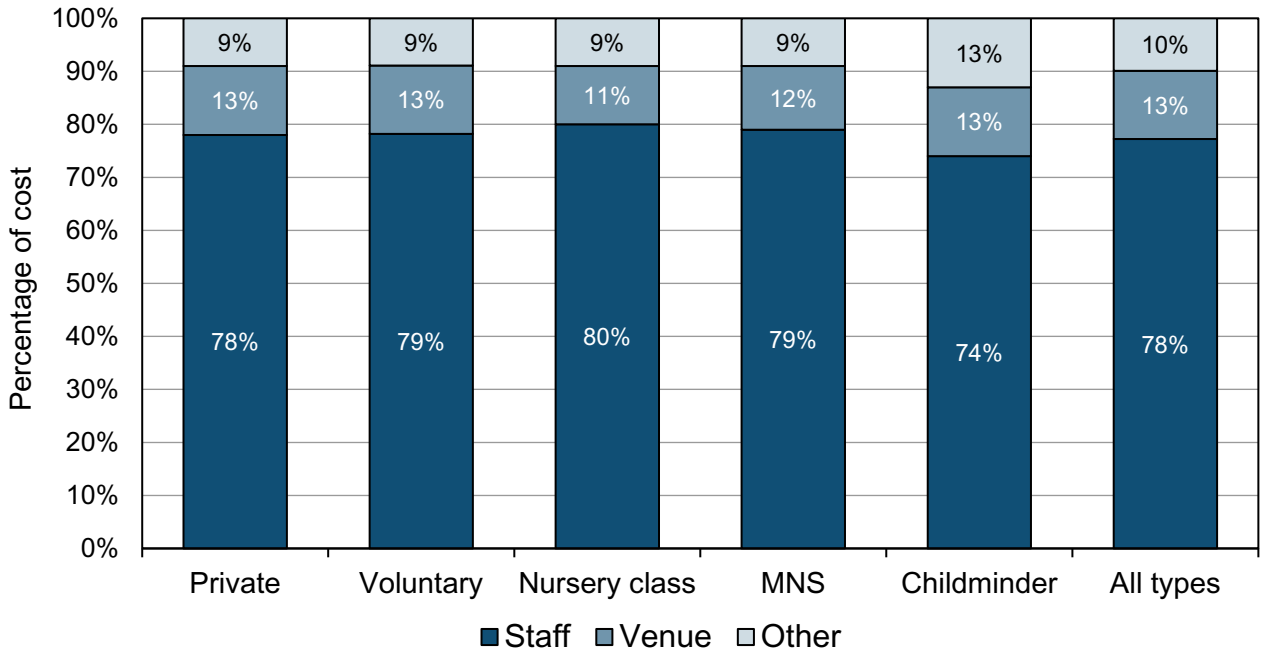
Notes: Total costs and total income includes costs paid by other organisations and the implicit value of volunteer time.

It is important to note that the estimated income-to-cost ratios are not precise measures of financial sustainability for two reasons (explained in detail in section 2.4). First, they may overstate the ratio because (i) occupancy and thereby total income may have been unusually high during the summer term fieldwork and (ii) the cost measure excludes investment costs. Second, they may understate financial sustainability for childminders because the cost part of the income-to-cost ratio is based on an imputed value for their time which may not have to be paid.

3.2 Breakdown of costs

Figure 3 presents the breakdowns of cost by the type of cost for the different types of providers and figure 4 present the breakdowns of cost by use for the different types of providers.

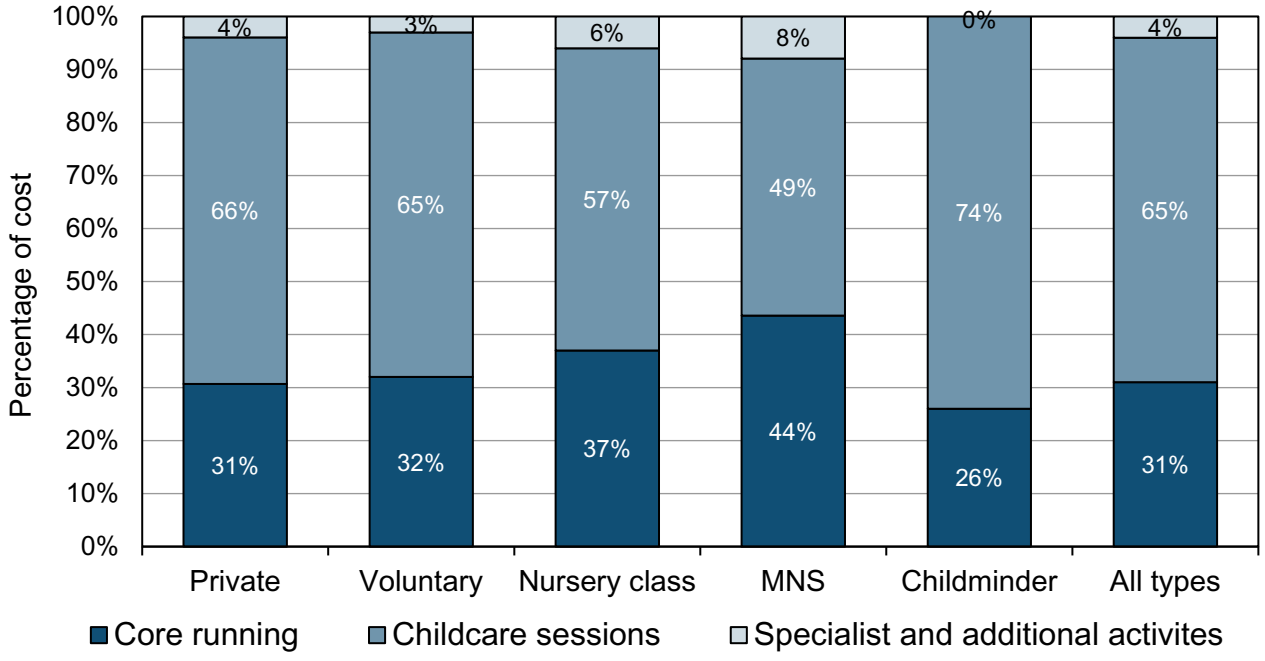
Figure 3: Breakdown of costs by type of cost



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are 24 for private providers, 18 for voluntary providers, 26 for nursery classes, 30 for MNS, 22 for childminders and 120 for all types.

Figure 4: Breakdown of costs by use



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are 24 for private providers, 18 for voluntary providers, 26 for nursery classes, 30 for MNS, 22 for childminders and 120 for all types. Childminders were not asked about specialist and additional services.

Figure 3 shows:

- On average across all provider types, staff costs constitute 78 percent of provider costs, with 13 percent attributable to venue-related expenses (including rent, imputed rental values for venues owned or used rent-free by the setting[28], business rates, utilities, maintenance, cleaning and insurance). The remaining 10 percent of costs are for other items including consumables (such as food, materials and toys), externally purchased services (such as Local Authority services, HR and payroll, staff absence insurance and advertising) and training (such as materials and course fees).

- The average breakdown into types of cost is very similar across all the provider types. The only small exception is that childminders, on average, have a slightly lower proportion of costs for staff and a higher share for other costs.

Figure 4 shows:

- On average across all provider types, 65 percent of total costs can be attributed to the delivery of specific childcare sessions, but only 4 percent to the delivery of specific additional and specialist services. The remaining 31 percent constitutes "core running" costs which include the cost of staff time for setting management and administrative tasks, venue costs for spaces without specific session or activity use (such as toilets, hallways and storage) and the cost of consumables which are broadly used for all sessions and activities.

- The average share of costs for core running is higher for nursery classes and MNS, even allowing for the higher proportions that these types of providers spend on additional and specialist services. This could be explained by additional and specialist services requiring more core management per user hour than childcare sessions, both because the activities are more diverse and because there are far fewer user hours than childcare session hours. Childminders have a lower share of costs attributable to core running than the other provider types (and were not asked about additional and specialist services on the presumption that they would not run such services).

Only a small proportion of total costs are incurred by other organisations and individuals on behalf of the setting. These costs are paid "in-kind" in the sense that other organisations or individuals provide the resource without any financial payment from the setting and the donating organisation or individual has a cost in the foregone payment that they might have otherwise received for the resource (such as rent for a venue provided free of charge or a wage for volunteer time provided free of charge). On

[28] Mortgage payments were not used as these include payment for the acquisition of an asset while the imputed rent is the operational cost of using the venue.

average, across all provider types, 2 percent of total costs are paid in-kind by the government, 1 percent are paid in-kind by charities and 1 percent are paid in-kind by volunteer staff. Across the difference types of providers:

- The total contribution of other organisations and individuals is negligible for childminders (less than 1 percent), but of broadly similar magnitude across all other types of providers (5 to 6 percent).
- In-kind contributions by the government are more common among nursery classes and MNS (5 percent of costs) than the other group based providers types (2 percent of costs), primarily reflecting the free use of venues and payment of business rates.
- In-kind contributions by charities mainly reflect venues provided for free by church and local community groups and are equally common among private, voluntary and nursery class providers (1 percent of costs).
- The value of free volunteer time constitutes 2 percent of costs for private providers and 3 percent of costs for voluntary providers, but is negligible for other provider types. Volunteer time typically reflects student volunteers or family members performing support tasks for the setting such as laundry or maintenance.

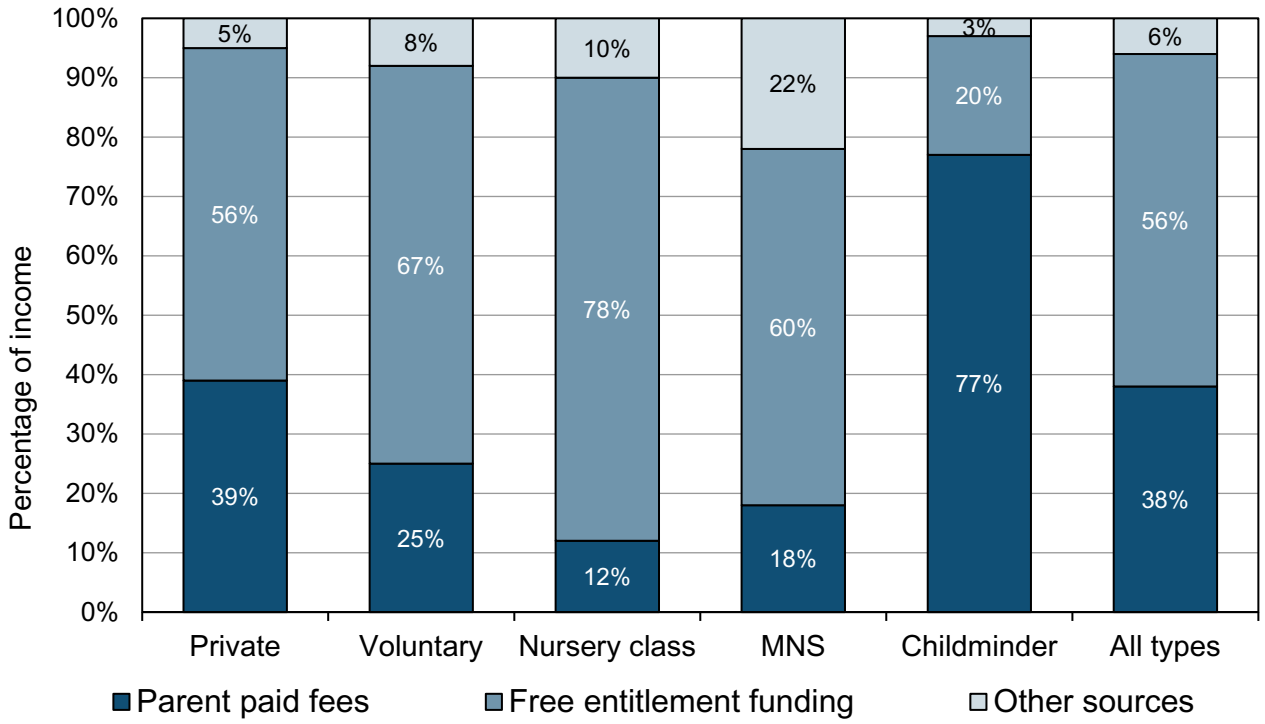
3.3 Sources of income

Figure 5 presents the breakdown of total income received by the setting across three broad sources while table 10 presents greater detail of the breakdown within these categories.[29]

On average, across all provider types, 38 percent of income is from parent-paid fees, 56 percent from free entitlement funding[30] and 6 percent from other sources. On average, the income from parent paid fees is evenly distributed across the three preschool age groups (with a smaller share from school children), but most free entitlement funding is for three and four year old children. Consequently, only a third of income for two year olds is from the free entitlement (7 percent of the total of 18 percent) while 80 percent of income for three and four year olds is from the free entitlement (48 percent of the total of 60 percent).

[29] Total income and the breakdown across sources was derived using the reported hourly parent fee rates, the free entitlement hourly funding rates and the numbers of childcare hours provided under the free entitlement and as parent paid hours in the snapshot week, together with reported income amounts for the other sources. Amounts reported for EYPP were removed from other income and added to free entitlement funding when they could be identified, but only very small amounts were involved.
[30] The free entitlement funding includes the universal entitlement and 30 hours free childcare for three and four year olds. Of the 77 settings reporting income from EYPP payments, 55 settings recorded it as other income while 22 included it in the average free entitlement rate.

Figure 5: Breakdown of income



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are 24 for private providers, 18 for voluntary providers, 26 for nursery classes, 30 for MNS, 22 for childminders and 120 for all types.

All four types of group-based providers (including private, voluntary and school-based providers) receive, on average, more than half of their income from the free entitlement, but the proportion is lower for private providers (due to a higher proportion from parent fees) and for MNS (due to a higher proportion from other income). In contrast, on average, childminders receive over three quarters of their income from parent fees and less than a quarter from free entitlement funding.

Reflecting the age profile of children in the settings, almost all free entitlement funding and parent fees are for children aged three and four in nursery classes and a substantial proportion is for this age group for voluntary providers and MNS. For private providers, the proportion of income from parent fees for children aged under two and for school children is higher than for the other group-based providers (13 percent compared to 2 percent to 4 percent), but childminders receive, on average, almost half of their income (48 percent) in parent fees for these age groups.

Table 10: Detailed breakdown of income

	Private	Voluntary	Nursery class	MNS	Child-minders	All types
Parent paid fees:						
Under age two	10%	1%	0%	3%	30%	10%
Two year olds	14%	7%	2%	5%	18%	11%
Three / four year olds	13%	14%	9%	8%	11%	12%
School children	3%	2%	2%	1%	18%	5%
Free entitlement funding						
Two year olds	11%	6%	1%	8%	3%	7%
Three / four year olds	44%	61%	77%	52%	18%	48%
Other sources						
Additional charges	2%	1%	1%	1%	2%	1%
Charitable donations	<1%	3%	<1%	<1%	0%	1%
Other income	3%	5%	9%	21%	1%	4%
Total	100%	100%	100%	100%	100%	100%
Number of settings	24	18	26	30	22	120

Source: Early Years Providers Cost Study, 2018

Notes: <1% indicates percentages between 0 percent and 0.5 percent. Columns may not sum to 100 percent due to rounding.

Additional charges (for such items as meals, snacks, trips and extra activities) constitute, on average, only 1 or 2 percent of income for all types of providers, while charitable donations form a slightly higher proportion of income for voluntary providers. The proportion of income from other sources is notably higher for MNS (22 percent) and somewhat higher for nursery classes (10 percent) and voluntary providers (9 percent) than private providers (5 percent) and childminders (3 percent). This may reflect

additional school-based funding and supplementary funding for MNS and their higher share of children in receipt of EYPP.[31]

Over half (60 percent) of settings have additional charges for parents, but the proportion is higher among group-based providers (around two thirds) than childminders (just over one third) (table 11). However, the charges are quite low: across all settings, the charges average £0.08 per childcare hour and £0.14 per childcare hour for all ages of children among settings with such charges. The average charge per hour is slightly higher among childminders and private providers than among voluntary providers, nursery classes and MNS.

Table 11: Additional charges for parents

	Private	Voluntary	Nursery class	MNS	Child-minders	All types
Proportion of settings with additional charges	67%	64%	59%	57%	35%	60%
Average charge per childcare hour for all ages of children (all settings)	£0.11	£0.07	£0.05	£0.04	£0.08	£0.08
Average charge per childcare hour for all ages of children (for settings with charges)	£0.16	£0.10	£0.08	£0.06	£0.22	£0.14
Number of settings	24	18	26	30	22	120

Source: Early Years Providers Cost Study, 2018

3.4 Hourly parent-paid fees and free entitlement funding rates

Most settings in this study (82 percent) received income from both parent-paid fees and free entitlement funding, while 5 percent received income from parent-paid fees but did not receive any free entitlement funding and 13 percent received income from free entitlement funding but did not receive any parent fees. All of the settings without any

[31] On average, MNS reported that 13 percent of their children were in receipt of EYPP and nursery classes reported that 10 percent were in receipt of EYPP compared to 4 percent for private providers and 3 percent for voluntary providers.

income from parent fees had no children under the age of two (and almost half were nursery classes), while almost all of those without any free entitlement funding had children under the age of two (and all bar one were childminders).

Almost all settings (83 percent) that received income from parent fees charged the same hourly fee for all ages of children. Unsurprisingly, this proportion was higher for settings with a youngest child aged two (94 percent) or aged three of four (97 percent) than the proportion for those with a child aged under two (68 percent). MNS were most likely to have any variation in the hourly parent fee (44 percent), but the proportions with any variation were notably lower for other provider types. Almost all of the 65 settings who received free entitlement funding reported that the hourly free entitlement funding rate was higher for two years olds than for the older age group, with just three MNS reporting that the rate was higher for three and four year olds (two of which had quite high proportions of children with SEND).

Table 12: Hourly parent-paid fees and funding rates by age of child

Age of child (number of settings)	All settings		Settings with parental fees and free entitlement funding rate		
	Mean hourly parent paid fee	Mean hourly funding rate	Mean hourly parent paid fee	Mean hourly funding rate	Difference (funding rate minus fee)
Under two years old	£5.06 (39)	n/a	n/a	n/a	n/a
Two years old	£5.10 (73)	£5.23 (66)	£5.17 (58)	£5.23 (58)	£0.06
Three and four year old preschool children	£5.21 (92)	£4.28 (112)	£5.19 (87)	£4.28 (87)	- £0.91
School children	£5.11 (35)	n/a	n/a	n/a	n/a

Source: Early Years Providers Cost Study, 2018

Note: 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.

The mean hourly parent-paid fees vary somewhat across child age: £5.06 for children under age two, £5.10 for two year olds; £5.21 for three and four year olds and £5.11 for school children (table 12). Settings with income from both parent fees and free entitlement funding receive, on average, 6p more per hour for free entitlement hours than parent-paid hours for two year olds and 91p less per hour for free entitlement hours than parent-paid hours for three and four year olds.

3.5 Expectations for future costs and income and planned responses

This section reports the findings from a qualitative component of the study which collected respondents' views on their expectations for future costs and incomes and their planned responses to these expectations. As the information was collected in a qualitative manner (using broad open-ended questions) and is based on the individual respondents' perceptions, the findings are presented in terms of broad prevalence of views rather than specific proportions, in accordance with good practice for qualitative work.

First, interview respondents were asked whether they expected their hourly cost of delivering childcare to increase, decrease or stay the same in the next 12 months and what the drivers of any changes would be. Most respondents expected their hourly costs to rise, although childminders were notably less likely to expect their costs to rise than other respondents possibly because many of their costs are not explicitly paid (including a specific salary to themselves or specific rent or venue costs). Other respondents expected their costs to remain the same rather than decrease (there was a single setting where the respondent expected costs to fall).

There were several reasons why respondents expected delivery costs to rise:

- The most common reason was potential increases in staff costs, driven by such factors as increases in the national minimum wage (and the knock-on effects further up the pay scales) and increases in pension contributions.

- Expected rises in venue costs were also a common reason, driven by expected increases in the costs for rent, business rates and utility bills.

- Some respondents expected an increase in the share of their children who would have higher cost requirements including those with SEND, those with English as an Additional Language (EAL) and children from disadvantaged families who are less prepared for nursery. This response was more common among MNS and was not reported by any childminders, consistent with MNS more commonly caring for children with these needs and childminder being less likely to do so than other types of providers.

- Some respondents felt that their costs would rise because of lower occupancy, primarily due to competition from new settings opening nearby or to falling birth rates in the area.

- Some respondents cited new regulation and policy developments as reasons that they expected costs to increase, most notably the cost of compliance with data protection under GDPR but some settings also mentioned the administrative costs of 30 hours free childcare and the apprenticeship levy.

- Other, less common, reasons included expected increases in food prices, insurance costs and service charges such as payroll.

Second, interview respondents were asked whether they expected their hourly income to increase, decrease or stay the same in the next 12 months and what the drivers of any changes would be. Most respondents expected their hourly income to remain the same, with a few reporting that they thought it would decrease and a very small number reporting that they thought hourly income would rise. Respondents at voluntary providers had a greater tendency than at other types to report that they believed that hourly income would stay the same, while respondents at MNS were considerably more likely to be expecting hourly income to decrease in the coming 12 months (and no respondents for these two types expected income to increase).

Among respondents expecting hourly income to decrease, there were two commonly cited reasons:

- Reductions to Local Authority funding including both cuts in the free entitlement funding rate and reductions or withdrawals of Local Authority grants. Respondents at MNS were most likely to report that they expected their income to fall in the next year due to anticipated cuts to MNS grants.

- A rise in the share of hours paid by free entitlement funding and decline in the share paid by higher hourly parent-paid fees due to the 30 hours free childcare (with a lower funding rate than hourly parent-paid fee). However, some respondents also expected that occupancy would rise as a result of the 30 hours free childcare which could offset some of the loss in hourly income through a lower hourly delivery cost.

Other reasons for expected decreases in hourly income included changes to the age composition of children (including lower free entitlement funding for children as they became three years old), falls in charitable donations and delays to SEND or free school meals registration affecting the amount of Local Authority supplemental funding.

Finally, interview respondents that reported an expected rise in hourly costs or decrease in hourly income were asked whether there were any plans to make changes to their business model in the next 12 months in response to these expectations.

Plans to reduce or limit increases to the hourly cost included:

- Increasing or maintaining occupancy by increasing advertising or offering greater flexibility to attract more children to fill unused places. Partial closing for some days of the week when occupancy was lower was also cited as a means to achieve this.

- Decreasing hourly staff costs by reducing the number of staff, staff working hours or staff salaries. In some cases, there were plans to reduce costs by replacing senior high-paid staff with more junior staff.

- A few respondents (more prominently among MNS) reported that they planned to limit the intake of SEND or disadvantaged children as a way to cut hourly delivery costs.[32]

Plans to generate higher hourly income included:

- The most common response was a plan to increase parent-paid fees (and was more prominent among private and voluntary providers).

- Some respondents (more prominent among voluntary providers) reported that they planned to increase or introduce additional charges to parents.

- Some respondents reported that they planned to reduce the share of hours that were paid by the free entitlement for three and four year olds (which had lower hourly income) and increase the share paid for by free entitlement for two year olds or paid for by parent fees (which had higher hourly income).

- A small number of respondents (predominantly from voluntary provider and MNS) reported plans to generate additional sources of income such as offering staff training to other settings, renting out rooms or increasing fundraising efforts.

A small proportion of respondents reported other measures to improve their financial position in response to expected changes. These included scaling back on outreach activities and working with other settings to improve efficiency.

Childminders were considerably more limited in their plans, mainly focused on increasing parent fees as a means to respond to expected changes in costs and income, reflecting their limited ability to change their profile of children or to obtain income from additional charges or other sources.

[32] These changes would presumably be within settings' legal duties in relation to children with SEND.

4. Hourly delivery cost for three and four year olds

This chapter examines the hourly cost of delivering childcare for three and four year old preschool children. The first section presents the variation in hourly cost, while the second section explores how this variation relates to settings' characteristics and the potential key drivers of differences across settings. The final section compares the estimated hourly cost to the report hourly parent-paid fees and free entitlement funding rates for three and four year olds.

Because of the small number of settings with children aged under two and with school age children in the data and because of the potential understatement of the hourly cost for two year olds (see section 2.3), there is significantly less confidence in the hourly cost estimate and analysis for these age groups than for three and four year olds. The hourly cost estimates and analysis for these other age groups are therefore only presented in Annex A and should not be cited without these specific warnings on their robustness.

The key findings are (in order of analysis and not magnitude of associations):

- The mean hourly delivery cost for three and four year olds is £3.95, but there is substantial variation in the hourly cost across settings (with a wide 95 percent confidence interval around the mean of £3.48 to £4.41 reflecting both this variation and the small sample size). (section 4.1)

- MNS have a higher hourly cost than all other provider types, driven by higher hourly staff costs and greater core running time which is are not offset by the cost benefits of the higher child-to-staff ratios and group sizes in MNS. (section 4.2.2)

- Childminders have a higher hourly cost than other provider types (except MNS), but this is due to their low child-to-staff ratios and small group sizes. For any specific ratio and group size, childminders have a *lower* cost than all other provider types (except nursery classes). (section 4.2.2)

- London has a higher average hourly cost than all other regions, while the Midlands has the lowest cost. There are no substantial differences in the hourly cost between rural and urban areas, but there are some indications that the hourly cost is higher in less deprived areas. (section 4.2.3)

- While there are no consistent patterns in the hourly cost by provider size, regression analysis controlling for other factors indicates that being middle-sized (as measured by the number of registered places) is associated with a higher cost. (section 4.2.4)

- Settings with children under the age of two have a higher hourly cost for three and four year olds, but the presence of children under age two is associated with a *lower* hourly delivery costs once other related characteristics are controlled for.

The hourly cost is higher for settings with a higher proportion of children with SEND and for settings with no children in receipt of the Early Years Pupil Premium (EYPP). (sections 4.2.5)

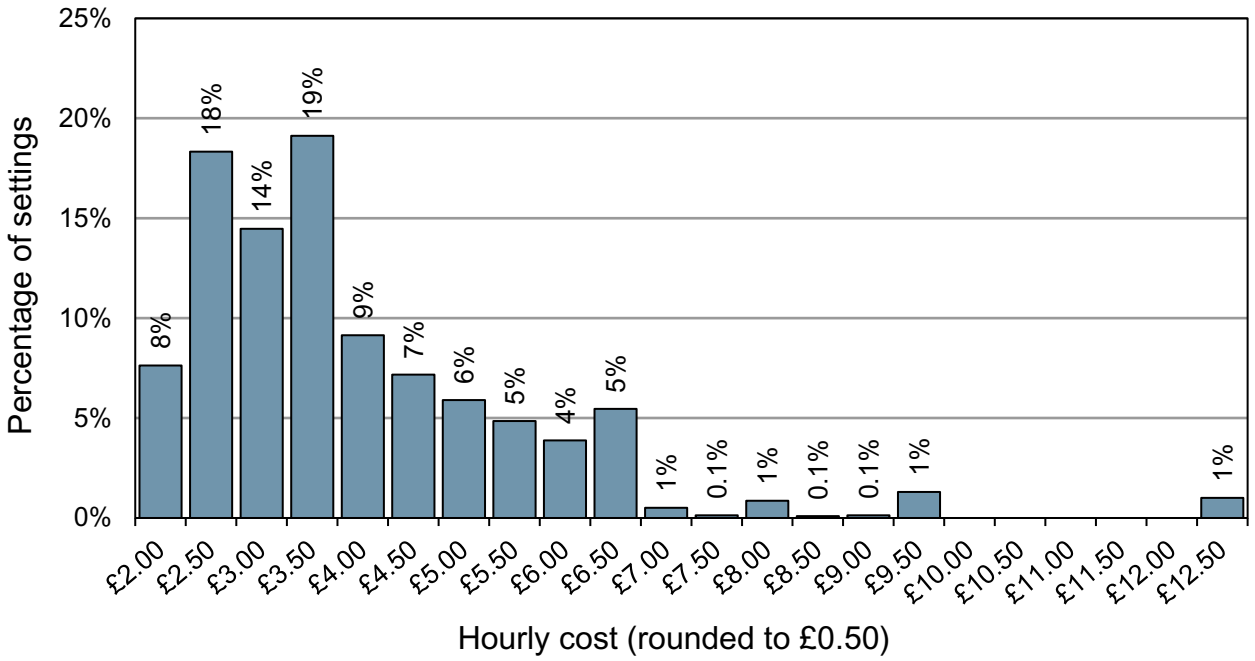
- The hourly cost is lower for settings which open for more hours each day (section 4.2.6)
- Settings with higher average staff qualifications, lower child-to-staff ratios and smaller group sizes have a higher cost. (sections 4.2.7 and 4.2.8)
- For private providers, voluntary providers and nursery classes, the mean hourly parent-paid fee for three and four year olds is notably *higher* than both the mean funding rate and the mean hourly delivery cost. For MNS and childminders, the average parent-paid fee and funding rate are both slightly *lower* than the mean hourly cost. (section 4.3)

4.1 Variation in the hourly delivery cost

The mean hourly delivery cost for three and four year olds is £3.95, but there is substantial variation in the hourly cost across settings (with a wide 95 percent confidence interval around the mean of £3.48 to £4.41 reflecting both this variation and the small sample size).

The distribution of the estimated hourly cost for three and four year olds is presented in bands rounded to the nearest £0.50 in figures 6. The distribution is quite condensed with almost two thirds (61 percent) in the £2.50 to £4 bands but a number of settings lie just above the bulk of the distribution. The one outlier (in the £12.50 band) is a setting with an unusually high proportion of children with SEND (roughly double that of the setting with the second highest proportion).

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



Source: Early Years Providers Cost Study, 2018

Note: Sample size is 117 settings.

4.2 Sources of variation

4.2.1 Identifying key drivers

The following sections explore how this variation in the hourly delivery cost is related to the characteristics of settings. These characteristics were selected and grouped according to the way in which they may affect the delivery cost (and not the likely magnitude of the association or their importance):

- Provider type (defined as private, voluntary, nursery class, MNS and childminder): the primary purpose and breadth or remit, organisational structure and behavioural incentives (particularly financial constraints) vary by provider type, potentially affecting delivery choices and costs even controlling for all other characteristics.

- Local cost drivers (proxied by region, rurality and local levels of deprivation): local economic conditions could affect the cost of resources, particularly staff and rents and also the level and nature of parent demand for childcare.

- Size of provider (including number of places at the setting and whether the setting is part of a chain): larger settings or those that are part of a larger chain may benefit from lower cost due to economies of scale in delivery (the average cost per child falls as more children are in the setting or head office management covers more children) or due to greater power to obtain resources for lower prices.

- Child profile (including age of youngest child, proportion of children with a SEN statement or EHC plan and proportion of children in receipt of Early Years Pupil Premium (EYPP): the types of children served can affect the types or amount of resources required (especially staffing) driving variation in hourly cost.

- Opening hours (including hours open per day, whether continuously open during the day and whether open year round): opening hours may directly impact on the hourly cost and also indicate the level of flexibility offered to parents which could also affect hourly cost.

- Staff characteristics (including staff qualification levels, training and staff turnover): these characteristics may be related to hourly costs through their effects on staff wages and the costs of providing training.

- Child-to-staff ratios and group sizes in each room: these factors can affect the hourly cost either through the amount of staffing used for each child or through potential economies of scale reducing the average cost per child in larger groups.

The staff, child-to-staff ratios and group sizes are commonly used to assess the structural quality of childcare settings (for example, see Gambaro et al (2013) or Munton et al. (2002)). These structural quality indicators have been shown to be correlated with measures of process quality, which in turn have been shown to affect child development (for example, see Melhuish and Gardiner (2017) and (2018)).

The relationships between these factors and hourly costs are explored in the following seven subsections, both in terms of raw differences and by presenting findings from regression models for all characteristics used to identify the key drivers. This regression analysis identified the factors that have statistically significantly associations with hourly cost controlling for other influences. For example, cost may be higher both for MNS and for settings using more qualified staff but the raw associations could be confounded because MNS tend to have more qualified staff. The regression analysis distinguishes whether it is being a MNS or whether it is the more qualified staff that is the “key driver” or whether both factors are independently important. Full regression results for the models are presented in the Annex B, together with the alternative specification for group size. Table 44 in the Annex presents a summary of the statistically significant findings for the preferred regression model.

Throughout the remaining sections of this chapter, statistically significant differences in mean hourly costs and statistically significant relationships in the regression models are reported for a minimum 10 percent significance level.

4.2.2 Provider type

The hourly delivery cost is highest for MNS and childminders and lowest for private providers and lowest for voluntary providers, with that for nursery classes lying in-between (table 13). Some of these differences are statistically significant:

- The cost for MNS is greater than for private providers, voluntary providers and nursery classes.
- The cost for childminders is greater than for private providers.

Table 13: Hourly delivery cost for three and four year olds by provider type

	Mean hourly delivery cost	Number of settings
Private	£3.71	24
Voluntary	£3.68	18
Nursery class	£4.08	26
MNS	£4.92	30
Childminder	£4.85	19

Source: Early Years Providers Cost Study, 2018

The regression analysis indicates that some of these differences across provider types remain even controlling for a broad range of other factors, but others change once allowance is made for other characteristics:

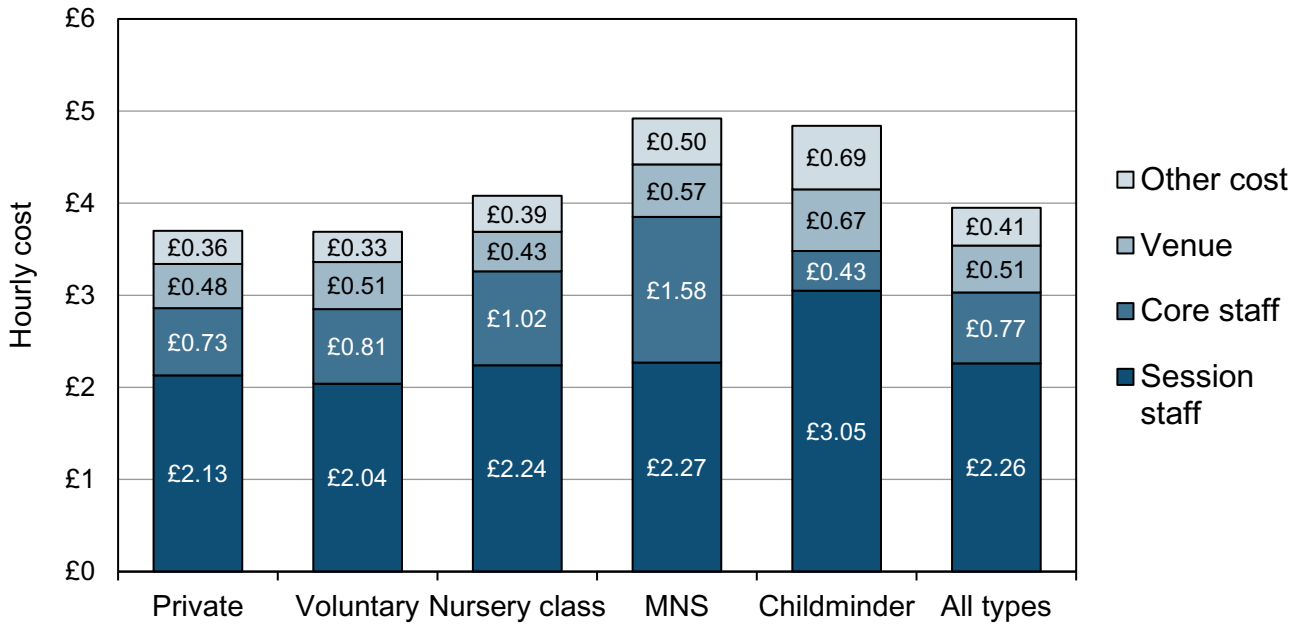
- Being an MNS is associated with a higher hourly cost than for all other provider types even controlling for other characteristics. Different specifications of the regression models (shown in Annex B) indicate that the differences in the hourly cost between MNS and other providers is considerably smaller when controls are not included for the average child-to-staff ratio and group size. This suggests either that MNS are not deriving the full benefit of lower costs from their higher child-to-staff ratios and group sizes or that they are benefitting from these factors but that the benefits are offset by other sources of higher costs.
- Being a childminder is associated with a *lower* hourly cost than for private and voluntary providers (as well as MNS). This contrasts with the pattern in the raw mean costs and is driven by the fact that childminders have lower child-to-staff ratio and group sizes than other provider types. For any specific given ratio and group size, childminders have a lower hourly cost than all other provider types.

In order to explore the sources of the differences in the mean costs between provider types, figure 7 breaks down the mean hourly costs into staff session costs (time

specifically allocated to a session), staff core costs (time not directly attributable to specific sessions such as administration), venue costs and other costs. The figure shows:

- The higher costs for nursery classes and MNS are largely due to higher mean hourly core staff costs: these are £1.02 and £1.58 for nursery classes and MNS respectively compared to £0.73 for private providers and £0.81 for voluntary providers.
- Staff session costs are notably higher for childminders, but core staff costs are lower than most other provider types.

Figure 7: Hourly delivery cost by source and provider type



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are shown in table 13.

Table 14 shows how these differences in staff cost relate to differences in the hourly employer cost and the utilisation of staff across provider types:

- Mean hourly employer costs for core staff are substantially higher for nursery classes and MNS which drives the higher hourly core staff cost. In addition, more hours are spent on core running per childcare hour (core hours constitute 7.2 percent of total childcare hours for MNS) which also increases the core staff cost.[33]

[33] One possible explanation for the higher core cost for MNS and nursery classes could be their greater involvement in additional and specialist services (described in Paull & Popov, 2019). Although a share of core running has been allocated to the additional and specialist services based on childcare and user hour

- Mean hourly employer costs for session staff are also higher among nursery classes and MNS, but this is offset by higher mean child-to-staff ratios for these provider types.

- Mean hourly employer costs are lower for childminders than other provider types and, as would be expected, almost identical for core running and session staffing. Combined with the lower proportion of time spent on core running for childminders (6.0 percent), this means that the core staff cost is lower than for other provider types. However, the lower employer cost for session staffing is outweighed by the low child-to-staff ratio, resulting in the higher mean hourly session staff cost for childminders than for other provider types shown in figure 7.

Table 14: Employer cost and staff utilisation

	Private	Voluntary	Nursery class	MNS	Child-minder	All types
Mean hourly employer cost for core running staff	£12.24	£12.00	£19.17	£22.73	£8.45	£12.96
Core hours as % of total childcare hours	6.5%	6.8%	5.8%	7.2%	6.0%	6.4%
Mean hourly employer cost for session staff	£10.29	£8.98	£14.44	£16.26	£8.44	£10.58
Mean child-to-staff ratio for three/four year olds	7.8	7.0	8.5	10.4	2.9	7.2
Number of settings	24	18	26	30	22	120

Source: Early Years Providers Cost Study, 2018

Notes: The mean hourly employer cost is weighted by the hours that each staff member spends on core running or on specific sessions. The mean hourly employer cost for childminders are mainly imputed values (as described in chapter 2). Four childminders did not report a child-staff ratio and the ratio is drawn from 18 childminders.

4.2.3 Area characteristics

The mean hourly cost is highest in London and lowest in the Midlands, with relatively little variation across the remaining regions. There are few statistically significant differences in the raw regional averages shown in figure 8:

numbers, this will only approximate the actual division and there could be some overstatement in the core running costs for childcare for these provider types.

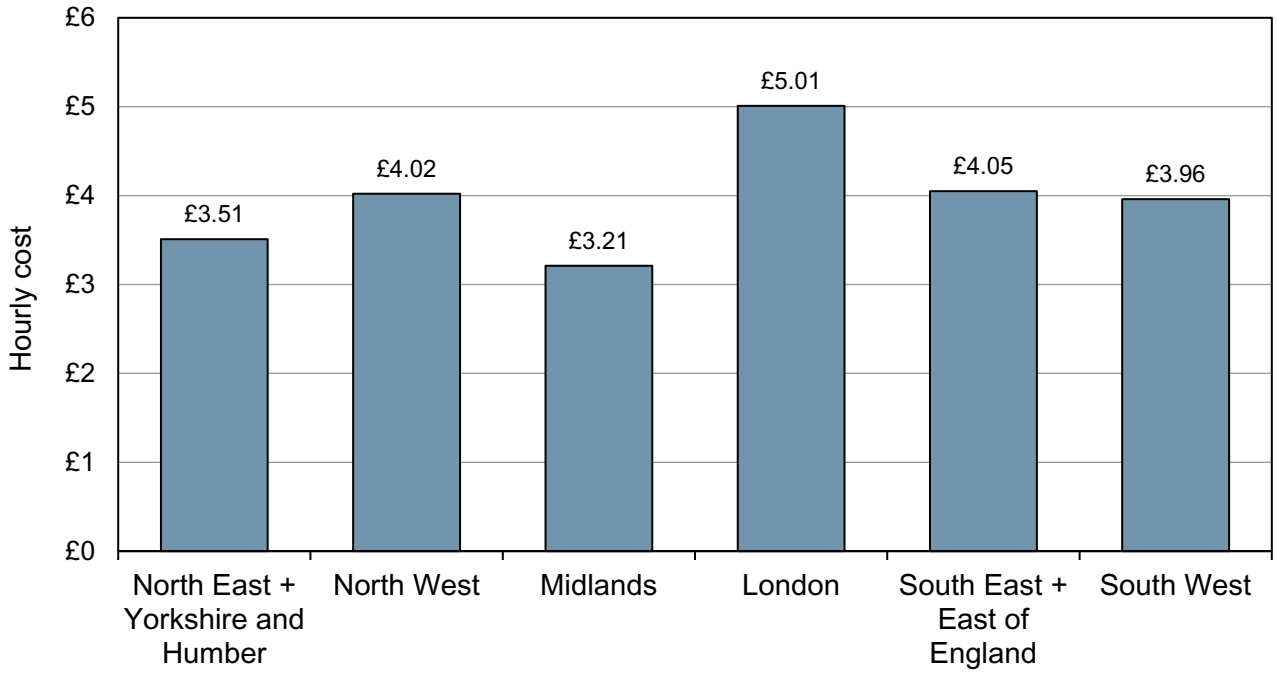
- The hourly cost is higher in three regions (London, South East & East and South West) than in the Midlands.

The regional differences in cost are much stronger in the regression analysis than for the raw differences:

- Being located in London is associated with a higher hourly cost than being located in all other regions except the North West and being located in North West or South East is associated with a higher hourly cost than being located in the North East or the Midlands. The point estimates of the mean difference between London and other regions ranges from £0.90 to £1.95.

This most likely reflects higher costs in London for resources such as staff and property rents, but could also reflect higher parental demand for childcare and ability to pay higher fees due to greater affluence in London.

Figure 8: Hourly delivery cost for three and four year olds by region



Source: Early Years Providers Cost Study, 2018

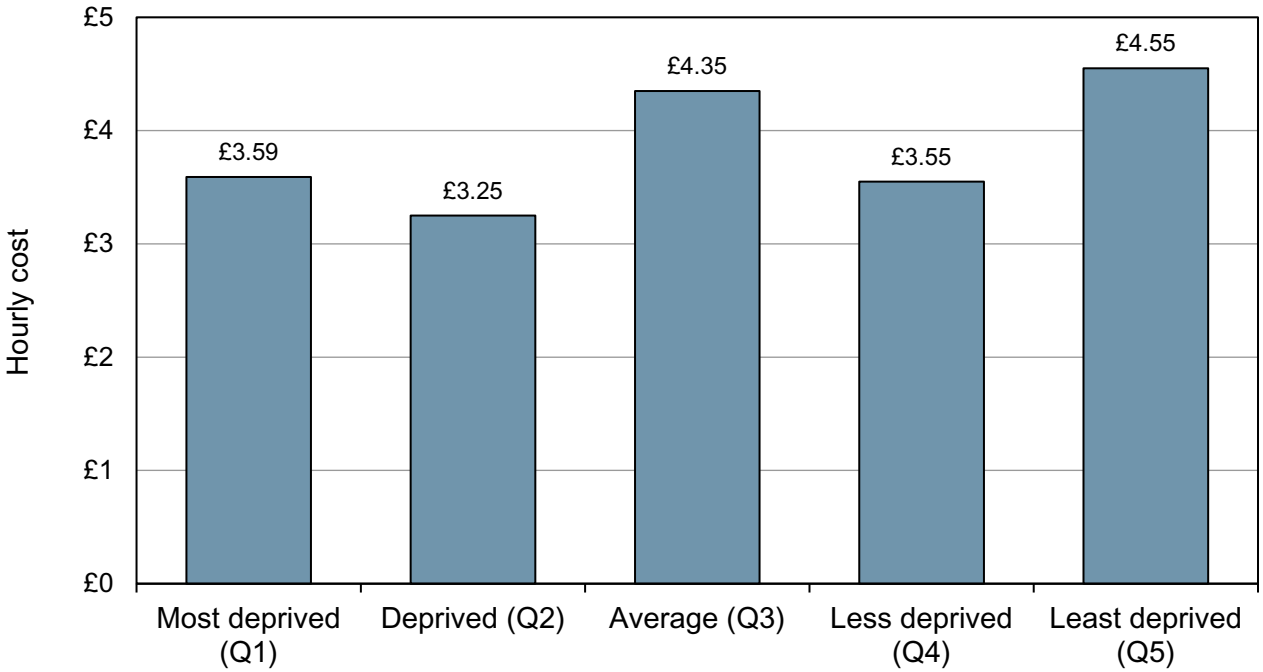
Notes: Sample sizes are 32, 11, 17, 14, 29 and 14 across the six regions.

Mean hourly delivery costs are very slightly higher in rural areas: £4.07 in rural areas compared to £3.91 in urban areas (16 settings in rural areas and 101 settings in urban areas provided an hourly cost for three and four year olds). These differences are not statistically significant and remained so in the regression analysis controlling for other factors.

Figure 9 presents the variation in hourly delivery costs by the deprivation level of the setting's location. There is some tendency for the hourly cost to be higher in less deprived areas with the following statistically significant differences between the quintiles:

- Settings in average deprivation areas (Q3) and least deprived areas (Q5) have higher costs than settings in deprived areas (Q2).

Figure 9: Hourly delivery cost for three and four year olds by deprivation quintile



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are 23, 22, 29, 20 and 23 across the five deprivation quintiles. The deprivation measure is IDACI (Income Deprivation Affecting Children Index).

However, the regression analysis draws less clear conclusions about the associations:

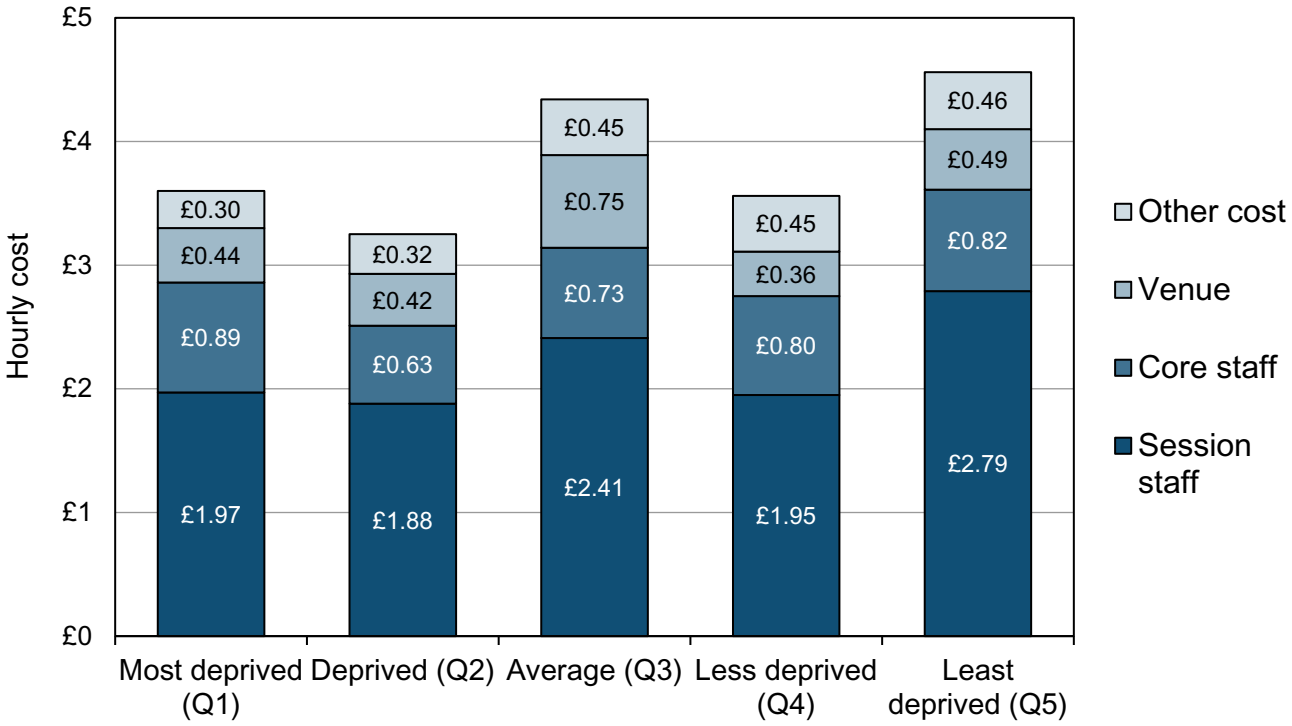
- Being located in an average deprivation area (Q3) and least deprived area (Q5) is associated with higher hourly costs than being located in a less deprived area (Q4).

In order to explore the sources of the differences in the mean costs across local deprivation level, figure 10 break downs the raw mean hourly costs shown in figure 9 into staff session costs (time specifically allocated to a session), staff core costs (time not directly attributable to specific sessions such as administration), venue costs and other costs. The figure shows:

- Session staff costs are notably higher for settings in the least deprived and average deprivation areas: the mean hourly session staff cost is £2.79 and £2.41 for settings in these two types of areas compared to less than £2 in the other three types of areas.

- Core staff costs are slightly higher for settings in the most deprived areas.
- Other costs are slightly lower for settings in the most deprived and deprived areas.

Figure 10: Hourly delivery cost by source and deprivation quintile



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are 23, 22, 29, 20 and 23 across the five deprivation quintiles. The deprivation measure is IDACI (Income Deprivation Affecting Children Index). Amounts may not sum to those in figure 9 due to rounding.

Table 15 shows how these differences in staff cost relate to differences in the hourly employer cost and the utilisation of staff across provider types:

- Mean hourly employer costs for core staff and the number of core hours as a proportion of childcare hours are higher for settings in the most deprived areas which drives the higher hourly core staff cost.
- The notably higher staff session costs for settings in the least deprived and average deprivation areas are at least partly driven by the lower average child-to-staff ratios in these areas, but this is partly offset by the lower mean hourly employer costs than in most other areas.

Table 15: Employer cost and staff utilisation by deprivation quintile

	Most deprived	Deprived	Average	Less deprived	Least deprived
Mean hourly employer cost of core running staff	£14.37	£11.78	£13.22	£12.93	£12.66
Core hours as % of total childcare hours	7.1%	5.5%	6.4%	6.1%	6.7%
Mean hourly employer cost for session staff	£10.77	£10.41	£10.21	£11.03	£10.60
Mean child-to-staff ratio for three/four year olds	7.4	7.5	7.3	7.5	6.6
Number of settings	23	22	29	20	23

Source: Early Years Providers Cost Study, 2018

Notes: The mean hourly employer cost is weighted by the hours that each staff member spends on core running or on specific sessions.

Similar to the findings for the regional variation, the association between higher costs and lower levels of deprivation may reflect higher costs in these areas for staff resources, but could also reflect higher parental demand for childcare and ability to pay higher fees in more affluent areas.

4.2.4 Size of setting and provider chains

Size is defined here as the number of registered places at a setting, that is, the maximum number of children that a setting can care for at a given point in time. As childminders are so much smaller than other types of settings, a measure of provider size was defined separately for childminders and for group-based settings (including private, voluntary and school-based providers) using a definition of small (less than 6 places for childminders and less than 35 places for all other provider types), medium (exactly 6 places for childminders and 35 to 65 places for all other provider types) and large (more than 6 places for childminders and more than 65 places for all other providers). A second measure of provider size was also considered for the group-based providers: whether they belonged to a chain of settings (that is, was part of a provider group based on more than one site).[34]

[34] Information was not collected on the size of chains or the number of settings owned or managed by the same provider.

Table 16: Hourly delivery cost for three and four year olds by setting size and single site or multisite

	Mean hourly delivery cost	Number of settings
Size of setting (number of registered places)		
Small	£4.09	41
Medium	£3.64	36
Large	£4.20	40
Multi-site		
Single site	£3.82	88
Part of a chain	£3.75	10

Source: Early Years Providers Cost Study, 2018

Notes: The multi-site question was only asked of group based providers (not childminders).

There is no consistent pattern in the hourly cost across setting size, but the hourly cost is slightly lower for settings which are part of a chain (table 16). Although there are no statistically significant differences in the raw hourly cost figures, the regression analysis controlling for other factors identified:

- Being middle-sized settings is associated with a higher hourly cost than being small.

It is not clear why middle-sized settings have the highest costs controlling for the other factors, but it could reflect some discrete increases in core costs as settings initially grow followed by falling costs as size increases sufficiently to benefit from larger economies of scale.

4.2.5 Child profile

The profile of children served by the setting was considered in terms of the youngest child at the setting and the proportions of children with SEND (defined as having either a SEND statement or an EHC plan) and in receipt of EYPP (Early Years Pupil Premium). The proportions of children with SEND and in receipt of EYPP were divided into three roughly even groups of none, low and high. Table 17 presents the variation in hourly cost across these three characteristics.

Table 17: Hourly delivery cost for three and four year olds by child profile

	Mean hourly delivery cost	Number of settings
Age of youngest child		
Under two years old	£3.78	36
Two years old	£3.66	46
Three or four years old	£4.65	35
Proportion SEND children		
None	£4.70	35
Low (10% or less)	£3.20	54
High (more than 10%)	£4.25	27
Proportion EYPP children		
None	£4.60	37
Low (10% or less)	£3.22	39
High (more than 10%)	£3.81	37

Source: Early Years Providers Cost Study, 2018

Notes: SEND is defined as either having a SEND statement or an EHC plan. EYPP is the Early Years Pupil Premium for children aged three or four.

The hourly cost is highest for settings without any children under the age of three and lowest for settings whose youngest child is two years old. One difference across the age of youngest child is statistically significant:

- The hourly cost is higher for settings which do not have any children under the age of three than those whose youngest child is aged two.

However, the regression analysis generates slightly different conclusions from the raw differences about the associations between the hourly costs and age of youngest child in the setting. Controlling for other characteristics:

- Having children under the age of two is associated with a lower hourly cost.
- The point estimate of the differences between settings who have children under age two and settings with a youngest child aged two is £1.23.
- The point estimate for the difference between settings who have children under the age of two and settings with a youngest child aged three is £1.58.

Given the range of controls included in the model (including provider type and average staff qualification level), there is no obvious explanation why the presence of the youngest group of children in the setting should reduce the hourly delivery costs for older children.

The hourly cost has no consistent pattern across settings with different proportions of children with SEND children and only one difference is statistically significant:

- The hourly cost is higher for settings with no children with SEND than for settings with a low proportion of children with SEND.

However, the regression results indicate that this counterintuitive finding is because of the other characteristics of these settings. Controlling for other setting characteristics using regression analysis shows that having children with SEND is associated with a higher hourly cost:

- The hourly cost rises as the proportion of children with SEND increases with a point estimate of an average £0.05 increase for each additional percentage point in the proportion of children with SEND.

It should be noted that the average higher cost of £0.05 is for every child in the setting and not just those with SEND. As a hypothetical example, if a setting with 100 children has one child with SEND, this estimate would suggest an additional cost of £5.00 per hour for the child with SEND (because the analysis spreads the £5.00 across all 100 children to generate an average additional cost of £0.05 for each of the 100 children).

Settings with proportions of children in receipt of EYPP in the middle (low) group have the lowest mean hourly cost and the differences with the other two categories are statistically significant[35]:

- The hourly cost is higher for settings with no children or a high proportion in receipt of EYPP than for settings with a low proportion of children in receipt.

The regression analysis controlling for other setting characteristics draws slightly different conclusions:

- Having no children in receipt of EYPP is associated with a higher hourly cost than having low or high proportions of children in receipt of EYPP.

Rather than the type of child being served driving the hourly cost (that is, children from more disadvantaged backgrounds requiring more staff resources), this suggests that the EYPP proportion may reflect variation in local deprivation not fully captured in the IDACI

[35] A simple linear relationship between hourly cost and the (ungrouped) proportion was not statistically significant.

measure: higher costs for settings with no children in receipt of EYPP being driven by higher local costs for resources such as staff and property rents or higher parental demand for childcare and ability to pay higher fees in more affluent areas.

4.2.6 Opening hours

Three measures of opening hours were considered: the number of hours that the setting is open each day (grouped into three categories), whether the setting was continuously open though the day and whether the setting was open year round.

Table 18 shows that settings with a low number of opening hours each day (6 or less) have a lower mean hourly cost than settings opening for longer hours and those with a middle number of opening hours (7 to 10) have a higher cost than for settings with longer opening hours. The hourly cost is slightly higher for those which are not continuously open through the day, but the cost is notably higher for those open year round than for those open just during term time. However, there are no statistically significant differences.

Table 18: Hourly delivery cost for three and four year olds by opening hours

	Mean hourly delivery cost	Number of settings
Daily opening hours		
Low (6 hours or less)	£3.65	28
Middle (7 to 10 hours)	£4.26	63
High (11 hours or more)	£3.79	26
Continuous opening through the day		
Not continuous opening	£4.16	13
Continuous opening	£3.92	104
Open year round		
Term only	£3.85	72
Both term and holidays	£4.08	45

Source: Early Years Providers Cost Study, 2018

However, the regression analysis identified some associations with hourly cost:

- The hourly cost decreases with the daily opening hours.
- Opening year round is associated with a higher hourly cost than only opening during term time, the point estimate for the difference being £0.93.[36] However, it should be noted that the "snapshot" nature of the data collection described in section 2.4 may lead to some imprecision in comparisons between settings open year round and those only open part of the year.

4.2.7 Staff characteristics

Staff characteristics were captured in three types of measures. First, the level of staff qualifications was measured in terms of the average NVQ level of the highest relevant qualification across all staff and the whether the setting was "graduate led" (defined here as any staff held a relevant qualification at level 6). Second, the level of ongoing workforce development was captured in whether the setting had a training plan, whether the setting had a dedicated training budget and the frequency of staff CPD and staff supervision. Third, retention of staff was measured as the rate of turnover, defined here

[36] The regression models control for different provider types and the fact that some provider types are more likely to be open year round than others.

as the number of staff who have left and joined the setting over the past year as a proportion of the total number of staff. Information for the last two groups of measures (workforce development and staff turnover) was only collected for group based settings (not childminders) and the analysis of these elements is restricted to these settings.

Table 19 presents the variation in these measures (shown in the number of settings) and the mean hourly cost for each category.

By construction (choice of the group thresholds), settings are roughly evenly divided across the three average qualification groups. The hourly cost is notably higher for settings with an average qualification level greater than 3.5 than for both other groups and these differences are statistically significant:

- The hourly cost is higher for settings with staff with an average qualification greater than 3.5 than for settings with average qualifications levels of 3 to 3.5 or less than 3.

The regression analysis controlling for other setting characteristics confirms this finding:

- The point estimates indicate average differences of £1.14 between settings with an average qualification greater than 3.5 and those with an average qualification of less than 3 and of £0.72 between settings with an average qualification of higher than 3.5 and those with an average qualification of 3 to 3.5.

Most settings have at least one member of staff qualified to graduate level[37], but there is little variation and no statistically significant differences in hourly cost between settings that are "graduate led" and those that are not. It is not surprising that the average qualification level would be associated with higher costs while the graduate level measure is not: the average qualification level across staff indicates a potentially higher wage level for all staff while graduate led indicates a potentially higher wage for one member of staff.

[37] Weighted by the number of places, for all providers, 61 percent were graduate-led and the proportions were 70 percent for private providers, 44 percent for voluntary providers, 93 percent for nursery classes, 100 percent for MNS and 10 percent for childminders.

Table 19: Hourly delivery cost for three and four year olds by staff characteristics

	Mean hourly delivery cost	Number of settings
Average staff qualification		
Less than 3	£3.50	27
3 to 3.5	£3.79	55
More than 3.5	£4.81	35
Whether graduate led		
No graduate	£3.78	33
At least one graduate	£4.04	84
Training plan		
No training plan	£3.26	4
Training plan	£3.83	94
Training budget		
No training budget	£3.24	30
Training budget	£4.22	68
Frequency of CPD		
Less than monthly	£4.03	57
At least monthly	£3.39	41
Frequency of staff supervision		
Less than monthly	£3.99	63
At least monthly	£3.30	35
Staff turnover		
Low (less than 10%)	£3.77	28
Middle (10% to 40%)	£3.98	36
High (more than 40%)	£3.81	33

Source: Early Years Providers Cost Study, 2018

Notes: See text for a description of the measures. The average staff qualification is the mean of the NVQ levels for all staff. For example, a setting with an average level of 3.5 could have half of its staff with level 3 and half of its staff with level 4.

Very few of the group-based settings (including private, voluntary and school-based providers but not childminders) do not have a training plan (only 4 of the 98 settings with three and four year olds), while most settings do have a training budget (68 of the 98 settings with three and four year olds). Most settings have less than monthly staff CPD

and less than monthly staff supervision. By construction (choice of the groupings), settings are roughly evenly distributed across the three staff turnover groups.

There is only one statistically significant difference in the hourly cost across the workforce development measures:

- The hourly cost is higher for settings with a training budget than for settings without a training budget.

There are no statistically significant differences in hourly cost between settings with and without a training plan; across settings with different frequencies of staff CPD or staff supervision; and across settings with different levels of staff turnover. None of the workforce development measures) nor staff turnover were statistically significant in the regression analysis.

4.2.8 Child-to-staff ratios and group sizes

The average child-to-staff ratios for each age group were simply reported by the setting interviewee as part of the background information. The average group size for each age group was calculated as the average number of children in the sessions attended by those children (including the number of children of other ages in the same sessions), weighted by the length of those sessions. Tables 20 and 21 present the distributions of these measures by provider type.

Table 20: Child-to-staff ratios groups by provider type for three and four year olds

% of providers with child-to-staff ratio:	Private	Voluntary	Nursery class	MNS	Child-minder	All types
Low (less than 8)	17%	25%	38%	11%	90%	31%
Middle (exactly 8)	83%	75%	10%	13%	10%	59%
High (more than 8)	0%	0%	52%	77%	0%	11%
Total	100%	100%	100%	100%	100%	100%
Number of settings	24	18	26	30	18	116

Source: Early Years Providers Cost Study, 2018

For three and four year olds, over half of all settings (59 percent) reported an average ratio of exactly 8, while most private and voluntary providers reported this ratio. As would be expected given statutory ratio requirements, only nursery classes and MNS reported average ratios in excess of 8, with substantial proportions (52 percent of nursery classes and 77 percent of MNS) reporting a ratio in the high group. Most childminders (90 percent), unsurprisingly, reported an average ratio in the lowest group.

Table 21: Group sizes by provider type for three and four year olds

% of providers with average group size:	Private	Voluntary	Nursery class	MNS	Child-minder	All types
Low (less than 20)	53%	18%	21%	12%	100%	47%
Middle (20 to 30)	28%	67%	64%	17%	0%	37%
High (more than 30)	19%	15%	16%	71%	0%	16%
Total	100%	100%	100%	100%	100%	100%
Number of settings	24	18	26	30	19	117

Source: Early Years Providers Cost Study, 2018

The thresholds for the categorisation of the mean group sizes into low, medium and high were chosen to give the most reasonable sample sizes in each category within each provider type. In particular, the categories are slightly unbalanced for all provider types in order to ensure some variation within MNS. Most MNS (71 percent) have a mean group size in the highest category, while most private providers (53 percent) are in the lowest category and both voluntary providers and nursery classes are predominantly in the middle category. Unsurprisingly, all childminders are in the lowest group size category.

Table 22 presents the mean hourly costs by the child-to-staff ratio groups and group size categories. The lowest ratio group has the highest cost and the differences are statistically significant:

- The hourly cost is higher for settings with a child-to-staff ratio below eight than for those with a ratio that is exactly eight.
- In addition, there is a statistically significant relationship between the hourly cost and the (ungrouped) child-to-staff ratio: on average, the hourly cost decreases by £0.13 for each additional child.

Table 22 also indicates a strong pattern of lower hourly costs for settings with higher average group sizes, with substantially lower costs for settings in the high group size category. The differences are generally statistically significant:

- The hourly cost is higher for settings with an average group size in the low or middle categories than those with an average group size in the high category.
- In addition, there is a statistically significant relationship between the hourly cost and the (ungrouped) average group size: on average, the hourly cost decreases by £0.05 for each additional child in the group.

Table 22: Hourly delivery cost for three and four year olds by child-to-staff ratios and group sizes

	Mean hourly delivery cost	Number of settings
Child-to-staff ratio		
Low (less than eight)	£4.80	38
Middle (exactly eight)	£3.46	41
High (more than eight)	£4.15	37
Group size		
Low (less than 20)	£4.46	45
Middle (20 to 30)	£3.83	40
High (more than 30)	£2.67	32

Source: Early Years Providers Cost Study, 2018

The associations between the hourly cost and both the child-to-staff ratios and average group sizes are statistically significant in regression models which control for other factors:

- The hourly cost is lower for settings with higher child-to-staff ratios: the point estimate indicates that the cost falls by an average of £0.15 for each additional child.
- The hourly cost is lower for settings with larger average group sizes: the point estimates indicate that the cost falls by an average of £0.09 for each additional child in the group.

The substantial effects of child-to-staff ratios and group sizes reflect that staff costs are a key component of total costs and shows how delivery costs are considerably lower when fewer staff resources are used for each hour of care per child.

4.3 Hourly cost, parent-paid fees and funding rates

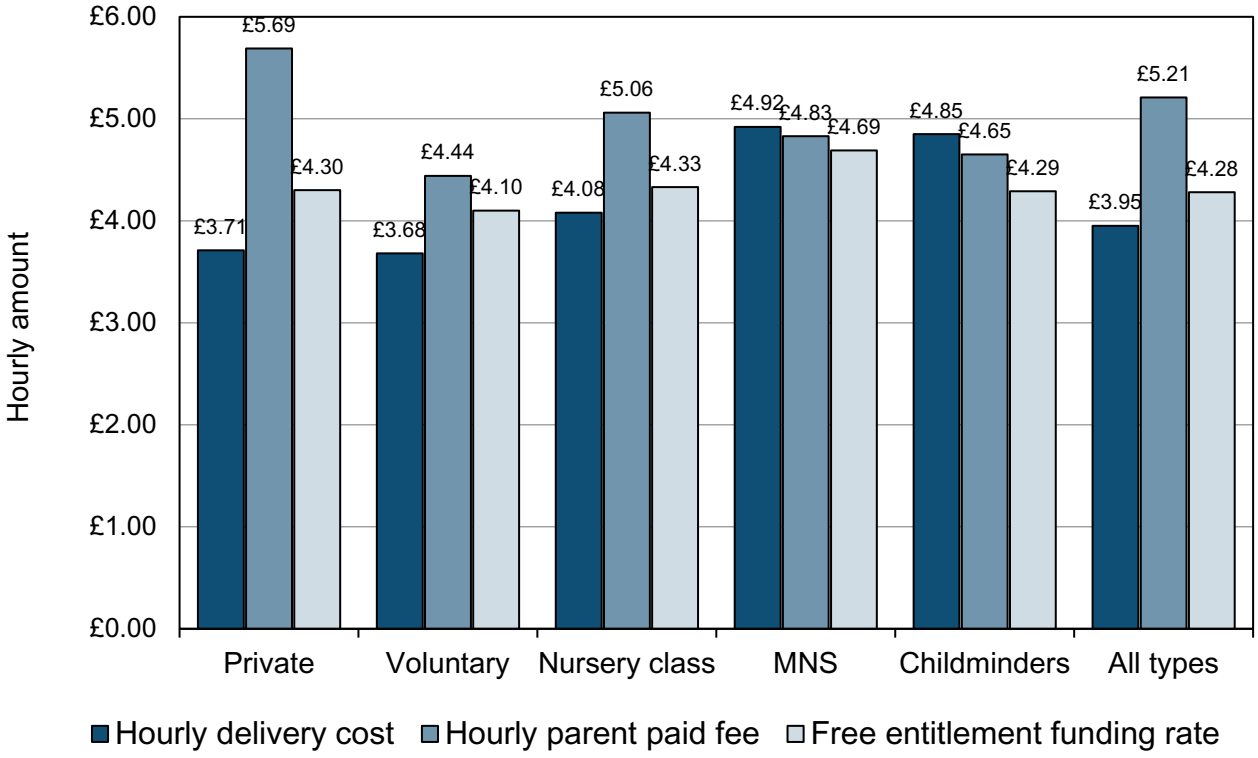
Figure 11 presents the mean hourly delivery cost, hourly parent paid fee and hourly free entitlement funding rate for three and four year olds. The figure shows:

- Across all types of settings, the mean hourly parent fee (£5.21) is higher than both the mean funding rate (£4.28) and the mean hourly delivery cost (£3.95).
- This pattern also holds for private, voluntary and nursery class providers, although the hourly fee for private providers is substantially higher (potentially reflecting

more prevalent and greater cross-subsidisation of costs from older to younger children).

- For MNS and childminders, the mean hourly cost is higher than either the parent fee or funding rate, but the differences are relatively small.[38]

Figure 11: Hourly cost, parent fee and funding rate for three and four year olds



Source: Early Years Providers Cost Study, 2018

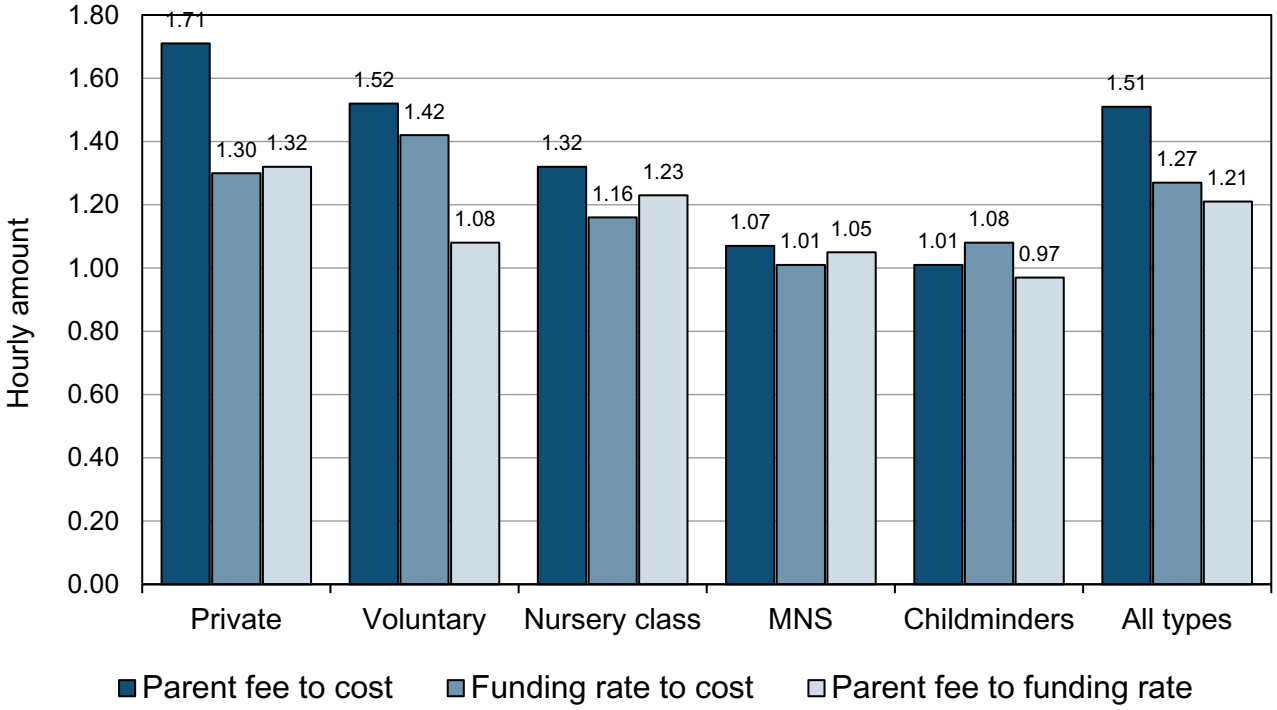
Notes: Sample sizes for the hourly cost, parent fee and funding rate are 24, 20 and 24 for private providers; 18, 15 and 17 for voluntary providers; 26, 13 and 26 for nursery classes; 30, 26 and 30 for MNS; 19, 18 and 15 for childminders; and 117, 92 and 112 for all types.

Mean ratios across the three hourly measures are presented in figure 12. These broadly reflect the patterns seen in figure 11 but will differ slightly because they are the means of the ratios within each setting and only include settings with both elements of the ratio. For example, settings which do not receive both parent fees and entitlement funding for the age of child will not contribute to the parent fee to funding rate ratio.[39]

[38] It should be noted that MNS receive, on average, 22 percent of income from other sources (see section 3.4), which, if evenly distributed across all childcare hours would bring the hourly income much closer to the hourly cost. However, it is possible that the income from these other sources is used to fund additional and specialist services rather than childcare.

[39] It should be noted that both hourly costs and hourly revenues may vary by the time of day but averages across the day are used for both. If parent paid hours and free entitlement hours are taken at different times of day with different costs, the actual ratios may differ from those presented here.

Figure 12: Ratios of parent-paid fees, funding rate and delivery cost for three and four year olds



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes for the parent fee to cost, funding rate to cost and parent fee to funding rate are 20, 24 and 20 for private providers; 15, 17 and 14 for voluntary providers; 13, 26 and 13 for nursery classes; 26, 30 and 26 for MNS; 18, 15 and 14 for childminders; and 92, 112 and 87 for all types.

The figure shows that, on average, private and voluntary providers receive substantially more and nursery classes receive somewhat more in parents' fees and funding rates each hour than their hourly delivery cost. For MNS and childminders, both hourly parent fees and funding rates are, on average, around the same as the hourly cost.[40] There are some statistically significant differences across provider types in the parent fee to cost ratio:

- The parent fee to cost ratio is higher for private and voluntary providers than for MNS and childminders.

There are some statistically significant differences across provider types in the funding rate to cost ratio:

- The funding rate to cost ratio is higher for private and voluntary providers than for MNS and childminders.

[40] This is in line with the total income to total cost ratios shown in section 3.1 except that the more substantial sources of other income for MNS mean that the ratio presented there is higher and closer to that for nursery classes.

- The funding rate to cost ratio is higher for voluntary providers than nursery classes.
- The funding rate to cost ratio is higher for nursery classes than for MNS.

The higher parent fee to funding ratios for private providers (and, to a lesser extent, for nursery classes) indicate that these types of providers receive, on average, notably more per hour from parent fees than funding rates. On the other hand, the mean ratio of around one for voluntary providers, MNS and childminders indicate more similar hourly income from the two sources. Some of these differences are statistically significant:

- The parent fee to funding rate ratio is higher for private providers than for voluntary providers, MNS and childminders
- The parent fee to funding rate ratio is higher for voluntary providers than for childminders.

5. Comparisons with SEED data from 2015

This chapter compares the findings in this report with those from a similar study which collected data in 2015 and was published as part of the Study of Early Education and Development (SEED) in 2017 (Blainey and Paull (2017)). The first section considers the comparability of the two studies and describes the adjustments required to improve comparability. The second section presents comparisons of the costs and income between the two studies while the third section examines the differences in the hourly costs and the cost drivers for three and four year olds. Section A3 in Annex A presents a comparable exploration for two year olds.

The key findings are:

- Total weekly costs are slightly lower for private and voluntary providers in the current study than in 2015, but this most likely reflects differences in the two samples rather than a change in total weekly costs for these types of providers. (section 5.2)
- With allowance for the summer fieldwork period in the current study, the income-to-cost ratio in the current study is close to that in 2015 for most provider types, suggesting that the ratio has not changed substantially over the three years. (section 5.2)
- The division of total cost across type of cost, use and the organisation paying the cost are very similar in the two studies, but free entitlement funding and other income sources constitute higher proportions of total income and parent fees a lower proportion in the 2018 study than in the 2015 study. (section 5.2)
- There is a smaller positive gap in the funding rate over the parent fee for two year olds and a larger negative gap for three and four year olds than in the current study than in 2015. (section 5.2)
- With allowance for the summer fieldwork period in the current study, the mean hourly cost for three and four year olds is 11 percent higher in the current study than in 2015, of which about 9 percent can be explained by inflation and changes to minimum wage and pension contribution policies over the three years. However, there are indications of notable reductions in the hourly cost for MNS, although this finding should be treated with caution due to the particularly small number of MNS in the SEED sample in 2015. (section 5.3)
- Although the SEED study considered a smaller range of potential key drivers of the hourly cost than the current study, there is no evidence that the key drivers of have changed over the three years. (section 5.3)

5.1 Comparability of the two studies

The two studies were broadly similar in their methodological approach:

- Data for the SEED study was collected from 160 settings and from a slightly smaller number of 120 settings in this study.
- The SEED study drew a broadly representative sample across provider types and regions and weighted the data to adjust for an oversampling of MNS, while a balanced sample across provider type and region was used in this study with weighting to rebalance the sample to match the national distribution.[41] Hence, the estimates from each study are representative of the costs in the year of the study and differences between the two studies could reflect both changes in costs within settings as well as changes in the mix of settings across type and region.
- The survey instruments and method of allocating delivery costs across child age groups were essentially the same in both studies. The main difference was that the current study collected information on the provision and cost of delivering additional and specialist services while such activities were simply not included in the data collection in SEED and would therefore not have affected the childcare cost estimates.[42] In addition, the current study also collected information on respondents' perceptions of future changes in costs and income in a section added to the end of the data collection visit.

However, there were two differences between the studies which were found to affect their comparability.

First, as explained in the second caveat in section 2.4, the fieldwork for the current study primarily covered the summer term which means that total income and the income-to-cost ratio are likely to be higher and the hourly delivery cost lower than in the SEED study which collected data basically throughout the year (March to December 2015). Figures from the SEED study indicate that the mean hourly cost for three and four year olds is around 10 percent higher during the summer term than year round.[43] This had two implications for the comparisons presented here:

[41] The SEED study included 15 LA-run and Children Centre's settings while the current study contained no settings of this type, but the weighting meant that these only contributed 4 percent to the sample for the overall average hourly cost in the SEED study and hence would not substantially affect the findings.
[42] The only minor difference is if the core costs for additional and specialist services were included in the core costs for childcare, but this would not have a major impact given that additional and specialist services constitute such a small proportion of all costs and the core costs an even smaller part.
[43] See table 23 in Blainey and Paull (2017).

- The income-to-cost ratio would be expected to be around 10 percent higher in the current study than in the SEED study because of the difference in the fieldwork period.[44]
- To improve comparability, the hourly cost estimates in the current study were adjusted to "all year" numbers using the 10 percent figure for three and four year olds.

Second, the two samples differed in terms of the child profile in the settings, captured in the age of the youngest child in the setting[45] and in the proportion of sessions with mixed age groups for two year olds and three and four year olds.[46] These differences were particularly marked for voluntary providers. As shown in the previous chapter, the age of youngest child is associated with differences in hourly costs for all ages, while the use of mixed age sessions will, by construction, reduce and potentially remove hourly cost differences between the two age groups. This had two implications for the comparisons presented here:

- The comparability of all statistics is weaker for voluntary providers than other types because of the more substantial difference in the child age profile between the two surveys.
- To improve comparability, the hourly cost estimates in the current study were reweighted by the SEED sample child profile. This adjustment decreased the hourly cost for three and four year old preschool children by 24p in the expected manner.[47]

The effects of the two adjustments on the hourly cost estimates for three and four year olds are presented in the comparisons of hourly costs in section 5.3 below.

[44] If the hourly costs are estimated to be 10 percent higher during the summer term than the annual average, this suggests that occupancy is 10 percent higher which in turn indicates that total income is be 10 percent higher in the summer term.
[45] In the weighted SEED sample, 58 percent of settings had a youngest child aged under two, 30 percent had a youngest child aged two and 12 percent had a youngest child aged three or four, but the weighted proportions in the Early Years Providers Cost Study sample were 47 percent, 39 percent and 28 percent. In comparison, the large sample data from the Survey of Childcare and Early Years Providers (SCEYP) for 2018 had weighted proportions of 60 percent, with a youngest child aged under two, 25 percent with a youngest child aged two and 15 percent with a youngest child aged three or four for settings with preschool children, suggesting that the SEED sample was closer to the national proportions.
[46] In the SEED sample, 28 percent of settings had two and three and four year old in sessions with only their own group and sessions with mixed ages and 27 percent had only age specific sessions, but the proportions in the Early Years Providers Cost Study were 9 percent and 19 percent.
[47] This included decreases of 34p for private providers, 26p for voluntary providers, 4p for MNS and 6p for childminders and an increase of 4p for nursery classes.

5.2 Costs and income

Table 23 presents the mean total weekly costs by provider type from the two studies. The mean total cost is notably lower in the current study than in SEED, driven primarily by lower costs for private and voluntary providers. However, this most likely indicates differences in provider size between the two samples (suggested by the difference in the child age profile) rather than a change in total weekly costs for these two types of providers. The variation in the total weekly cost across type of provider is consistent between the two studies: while private providers, voluntary providers and nursery classes have broadly similar levels of total costs, MNS have considerably higher total costs and childminders considerably lower total costs reflecting their relative sizes.

Table 23: Comparison of total weekly cost

	Private	Voluntary	Nursery class	MNS	Child-minders	All types
2015						
Mean total weekly cost	£6,307	£4,116	£3,243	£11,144	£797	£4,747
Number of settings	68	25	18	10	24	160
2018						
Mean total weekly cost	£4,326	£2,465	£3,165	£13,247	£784	£3,479
Number of settings	24	18	26	30	22	120

Sources: Blainey & Paull (2017) and Early Years Providers Cost Study, 2018

Notes: Total costs include costs paid by other organisations and the implicit value of volunteer time. The all types column for SEED also includes 15 Local Authority run providers and Children's Centres.

A comparison of the income to cost ratios is presented in table 24, with an adjusted estimate to the year round ratio shown in the bottom row to allow for the summer fieldwork period (as explained in section 5.1). The ratios for the current study are a hybrid of the two presented above using income received by the setting and the total cost including the cost of items paid by other organisations and the implicit value of volunteer time. This measure is used because it matches that presented in the SEED report and does not differ to any substantial degree from the two presented above.

For all types of providers with the exception of voluntary providers, the adjusted ratio in the current study is close to that in the SEED study, suggesting that the income-to-cost ratio has not changed substantially over the three years. The larger difference between the studies for voluntary providers may be due to the more substantial differences in the

child profile between the two samples. In both studies, the ratios for private and voluntary providers are generally statistically significantly higher than for MNS and childminders.[48]

Table 24: Comparison of income to cost ratios

	Private	Voluntary	Nursery class	MNS	Child-minders	All types
2015						
Mean ratio of income received by setting to total cost	1.30	1.18	1.17	0.98	1.01	1.19
Number of settings	65	25	18	10	24	157
2018						
Mean ratio of income received by setting to total cost	1.35	1.49	1.25	1.15	1.11	1.32
Adjusted to year round estimate	1.23	1.35	1.14	1.05	1.01	1.20
Number of settings	24	18	26	30	22	120

Sources: Blainey & Paull (2017) and Early Years Providers Cost Study, 2018

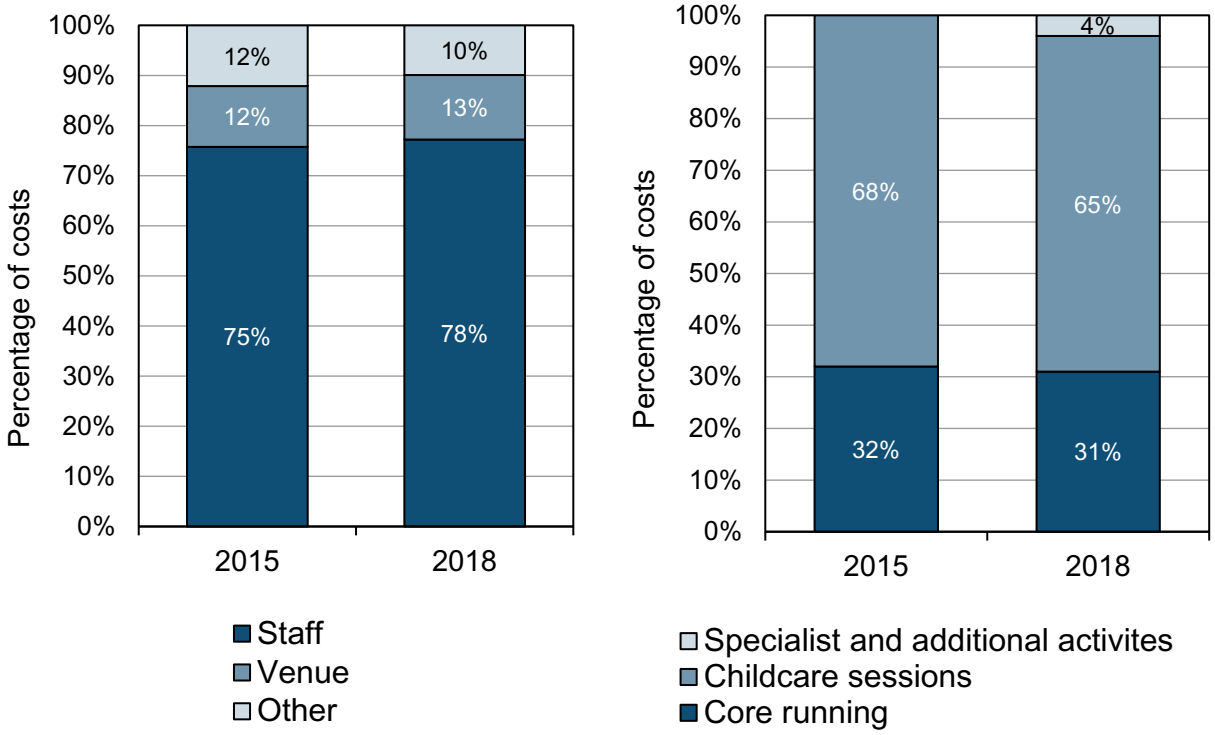
Notes: Total costs include costs paid by other organisations and the implicit value of volunteer time. The all types column for SEED also includes 15 Local Authority run providers and Children's Centres. The ratios for the childcare cost study are adjusted to year round estimates by dividing by 1.1 using the estimate that total income is 10 percent higher in the summer term than year round.

The division of costs across type of cost and use are very similar across the two studies (figure13), even though the SEED study did not collect information on additional and specialist services.[49]

[48] In SEED, the ratio is statistically significantly higher for private providers over MNS and childminders and is higher for voluntary providers and nursery classes over childminders. In the current study, the ratio is statistically significantly higher for private and voluntary providers on the one hand and MNS and childminders on the other.

[49] The breakdown by organisation paying for costs were also very similar: in SEED, 97 percent was paid by the setting, 2 percent by Government, less than 1 percent by charities and 1 percent by volunteer time, while the proportions were 96 percent, 2 percent, 1 percent and 1 percent in the current study.

Figure 13: Comparison of the breakdown of costs by cost type and use

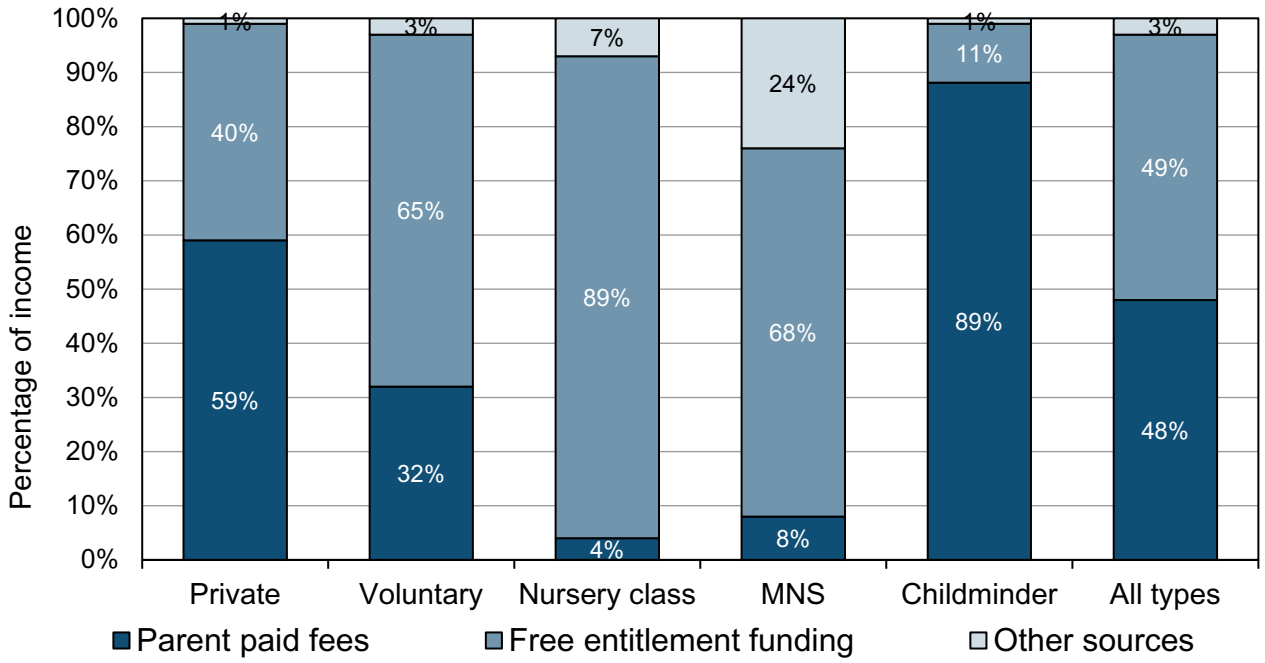


Sources: Blainey & Paull (2017) and Early Years Providers Cost Study, 2018

Notes: Sample sizes are 160 settings for SEED data from 2015 and 120 settings for Childcare Cost Study data from 2018

There are some small differences in the breakdown of total income for all types of providers (figures 14 and 15), with the current study indicating higher shares of income from free entitlement funding (7 percentage points higher) and other sources (3 percentage points higher) and a lower share of income from parents fees (10 percentage points lower). This is consistent with a rise in the share of income from free entitlement funding due to the introduction of 30 hours free childcare in September 2017. Interestingly, there is some suggestion of a convergence in income sources across provider types with private providers and childminders receiving a smaller share of their income from parent fees relative to free entitlement and nursery classes and MNS receiving a larger share in the current study than in SEED. The latter may reflect that these maintained providers are becoming more engaged with the provision of childcare for working parents outside of free entitlement hours.

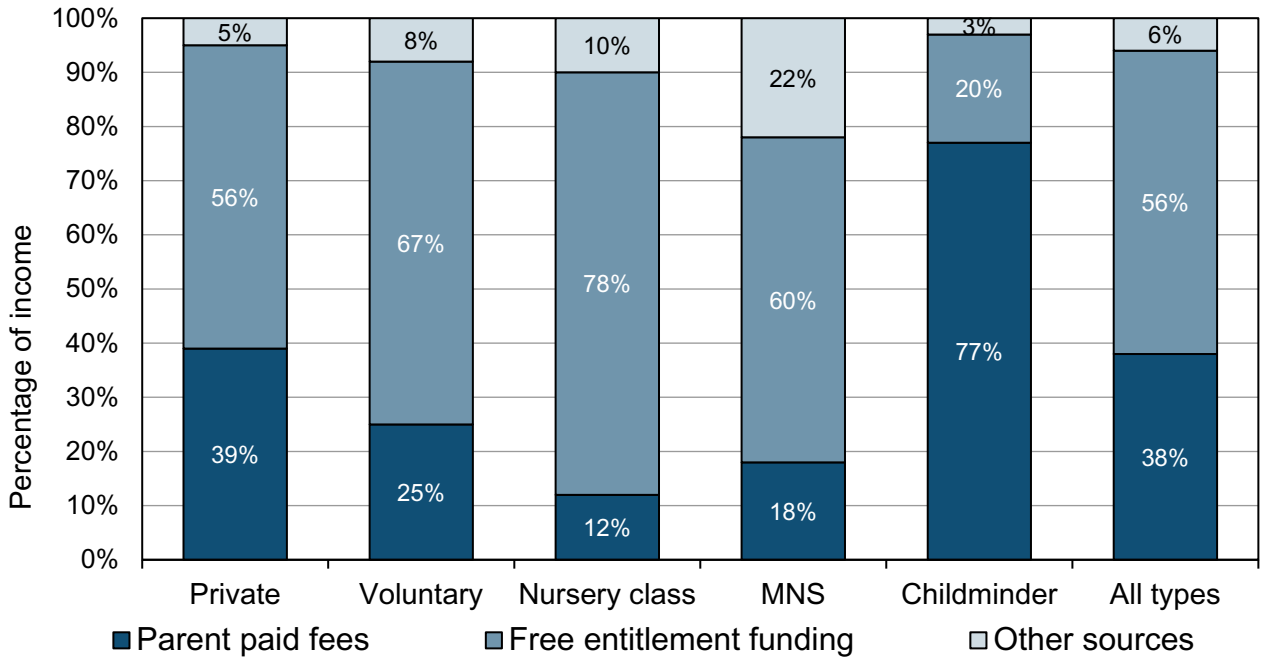
Figure 14: Breakdown of income for 2015



Source: Blainey & Paull 2017

Notes: Sample sizes are 65 for private providers, 25 for voluntary providers, 18 for nursery classes, 10 for MNS, 24 for childminders and 157 for all types.

Figure 15: Breakdown of income for 2018



Source: Childcare Cost Study 2018

Notes: Sample sizes are 24 for private providers, 18 for voluntary providers, 26 for nursery classes, 30 for MNS, 22 for childminders and 120 for all types.

Table 25: Comparison of hourly parent-paid fees and funding rates

	All settings		Settings with parental fees and free entitlement funding rate		
	Mean hourly parent paid fee	Mean hourly funding rate	Mean hourly parent paid fee	Mean hourly funding rate	Funding rate minus fee
Two year olds					
2015	£4.29	£4.93	£4.25	£4.92	£0.67
2018	£5.10	£5.23	£5.17	£5.23	£0.06
Three and four year old preschool children					
2015	£4.33	£3.93	£4.34	£3.90	- £0.44
2018	£5.21	£4.28	£5.19	£4.28	- £0.91

Sources: Blainey & Paull (2017) & Early Years Providers Cost Study, 2018

Note: Sample sizes for the current study are 73 for parent fees for two year olds and 92 for three and four year olds and 66 for the hourly funding rate for two year olds and 112 for three and four year olds. Sample sizes for SEED data from 2015 were not published. Mean hourly parent paid fees for children under age two were £4.44 for SEED data from 2015 and £5.06 in the current study and mean hourly parent paid fees for school children were £4.17 for SEED data in 2015 and £5.11 in the current study.

Comparisons of the mean hourly parent-paid fee and the mean hourly funding rate for free entitlement hours are presented in table 25. For both age groups, the mean hourly parent-paid is considerably higher in the current study than in 2015, while the difference in the mean hourly funding rate is smaller. Consequently, the more recent estimates suggest a smaller positive gap in the funding rate over the parent fee for two year olds and a larger negative gap for three and four year olds.

5.3 Hourly delivery costs for three and four year olds

The effects of the adjustments to the hourly cost estimates from the current study described in section 5.1 are presented in table 26. The adjustment to the year round figure increased the hourly cost estimates by approximately 10 percent, while the reweighting to match the SEED child age profile reduced the estimated hourly costs, most substantially for private and voluntary providers. The net effects of the two adjustments are notably higher estimates for nursery classes, MNS and childminders, but little change for private and voluntary providers.

The confidence intervals for the hourly cost for three and four year olds are wide for both studies and overlap between the two studies for all provider types and for all settings combined, reflecting the small sample sizes. Across all settings, because of the

overlapping confidence intervals, the inferred 11 percent increase in the mean hourly delivery cost for three and four year olds over the three years is not statistically significant. In other words, there is no statistically significant change in hourly costs over the three years from comparing hourly costs across the two studies.

The estimated increase is higher for private providers (18 percent) and lower for nursery schools (13 percent), childminders (9 percent) and voluntary providers (7 percent), but the hourly cost for MNS is estimated to have fallen substantially (by 20 percent).[50] However, the estimated change for MNS should be treated with additional caution because the sample size for this provider type was particularly small in the 2015 SEED study.

Table 26: Comparison of hourly costs for three and four year olds

	SEED 2015		Childcare cost study 2018			Difference between study estimates
	Mean hourly cost (95% confidence intervals)	Number of settings	Mean hourly cost	Adjusted mean hourly cost (95% confidence intervals)	Number of settings	
Private	£3.12 (£2.92 - £3.32)	68	£3.71	£3.68 (£2.98 - £4.38)	24	18%
Voluntary	£3.45 (£3.01 - £3.88)	25	£3.68	£3.68 (£2.88 - £4.49)	18	7%
Nursery class	£3.96 (£3.28 - £4.65)	18	£4.08	£4.48 (£3.81 - £5.15)	26	13%
MNS	£6.65 (£5.18 - £8.13)	10	£4.92	£5.32 (£4.70 - £5.95)	30	- 20%
Childminder	£4.77 (£3.83 - £5.72)	22	£4.85	£5.19 (£4.33 - £6.05)	19	9%
All settings	£3.72 (£3.47 - £3.96)	158	£3.95	£4.12 (£3.67 - £4.56)	117	11%

Source: Blainey & Paull (2017) & Early Years Providers Cost Study, 2018

Notes: All estimates were weighted using the sample weights. All settings include 15 LA-run and children's centres in the SEED sample.

[50] Because of the small number of MNS nationally and the correspondingly low weight assigned to MNS, the substantial decrease makes little contribution to the mean value of 11 percent.

There are several reasons to expect the hourly costs to have increased over the three years between the two studies:

- Simple inflation: the Consumer Price Index (CPI) in July 2018 was 5.8 percent higher than the 2015 level (ONS 2018).
- With the introduction of the National Living Wage, the minimum hourly wage for workers aged 25 and above has risen from £6.70 in October 2015 to £7.83 in April 2018.
- Compulsory opt-out pension contribution schemes have been introduced with a minimum opt-out level of two percent in 2018.

The potential effects of each of these factors were modelled using the childcare study data by:

- Discounting the hourly cost estimates back to 2015 using an overall inflation rate of 5.8 percent across the three years.
- Reducing the hourly pay for staff paid at the current national minimum or living wage to the 2015 levels. This may understate the impact on costs because the rise in the national minimums may have also led to rises in wages above the minimum in order to maintain pay differentials.
- Reducing the pension contributions to zero for any staff with pension contributions between zero and two percent (assuming that they would not be paying these contributions if there were no statutory opt-out).

The first three columns of table 27 presents the estimated effects of these three factors on the hourly cost for each provider type. The table shows:

- Inflation is estimated to have had the largest impact, increasing the hourly cost by an average £0.22, but having a slightly greater absolute impact on costs for MNS and childminders because of the slightly higher level of costs for these provider types.
- Increases in the minimum wage are estimated to have increased the average hourly cost by £0.12. However, the estimated impact varies substantially by provider type according to the proportion of staff paid at the statutory minimum levels. While the minimum wage effects are considerably smaller than those from inflation for most provider types, they are considerably larger for childminders by construction because salaries for most childminders were imputed at the minimum wage level.
- The estimates indicate that the statutory opt-out for pension contributions had almost no impact on the hourly cost for all provider types. The simple reason for

this is that were very few staff with pension rates between zero and two percent: staff tended either to make no contributions or to make considerably higher ones (particularly if working in a nursery class or MNS).

Table 27: Sources of difference between 2015 and 2018

	Estimated change in hourly cost due to			Percentage difference	
	Inflation	Minimum wage	Pension	Modelled from three factors combined	Difference between study estimates
Private	£0.20	£0.07	£0.02	9%	18%
Voluntary	£0.20	£0.06	£0.01	8%	7%
Nursery class	£0.22	£0.02	£0.00	6%	13%
MNS	£0.27	£0.01	£0.00	4%	- 20%
Childminder	£0.27	£0.49	£0.00	16%	9%
All settings	£0.22	£0.12	£0.01	9%	11%

Source: Early Years Providers Cost Study, 2018

Notes: All estimates were weighted using the sample weights. The three factors combined are inflation, increases to the national living wage and national minimum wage and the introduction of compulsory opt-out for a minimum pension contribution of 2 percent.

The final two columns in table 27 show the percentage change in the hourly cost estimated from the combined effects of inflation and the minimum wage and pension contribution changes and the percentage difference between the estimates from the two studies. These show that:

- The 18 percent and 13 percent differences between the two studies for private providers and nursery classes can only be partly explained by inflation and the minimum wage and pension contribution policy changes. The gap between the difference in the survey estimates and the “explained” potential change suggests that other factors may have also increased costs by around 7 percent to 9 percent for these providers.

- For voluntary providers, the difference in estimates between the two studies almost matches the estimated change due to inflation and the minimum wage and pension contribution policy changes, suggesting that these factors may explain the increase.

- For childminders, the estimated change due to inflation and the minimum wage and pension contribution policy changes is substantially greater than the difference in estimates between the two studies. But this is largely due to the

impact of changes in the minimum wage which is a direct consequence of the imputed salary level used for most childminders in this study. In the absence of this imputation, the explained change would be around 6 percent, only slightly less the observed difference.

- The considerably lower costs for MNS in the current study than in the SEED study are in contradiction to the small estimated increase due, mainly, to inflation. This suggests that there may have been substantial cost reductions within MNS since 2015, but this finding should be treated with caution due to the particularly small number of MNS in the SEED sample in 2015.

Overall, this suggests that hourly costs may have risen more over the last three years for private providers and nursery classes than can be explained by inflation and the minimum wage and pension contribution policy changes, but that these factors may account for the increases observed for voluntary providers and childminders. There are indications of notable reductions in the hourly cost of delivering childcare within MNS, but this finding should be treated with caution due to the particularly small number of MNS in the SEED sample in 2015.

The SEED report contained some multivariate regression analysis to identify key drivers of the variation in hourly delivery costs for three and four year olds, but it was more limited that the analysis presented in the current study. In particular, the SEED data contained a more limited range of variables[51] and the regression analysis only sequentially included controls for provider type, region, quality, age profile and month.[52] Nevertheless, findings on the key drivers of the hourly cost for three and four year olds were also identified in the SEED study:

- MNS had higher hourly costs than private providers, voluntary providers and nursery classes.
- London had higher hourly costs than the North East, the North West, Yorkshire and the Humber and the South East.
- There were mixed and inconsistent patterns across deprivation quintiles.
- There were no differences between urban and rural areas.
- Middle and large size settings had higher costs than small settings.

[51] Specifically, the SEED study did not collect data on the proportion of children with SEND, the proportion of children in receipt of EYPP, daily opening hours, continuous opening throughout the day, whether open year round or only during term time, the average staff qualification and child-to-staff ratios. In addition, average group sizes were not calculated from the data.

[52] Sequentially means that separate models were estimated for each control variable rather than a single model containing all control variables.

- There were no differences between single site settings and chains.
- Settings with children under the age of two had lower costs than those with only preschool children aged two and older.

There were only two minor differences in the findings in SEED:

- Childminders had higher hourly costs than private or voluntary providers, but this could be explained by the absence of controls for child-to-staff ratios or group sizes in the SEED analysis.

Hence, there is no evidence that the key drivers of the hourly cost of childcare have changed over the three years.

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Annex A: Analysis of hourly cost for all ages of children

This annex presents the analysis of the estimated hourly cost for all ages of children (that is, the estimates for children under age two, two year olds and school age children as well as the estimates for three and four year olds presented in the main body of the report. This analysis is presented in this Annex because the small number of settings with children aged under two and with school age children in the data and because of the potential understatement of the hourly cost for two year olds mean that there is significantly less confidence in the hourly cost estimate and analysis for these age groups than for three and four year olds. The hourly cost estimates and analysis presented in this Annex should not be cited without these specific warnings on their robustness.

The first section presents the hourly cost estimates for all four age of children, while the second section presents analysis of the variation in hourly cost for two year olds (comparable to section 4.2 for three and four year olds). The third section compares the hourly costs with hourly parent-paid fees and free entitlement funding rates for two year olds (comparable to section 4.3 for three and four year olds). The final section draws comparisons for all age groups with the estimated hourly costs from 2015 and analyses in more detail the comparisons for two year olds (comparable to section 5.3 for three and four year olds). Throughout, further details on the measures and analysis can be found in the corresponding sections in the main part of the report.

A.1 Hourly delivery cost per child

Across all settings, the average (mean) hourly delivery cost per child is £5.27 for children under the age of two, £3.96 for two year olds, £3.95 for three and four year old preschool children and £4.39 for school children[53] (table 28). The confidence intervals for the mean estimates (showing the range which contains the true population mean with 95 percent confidence) are wide due to the small sample sizes and the considerable variation in costs across settings. These intervals indicate that the hourly cost for children under aged two is higher than that for the other preschool age groups, but they give no indication that the mean cost differs across the other three age groups. The median hourly cost (the cost for the middle setting when settings are ranked from lowest to highest) is lower than the mean for all four age groups. This indicates that there are a large number of settings concentrated together at the lower end of the range of costs with a small number of settings with much higher costs raising the mean cost above that for the middle setting.

[53] It should be noted that the figure for school children is for care in a setting which also has preschool children and is therefore not necessarily representative of the cost of care for school children across all settings, including those which only cater for school age children.

Table 28: Hourly delivery cost by age of child

Age of child	Mean	95% confidence intervals for the mean	Median	Number of settings
Under two years old	£5.27	£4.46 – £6.07	£4.75	39
Two years old	£3.96	£3.44 – £4.49	£3.74	81
Three and four year old preschool children	£3.95	£3.48 – £4.41	£3.61	117
School children	£4.39	£3.53 – £5.25	£4.17	35
All ages	£4.21	£3.75 – £4.68	£3.77	120

Source: Early Years Providers Cost Study, 2018

Note: 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.

Table 29: Hourly delivery cost by youngest child in setting

Mean hourly delivery cost	Age of youngest child in setting		
	Under two years old	Two years old	Three and four year old preschool
Under two years old	£5.27	n/a	n/a
Two years old	£4.26	£3.70	n/a
Three and four year old preschool children	£3.78	£3.66	£4.65
School children	£3.60	£4.81	£9.31
Number of settings	39	46	35

Source: Early Years Providers Cost Study, 2018

Note: 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.

The similarity in the mean cost for two year olds and three and four year olds partly reflects that settings without children under the age of three have notably higher mean hourly costs than those with younger children. As shown in table 29, these settings have a mean cost of £4.65 for three and four year olds compared to £3.66 for settings with a youngest child aged two and £3.78 for settings which have children under the age of two. Within settings with children under the age of two, the difference in the mean hourly cost between two year olds and three and four year olds is quite large (£4.26 compared to £3.78), although it is quite similar in settings with a youngest child aged two.

The differences in the hourly delivery cost across different ages of children contrasts with the lack of variation in the hourly parent-paid fees presented above. Table 30 explores this by presenting the ratio of the hourly parent paid fee to the hourly delivery cost by age of youngest child in the setting.[54] The higher ratios for children aged two over those under age two and for those aged three and four over those aged two reflects that hourly parent fees are smoothed across ages while costs decline for older age groups of children. This "cross-subsidisation" from older to younger children could be interpreted as part of a "loss leader" marketing strategy as providers compete on price when parents initially select a setting or could be seen as a means by which providers help parents smooth the costs of care.[55]

Table 30: Ratio of hourly parent paid fee to hourly delivery cost

Mean ratio for children aged: (Number of settings)	Age of youngest child in setting:			All settings
	Under two years old	Two years old	Three and four years old	
Under two years old	1.05 (39)	n/a	n/a	1.05 (39)
Two years old	1.31 (35)	1.53 (38)	n/a	1.42 (73)
Three and four year old preschool children	1.53 (35)	1.57 (40)	1.30 (17)	1.51 (92)
School children	1.49 (21)	1.22 (10)	* (4)	1.34 (35)

Source: Early Years Providers Cost Study, 2018

Notes: The ratio for school children in settings with a youngest child aged three or four has been suppressed due to a sample size of less than six. Sample sizes are smaller than for the hourly cost because some settings have children with no parent fees in some age groups.

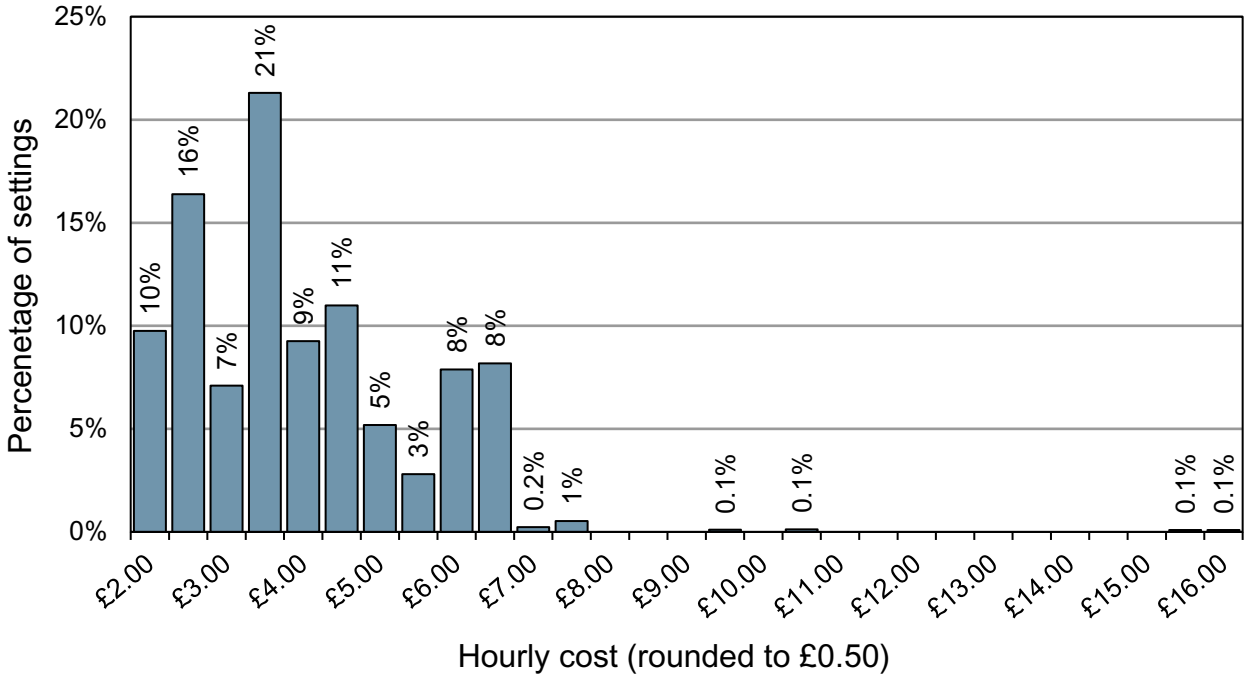
A.2 Analysis of hourly delivery cost for two year olds

The distribution of the estimates of hourly costs for two year olds is presented in bands rounded to the nearest £0.50 in figure 16. The distribution is spread across a broad range

[54] The sample is too small to present this analysis by provider type.
[55] A similar pattern was observed in the SEED study (section 4.3 in Blainey & Paull (2017)), where analysis of all age-specific income (including both parent-paid fees and free entitlement funding) showed that the costs of children under age two were cross subsidised by income for two year olds and three and four year olds and that income for school children cross-subsidised the costs of preschool children in settings which also cared for school children.

from the £2 to the £6.50 band with two outliers in the £15.50 and £16 bands (which contribute to the mean being above the median).[56]

Figure 16: Distribution of hourly cost for two year olds



Source: Early Years Providers Cost Study, 2018

Note: Sample size is 81 settings.

Comparing hourly costs across **provider type**, the hourly delivery cost is highest for MNS, second highest for childminders, second lowest for private providers and lowest for voluntary providers (table 31). All of the differences are statistically significant:

- The cost for MNS is greater than for all other provider types.
- The cost for childminders is greater than for private providers, voluntary providers and nursery classes.
- The cost for private providers is greater than for voluntary providers.

[56] These two outliers are both MNS in one of the higher cost regions and both settings also have an hourly cost for three and four year olds in the higher part of the distribution.

Table 31: Hourly delivery cost for two year olds by provider type

	Mean hourly delivery cost	Number of settings
Private	£4.00	22
Voluntary	£2.91	14
Nursery class	*	5
MNS	£6.34	24
Childminder	£4.87	16

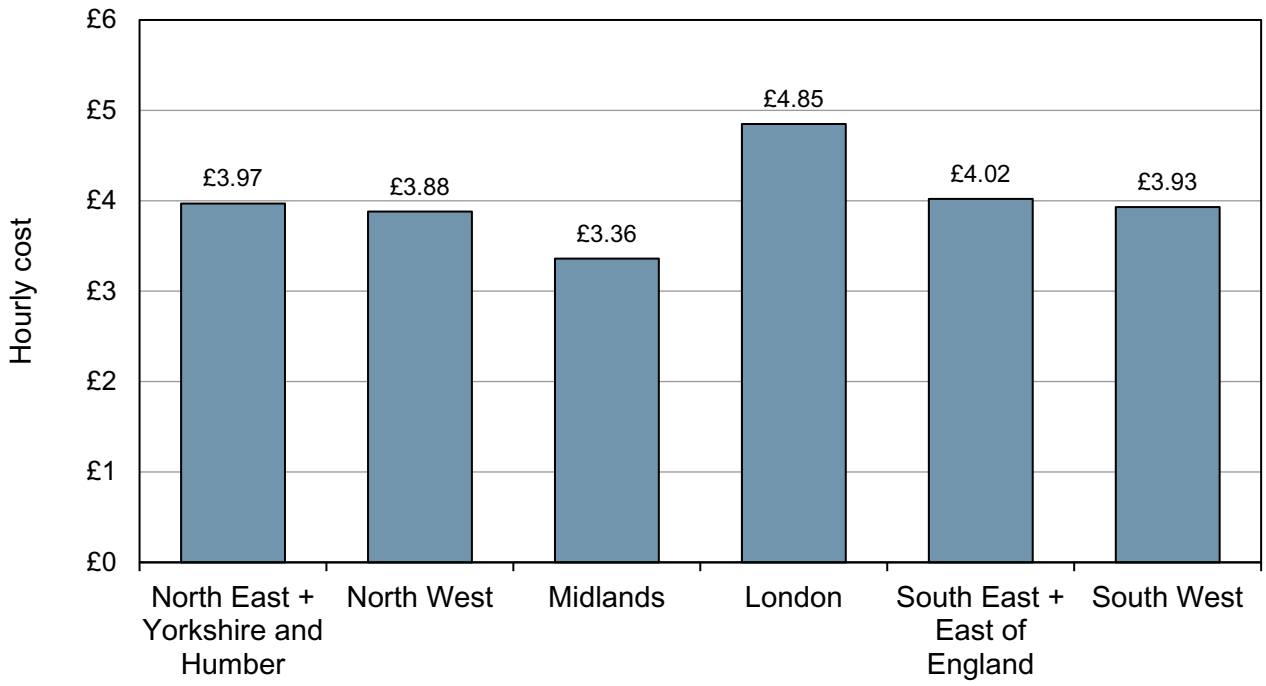
Source: Early Years Providers Cost Study, 2018

Notes: The mean hourly cost for two year olds in nursery classes has been suppressed due to a sample size of less than six.

The regression analysis controlling for variation in other characteristics across provider types indicated that:

- Being an MNS is associated with a higher hourly cost than for all other provider types
- Being a private provider is associated with a higher hourly cost than for voluntary providers and nursery classes.

Figure 17: Hourly cost for two year olds by region



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are 21, 8, 12, 9, 19 and 13 across the six regions.

Comparing hourly costs across **regions**, the mean hourly cost for both age groups is highest in London and lowest in the Midlands, with relatively little variation across the remaining regions (figure 17), but there are no statistically significant differences in the raw differences across regions.

However, the regional differences in cost are much stronger in the regression analysis than for the raw differences:

- Being located in London is associated with a higher hourly cost than being located in all other regions and being located in the North East and in the Midlands is associated with a lower hourly cost than being located in all other regions. The point estimates of the mean difference between London and other regions ranges from £1.03 to £2.24.

As with the costs for three and four year olds, this most likely reflects higher costs in London for resources such as staff and property rents, but could also reflect higher parental demand for childcare and ability to pay higher fees in more affluent areas in London.

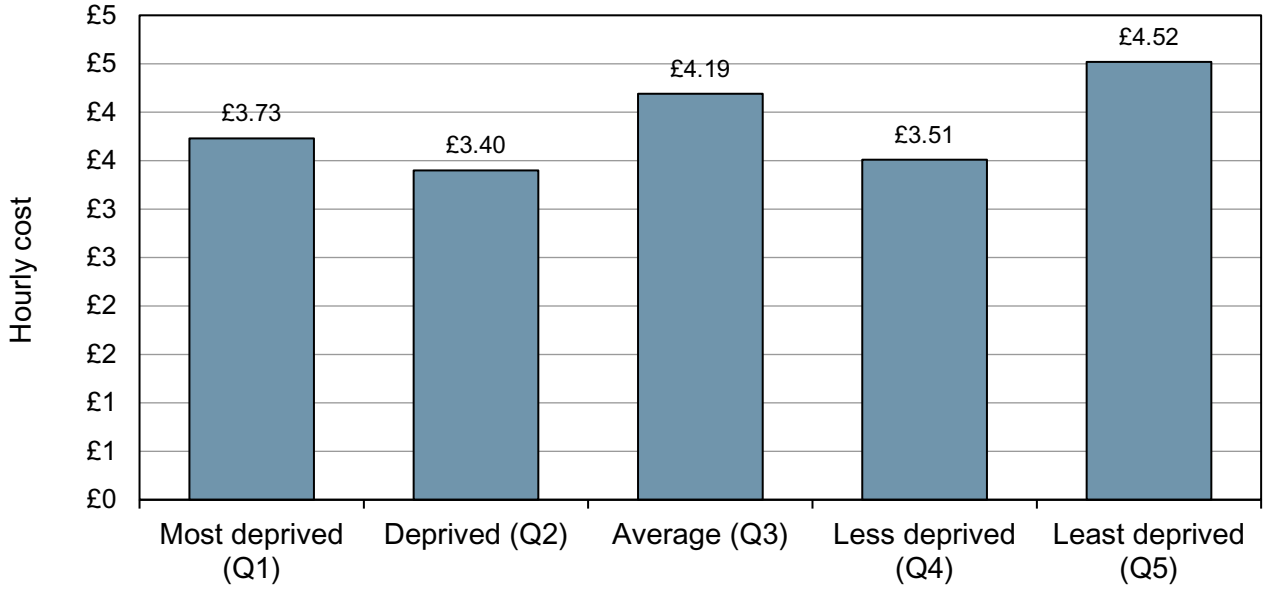
Mean hourly delivery costs are very slightly higher in **rural** areas: £4.15 in rural areas compared to £3.91 in urban areas (14 settings in rural areas and 68 settings in urban areas provided an hourly cost for two year olds). These differences are not statistically significant and this finding is unchanged in the regression analysis controlling for other factors.

Figure 18 presents the variation in hourly delivery costs by the **deprivation** level of the setting's location. There is only one statistically significant differences between the quintiles:

- Settings in least deprived areas (Q5) have higher costs than settings in less deprived areas (Q4).

There are no statistically significant differences in the regression analysis across deprivation level.

Figure 18: Hourly cost for two year olds by deprivation quintile



Source: Early Years Providers Cost Study, 2018

Notes: Sample sizes are 17, 12, 20, 15 and 17 across the five deprivation quintiles. The deprivation measure is IDACI (Income Deprivation Affecting Children Index).

Table 32: Hourly delivery cost for two year olds by setting size and single site or multisite

	Mean hourly delivery cost	Number of settings
Size of setting (number of registered places)		
Small	£4.01	26
Medium	£3.92	21
Large	£3.94	34
Multi-site		
Single site	£3.68	58
Part of a chain	£4.29	7

Source: Early Years Providers Cost Study, 2018

Notes: The multi-site question was only asked of group based providers (not childminders).

There are no consistent patterns in the hourly cost across **setting size** or by whether settings are part of a chain (table 32). There were no statistically significant raw differences in the hourly cost by provider size, but the regression analysis controlling for other factors identified:

- Being a middle-sized setting is associated with a higher hourly cost over being a small or large setting.

It is not clear why middle-sized settings have the highest costs controlling for the other factors, but it could reflect some discrete increases in core costs as settings initially grow followed by falling costs as size increases sufficiently to benefit from larger economies of scale.

Table 33: Hourly delivery cost for two year olds by child profile

	Mean hourly delivery cost	Number of settings
Age of youngest child		
Under two years old	£4.26	36
Two years old	£3.70	45
Proportion SEND children		
None	£4.61	26
Low (10% or less)	£3.50	38
High (more than 10%)	£3.58	16
Proportion EYPP children		
None	£4.36	29
Low (10% or less)	£3.33	30
High (more than 10%)	£4.51	21

Source: Early Years Providers Cost Study, 2018

Notes: SEND is defined as either having a SEND statement or an EHC plan. EYPP is the Early Years Pupil Premium for children aged three or four.

Table 33 presents the variation in hourly cost across these three characteristics the child profile measures. There are no statistically significant differences in the hourly cost across the **age of youngest child**. However, the regression analysis controlling for other provider characteristics generated the following conclusions:

- Having no children under the age of two is associated with a higher hourly cost.
- The point estimate of the differences between settings who have children under age two and settings with a youngest child aged two is £0.91.

Given the range of controls included in the model (including provider type and average staff qualification level), there is no obvious explanation why the presence of the youngest group of children in the setting should reduce the hourly delivery costs for older children.

The hourly cost is highest for settings without any **children with SEND** and lowest for those with a "high" level. Some differences are statistically significant:

- The hourly cost is higher for settings with no children with SEND than for settings with either low or high proportions of children with SEND.
- In addition, there is a statistically significant relationship between the hourly cost and the (ungrouped) proportion of children with SEND: on average, the hourly cost decreases by £0.10 for each additional percentage point.

The regression results confirm those in the raw differences:

- The hourly cost for two year olds decreases as the proportion of children with SEND increases with a point estimate of an average £0.09 decrease in hourly cost for each additional percentage point.

It is important to note that the SEND proportion is the proportion of all children and not two year olds. Hence, this surprising pattern may be due to the fact that the SEND percentage is not age specific and that children with a SEND statement or EHC plan tend to be older than two.

Settings with the **proportion of children in receipt of EYPP** in the middle (low) group have the lowest mean hourly cost. The differences are statistically significant[57]:

- The hourly cost is lower for settings with low proportions of children in receipt of EYPP than for settings with no children or high proportions in receipt.

However, the regression analysis controlling for provider characteristics found no statistically significant relations between the hourly cost and proportion of children with EYPP.

Table 34 shows that settings with a low number of **opening hours each day** (6 or less) have a lower mean hourly cost than settings opening for longer hours. The hourly cost is slightly higher for those which are not **continuously open** through the day, but the cost is notably higher for those **open year round** than for those open just during term time. However, the only statistically significant differences are:

- The hourly cost is higher for settings with the middle or high number of opening hours each day than for those with a low number of opening hours. In addition, there is a statistically significant relationship with the (ungrouped) number of daily

[57] A simple linear relationship between hourly cost and the (ungrouped) proportion was not statistically significant.

open hours: on average, the hourly cost increases by £0.17 for each additional hour that the setting is open.

Table 34: Hourly delivery cost for two year olds by opening hours

	Mean hourly delivery cost	Number of settings
Daily opening hours		
Low (6 hours or less)	£3.06	16
Middle (7 to 10 hours)	£4.48	42
High (11 hours or more)	£4.16	23
Continuous opening through the day		
Not continuous opening	£4.24	3
Continuous opening	£3.95	78
Open year round		
Term only	£3.69	41
Both term and holidays	£4.23	40

Source: Early Years Providers Cost Study, 2018

These differences are present in regression analysis controlling for other factors:

- The hourly cost increases with the daily opening hours.
- Not being continuously open throughout the day is associated with a higher hourly cost than being continuously open. Although the magnitude of the difference is large (£2.47), it should be noted that there were only three settings in the sample with this age group that did not open continuously and the finding should be treated with caution.

The hourly cost is notably higher for settings with an average **staff qualification** greater than 3.5 than for other two groups (table 35) and these differences are statistically significant:

- For both age groups, the hourly cost is higher for settings with staff with an average qualification level greater than 3.5 than for settings with average qualification levels of 3 to 3.5 or less than 3.

The regression analysis controlling for other factors identified:

- Having an average qualification level of 3 to 3.5 is associated with a higher hourly cost over an average qualification level of less than 3.

The hourly cost is higher for settings which have a training plan and for settings which have a training budget. However, settings with at least monthly staff CPD or at least monthly staff supervision have lower costs, while there is no consistent pattern in the hourly cost across the staff turnover group. There are a few statistically significant differences across these **workforce development** measures:

- The hourly cost is higher for settings with a training plan than for settings without a training plan.
- The hourly cost is higher for settings with less than monthly staff supervision than settings with at least monthly supervision.

However, the regression analysis controlling for other factors did not identify any differences in hourly cost across the workforce development measures.

There are no statistically significant differences across the staff turnover groups or any statistically significant association in the regression analysis between hourly cost and the (ungrouped) level of staff turnover.

Table 35: Hourly delivery cost for two year olds by staff characteristics

	Mean hourly delivery cost	Number of settings
Average staff qualification		
Less than 3	£3.40	22
3 to 3.5	£3.98	41
More than 3.5	£5.34	18
Whether graduate led		
No graduate	£3.79	29
At least one graduate	£4.11	52
Training plan		
No training plan	£2.41	2
Training plan	£3.86	63
Training budget		
No training budget	£3.43	25
Training budget	£4.21	40
Frequency of CPD		
Less than monthly	£3.85	40
At least monthly	£3.68	25
Frequency of staff supervision		
Less than monthly	£3.99	45
At least monthly	£3.03	20
Staff turnover		
Low (less than 10%)	£3.22	10
Middle (10% to 40%)	£4.02	29
High (more than 40%)	£3.68	25

Source: Early Years Providers Cost Study, 2018

Tables 36 and 37 present the distributions of the **child-to-staff ratio** and average **group size** by provider type for two year olds.

Table 36: Child-to-staff ratios for two year olds

Percentage of settings with child-to-staff ratios	Private	Voluntary	Nursery class	MNS	Child-minder	All types
Low (less than 4)	0%	12%	*	0%	88%	15%
High (exactly 4)	100%	88%	*	100%	12%	85%
Total	100%	100%	*	100%	100%	100%
Number of settings	22	14	5	24	15	80

Source: Early Years Providers Cost Study, 2018

Notes: The child-to-staff ratio for two year olds in nursery classes has been suppressed due to a sample size of less than six.

Table 37: Group sizes by provider type for two year olds

Percentage of settings with average group size	Private	Voluntary	Nursery class	MNS	Child-minder	All types
Low (less than 10)	21%	4%	*	9%	89%	28%
Middle (10 to 20)	45%	15%	*	59%	11%	35%
High (more than 20)	34%	81%	*	32%	0%	37%
Total	100%	100%	*	100%	100%	100%
Number of settings	22	14	5	24	16	81

Source: Early Years Providers Cost Study, 2018

Notes: The group size for two year olds in nursery classes has been suppressed due to a sample size of less than six.

There is very little variation in the average child-to-staff ratio, with most settings (85 percent) reporting exactly 4 children per staff member and only a few voluntary providers and most childminders (88 percent) reporting lower ratios. A high proportion (81 percent) of voluntary providers are in the highest category for the average group size, while most childminders (89 percent) are in the lowest group. Both private providers and MNS have a more even distribution.

Table 38 presents the mean hourly costs by the child-to-staff ratio groups and group size categories. The lowest ratio group has the highest cost and the differences are statistically significant:

- The hourly cost is higher for settings with a child-to-staff ratio below four than for those with a ratio that is exactly four.

- In addition, there is a statistically significant relationship between the hourly cost and the (ungrouped) child-to-staff ratio: on average, the hourly cost decreases by £0.53 for each additional child.

Table 38: Hourly delivery cost by child-to-staff ratios and group sizes

	Mean hourly delivery cost	Number of settings
Child-to-staff ratio		
Low (less than 4)	£4.98	16
High (exactly 4)	£3.78	64
Group size		
Low (less than 10)	£5.04	25
Middle (10 to 20)	£4.24	32
High (more than 20)	£2.88	24

Source: Early Years Providers Cost Study, 2018

Table 38 also indicates a strong pattern of lower hourly costs for settings with higher average group sizes, with substantially lower costs for settings in the high group size category. The differences are all statistically significant:

- The hourly cost is higher for settings with an average group size in the low or middle categories than those with an average group size in the high category.

- In addition, there is a statistically significant relationship between the hourly cost and the (ungrouped) average group size: on average, the hourly cost decreases by £0.06 for each additional child in the group.

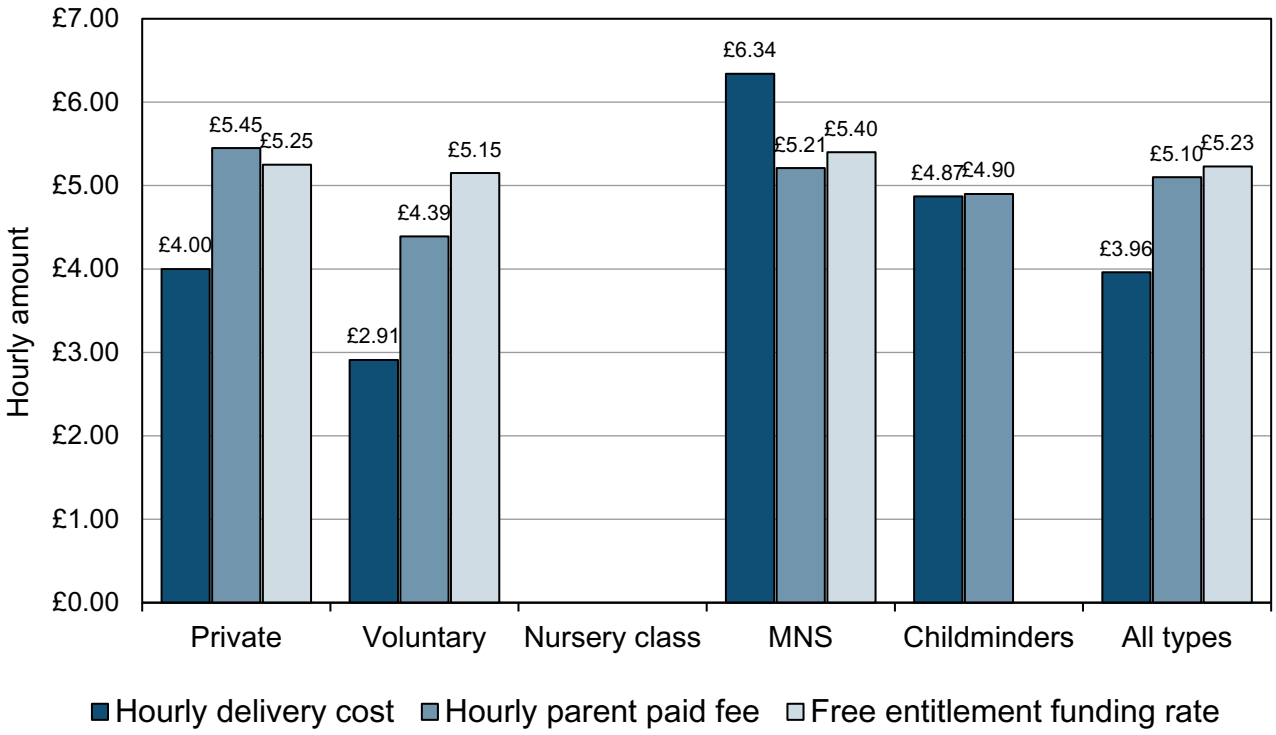
There was no statistically significant association between hourly cost and the child-to-staff ratio in the regression models, most likely because almost all group-based settings (including private, voluntary and school-based providers but not childminders) have an average ratio of exactly four. However, the associations between the hourly cost and the average group sizes remain in regression models controlling for other factors.

- The hourly cost is lower for settings with larger average group sizes: the point estimates indicate that the cost falls by an average of £0.08 for each additional child.

A.3 Hourly cost, parent-paid fees and funding rates for two year olds

Figure 19 presents the mean hourly delivery cost, hourly parent paid fee and hourly free entitlement funding rate for two year olds. It should be noted that the hourly cost and parent-paid fees are for all two year olds, while the funding rate pays for hours for the most disadvantaged two year olds and hence is not as comparable as the case for three and four year olds.

Figure 19: Mean hourly cost, parent fee and funding rate for two year olds



Source: Early Years Providers Cost Study, 2018

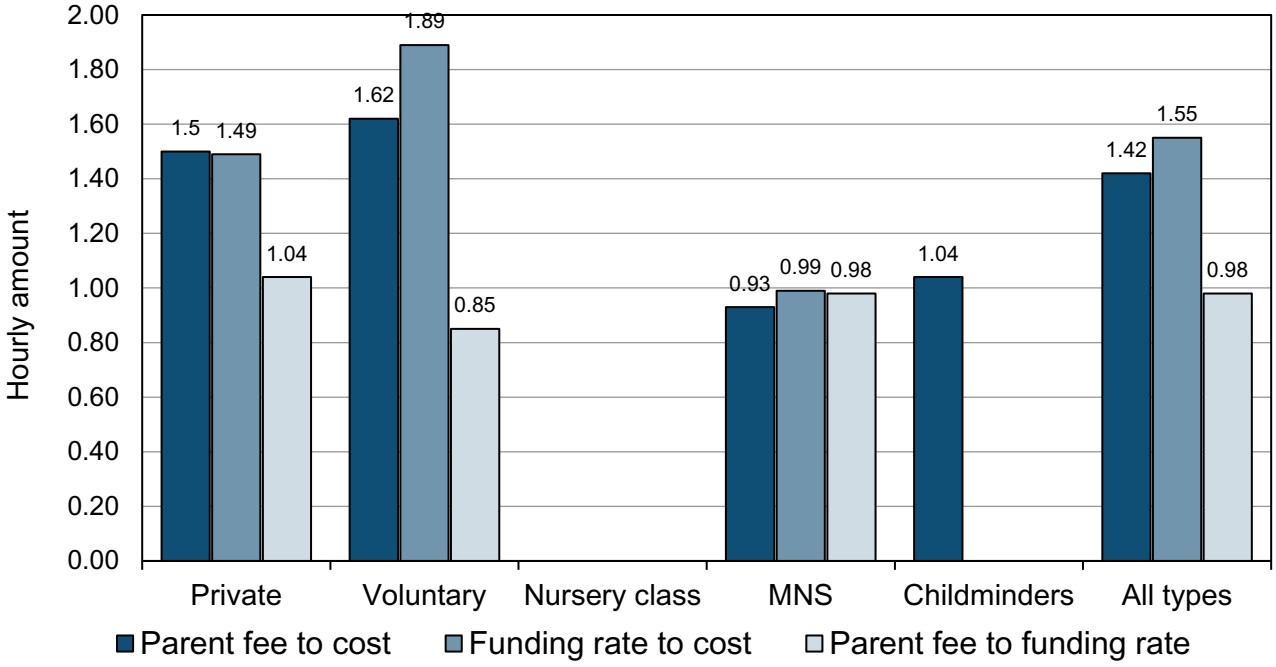
Notes: Figures are suppressed for nursery classes and for the free entitlement rate for childminders due to samples size of less than six. Sample sizes for the hourly cost, parent fee and funding rate are 22, 19 and 20 for private providers; 14, 12 and 14 for voluntary providers; 5, 5 and 4 for nursery classes; 24, 21 and 24 for MNS; 16, 16 and 4 for childminders; and 81, 73 and 66 for all types.

The figure shows:

- Across all types of settings (shown in the final three columns), the mean parent fee and funding rate are quite close (£5.10 and £5.23) and both are considerably higher than the mean hourly delivery cost (£3.96).
- Within each of the provider types, the parent fee and funding rate are similar, with the exception that the funding rate is notably higher than the parent fee for voluntary providers.
- The substantial variation in hourly cost across provider type means that both the mean parent fee and funding rates are notably higher than the mean delivery cost

for private and voluntary providers, they are both lower than the cost for MNS and the mean parent fee almost matches the mean cost for childminders.

Figure 20: Ratios of parent paid fee, funding rate and delivery cost for two year olds



Source: Early Years Providers Cost Study, 2018

Notes: Figures are suppressed for nursery classes and for ratios involving the free entitlement rate for childminders due to samples size of less than six. Sample sizes for the parent fee to cost, funding rate to cost and parent fee to funding rate are 19, 20 and 17 for private providers; 12, 14 and 12 for voluntary providers; 5, 4 and 4 for nursery classes; 21, 24 and 21 for MNS; 16, 4 and 4 for childminders; and 73, 66 and 58 for all types.

Mean ratios across the three hourly measures are presented in figure 20. On average, private and voluntary providers receive substantially more and nursery classes receive somewhat more in parents' fees and funding rates each hour than their hourly delivery cost. For MNS and childminders, both hourly parent fees and funding rates are, on average, around the same as the hourly cost. Some differences are statistically significant:

- The parent fee to cost ratio is higher for private and voluntary providers than for MNS and childminders.
- The funding rate to cost ratio is higher for private and voluntary providers than for MNS and childminders.
- The funding rate to cost ratio is higher for voluntary than for private providers.

The ratio of the parent fee to funding rate is around one for private providers and MNS but a little below one for voluntary providers, indicating that providers, on average,

receive slightly more from the hourly funding rate than parent fees for this age of child. Across the three provider types with sufficient sample sizes, there are some statistically significant differences:

- The parent fee to funding rate ratio is higher for private providers and MNS than for voluntary providers.

A.4 Comparison of hourly costs with 2015

The estimates of the hourly cost for each age of child from both studies are shown in table 39.

Table 39: Unadjusted (non-comparable) hourly delivery costs by age of child

Age of child	2015		2018	
	Mean (95% confidence intervals)	Number of settings	Mean (95% confidence intervals)	Number of settings
Under two years old	£4.58 (£4.31 – £4.85)	90	£5.27 (£4.46 - £6.07)	39
Two years old	£4.30 (£4.01 – £4.60)	140	£3.96 (£3.44 - £4.49)	81
Three and four year old preschool children	£3.72 (£3.47 – £3.96)	158	£3.95 (£3.48 - £4.41)	117
School children	£3.91 (£3.16 –£4.65)	49	£4.39 (£3.53 - £5.25)	35
All ages	£4.05 (£3.79 – £4.31)	160	£4.21 (£3.75 - £4.68)	120

Sources: Blainey & Paull (2017) and Early Years Providers Cost Study, 2018

Note: 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.

The magnitudes of these numbers are not directly comparable due to the differences in fieldwork period and child age profiles in the samples described in the previous section, but are presented here to highlight two points:

- The pattern across the age groups is broadly similar (allowing for the specific issues around the estimate for two year olds in the current study). In particular, the hourly cost for children under the age of two is considerably higher than for other age groups, while that for three and four year olds is lowest.

- The confidence intervals are wide for both studies and overlap between the two studies for all age groups, reflecting the small sample sizes. This indicates that statistically significant conclusions cannot be drawn about changes in hourly costs over the three years from comparing hourly costs across the two studies.

To improve the comparability of the estimated between the two samples, the hourly cost estimates for two year olds were adjusted in two ways:

- The estimates were adjusted to "all year" numbers using a figure of 12 percent figure indicated by figures from the SEED study.[58]
- The estimates were reweighted by the SEED sample child profile. This adjustment for two year old children was less robust than for three and four year olds[59], with an average increase of 17p but with notable variation across provider types.[60]

The effects of these adjustments are presented in table 40. The adjustment to the year round figure increased the hourly cost estimates by approximately 12 percent, while the reweighting to match the SEED child age profile also increased the estimated hourly cost but to a lesser degree (and reduced it for MNS). The net effects of the two adjustments are notably higher estimates for all provider types.

The confidence intervals for the estimates of the hourly delivery cost are wide for both studies and overlap between the two studies for all provider types and all settings combined, reflecting the small sample sizes. Across all settings, because of the overlapping confidence intervals, the inferred 8 percent increase in the mean hourly delivery cost over the three years is not statistically significant (table 40). In other words, there is no statistically significant change in hourly costs over the three years from comparing hourly costs across the two studies. For specific provider types, the estimated changes are increases of 22 percent for private providers, 5 percent for childminders and 1 percent for MNS, while there is a decline of 16 percent for voluntary providers. As highlighted above, the estimated change for voluntary providers should be treated with caution because the two surveys were substantially different in their child age profiles.

[58] See table 23 in Blainey and Paull (2017).
[59] The reweighting of the data was limited for two year olds because some combinations of youngest child age and mixed age sessions appeared only in one of the surveys for this age group.
[60] This included increases of 16p for private providers, 12p for voluntary providers and 17p for childminders and a decrease of 46p for MNS.

Table 40: Hourly costs in 2015 and 2018 for two year olds

	SEED 2015		Childcare cost study 2018			Difference between study estimates
	Mean hourly cost (95% confidence intervals)	Number of settings	Mean hourly cost	Adjusted mean hourly cost (95% confidence intervals)	Number of settings	
Private	£3.80 (£3.54 - £4.06)	67	£3.99	£4.64 (£4.00 - £5.29)	22	22%
Voluntary	£4.01 (£3.52 - £4.51)	25	£2.88	£3.36 (£2.77 - £3.94)	14	- 16%
Nursery class	*	4	*	*	5	*
MNS	£6.45 (£4.56 - £8.33)	7	£6.26	£6.49 (£5.36 - £7.62)	24	1%
Childminder	£5.35 (£4.17 - £6.53)	22	£4.86	£5.61 (£4.75 - £6.46)	16	5%
All settings	£4.30 (£4.01 - £4.60)	140	£3.99	£4.65 (£4.18 - £5.13)	81	8%

Source: Blainey & Paull (2017) & Early Years Providers Cost Study, 2018

Notes: The estimates for two year olds in nursery classes have been suppressed due to sample sizes of less than six. All settings include 15 LA-run and children's centres in the SEED sample.

The first three columns of table 41 presents the estimated effects of inflation and the minimum wage and pension contribution changed on the hourly cost for each provider type:

- Inflation is estimated to have had the largest impact, increasing the hourly cost by an average £0.22, but having a slightly greater absolute impact on costs for MNS and childminders because of the slightly higher level of costs for these provider types.

- Increases in the minimum wage are estimated to have increased the average hourly cost by £0.14. However, the estimated impact varies substantially by provider type according to the proportion of staff paid at the statutory minimum levels. While the minimum wage effects are considerably smaller than those from inflation for most provider types, they are considerably larger for childminders by construction because salaries for most childminders were imputed at the minimum wage level.

- The estimates indicate that the statutory opt-out for pension contributions had almost no impact on the hourly cost for all provider types. The simple reason for this is that were very few staff with pension rates between zero and two percent: staff tended either to make no contributions or to make considerably higher ones (particularly if working in a nursery class or MNS).

Table 41: Sources of difference between 2015 and 2018 for two year olds

	Estimated change in hourly cost due to			Percentage difference	
	Inflation	Minimum wage	Pension	Modelled from three factors combined	Difference between study estimates
Private	£0.22	£0.09	£0.02	9%	22%
Voluntary	£0.16	£0.05	£0.02	6%	- 16%
Nursery class	*	*	*	*	*
MNS	£0.35	£0.02	£0.00	6%	1%
Childminder	£0.27	£0.50	£0.00	14%	5%
All settings	£0.22	£0.14	£0.01	9%	8%

Source: Early Years Providers Cost Study, 2018

Notes: The estimates for two year olds in nursery classes have been suppressed due to sample sizes of less than six.

The final two columns in table 41 show the percentage change in the hourly cost estimated from the combined effects of inflation and the changes to the minimum wage and pension contribution policies and the percentage difference between the estimates from the two studies. The difference in the modelled change and observed difference vary substantially by provider type:

- The differences in the estimates between the two studies are greater for private providers and lower for the other provider types than the modelled change.

- The absence of any change for MNS and the lower estimated cost in the more recent study for voluntary providers contradicts the estimated increase, but the very small sample of 7 MNS in the SEED study and the different child profiles for voluntary providers between the two studies means that these estimates should be treated with a high degree of caution.

Annex B: Multivariate regression results

Regression results from the multivariate regression analysis for the hourly delivery cost are presented in table 42 for two year old children and in table 43 for three and four year old preschool children. Table 44 presents a summary of the key drivers for both age groups.

The following points should be noted about this regression analysis:

- The term “key driver” does not mean causation but only that the factor has a direct association with hourly cost which is not due to other related influences
- The sampling approach to achieve reasonably sized and balanced sample sizes across provider types and regions allows a number of significant results to be obtained in the regression analysis even with the small sample size.
- The regressions do not include the workforce development measures (training plan and budget and CPD and supervision frequency) nor staff turnover. These were not recorded for childminders and were not statistically significant or affected any of the findings in regressions only for group-based providers (including private, voluntary and school-based providers).[61] The variable graduate-led was also excluded because it was not statistically significant in any regressions.
- The variable indicating open all year was excluded from the regressions for two year olds because it is collinear with age of youngest child (that is, the wo are so closely related that it is not possible to distinguish between the relationships with age of youngest child and with open all year round.
- Proportion of children with SEND, daily opening hours and child-to-staff ratios were included as continuous variables because the grouped variables did not produce different results and the linear specification provides a clearer interpretation of size of association. Group size is included as a continuous variable in the preferred model presented in this chapter, but an alternative model using groups for this variable generated slightly different findings as shown in the Annex.
- Multicollinearity between the age of youngest child and whether the setting was open year round meant that the year round variable could not be included in the models for two year olds. All presented models had no issues of multicollinearity in spite of the small sample size and number of explanatory factors.

[61] Given that training tends to be a relatively small part of total costs, it is not surprising that these factors do not have any significant impact on the hourly cost.

- Findings are presented for the hourly cost for two year olds including nursery classes as the total sample size exceeds six, but it should be kept in mind that the numbers of observations is small and the findings for the cost for two year olds in nursery classes should be treated with caution.

Each table contains three models for each age group:

- The preferred model contains all the potential drivers and includes group sizes as a linear, continuous variable. This preferred specification has the highest R-squared value (highest proportion of the variation explained) of all the models tested with findings that are robust to most alternative specifications (including quadratic terms for continuous variables or switching between continuous and discrete specifications for some variables). Findings for two exceptions to this are presented as alternatives alongside the preferred model.

- The first alternative model excludes the child-to-staff ratios and group size variables to indicate the substantial role that these variables play in explaining the variation in hourly cost and the impact that their omission has on the other relationships.

- The second alternative model replaces the linear specification for group size with a discrete specification of three groups. This had some notable differences in the findings from the preferred model which are presented below.

The factors included in the preferred regression model explain 83 percent of the variation in hourly costs for two year olds and 71 percent of the variation in hourly costs for three and four year olds.

Tables 45 to 46 summarise the differences in statistically significant findings between the preferred model and the two alternative specifications. The differences between the findings for the preferred model and the first alternative specification indicate that the inclusion of measures of child-to-staff ratios and group sizes are required to identify:

- A higher hourly cost for three and four year olds for MNS over all other provider types and a lower hourly cost for childminders than private and voluntary providers.

- Additional regional differences in hourly cost for both age groups.

- Differences in hourly cost by age of youngest child for both age groups.

- The higher cost for middle-sized settings and settings with shorter daily opening hours for three and four year olds.

The differences between the findings for the preferred model and the second alternative specification indicate that the alternative specification for the group size variable means that in terms of statistically significant differences:

- The hourly cost for two year olds is not higher for settings with a child under the age of two than for settings with a youngest child aged two.
- The hourly cost for three and four year olds is not lower for childminders and is not higher for settings without any children in receipt of EYPP.
- There are other more minor differences in the relationships between hourly cost for both age groups and provider type, region and local level of deprivation.

Table 42: Regression results for hourly cost for two year old children

Setting characteristic		Preferred model		Alternative 1		Alternative 2	
		coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
Provider type (ref = private)	Voluntary	-0.53*	(0.31)	-0.79*	(0.44)	-0.18	(0.42)
	Nursery class	-0.91**	(0.43)	-0.40	(0.51)	-1.08**	(0.52)
	MNS	3.96***	(0.84)	3.99***	(0.92)	3.83***	(0.85)
	Childminder	-0.60	(0.53)	0.41	(0.40)	-0.25	(0.52)
Region (ref= north east + Yorkshire & Humber)	North west	1.00***	(0.32)	1.04**	(0.48)	1.06***	(0.37)
	Midlands	-0.04	(0.31)	0.13	(0.37)	0.41	(0.34)
	London	2.20***	(0.38)	1.65***	(0.60)	1.53***	(0.37)
	East + south east	0.99***	(0.33)	1.15**	(0.48)	1.22***	(0.37)
	South west	1.17***	(0.29)	1.26***	(0.44)	1.24***	(0.30)
Rural (ref = urban)		0.27	(0.24)	0.40	(0.35)	0.40*	(0.24)
IDACI quintile (ref = Q1 most deprived)	Q2 deprived	-0.62	(0.38)	-0.86*	(0.46)	-1.09**	(0.50)
	Q3 average	-0.03	(0.34)	0.49	(0.59)	-0.17	(0.36)
	Q4 less deprived	-0.30	(0.38)	0.27	(0.48)	-0.34	(0.40)
	Q5 least deprived	0.03	(0.34)	0.55	(0.41)	0.07	(0.40)
Size (ref = small)	Medium	0.92***	(0.28)	0.87**	(0.34)	0.73**	(0.35)
	Large	-0.06	(0.39)	-0.43	(0.46)	-0.33	(0.35)
Chain (ref = single site)		-0.28	(0.39)	-0.15	(0.50)	-0.69*	(0.38)
Youngest child (ref = under two)	Two years old	0.91*	(0.47)	0.57	(0.64)	0.76	(0.61)
% of children with SEND		-0.09***	(0.03)	-0.16***	(0.04)	-0.10***	(0.04)
% of children with EYPP (ref = none)	Low	0.07	(0.26)	0.28	(0.40)	-0.25	(0.26)
	High	-0.30	(0.32)	0.61	(0.52)	-0.44	(0.42)
Hours open per day		0.23***	(0.07)	0.30***	(0.09)	0.22**	(0.09)
Continuously open (ref = closed for lunch)		-2.47***	(0.46)	-2.49***	(0.69)	-2.81***	(0.53)

Setting characteristic		Preferred model		Alternative 1		Alternative 2	
		coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
Average staff qualification (ref = low)	Middle	0.43*	(0.25)	0.75***	(0.28)	0.39	(0.25)
	High	0.36	(0.39)	1.00**	(0.48)	0.92**	(0.41)
Child-to-staff ratio for two year olds		-0.10	(0.22)	----	----	0.19	(0.23)
Average group size for two year olds		-0.08***	(0.01)	----	----	----	----
Average group size (ref = low)	Middle	----	----	----	----	-1.23***	(0.40)
	High	----	----	----	----	-2.23***	(0.42)
Constant		4.73***	(1.26)	1.99	(1.47)	4.28***	(1.48)
Number of observations		79		80		79	
R-squared		0.81		0.68		0.78	

Source: Early Years Providers Cost Study, 2018

Notes: A dash indicates a variable omitted from the model. A single star indicates a statistically significant coefficient at the 10 percent level, two stars at the 5 percent level and three stars at the 1 percent level. Size is defined as small (less than 6 registered places), medium (6 registered places) and large (more than 6 registered places) for childminders and as small (less than 30 places), medium (between 30 and 65 registered places) and large (65 or more places) for all other providers.

Table 43: Regression results for hourly cost for three and four year old children

Setting characteristic		Preferred model		Alternative 1		Alternative 2	
		coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
Provider type (ref = private)	Voluntary	0.33	(0.36)	0.63	(0.48)	0.64	(0.40)
	Nursery class	-0.05	(0.45)	-0.27	(0.51)	0.26	(0.50)
	MNS	2.66***	(0.60)	1.01	(0.73)	2.22***	(0.61)
	Childminder	-1.36**	(0.60)	1.06*	(0.57)	-0.52	(0.57)
Region (ref= north east + Yorkshire & Humber)	North west	0.93**	(0.38)	1.08*	(0.61)	1.32***	(0.43)
	Midlands	-0.12	(0.39)	0.40	(0.49)	0.07	(0.43)
	London	1.83***	(0.63)	1.69**	(0.72)	1.79***	(0.63)
	East + south east	0.56*	(0.33)	0.83	(0.50)	0.63*	(0.33)
	South west	0.41	(0.33)	0.98**	(0.47)	0.51	(0.35)
Rural (ref = urban)		0.00	(0.31)	0.60	(0.42)	0.03	(0.33)
IDACI quintile (ref = Q1 most deprived)	Q2 deprived	-0.20	(0.42)	-0.99	(0.64)	-0.32	(0.47)
	Q3 average	0.44	(0.45)	0.46	(0.67)	0.73	(0.51)
	Q4 less deprived	-0.50	(0.50)	-0.93	(0.63)	-0.46	(0.50)
	Q5 least deprived	0.22	(0.44)	0.10	(0.59)	0.33	(0.44)
Size (ref = small)	Medium	0.61*	(0.33)	0.04	(0.43)	0.62*	(0.36)
	Large	0.44	(0.48)	-0.38	(0.60)	0.50	(0.52)
Chain (ref = single site)		-0.57	(0.38)	-0.26	(0.61)	-0.27	(0.44)
Youngest child (ref = under two)	Two years old	1.23**	(0.55)	1.12	(0.71)	1.09*	(0.61)
	Three or four years old	1.58***	(0.50)	1.36**	(0.64)	1.32**	(0.53)
% of children with SEND		0.05**	(0.02)	0.07**	(0.03)	0.05*	(0.02)
% of children with EYPP (ref = none)	Low	-0.86**	(0.41)	-0.98**	(0.44)	-0.63	(0.39)
	High	-0.63*	(0.32)	-0.42	(0.46)	-0.23	(0.32)
Hours open per day		-0.17**	(0.08)	-0.03	(0.10)	-0.16*	(0.09)
Continuously open (ref = closed for lunch)		0.13	(0.45)	-0.28	(0.59)	0.22	(0.52)
Open year round (ref = open term time only)		0.93***	(0.33)	0.86**	(0.40)	0.91**	(0.37)

Setting characteristic		Preferred model		Alternative 1		Alternative 2	
		coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
Average staff qualification (ref = low)	Middle	0.42	(0.29)	0.49	(0.39)	0.40	(0.31)
	High	1.14**	(0.46)	1.80***	(0.51)	1.44***	(0.43)
Child-to-staff ratio for three and four year olds		-0.15**	(0.07)	----	----	-0.19**	(0.07)
Average group size for three and four year olds		-0.09***	(0.01)	----	----	----	----
Average group size (ref = low)	Middle	----	----	----	----	-1.06***	(0.28)
	High	----	----	----	----	-2.26***	(0.35)
Constant		4.58***	(1.25)	0.70	(1.62)	3.13**	(1.32)
Number of observations		112		113		112	
R-squared		0.71		0.56		0.69	

Source: Early Years Providers Cost Study, 2018

Notes: A dash indicates a variable omitted from the model. A single star indicates a statistically significant coefficient at the 10 percent level, two stars at the 5 percent level and three stars at the 1 percent level. Size is defined as small (less than 6 registered places), medium (6 registered places) and large (more than 6 registered places) for childminders and as small (less than 30 places), medium (between 30 and 65 registered places) and large (65 or more places) for all other providers.

Table 44: Summary of key drivers of hourly delivery cost

Statistically significant associations	Hourly cost for two year olds	Hourly cost for three and four year olds
Provider type	Private > voluntary, nursery class MNS > all others	MNS > all others Private, voluntary > childminder
Region	All others > north east, Midlands London > all others	North west, south east > north east, Midlands London > north east, Midlands, south east, south west
Deprivation quintile	---	Least deprived (Q5), average (Q3) > less deprived (Q4)
Rurality	---	---
Setting size	Middle > small, large	Middle > small
Chain / multisite	---	---
Youngest age	2YO > under 2	2YO > under 2 3-4YO > under 2
Proportion SEND	Decreases with SEND proportion	Increases with SEND proportion
Proportion EYPP	---	No EYPP > low EYPP, high EYPP
Daily opening hours	Increases with more opening hours	Decreases with more opening hours
Continuous opening	Not continuous > continuous	---
Open year round	n/a	Year open > term open
Average staff qualification	Middle > low	High > low, middle
Child-to-staff ratio	---	Decreases with higher ratio
Average group size	Decreases with higher group size	Decreases with higher group size

Source: Early Years Providers Cost Study, 2018

Notes: Includes statistically significant relationships at least at the 10 percent level. "---" indicates no statistically significant relationship.

Table 45: Comparison of key drivers across models: two year olds

Preferred model	Alternative model 1 (no child-to-staff ratio and group size)	Alternative model 2 (group size in discrete categories)
MNS > all other types		
Private > voluntary, nursery class	Private > voluntary Childminder > voluntary	Private > nursery class Voluntary > nursery class
All other regions > north east, Midlands		
London > all others		
None for deprivation level	All other deprivation levels > deprived (Q2)	Least (Q5) > deprived (Q3) Most (Q1), average (Q3), least (Q5) > deprived (Q2)
None for rurality		Rural > urban
Middle-sized > small, large		
None for chain / multi-site		Single site > chain
Youngest 2YO > youngest under 2	None for age of youngest child	None for age of youngest child
Decreases with SEND proportion		
None for EYPP proportion		
Increases with daily opening hours		
Not continuous opening > continuous opening		
Middle > low average staff qualification	Middle, high > low average staff qualification	High > low average staff qualification
None for child-to-staff ratio	Not included	None for child-to-staff ratio
Decreases with higher group size	Not included	Low > medium, high group size Medium > high group size

Source: Early Years Providers Cost Study, 2018

Table 46: Comparison of key drivers across models: three and four year olds

Preferred model	Alternative model 1 (no child-to-staff ratio and group size)	Alternative model 2 (group size in discrete categories)
MNS > all other types Private, voluntary > childminder	MNS > nursery class Childminder > private, nursery class	MNS > all other types
North west, south east > north east, Midlands London > north east, Midlands, south east, south west	North west, south west > north east London > north east, Midlands	North west > north east, Midlands, south west London > north east, Midlands, south east, south west South east > north east
Least (Q5), average (Q3) > less deprived (Q4)		
	Least (Q5) > deprived (Q2) Average (Q3) > deprived (Q2)	Least (Q5) > deprived (Q2) Average (Q3) > deprived (Q2)
None for rurality		
Middle-sized > small	None for setting size	Middle-sized > small
None for chain / multi-site		
Youngest 3-4YO > youngest under 2		
Youngest 2YO > youngest under 2		Youngest 2YO > youngest under 2
Increases with SEND proportion		
No EYPP > low EYPP No EYPP > high EYPP	No EYPP > low EYPP	None for proportion EYPP
Decreases with more daily opening hours	None for daily opening hours	Decreases with more daily opening hours
None for continuous opening		
Year open > term open		
High > low, middle average staff qualification		
Decreases with child-to-staff ratio	Not included	Decreases with child-to-staff ratio
Decreases with higher group size	Not included	Low > medium, high group size Medium > high group size

Source: Early Years Providers Cost Study, 2018

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