COGNISANT RESEARCH

Pupil Product Ratio Study

Produced for Milton Keynes Council

Carbonfree™ with Carbonfund.org

MRS COMPANY PARTNER

Table of Contents

1 Introduction

In June 2017 Milton Keynes Council (the Council) commissioned a research project to visit housing developments completed in the authority since 2012. The primary purpose of the study was to establish Pupil Product Ratios (PPR). The PPR is the number of children typically generated by a new housing development and is used to support proposed levels of developer contributions required under Section 106 of the Town and Country Planning Act 1990. PPRs are also used to assist with the production of pupil forecasts.

This report sets out the results of the Milton Keynes population study. Section 2 of this report details the methodology that was used to conduct the research and identify the PPRs. Section 3 sets out the overall Child Product Ratio. Section 4 looks specifically at the PPR results and section 5 sets out the product ratios, by age.

Appendix 1 contains additional data tables created as part of this study.

For the purposes of consistency in this report the following phrases are defined as follows:

Child – a household member aged between 0-19.

Resident – a household member living at the address during school term time.

2 Methodology

2.1 Questionnaire Design

The questionnaire was paper based and designed so that it could be completed with or without the assistance of an interviewer. It was developed in co-operation with the Council, in order to establish pupil numbers.

2.2 Population

Milton Keynes Council provided address data for new dwellings, built since 2012. In total 6,209 dwellings were identified.

2.3 Sample

Cognisant selected a random sample, based on achieving 1000 completed interviews from the overall population described above. During the fieldwork it became apparent that the initial sample selection would not be sufficient to generate the required number of interviews, requiring a further random sample selection to be made. In total 5,361 properties were visited in the course of completing this project.

2.4 Fieldwork

Three research assistants, supervised by a research director, conducted interviews across the four settlements during the period June to August 2017. The fieldworkers used for this study operated according to the Market Research Society Code of Conduct.

Face-to-face interviews were conducted with residents who agreed to participate. When residents were unavailable a questionnaire, covering letter and reply-paid envelope were posted through the letterbox. The covering letter explained to respondents why the research was taking place and provided basic instructions on how to complete and return the questionnaire. This mixed method approach of using face-to-face interviews and postal surveys was chosen because it was the most effective way of maximising participation whilst minimising fieldwork costs.

2.5 Data Validation

Prior to data entry Cognisant conducted a back check by telephone of 5% of all completed questionnaires. The back check included confirmation that the interview had taken place and confirmed the response of at least one question. The respondents chosen for back checking were randomly selected.

Completed questionnaires were entered for analysis using specialist software. The software enables rules to be created ensuring that keystrokes used for data entry relate to a value appropriate to the question concerned. Rules were also established to ensure that only appropriate questions were served up for data entry (e.g. it would not be possible to enter data related to the age of a child, or the type of school a child attended or if the respondent indicated that

they had no children). Using data entry rules in this way greatly reduces the potential for error during the process of data entry.

2.6 Weighting

The Council provided completion data setting out the overall number of dwellings present on the site at the time the PPR study was conducted, broken down by size of dwelling.

In a perfect world the dwellings participating in the study would perfectly resemble the overall make-up of the development. However, we can see that this is not the case. Table 1 shows that two fifths (40%) of the dwellings participating in this study had four bedrooms. In reality, this proportion should have been less than a third (28%). Cognisant weighted the results of the study by dwelling size to make the overall results more representative of the true make-up of our target population.

To calculate the weighting factor we divide the target proportion by the actual proportion. Table 1 shows how the proportions of dwelling size identified by the Council compare with the proportions that participated in the study and details the weights to compensate.

Table 1 – Milton Keynes Dwellings, Study Participation Totals and Weight

		Study	Target	Weight
How many bedrooms in this property?	**1**	6%	11%	1.83
	2	20%	33%	1.65
	3	34%	27%	0.79
	4+	40%	28%	0.70

3 Child Product Ratios

This section of the report identifies how many children are produced by new dwellings in Milton Keynes. All statistics have been rounded up to two decimal places. Where Cognisant believes that statistics should be treated with caution this important information is highlighted in the tables and footnotes below.

Table 2, below, shows that the weighted CPR for the average dwelling was 0.80. The data in Table 2 has been weighted to take into account participation across dwelling size.

The CPR of 0.80 has a 95% Confidence Interval of 2.6%. If the same study were undertaken 100 times, on 95 occasions the CPR value would be between 0.81 and 0.77.

Table 2– Top Level CPR Statistics

	Un-weighted	Weighted by Dwelling Size
Mean	0.91	0.80
Standard Error	2.6%	
95% Confidence Interval	±0.02	
	0.93 – 0.89	0.82 – 0.78

3.1 Dwelling Size

Table 3, below, shows how many children are produced when a new dwelling is built in Milton Keynes, broken down by the size of the dwelling as defined by the number of bedrooms. The results show that a 2-bedroom dwelling typically generates 0.54 children, whilst a dwelling of 4-bedrooms or more generates 1.30 children.

Participation data for size categories can be found in Table A of Appendix 1.

Table 3 – CPR Across all Sizes of Dwelling

How many bedrooms in this property?	CPR
1	0.04
2	0.54
3	0.88
4+	1.30

3.2 Dwelling Type

Table 4 sets out the CPR for dwelling types across Milton Keynes. The data in this table has been weighted to take into account participation across different sizes of dwelling.

Table 4 shows that the average number of children produced by one Detached house is 1.08, whilst only 0.26 children are created for every one Flat/Apartment. Participation data for type categories can be found in Table A in Appendix 1.

Table 4 – CPR Across all Types of Dwelling

What type of dwelling do you live in?	CPR
Detached	1.08
Semi detached	0.81
Flat/Apartment	0.26
Terrace/End terrace	1.03

3.3 Tenure

Table 5, below, sets out the CPR for different dwelling tenures across Milton Keynes. Table 5 shows that the average number of children produced by one Owned (inc. mortgaged) dwelling is 0.80, whilst 0.56 children are created for every one privately rented dwelling. Participation data for tenure categories can be found in Table B of Appendix 1.

Table 5 : No. of Children Produced by 1 New Dwelling Broken Down by Tenure

What is the tenure of this property?	CPR
Owned (inc. mortgaged)	0.80
Privately rented	0.56
Shared ownership (part own/part rent)	0.73
Housing Association/Council	1.22

4 Pupil Product Ratio

This section of the report identifies how many children, broken down across the different schooling classifications, including pre-school and those eligible for post-16 education, are produced by the new dwellings across Milton Keynes. All statistics have been rounded up to two decimal places.

Where a respondent indicated that a child was resident, they were required to indicate which type of schooling, if any, the child attends. Respondents could choose from a variety of categories covering pre-school, primary, secondary and post-16 education. Categories covered independents and state education as well as home educated.

The data presented in Table 2, in the previous section, showed that the weighted CPR for the average settlement dwelling is 0.80. Table 6, below, breaks this figure down across each category of schooling. The results show that the PPR for Primary School children in Milton Keynes is 0.28 similar, but the Pre-school figure is 0.36.

Table 6 - Top Level PPR Statistics

	Un-weighted	Weighted
Total Number of Pre School Children	0.40	0.36
Total Number of Primary School Children	0.33	0.28
Total Number of Secondary School Children	0.13	0.11
Total Number of Post 16 Children	0.04	0.03

4.1 PPR by Dwelling Size

Table 7, below, shows how many pupils are produced by new dwellings in Milton Keynes, broken down by the size of the dwelling as defined by the number of bedrooms. The results show that a 2-bedroom dwelling typically generates 0.17 primary school pupils, whilst a dwelling of 4-bedrooms or more generates 0.48 primary school pupils.

Table 7 – PPR Across all Sizes of Dwelling

	No. of Bedrooms in Dwelling			
	1	2	3	4+
Total Number of Pre School Children	0.04	0.30	0.39	0.51
Total Number of Primary School Children	0.00	0.17	0.31	0.48
Total Number of Secondary School Children	0.00	0.05	0.10	0.22
Total Number of Post 16 Children	0	0	0.04	0.06

4.2 PPR by Dwelling Type

Table 8, below, shows how many pupils are produced when a new dwelling is built in Milton Keynes, broken down by the type of dwelling. The results show that a detached house generates 0.38 primary school pupils, whilst a flat/apartment generates 0.09 primary school pupils.

Table 8 – PPR Across all Sizes of Dwelling Type

	Type of Dwelling			
	Detached	Semi detached	Flat / Apartment	Terrace / End terrace
Pre School Children	0.43	0.39	0.14	0.44
Primary School Children	0.38	0.26	0.09	0.39
Secondary School Children	0.20	0.10	0.03	0.12
Post 16 Children	0.04	0.04	0.00	0.04

Looking specifically at flats, broken down by number of bedrooms, 2-bed flats generate 0.21 pre-school children and 0.14 primary school children.

Table 9 – PPR Across all Sizes of Flats

Flats	No. of Bedrooms in Dwelling		
	1	2	3[1]
Total Number of Pre School Children	0.05	0.21	0.00
Total Number of Primary School Children	0.00	0.14	0.17
Total Number of Secondary School Children	0.00	0.04	0.00
Total Number of Post 16 Children	0.00	0.00	0.00

[1] PPR data concerning 3-bed flats was calculated from only 6 interviews and should be treated with caution. However, it should be noted that only 11 dwellings of this type were identified in the population of interest.

4.3 PPR by Dwelling Tenure

Table 10, below, shows how many pupils are produced when a new dwelling is built in Milton Keynes, broken down by the type of dwelling. The results show that an Owned (inc. mortgaged) dwelling, generates 0.27 primary school pupils, whilst a rented dwelling generates 0.14 primary school pupils.

Table 10 – PPR Across all Sizes of Dwelling Type

	Owned (inc. mortgaged)	Rent privately	Shared Ownership	Rent from Housing Association / Council
Pre School Children	0.39	0.24	0.33	0.43
Primary School Children	0.27	0.14	0.25	0.49
Secondary School Children	0.09	0.13	0.11	0.17
Post 16 Children	0.03	0.02	0.03	0.10

4.4 PPR by Year of Completion

Table 11, below, shows how many pupils are produced by households based on when they were built. The results show that pre-school and primary school number peak in 2012 at 0.45 and 0.60 respectively.

Table 11 – PPR by Year of Completion

	2012	2013	2014	2015	2016	2017
Pre School Children	0.45	0.29	0.29	0.43	0.39	0.36
Primary School Children	0.60	0.28	0.20	0.29	0.24	0.11
Secondary School Children	0.14	0.14	0.11	0.05	0.11	0.05
Post 16 Children	0.03	0.08	0.04	0.07	0.02	0.01

4.1 PPR by Migration of Householder

Table 12, below, shows how many pupils are produced by households based on where they have moved to Milton Keynes from. The results show that householders moving to Milton Keynes from the EU generate the largest pupil yield with 0.52 pre-school children and 0.66 primary school children, per dwelling.

Table 12 – PPR Across Location of Migration

	Milton Keynes	Bordering LA	Rest of the UK	EU[2]	Rest of the World
Pre School Children	0.35	0.35	0.41	0.51	0.30
Primary School Children	0.29	0.12	0.30	0.66	0.32
Secondary School Children	0.11	0.08	0.09	0.24	0.23
Post 16 Children	0.04	0.04	0.00	0.00	0.10

5 Age Product Ratio

This section of the report identifies how many children, broken down by age, are produced by the new dwellings across Milton Keynes. All statistics have been rounded up to two decimal places.

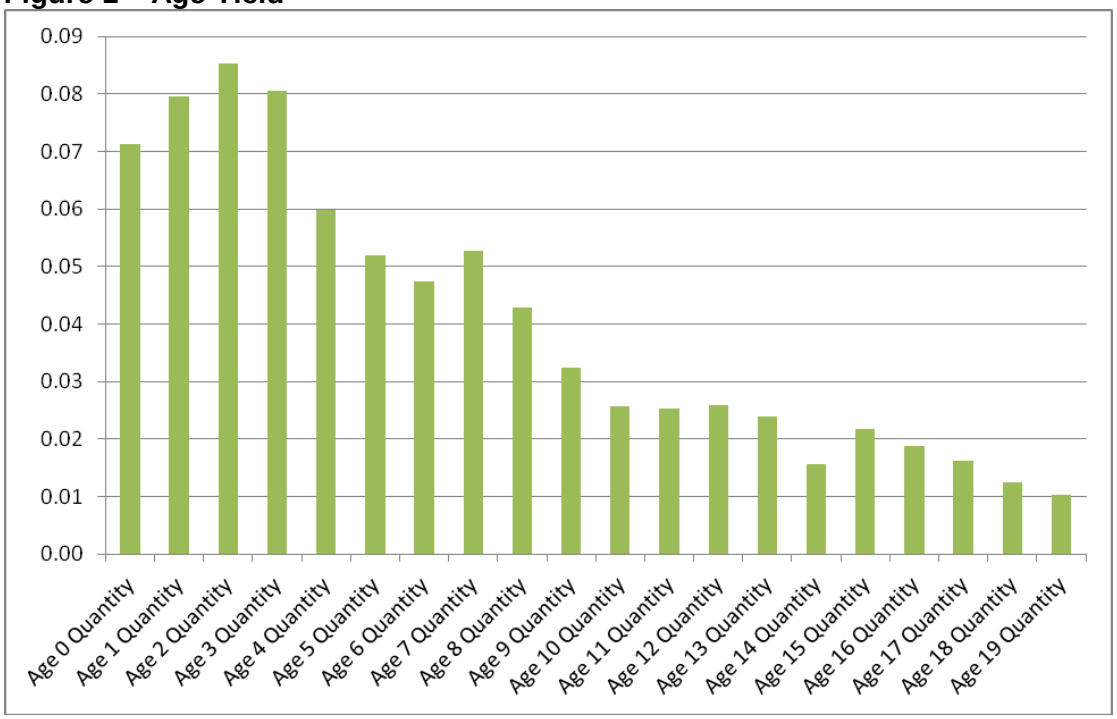
Table 12 – Age Product Ratio Across all Sizes of Dwelling

	Overall	1 bed	2 bed	3 bed	4+ bed
Age 0	0.07	0.01	0.07	0.07	0.09
Age 1	0.08	0.00	0.07	0.08	0.12
Age 2	0.09	0.01	0.06	0.10	0.13
Age 3	0.08	0.00	0.06	0.09	0.12
Age 4	0.06	0.01	0.05	0.05	0.10
Age 5	0.05	0.00	0.04	0.06	0.07
Age 6	0.05	0.00	0.03	0.05	0.08
Age 7	0.05	0.00	0.03	0.06	0.09
Age 8	0.04	0.00	0.02	0.05	0.08
Age 9	0.03	0.00	0.02	0.04	0.05
Age 10	0.03	0.00	0.01	0.03	0.05
Age 11	0.03	0.00	0.00	0.03	0.06
Age 12	0.03	0.00	0.02	0.02	0.05
Age 13	0.02	0.00	0.02	0.01	0.05
Age 14	0.02	0.00	0.01	0.01	0.03
Age 15	0.02	0.00	0.00	0.03	0.04
Age 16	0.02	0.00	0.00	0.03	0.03
Age 17	0.02	0.00	0.00	0.02	0.03
Age 18	0.01	0.00	0.00	0.02	0.02
Age 19	0.01	0.00	0.01	0.01	0.01

[2] PPR data from households moving to Milton Keynes from the EU is based on only 7 interviews and should be treated with caution.

The data shows that the average new build dwelling in Milton Keynes generates 0.08 of a 3 year old. Looking at Figure 1, below, it's easier to see the overall trend that shows a peak in child yield around the ages of 1, 2 and 3. Indeed, children aged 5 and under accounted for more than half (54%) of the children identified in the study.

Figure 1 – Age Yield



Appendix 1 – Data Tables

Table A – Participation by Type

		Total	Dwelling Size			
			1	2	3	4
	Total	1199	67	244	405	483
			5.59%	20.35%	33.78%	40.28%
What type of dwelling do you live in?	Detached	330	2	11	57	260
		27.50%	3.00%	4.50%	14.00%	53.90%
	Semi detached	436	10	83	218	125
		36.40%	14.90%	34.00%	53.70%	25.90%
	Terrace/End terrace	280	-	59	124	97
		23.40%	-	24.20%	30.50%	20.10%
	Flat/Apartment/Maisonette	153	55	91	7	-
		12.80%	82.10%	37.30%	1.70%	-

Table B – Participation by Tenure

		Total	Dwelling Size			
			1	2	3	4
	Total	1199	67	244	406	482
			5.60%	20.40%	33.90%	40.20%
Missing	No reply	54	1	7	28	18
			1.90%	13.00%	51.90%	33.30%
Does your household own or rent this property?	Owned (inc. mortgaged)	767	23	93	277	374
			3.00%	12.10%	36.10%	48.80%
	Rent privately	180	18	50	55	57
			10.00%	27.80%	30.60%	31.70%
	Shared ownership (part own/part rent)	97	-	50	25	22
			-	51.50%	25.80%	22.70%
	Rent from Housing Association/Council	99	25	43	20	11
			25.30%	43.40%	20.20%	11.10%
	Other	2	-	1	1	-
			-	50.00%	50.00%	-