Economic costs associated with moderate and late preterm birth: A prospective population-based study

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Short title: Costs of moderate and late preterm birth

Abstract

Objective: We sought to determine the economic costs associated with moderate and late preterm birth.

Design: An economic study was nested within a prospective cohort study.

Sample: Infants born between 32^{+0} and 36^{+6} weeks gestation in the East Midlands of England. A sample of infants born at ≥37 weeks' gestation acted as controls.

Methods: Resource use, estimated from a National Health Service (NHS) and personal social services perspective, and separately from a societal perspective, was collected between birth and 24 months corrected age (or death) and valued in GB£, 2010-11 prices. Descriptive statistics and multivariable analyses were used to estimate the relationship between gestational age at birth and economic costs.

Results: Of all eligible births, 1,146 (83%) preterm and 1,258 (79%) term infants were recruited. Mean (standard error) total societal costs from birth to 24 months were £12,037 (£1,114) and £5,823 (£1,232) for children born moderately preterm (32^{+0} to 33^{+6} weeks) and late preterm (34^{+0} to 36^{+6} weeks), respectively, compared to £2,056 (£132) for children born at term. The mean societal cost difference between moderate and late preterm and term infants was £4,657 (bootstrap 95% CI £2,513, £6803; $p<0.001$). Multivariable regressions revealed that, after controlling for clinical and sociodemographic characteristics, moderate and late preterm birth increased societal costs by £7,583 (£874) and £1,963 (£337), respectively, compared to birth at full term.

Conclusions: Moderate and late preterm birth is associated with significantly increased economic costs over the first two years of life. Our economic estimates can be used to inform

budgetary and service planning by clinical decision-makers, and economic evaluations of interventions aimed at preventing moderate and late preterm birth or alleviating its adverse consequences.

Key Words: prematurity; late preterm; moderately preterm; economic; cost; resource use

Introduction

Late and moderately preterm (LMPT) births account for approximately 6-7% of UK births and 75% of all preterm births.(1) Despite comprising a majority of preterm births, outcomes of those born late (34^{+0}-36^{+6} weeks gestation) or moderately (32^{+0}-33^{+6} weeks gestation) preterm remain less frequently characterized than outcomes for births at earlier gestations. Published data suggest that LMPT infants are at increased risk of adverse growth, neuropsychological, educational and behavioural outcomes.(2-4) The increased risk of adverse sequelae following LMPT birth is likely to translate into economic consequences for health services and other sectors of the economy,(5) the study of which has been highlighted as a priority area for research enquiry.(6)

A recent structured review summarizing published evidence on the economic consequences of LMPT birth,(6) found that ten studies, published between 1980 and 2011, focussed on economic costs during the infant's initial hospitalisation,(7-16) whilst 13 studies reported economic costs in some form following the infant's initial hospitalisation.(5, 7, 9, 13, 17-25) However, none of the latter studies estimated the economic costs of LMPT birth from a societal perspective with eleven limited to an estimation of hospital costs,(5, 7, 9, 13, 19-25) and two limited to an estimation of health and social services(17) or public sector(18) costs. Moreover, these economic studies were either based on patient cohorts recruited over a decade ago,(5, 7, 9, 13, 17, 19-24) or hypothetical cohorts simulated within models.(18, 25) The aim of this study was to estimate the economic costs during the first two years of life associated with LMPT birth in the context of a recent prospective population-based study. The results of our study should be considered for use within economic evaluations of

preventive or treatment interventions for LMPT birth, or as inputs to studies attempting to model the economic costs of preterm birth throughout childhood.

Methods

Study population

The Late And Moderate preterm Birth Study (LAMBS) is a population-based, prospective, cohort study of LMPT infants born in the East Midlands region of England between September 2009 and December 2010.(26) All infants born at 32^{+0} to 36^{+6} weeks gestation, whose mothers resided in this defined geographical region during this period were eligible for inclusion. A control group comprised infants born at $\geq 37^{+0}$ weeks gestation to mothers resident in the same geographical area based on random sampling of the dates and times of birth of infants in this population during the previous year. Alternative methods such as selecting the next term birth to occur at the same maternity unit after a LMPT birth are likely to result in an over-sampling of high-risk term births as these are more likely to be delivered in the same places and times as LMPT births. In view of the large numbers of multiple births that occur between 32 and 36 weeks gestation, all multiples born at $\geq 32^{+0}$ weeks gestation were eligible for inclusion. Written informed consent was obtained from parents of participating infants. The study was approved by the Derbyshire Multicentre Research Ethics Committee.

Resource utilisation and costs

Relevant resource items were integrated into the LAMBS perinatal and follow-up data collection instruments.

Neonatal and maternal data collection forms captured a comprehensive profile of resource use during the initial hospitalisation for each infant. The total length of initial hospital stay was computed as the total number of hospital days until first discharge home or death. This incorporated any hospital stays following inter-hospital transfers that may have occurred. A clinical researcher (EB) used detailed information on interventions and feeding received by infants in the neonatal unit to map the time spent in the neonatal unit onto days by level of neonatal care (special, high dependency or intensive), and costs were calculated using the per diem cost of the respective level of care using data from the National Health Service (NHS) Reference Costs trusts schedule 2010/11.(27) Non-routine investigations excluded from these per diem costs were valued using a combination of primary and secondary costs. The costs of surgical procedures were calculated by assignment to relevant Healthcare Resource Group (HRG) codes and application of unit costs from the NHS Reference Costs trusts schedule 2010/11.(27) Transfers were recorded whenever an infant was transported between hospitals for different types of care, and were valued using costs from the NHS Reference Costs trusts schedule 2010/11.(27) Post-mortem costs were based on data from secondary sources.(28) Delivery and postnatal costs for mothers were based on the method of delivery and costs assigned using data from the NHS Reference Costs trusts schedule 2010/11.(27)

As part of the LAMBS follow-up, parents completed detailed retrospective postal questionnaires about their child's post initial hospital discharge resource utilisation at 6 months, 1 year and 2 years, corrected for gestational age. This included use of hospital inpatient, day care and outpatient services, community health and social care services, medicines and drugs. We also valued adaptations to the home, provision of special equipment

and parental lost productivity attributable to the child's health status. Resource inputs were valued using a combination of primary research, based on established accounting methods, and data collated from secondary national tariff sets.(27, 29)

All costs were expressed in pounds sterling and reflected values for the financial year 2010-11. All costs occurring beyond the first year after birth were discounted using the UK recommended discount rate of 3.5%.(30)

Statistical analysis

Maternal and neonatal characteristics and resource use items were summarised by gestational age at birth meta-group (LMPT vs. term) and subgroup (moderately preterm, late preterm, term). Resource use values were time period adjusted to account for differential lengths of follow-up between children. Differences between groups were analysed using t-tests for continuous variables and χ^2 test for categorical variables. Mean (standard error (SE)) costs by cost category and mean (SE) total costs were estimated by gestational age at birth status. Cost comparisons for LMPT vs. term infants were carried out using Student *t* tests and differences in mean costs and their respective confidence intervals were estimated. Non-parametric bootstrap estimates,(31) based on 1000 bias-corrected replications, were also calculated for these differences in mean costs and their respective confidence intervals calculated. The bootstrap method does not rely on parametric assumptions concerning the underlying distribution of data, hence its usefulness for generating confidence intervals for skewed data.(31) Total costs were estimated from a hospital service perspective for the initial hospitalisation. Total costs were also estimated from: a) the NHS and personal social services (PSS) perspective recommended by the National Institute for Health and Care Excellence

(NICE) in England and Wales for evaluative purposes,(30) and b) a broader societal perspective, for the entire period of follow-up.

Regression modelling was used to estimate the relationship between gestational age at birth and economic costs. The models were estimated using both ordinary least squares (OLS) and generalised linear modelling (GLM).(32) For the GLM models, a gamma distribution and log link function for costs was selected on the basis of its Akaike Information Criterion (AIC)(33) statistic, a test commonly used to assess model fit for models of this type. The first set of regression models were estimated with total hospitalisation costs, from birth to initial hospital discharge (or death), representing the dependent variable in the analyses. The first multivariable model (model 1) explored the impact of infant and birth characteristics on initial hospitalisation costs and covariates (categories presented in results tables) considered in these regression analyses included: gestational age at birth status, place of delivery, mode of delivery, baby survival status, multiplicity, gender, small for gestational age,(34) presence of a congenital anomaly, and first born status. The second model (model 2) additionally included the following maternal socio-demographic and lifestyle characteristics as covariates: age, body mass index (BMI), ethnicity, highest educational qualification, marital civil status, social class based on maternal occupational status, home ownership, pre-pregnancy EQ-5D utility score,(35) chronic health problems, socioeconomic deprivation (a composite indicator was derived for each postcode sector using the 2010 Index of Multiple Deprivation (IMD), which uses census-derived indicators of income, education, employment, environment, health and housing at small-area level),(36) recreational drug use during pregnancy, and smoking during pregnancy. The third model (model 3) built on model 2 and included two additional variables (previous premature birth and maternal drinking during pregnancy) for which there was a high degree (60.1%) of missing data.

Two further regression models (models 4 and 5) were also estimated with total societal costs, from birth to 24 months (or death), representing the dependent variable in the analyses. The first of these models (model 4) contained all of the covariates included in model 1 except for the baby survival status variable, whilst the second (model 5) included all of the covariates included in model 2 except for baby survival status and maternal BMI. These covariates were excluded from models 4 and 5 as they precluded estimation of GLM models and we wanted to present results for comparable models using alternative estimators.

Two set of analyses were conducted: the first included cases with cost data available at all time points (complete cases), whilst the second used the inverse probability weighting method(37, 38) to adjust for the presence of censored data. All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births. All analyses were estimated using Stata version 11 (Stata-Corp, College Station, TX).

Results

Descriptive statistics

Of 1,376 eligible infants born at 32-36 weeks gestation, 1,146 (83%) were recruited; 1,258 infants born at ≥37 weeks gestation (79% of all eligible) acted as controls. The corresponding number of mothers who gave birth to these infants was 1041 for the LMPT group and 1,120 for the term group.

Infant characteristics are presented by gestational age group (moderately preterm, late preterm, LMPT, term) in Table 1. Multiples comprised 19% of moderate preterm, 18% of late preterm and 2% of term births. Four per cent of moderately preterm and 2% of late preterm infants had a congenital anomaly compared with 1% for the term group. There were significant differences in the perinatal characteristics of the LMPT infants compared to term infants across all variables. Similarly, comparisons of demographic characteristics of the mothers revealed significant differences in all characteristics with the exception of marital/civil status, and smoking and alcohol consumption during pregnancy (Table S2).

Resource Use

Compared to term infants, median duration of initial stay in the neonatal unit (NNU) and hospital was substantially longer for LMPT infants (Figure S1). LMPT infants also had significantly higher levels of resource use across all other resource categories except hospital transfers compared to term infants (Table S1).

Resource use values between initial hospital discharge and 24 months are presented in Table S3 for the comparator groups, by period of follow-up. For the period between initial hospital discharge and 6 months, the proportion of infants using health services was significantly higher for LMPT infants than term infants for all categories of hospital services and all categories of community based services except for GP visits ($p<0.05$). There were also significant differences in the proportion of infants prescribed medications or for whom adaptions were made to the home between the study groups. The proportion of infants attending hospital day care and outpatient hospital departments was significantly higher for LMPT infants than term infants between 6 and 12 months. The proportion of infants using

health services was also significantly higher for LMPT than term infants for all categories of hospital and community based services between 12 and 24 months.

Economic costs

Birth to initial hospital discharge

Hospital costs to initial hospital discharge or death are summarised in Table 2 for moderate preterm, late preterm and term infants. Mean costs were significantly higher for LMPT infants than for term infants across all cost categories. Mean (SE) total costs were estimated at £11,629 (£605) and £4,528 (£336) for moderately preterm infants and late preterm infants, respectively, compared to £1,864 (£36) for infants born at term. The corresponding median (interquartile range (IQR) total costs values were £10,472 (£6,766) and £2,832 (£3,443) for moderately preterm infants and late preterm infants, respectively, compared to £1,594 (£1,416) for infants born at term. The mean cost differences were: (i) LMPT vs. term infants £3,668 (bootstrap 95% CI: £3,129, £4,361; p<.001); (ii) moderate preterm vs. term infants £9,764 (bootstrap 95% CI: £8,577, £10,951; p<0.001); and (iii) late preterm vs. term infants £2,665 (bootstrap 95% CI: £2,001, £3,328; p<0.001).

Initial hospital discharge to 24 months

Economic costs between initial hospital discharge and 24 months or death (whichever was earliest) are presented in Table S4 for moderately preterm, late preterm, combined LMPT, and term infants, by cost category and follow up period. For the period between initial hospital discharge and 6 months, all categories of hospital costs were significantly higher for LMPT infants. Mean (SE) NHS and PSS costs were £1,351 (£172) and £1,073 (£54) for

moderately preterm infants and late preterm infants, respectively, compared to £773 (£43) for infants born at term. The corresponding median (IQR) NHS and PSS costs values were £767 (£944) and £694 (£727) for moderately preterm infants and late preterm infants, respectively, compared to £579 (£488) for infants born at term. Mean societal costs were significantly higher for the combined LMPT group than those for the term group over this period (£1,165 vs. £810; $p<0.001$). For the period between 6 and 12 months, all hospital services, except accident and emergency department visits, and all community based services, except health visitor and walk-in centre contacts, generated significant cost differences between the comparator groups. For the period between 12 and 24 months, all costs remained significantly higher amongst LMPT infants.

Birth to 24 months

Economic costs from birth to 24 months or death are presented by cost category in Table 3 for moderately preterm (n=85), late preterm (n=509), combined LMPT (n=594), and term infants (n=716) for whom cost data was available at all follow up periods. Mean neonatal care costs, hospital care costs, NHS and PSS costs, and societal costs were significantly higher for LMPT infants than for term infants. There were no significant differences in mean community care costs, medication costs, parental lost earnings, special equipment costs, and adaption costs between the comparator groups. Mean (SE) total societal costs were estimated at £12,037 (£1,114) and £5823 (£1,232) for moderately preterm infants and late preterm infants, respectively, compared to £2,056 (£132) for children born at term. The corresponding median (IQR) total societal costs values were £10,246 (£7,216) and £3,176 (£4,360) for moderately preterm infants and late preterm infants, respectively, compared to £1,359 (£1,276) for infants born at term. The mean societal cost differences from birth to 24 months between the infant groups were: (i) LMPT vs. term infants £4,339 (bootstrap 95% CI: £3,142,

£5568; p<0.001); (ii) moderate preterm vs. term infants £9,981 (bootstrap 95% CI: £7,790, £12,173; p<0.001); and (iii) late preterm vs. term infants £3,768 (bootstrap 95% CI: £1,338, £6,198; p<0.001). Table S5 further disaggregates this information by follow up period excluding neonatal care costs.

Regression models for economic costs

Birth to initial hospital discharge

Table S6 shows the results of three generalised linear regression models (models 1-3) for total hospitalisation to initial discharge or death (whichever was earliest) costs. The first model explores the impact of infant and birth characteristics on cost, whilst the second and third models also include maternal socio-demographic and lifestyle characteristics to explore whether they additionally influence hospitalisation costs. Model 1 shows that, compared with term-born infants, the mean (SE) cost ratios for moderate preterm and late preterm birth were 5.02 (0.22) and 1.98 (0.07), respectively. Model 1 also shows that place of birth (Centre 2), mode of delivery (assisted/instrumental delivery, caesarean section during labour and caesarean section not in labour), presence of a congenital anomaly and whether the infant was first born were each associated with elevated costs. The addition of maternal socio-demographic and maternal lifestyle variables in models 2 and 3 had little significant impact on these findings. Table S7 contains the corresponding results for the OLS regressions. Model 1 shows that, even after controlling for infant and birth characteristics, moderate preterm and late preterm birth increased initial hospitalisation costs by an average of £8,340 (SE £610; *P*<.0001) and £2,224 (SE £282; *P*<.0001), respectively, in comparison to birth at

full term. The same patterns of statistical significance are present as in the corresponding GLM model (Table S6). Similarly, the addition of maternal socio-demographic and maternal lifestyle variables in models 2 and 3 had no significant impact on these findings.

Birth to 24 months

Table S8 shows the results of two generalised linear regression models on total societal cost from birth to 24 months or death (whichever was earliest). The results are presented for infants with complete data. The first model (model 4) explores the impact of the reduced set of infant and birth characteristics on total societal costs, whilst the second model (model 5) also includes the reduced set of maternal socio-demographic and lifestyle characteristics to explore whether they additionally influence societal costs. Model 4 shows that, compared with term-born infants, the mean (SE) cost ratios for moderate preterm and late preterm birth were 2.72 (0.20) and 1.55 (0.07), respectively. Model 4 also shows that place of birth (Centre 2), mode of delivery (assisted/instrumental delivery, caesarean section during labour and caesarean section not in labour), presence of a congenital anomaly and whether the infant was first born were each associated with elevated costs. The addition of maternal socio-demographic and maternal lifestyle variables in model 5 had no significant impact on these findings. Table S9 contains the corresponding results for the OLS regressions. Model 4 shows that, even after controlling for infant and birth characteristics, moderate preterm and late preterm birth increased total societal cost from birth to 24 months by an average of £7,730 (SE £886; $P<.0001$) and £2,079 (SE £370; $P<.0001$), respectively, in comparison to birth at full term. The same patterns of statistical significance are present as in the corresponding GLM model (Table S8).

Table 4 shows the results of two generalised linear regression models on total societal cost from birth to 24 months or death (whichever was earliest) using the inverse probability

weighting method(37, 38) to account for the presence of censored data. These analyses replicated the model specifications applied to the complete case analyses (Table S8). The same patterns of statistical significance present in model 4 for the complete case analysis are found in model 4 for the inverse probability weighted data. The addition of maternal socio-demographic and maternal lifestyle variables in model 5 resulted in one additional statistically significant effect. An unknown maternal ethnicity status resulted in a mean cost ratio of 0.73 compared to the white reference group. Table S10 contains the corresponding results for the OLS regressions. Model 4 shows that, even after controlling for infant and birth characteristics, moderate preterm and late preterm birth increased total societal cost from birth to 24 months by an average of £7,607 (SE £875; $P<.0001$) and £1,859 (SE £323; $P<.0001$), respectively, in comparison to birth at full term. The same patterns of statistical significance are present as in the corresponding GLM model (Table 4).The addition of maternal socio-demographic and maternal lifestyle variables in model 5 resulted in maternal age displaying a statistically significant effect, with each additional year of maternal age increasing costs by an average of £84 (SE £42; $P<.05$).

Discussion

Main findings

A recent review of published evidence on the economic consequences of LMPT birth found sparse evidence on this topic.(6) No recently published studies have, to our knowledge, disentangled the economic costs associated with LMPT birth, by period of follow-up and cost category, in a UK setting. Our main findings are that, during the initial hospitalisation, LMPT infants have higher rates of resource use compared to term infants across all hospital service

resource categories and that mean costs are significantly higher for LMPT infants than those for term infants across all categories of hospital services. Mean (SE) hospital costs to initial discharge or death were estimated at £11629 (£605) and £4528 (£336) for moderately preterm infants and late preterm infants, respectively, compared to £1864 (£36) for infants born at term. Our study also generated mean (SE) total societal costs estimates over the first two years of life of £12,037 (£1,114) and £5,823 (£1,232) for moderately preterm infants and late preterm infants, respectively, compared to £2,056 (£132) for children born at term.

Strengths and Limitations

The strengths of this study lie in the fact that it was based on a large geographically-determined prospective population cohort, included a term comparison group, and captured a comprehensive profile of resource use between birth and two years based on previously validated instruments.(39, 40) Furthermore, the rigorous costing methodology applied followed national guidance for health economic evaluation purposes.(30, 41)

A number of caveats need to be borne in mind. First, because the study was based in the East Midlands of England, it may not be representative of other populations of LMPT infants, nor indeed of the breadth of organisational structures for perinatal care across industrialized nations. Nevertheless, since we were able to collect information about the numbers of infants that were not recruited, together with denominators for "all births", it has still been possible to create reasonable underpinning epidemiological estimates for the population, which should be suitable for generalisation. Moreover, we are unaware of any evidence to suggest that alternative organisational structures would have significantly affected the cost differences between the comparator groups. Second, our study only considered hospitalisation costs during the period between birth and initial hospital discharge, whereas a broader societal perspective for economic costs over this initial time horizon might also appropriately

consider costs borne by parents and informal carers. A recent structured review of the economic costs associated with preterm birth highlighted the importance of non-healthcare costs associated with the initial period of hospitalisation, such as parental travel to neonatal units and those associated with lost parental productivity, and it is likely that these categories of costs are relevant to some families and carers of children born LMPT.(42) Third, the study covered a time horizon of birth to two years whereas a longer time horizon could have captured the economic consequences of potential longer-term sequelae, such as physical, neuropsychological and behavioural difficulties. (2-4) The economic consequences of LMPT birth are likely to be on-going in infants with long-term adverse sequelae and it is possible that the need for special educational support in this group is substantial but not yet fully recognised.

Interpretation

Comparability of our costs estimates relating to initial hospitalisation with other studies is constrained both by a paucity of broader evidence and a number of methodological factors, including variability in cohort dates, the way perinatal and neonatal care is organised, and differences in accounting procedures. In contrast, a significant body of literature exists on the initial hospitalisation costs associated with very or extreme preterm birth. For very preterm infants, estimates of mean costs associated with the initial hospitalisation have varied between $29,679 (US$, 2007 prices)(16) and $91,343(US$, price date not stated).(43) For extremely preterm infants, estimates range between $11,397(US$, 2007 prices)(16) and $195,254 (US$, price date not stated).(7, 43) Although these cost estimates are generally greater in magnitude than our own, disentangling the relative contributions of gestational age *per se* and methodological factors underpinning alternative cost study designs is beyond the scope of this study.

Similarly, comparability of our cost estimates over the first two years of life across studies is complicated particularly by differences in follow-up periods, types of costs included and accounting procedures. There are no directly comparable results for extremely or very preterm infants. The incremental societal cost of LMPT birth from birth to two years was estimated at £7583 (£874) and £1963 (£337), respectively, compared to birth at full term. In 2011, there were 6916 and 35,565 infants born moderately preterm and late preterm, respectively, in England and Wales.(44) Application of our incremental societal cost estimates to these epidemiological data translates to an annual national economic burden of LMPT birth of approximately £122 million.

Conclusion

Compared to birth at full term, LMPT birth is associated with significant additional costs during the period of the initial hospitalisation and throughout the first two years of life. Clinical decision-makers and budgetary and service planners should recognise the overall economic impact of LMPT birth in their service planning, as well as the potential contribution of clinical and socio-demographic factors to future hospital and broader societal costs. The results of this study support an increasing evidence base that suggests that delivering babies LMPT is neither risk-free nor without significant cost, economic as well as medical, and there is potential to reduce iatrogenic early delivery. In addition, economic variables should be incorporated into future longitudinal studies of moderate and late preterm infants with the view to estimating the economic costs of LMPT birth over the longer term. The results of our study should also be considered for use as inputs to studies attempting to model the economic costs of preterm birth throughout childhood. More particularly, our results should act as inputs into economic evaluations of preventive and treatment

interventions for LMPT birth that aim to ensure efficient allocation of finite resources in this area.

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Contributor's Statements:

Kamran A Khan: Mr. Khan carried out the bulk of the analyses, reviewed and revised the manuscript, and approved the final manuscript as submitted.

Stavros Petrou: Dr. Petrou designed the economic study and its data collection instruments, coordinated and supervised data collection, critically reviewed the manuscript, and approved the final manuscript as submitted.

Melina Dritsaki: Dr. Dritsaki carried out some of the cost analyses, reviewed and revised the manuscript, and approved the final manuscript as submitted.

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Elaine M Boyle: Dr. Boyle conceptualized, designed and provided overall oversight of the LAMBS study and its ancillary studies, reviewed and revised the manuscript, and approved the final manuscript as submitted.

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Table legends

Table 1: Summary descriptive statistics for infants by gestational age at birth (All births)

Table 2: Birth to discharge hospitalisation costs for late preterm, moderate preterm and term infants

Table 3: Costs of late and moderate preterm and term infants from birth to 24months; Mean (SE) by cost category and complete cases

Table 4: Relationship between gestational age at birth and total birth to 24 months costs; Generalised Linear Model (Gamma distribution with Log link), inverse probability weighted

Table 1: Summary descriptive statistics for infants by gestational age at birth (All births)

	Moderate preterm 32-33 weeks	Late preterm 34-36 weeks	Late and moderate preterm 32-36 weeks	Term ? 37 weeks	Term ? 37 weeks Re-weighted±	P value†
Number of infants	162	984	1146	1258		
Gestational age in completed weeks, median	33 (32 to 33)	36 (34 to 36)	35 (32 to 36)	39 (37 to 43)	-	
(range) Mean (SD)	32.57 (0.50)	35.32 (0.78)	34.93 (1.22)	39.18 (1.40)	39.59 (1.24)	
Birthweight, *g*, median (range)	1908 (820 to 3180)	2500 (1098 to 4960)	2420 (820 to 4960)	3280 (520 to 5160)	-	<0.001
Mean (SD)	1919.95 (372.10)	2497.74 (478.10)	2415.99 (506.24)	3275.02 (557.18)	3418.01 (502.47)	
Missing, n (%)	-	1 (0.1%)	1 (0.1%)	-	-	
[1]Below 10th birth weight centile at birth, n (%)	24 (14.8%)	120 (12.2%)	144 (12.6%)	115 (9.1%)	(6.9%)	0.003
[1]Below 10th fetal weight centile at birth, n (%)	48 (29.6%)	257 (26.1%)	305 (26.6%)	281 (22.3%)	(15.8%)	0.006
Male sex, n (%)	88 (54.3%)	533 (54.2%)	621 (54.2%)	651 (51.8%)	(51.3%)	0.002
Baby Status, n (%)						0.002
Alive	152 (93.8%)	971 (98.7%)	1123 (98.0%)	1253 (99.6%)	(99.6%)	
Stillbirth	8 (4.9%)	8 (0.8%)	16 (1.4%)	3 (0.2%)	(0.2%)	
Early neonatal deaths (within 1st 7 days)	1 (0.6%)	2 (0.2%)	3 (0.3%)	1 (0.1%)	(0.1%)	
Late neonatal death (8-28 days of life)	-	1 (0.1%)	1 (0.1%)	-	-	
Infant death (29 + days of life)	1 (0.6%)	2 (0.2%)	3 (0.3%)	1 (0.1%)	(0.1%)	
Multiplicity, n(%)						0.027
Singleton	132 (81.5%)	806 (81.9%)	938 (81.9%)	982 (78.1%)	(98.2%)	
Twins	24 (14.8%)	172 (17.5%)	196 (17.1%)	276 (21.9%)	(1.8%)	
Triplets	6 (3.7%)	6 (0.6%)	12 (1.1%)			
Congenital Anomaly, n (%)	7 (4.3%)	15 (1.5%)	22 (1.9%)	9 (0.7%)	(0.7%)	0.002
First born, n (%)	74 (45.7%)	470 (47.8%)	544 (47.5%)	564 (44.8%)	(44.6%)	0.002

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births.

† Comparisons of term vs Late and moderate preterm groups carried out using Student t-tests for continuous variables and χ^2 test for categorical variables.

1 The descriptive statistics relating to birthweight are based on the distribution of both below the 10th birthweight centile (45) and below the 10th centile of fetal weight (46)

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Table 2: Birth to discharge hospitalisation costs for late preterm, moderate preterm and term infants

	Moderate preterm 32-33 weeks	Late preterm 34-36 weeks	Late and moderate preterm 32-36 weeks	Term ≥ 37 weeks Re-weighted±	*Mean Difference, 95 % CI	Bootstrapped Difference & 95 % CI	P value†
Number of infants	162	984	1146				
Postnatal cost (£), mean (SE)	2207.13 (78.75)	1948.73 (26.61)	1985.26 (25.54)	1708.54 (19.25)	276.72 (211.76 to 341.68)	277.15 (213.68 to 342.13)	<0.001
Neonatal cost (£), mean (SE)	9226.81 (562.54)	2497.97 (325.33)	3449.17 (298.51)	146.45 (27.54)	3302.71 (2714.38 to 3891.05)	3293.67 (2825.30 to 3934.87)	<0.001
Other costs (£), mean (SE)							
Transfer	61.64 (15.05)	12.24 (3.10)	19.23 (3.44)	0.02 (0.05)	19.21 (12.47 to 25.96)	18.99 (12.25 to 26.62)	<0.001
Post mortem	22.97 (9.23)	2.52 (1.26)	5.41 (1.70)	1.86 (0.97)	3.55 (-0.40 to 7.50)	3.56 (-0.40 to 7.50)	0.078
Surgery	51.34 (27.93)	46.13 (17.56)	46.86 (15.58)	0.81 (0.73)	46.05 (15.45 to 76.65)	46.23 (17.17 to 79.77)	0.003
Investigations	58.72 (12.32)	20.50 (3.48)	25.91 (3.48)	6.76 (1.69)	19.14 (11.40 to 26.88)	18.96 (11.55 to 26.88)	<0.001
Total (other costs)	194.66 (39.10)	81.40 (19.34)	97.41 (17.53)	9.45 (2.49)	87.96 (53.15 to 122.76)	87.43 (56.70 to 125.35)	<0.001
Total birth to discharge hospital costs (£), mean (SE)	11628.60 (605.20)	4528.02 (336.18)	5532.62 (309.73)	1864.38.03 (36.49)	3668.24 (3055.84 to 4280.64)	3663.68 (3129.48 to 4361.64)	<0.001

SE, standard error; CI, confidence interval

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births.
*These are comparisons of term vs combined late and moderate preterm groups.
† Comparisons of term vs combined late and moderate preterm groups carried out using Student t-tests

Table 3: Costs of late and moderate preterm and term infants from birth to 24months; Mean (SE) by cost category and complete cases

	Moderate preterm 32-33 weeks	Late preterm 34-36 weeks	Late and moderate preterm 32-36 weeks	Term ≥ 37 weeks Re-weighted±	*Mean Difference, 95 % CI	Bootstrapped Difference & 95 % CI	P value†
Number of infants	85	509	594	716			
Neonatal care costs, mean (SE)	9387.69 (964.35)	2827.01 (589.51)	3765.83 (531.84)	172.66 (39.32)	3593.17 (2546.47 to 4639.86)	3602.08 (2736.07 to 4828.16)	<0.001
Other hospital care costs, mean (SE)	1411.65 (318.11)	1642.21 (646.89)	1069.22 (556.10)	673.76 (92.75)	935.46 (-170.47 to 2041.40)	931.77 (-172.36 to 2029.11)	0.097
Community care costs, mean (SE)	960.22 (68.47)	1059.32 (23.38)	1045.14 (22.32)	1005.24 (18.30)	39.90 (-16.72 to 96.53)	37.14 (-19.41 to 92.37)	0.167
Medication costs, mean (SE)	13.14 (4.45)	7.15 (0.86)	8.01 (0.98)	7.99 (1.56)	0.02 (-3.60 to 3.63)	0.04 (-3.37 to 3.51)	0.993
Lost earnings, mean (SE)	252.87 (86.44)	255.95 (55.46)	255.51 (49.08)	155.86 (21.74)	99.65 (-7.47 to 206.77)	98.73 (7.12 to 210.45)	0.068
Special equipment costs, mean (SE)	7.05 (2.60)	4.87 (1.27)	5.18 (1.15)	3.32 (0.98)	1.87 (-1.10 to 4.83)	1.82 (-1.14 to 4.87)	0.217
Adaptation costs , mean (SE)	4.24 (4.24)	26.97 (14.56)	23.72 (12.49)	36.70 (32.26)	-12.98 (-86.90 to 60.94)	-11.96 (-97.38 to 43.78)	0.731
Total NHS & PSS costs	11772.71 (1085.26)	5535.70 (1229.50)	6428.20 (1068.45)	1859.65 (117.93)	4568.55 (2459.92 to 6677.19)	4590.16 (2519.23 to 6630.14)	<0.001
Total Societal costs	12036.86 (1113.87)	5823.49 (1231.98)	6712.61 (1071.12)	2055.52 (131.76)	4657.09 (2540.11 to 6774.07)	4669.12 (2513.41 to 6802.75)	<0.001

SE, Standard error;

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births.

*These are comparisons of term vs combined late and moderate preterm groups.

† Comparisons of term vs Late and moderate preterm groups carried out using Student t-tests for continuous variables

Table 4: Relationship between gestational age at birth and total birth to 24 months costs; Generalised Linear Model (Gamma distribution with Log link), inverse probability weighted

	Model 4		Model 5	
Variable (unit)	**Cost Ratio (SE)**	**P>|t|**	**Cost Ratio (SE)**	**P>|t|**
GA Status (Referent= Term)				
Late preterm	1.50 (0.07)	<0.001	1.53 (0.07)	<0.001
Moderate preterm	2.79 (0.24)	<0.001	2.75 (0.24)	<0.001
Place of delivery (Referent= Centre 1)				
Centre 2	1.14 (0.05)	0.003	1.10 (0.05)	0.026
Other	1.04 (0.13)	0.729	1.12 (0.17)	0.448
Mode of delivery (Referent= Spontaneous Vaginal)				
Assisted/instrumental	1.17 (0.07)	0.013	1.17 (0.07)	0.008
CS labouring	1.49 (0.08)	<0.001	1.46 (0.08)	<0.001
CS not in labour	1.67 (0.09)	<0.001	1.64 (0.09)	<0.001
Multiplicity (Referent= Singleton)				
Multiple	1.07 (0.07)	0.285	1.06 (0.07)	0.360
Gender (Referent= Male)	0.96 (0.04)	0.266	0.96 (0.04)	0.276
***Small for gestational age (Referent= No)**	1.09 (0.06)	0.166	1.10 (0.06)	0.112
Congenital Anomaly (Referent= No)	4.32 (1.66)	<0.001	4.29 (1.43)	<0.001
First Born (Referent= No)	1.11 (0.05)	0.013	1.11 (0.05)	0.031
Maternal age			1.01 (0.00)	0.063
Maternal Ethnicity (Referent= White)				
Mixed			0.85 (0.14)	0.312
Asian or Asian British			0.94 (0.06)	0.342
Black or Black British			1.02 (0.11)	0.877
Chinese or Other			1.22 (0.17)	0.157
Not known			0.73 (0.11)	0.042
Highest Qual (Referent= Higher Degree)				
Degree			0.96 (0.06)	0.547
A levels, Voc level 3 and equivalent			1.04 (0.07)	0.567
GCSE A*-C, Voc level 2 and equivalent			1.05 (0.09)	0.578
GCSE D-G, Voc level 1 and below			0.89 (0.09)	0.252
Qualification level unknown			1.06 (0.1)	0.513
No qualifications			0.97 (0.11)	0.809
Not known			0.98 (0.18)	0.903

Marital Civil Status (Referent= Living as part of a couple)			0.94 (0.06)	0.404
National Statistics Socio-economic Classification (Referent = Managerial and professional occupations)				
Intermediate occupations			0.97 (0.06)	0.674
Routine and manual occupations			1.05 (0.08)	0.528
Never worked and long term unemployed			0.98 (0.07)	0.812
Looking after family			0.88 (0.07)	0.100
Not known			0.83 (0.17)	0.357
Home ownership (Referent= Own)				
Rent			1.06 (0.06)	0.282
Live rent free			1.06 (0.1)	0.553
EQ-5D Utility Score			0.83 (0.11)	0.165
Chronic health problems (Referent= No)			0.96 (0.04)	0.418
Deprivation Score (Referent = First Quintile)				
Second quintile			1.06 (0.07)	0.351
Third quintile			1.05 (0.07)	0.420
Fourth quintile			1.03 (0.08)	0.732
Fifth quintile			1.08 (0.08)	0.291
Recreational drugs during pregnancy (Referent= No)			1.05 (0.17)	0.753
Smoke during pregnancy (Referent= No)			1.02 (0.07)	0.757
Constant	7.95 (0.05)	<0.001	7.86 (0.23)	<0.001
N	1310		1310	
AIC	44951.95		44980.74	
*Based on Fetal weight centile <0.10				

Table S1: Resource use by birth status (all births), from birth to hospital discharge

	Moderate preterm 32-33 weeks	Late preterm 34-36 weeks	Late and moderate preterm 32-36 weeks	Term ? 37 weeks	Term ? 37 weeks Re-weighted±	P value†
Number of infants	162	984	1146	1258		
Mode of delivery, n (%)						0.006
Spontaneous vaginal, n (%)	67 (41.4%)	540 (54.9%)	607 (53.0%)	702 (55.8%)	(62.5%)	
Assisted/instrumental, n (%)	7 (4.3%)	94 (9.6%)	101 (8.8%)	213 (16.9%)	(16.8%)	
CS labour, n (%)	26 (16.05%)	132 (13.4%)	158 (13.8%)	129 (10.3%)	(9.2%)	
CS not in labour, n (%)	61 (37.7%)	218 (22.2%)	279 (24.4%)	214 (17.0%)	(11.5%)	
Not known, n (%)	1 (0.6%)		1 (0.1%)			
Place of delivery, n (%)						<0.001
Centre 1	91 (56.2%)	583 (59.3%)	674 (58.8%)	661 (52.5%)	(52.4%)	
Centre 2	67 (41.4%)	392 (39.8%)	459 (40.1%)	570 (45.3%)	(45.0%)	
Home/Other	4 (2.5%)	9 (0.9%)	13 (1.1%)	27 (2.2%)	(2.5%)	
Any active resuscitation at birth, n (%)	62 (38.3%)	149 (15.1%)	211 (18.4%)	104 (8.3%)	(7.5%)	<0.001
NNU admission, n (%)	154 (95.1%)	340 (34.6%)	494 (43.1%)	67 (5.3%)	(4.5%)	<0.001
Length of neonatal stay (days), median (range)	16 (0 to 77)	0 (0 to 101)	0 (0 to 101)	0 (0 to 26)	-	-
Length of neonatal stay (days), mean (SD)	15.60 (10.72)	2.61 (6.88)	4.45 (8.79)	0.27 (1.84)	0.24 (1.68)	<0.001
Maximum respiratory support required						
Mechanical ventilation, n (%)	46 (28.4%)	74 (7.5%)	120 (10.5%)	13 (1.0%)	(1.1%)	<0.001
Non-invasive respiratory support, n (%)	44 (27.2%)	56 (5.7%)	100 (8.7%)	6 (0.5%)	(0.4%)	<0.001
Nasal cannula oxygen, n (%)	32 (19.8%)	69 (7.0%)	101 (8.8%)	16 (1.3%)	(1.4%)	<0.001
No respiratory support, n (%)	91 (56.2%)	851 (86.5%)	942 (82.2%)	1234 (98.1%)	(98.0%)	<0.001
Parenteral nutrition, n (%)	30 (18.5%)	34 (3.5%)	64 (5.6%)	7 (0.6%)	(0.6%)	<0.001
Intravenous fluids, n (%)	122 (75.3%)	210 (21.3%)	332 (29.0%)	36 (2.9%)	(2.6%)	<0.001

Length of hospital stay (days), median (range)	17 (0 to 110)	5 (0 to 369)	5 (0 to 369)	2 (1 to 33)	-	-
Mean (SD)	17.95 (12.02)	7.71 (18.18)	9.15 (17.80)	2.97 (2.48)	2.64 (2.40)	<0.001
Surgery/Operations, n (%)	5 (3.1%)	13 (1.3%)	18 (1.6%)	1 (0.1%)	(0.1%)	<0.001
Hospital Transfer, n (%)						0.138
None	138 (85.2%)	961 (97.7%)	1099 (95.9%)	1257 (99.9%)	(99.9%)	
To Lower Intensity	19 (11.7%)	15 (1.5%)	34 (3.0%)	1 (0.1%)	(0.0%)	
To Higher Intensity	5 (3.1%)	8 (0.8%)	13 (1.1%)	-	-	
Post-mortem, n (%)	6 (3.7%)	4 (0.4%)	10 (0.9%)	3 (0.2%)	(0.3%)	<0.001
Other investigations, n (%)	53 (32.7%)	86 (8.7%)	139 (12.1%)	45 (3.6%)	(2.8%)	<0.001
No of investigations, n (%)						
One	38 (23.5%)	55 (5.6%)	93 (8.1%)	29 (2.3%)	(2.3%)	<0.001
Two	10 (6.2%)	15 (1.5%)	25 (2.2%)	6 (0.5%)	(0.3%)	
Three or more	5 (3.1%)	16 (1.6%)	21 (1.8%)	10 (0.8%)	(0.9%)	
Transitional care received, n (%)	28 (17.3%)	242 (24.6%)	270 (23.6%)	16 (1.3%)	(0.3%)	0.003
Length of transitional care stay (days), median (range)	0 (0 to 16)	0 (0 to 21)	0 (0 to 21)	0 (0 to 10)	-	
Length of transitional care stay (days), mean (SD)	1.23 (2.96)	1.48 (3.07)	1.44 (3.05)	0.06 (0.58)	0.02 (0.32)	<0.001
Special care received, n (%)	154 (95.1%)	525 (53.4%)	679 (59.3%)	80 (6.4%)	(4.6%)	<0.001
Length of special care stay (days), median (range)	15 (0 to 39)	0 (0 to 45)	0 (0 to 45)	0 (0 to 26)	-	
Length of special care stay (days), mean (SD)	13.76 (8.12)	2.29 (4.98)	3.91 (6.82)	0.24 (1.69)	0.20 (1.45)	<0.001
High dependency care received, n (%)	49 (30.3%)	68 (6.9%)	117 (10.2%)	5 (0.4%)	(0.4%)	<0.001
Length of high dependency care stay (days), median (range)	0 (0 to 39)	0 (0 to 307)	0 (0 to 307)	0 (0 to 7)	-	
Length of high dependency care stay (days), mean (SD)	1.13 (3.62)	0.60 (10.04)	0.68 (9.40)	0.01 (0.25)	0.02 (0.28)	<0.001
Intensive care received, n (%)	41 (25.3%)	67 (6.8%)	108 (9.4%)	11 (0.9%)	(1.0%)	<0.001
Length of intensive care stay (days), median (range)	0 (0 to 26)	0 (0 to 32)	0 (0 to 32)	0 (0 to 4)	-	
Length of intensive care stay (days), mean (SD)	0.91 (3.00)	0.24 (1.66)	0.34 (1.92)	0.02 (0.23)	0.02 (0.26)	<0.001

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births.

† Comparisons of term vs combined late and moderate preterm groups carried out using Student t-tests for continuous variables and χ^2 test for categorical variables. The Mann-Whitney U test was used to compare medians.

Table S2: Summary descriptive statistics for mothers by gestational age at birth (All births)

	Moderate preterm 32-33 weeks	**Late preterm 34-36 weeks**	**Late and moderate preterm 32-36 weeks**	**Term** ? 37 weeks	**Term** ? 37 weeks **Re-weighted±**	P value†
Number of Mothers	146	895	1041	1120		
Maternal age , mean	29.02 (5.92)	29.38 (5.84)	29.33 (5.85)	29.79 (5.96)	29.53 (5.87)	0.031
(SD) BMI						0.014
Normal, n (%)	87 (59.59%)	459 (51.28%)	546 (52.45%)	534 (47.68%)	(49.82%)	
Under-weight, n (%)	6 (4.11%)	43 (4.80%)	49 (4.71%)	40 (3.57%)	(3.81%)	
Overweight, n (%)	31 (21.23%)	231 (25.81%)	262 (25.17%)	290 (25.89%)	(26.45%)	
Obese, n (%)	14 (9.59%)	129 (14.41%)	143 (13.74%)	212 (18.93%)	(19.92%)	
Not known, n (%)	8 (5.48%)	33 (3.69%)	41 (3.94%)	44 (3.93%)	(3.93%)	
Ethnicity						0.013
White, n (%)	110 (75.34%)	642 (71.73%)	752 (72.24%)	863 (77.05%)	(77.17%)	
Mixed, n (%)	5 (3.42%)	28 (3.13%)	33 (3.17%)	25 (2.23%)	(2.24%)	
Asian or Asian British, n (%)	21 (14.38%)	165 (18.44%)	186 (17.87%)	159 (14.20%)	(14.45%)	
Black or Black British, n (%)	8 (5.48%)	46 (5.14%)	54 (5.19%)	60 (5.36%)	(4.93%)	
Chinese or other ethnic group, n(%)	1 (0.68%)	10 (1.12%)	11 (1.06%)	9 (0.80%)	(0.82%)	
Not known, n (%)	1 (0.68%)	4 (0.45%)	5 (0.48%)	4 (0.36%)	(0.41%)	
Marital/Civil Status						0.124
Living as part of a couple, n (%)	119 (81.51%)	737 (82.35%)	856 (82.23%)	976 (87.14%)	(86.60%)	
Single, n (%)	26 (17.81%)	158 (17.65%)	184 (17.68%)	141 (12.59%)	(13.28%)	
Not known, n (%)	1 (0.68%)		1 (0.10%)	3 (0.27%)	(0.12%)	
Age completed education, mean (SD)	18.30 (2.68)	18.45 (3.02)	18.43 (2.97)	18.74 (3.08)	18.65 (3.00)	0.003
Not known, n (%)	2 (1.37%)	4 (0.45%)	6 (0.58%)	7 (0.63%)		
Highest educational qualification						0.001
Higher degree, n (%)	11 (7.53%)	84 (9.39%)	95 (9.13%)	134 (11.96%)	(10.88%)	
Degree, n (%)	26 (17.81%)	147 (16.42%)	173 (16.62%)	245 (21.88%)	(21.24%)	
A Level, n (%)	32 (21.92%)	177 (19.78%)	209 (20.08%)	212 (18.93%)	(19.04%)	
GCSE A*-C, n (%)	38 (26.03%)	214 (23.91%)	252 (24.21%)	253 (22.59%)	(23.37%)	
GCSE D-G, n (%)	15 (10.27%)	96 (10.73%)	111 (10.66%)	88 (7.86%)	(8.42%)	
Qualification level unknown, n (%)	7 (4.79%)	75 (8.38%)	82 (7.88%)	88 (7.86%)	(7.93%)	
No qualifications, n (%)	11 (7.53%)	83 (9.27%)	94 (9.03%)	75 (6.70%)	(6.72%)	
Not known, n (%)	6 (4.11%)	19 (2.12%)	25 (2.40%)	25 (2.23%)	(2.43%)	

Occupational status during pregnancy						<0.001
Employed, n (%)	83 (56.85%)	526 (58.77%)	609 (58.50%)	738 (65.89%)	(65.23%)	
Unemployed, n (%)	13 (8.90%)	110 (12.29%)	123 (11.82%)	84 (7.50%)	(8.10%)	
Caring for family, n (%)	42 (28.77%)	221 (24.69%)	263 (25.26%)	252 (22.50%)	(22.32%)	
Full time student, n (%)	6 (4.11%) 1	25 (2.79%)	31 (2.98%)	33 (2.95%)	(3.04%)	
Long term sick or disabled, n (%)	(0.68%) 1	10 (1.12%)	11 (1.06%)	7 (0.63%)	(0.71%)	
Not known, n (%)	(0.68%)	3 (0.34%)	4 (0.38%)	6 (0.54%)	(0.60%)	
IMD Deprivation Score						<0.001
First quintile, n (%)	25 (17.12%)	154 (17.21%)	179 (17.20%)	255 (22.77%)	(22.25%)	
Second quintile, n (%)	30 (20.55%)	166 (18.55%)	196 (18.83%)	237 (21.16%)	(21.09%)	
Third quintile, n (%)	25 (17.12%)	194 (21.68%)	219 (21.04%)	211 (18.84%)	(18.37%)	
Fourth quintile, n (%)	38 (26.03%)	194 (21.68%)	232 (22.29%)	205 (18.30%)	(18.98%)	
Fifth quintile, n (%)	28 (19.18%)	187 (20.89%)	215 (20.65%)	212 (18.93%)	(19.32%)	
National Statistics Socio-economic Classification						0.001
Managerial and professional occupations, n (%)	33 (22.60%)	229 (25.59%)	262 (25.17%)	341 (30.45%)	(29.23%)	
Intermediate occupations, n (%)	31 (21.23%)	146 (16.31%)	177 (17.00%)	202 (18.04%)	(18.68%)	
Routine and manual occupations, n (%)	19 (13.01%)	149 (16.65%)	168 (16.14%)	193 (17.23%)	(17.11%)	
Never worked and long term unemployed, n (%)	20 (13.70%)	145 (16.20%)	165 (15.85%)	124 (11.07%)	(11.85%)	
Looking after family, n (%)	42 (28.77%)	221 (24.69%)	263 (25.26%)	252 (22.50%)	(22.32%)	
Not known, n (%)	1 (0.68%)	5 (0.56%)	6 (0.58%)	8 (0.71%)	(0.80%)	
Home Ownership						0.001
Own, n (%)	55 (37.67%)	409 (45.70%)	464 (44.57%)	561 (50.09%)	(48.87%)	
Rent, n (%)	83 (56.85%)	431 (48.16%)	514 (49.38%)	493 (44.02%)	(44.94%)	
Live rent free, n (%)	6 (4.11%)	54 (6.03%)	60 (5.76%)	66 (5.89%)	(6.19%)	
Not known, n (%)	2 (1.37%)	1 (0.11%)	3 (0.29%)			
EQ-5D-3L Utility score, mean (SD)	0.93 (0.16)	0.95 (0.14)	0.94 (0.14)	0.96 (0.13)	0.96 (0.13)	0.001
Chronic health problems						<0.001
No, n (%)	116 (79.45%)	667 (74.53%)	783 (75.22%)	900 (80.36%)	(80.63%)	
Yes, n (%)	29 (19.86%)	226 (25.25%)	255 (24.50%)	219 (19.55%)	(19.26%)	
Not known, n (%)	1 (0.68%)	2 (0.22%)	3 (0.29%)	1 (0.09%)	(0.11%)	
Previous preterm baby						<0.001
No, n (%)	56 (38.36%)	377 (42.12%)	433 (41.59%)	632 (56.43%)	(56.04%)	
Yes, n (%)	33 (22.60%)	159 (17.77%)	192 (18.44%)	59 (5.27%)	(5.58%)	
Not known, n (%)	57 (39.04%)	359 (40.11%)	416 (39.96%)	429 (38.30%)	(38.39%)	
Recreational drugs during pregnancy						0.002
No, n (%)	143 (97.95%)	874 (97.65%)	1017 (97.69%)	1106 (98.75%)	(98.67%)	
Yes, n (%)	2 (1.37%)	21 (2.35%)	23 (2.21%)	12 (1.07%)	(1.21%)	
Not known, n (%)	1 (0.68%)		1 (0.10%)	2 (0.18%)	(0.11%)	
Smoking during pregnancy						0.149
No, n (%)	104 (71.23%)	649 (72.51%)	753 (72.33%)	893 (79.73%)	(79.26%)	
Yes, n (%)	41 (28.08%)	241 (26.93%)	282 (27.09%)	227 (20.27%)	(20.74%)	
Not known, n (%)	1 (0.68%)	5 (0.56%)	6 (0.58%)			

Drink alcohol during pregnancy, N (%)	56 (38.36%)	352 (39.33%)	408 (39.19%)	475 (42.41%)	(42.61%)	0.062
Drink more than 5 units per day						
Never, n (%)	50 (34.25%)	313 (34.97%)	363 (34.87%)	431 (38.48%)	(38.54%)	
Less than once per month, n (%)	5 (3.42%)	21 (2.35%)	26 (2.50%)	24 (2.14%)	(2.33%)	
1-2 days per month, n (%)	1 (0.68%)	9 (1.01%)	10 (0.96%)	5 (0.45%)	(0.51%)	
1-2 days per week, n (%)		4 (0.45%)	4 (0.38%)	6 (0.54%)	(0.51%)	
3-4 days per week, n (%)	-	-	-	1 (0.09%)	(0.01%)	
5 or more days per week, n (%)	-	1 (0.11%)	1 (0.10%)	2 (0.18%)	(0.20%)	
Not known, n (%)	-	4 (0.45%)	4 (0.38%)	6 (0.54%)	(0.51%)	

BMI, Body Mass Index; GCSE, General Certificate of Secondary Education; IMD, Index of Multiple Deprivation

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births. † Comparisons of term vs Late and moderate preterm groups carried out using Student t-tests for continuous variables and χ^2 test for categorical variables.

Table S3: Resource use by birth status (all births) post initial hospital discharge to 24 months

	Moderate preterm 32-33 weeks	Late preterm 34-36 weeks	Late and moderate preterm 32-36 weeks	Term ? 37 weeks	Term ? 37 weeks Re-weighted±	P value†
Post discharge to 6months						
Number of infants	107	674	781	939		
Hospital care						
Inpatient admissions, n (%)	38 (35.51%)	192 (28.49%)	230 (29.45%)	162 (17.25%)	(16.46%)	<0.001
No of admissions, mean (SE)	0.34 (0.06)	0.26 (0.02)	0.27 (0.02)	0.16 (0.01)	0.15 (0.01)	<0.001
Cumulative inpatient length of stay, mean (SE)	1.21 (0.31)	0.67 (0.11)	0.74 (0.10)	0.35 (0.10)	0.34 (0.11)	<0.001
Cumulative inpatient length of stay, median (IQR)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-	-
Admission to day care, n (%)	25 (23.36%)	161 (23.89%)	186 (23.88%)	121 (13.00%)	(12.08%)	<0.001
No of admissions, mean (SE)	0.24 (0.06)	0.25 (0.02)	0.25 (0.02)	0.13 (0.01)	0.12 (0.01)	<0.001
A&E visits, n (%)	32 (29.91%)	167 (24.78%)	199 (25.61%)	176 (18.90%)	(18.01%)	<0.001
Mean visits (SE)	0.33 (0.08)	0.25 (0.02)	0.26 (0.02)	0.18 (0.01)	0.17 (0.01)	<0.001
Other outpatient department visits, n (%)	53 (49.53%)	198 (29.38%)	251 (32.35%)	189 (20.28%)	(19.74%)	<0.001
Mean visits (SE)	0.85 (0.14)	0.46 (0.04)	0.52 (0.04)	0.27 (0.02)	0.27 (0.02)	<0.001
Community care						
Routine 6 weeks check, n (%)	100 (93.46%)	654 (97.03%)	754 (96.92%)	914 (97.86%)	(98.32%)	0.004
Immunisations, n (%)	107 (100%)	660 (97.92%)	767 (98.46%)	925 (99.04%)	(99.05%)	<0.001
Mean (SE)	2.00 (0.08)	2.25 (0.04)	2.21 (0.03)	2.35 (0.03)	2.33 (0.03)	0.001
Weight checks, n (%)	99 (92.52%)	637 (94.51%)	736 (94.60%)	880 (94.12%)	(94.35%)	0.017
Mean (SE)	5.46 (0.42)	5.56 (0.16)	5.55 (0.15)	4.91 (0.12)	4.83 (0.11)	<0.001
Health Visitor visits, n (%)	101 (94.39%)	632 (93.77%)	733 (94.22%)	854 (91.43%)	(91.10%)	<0.001
Mean visits (SE)	3.62 (0.34)	3.77 (0.13)	3.75 (0.12)	3.10 (0.08)	3.02 (0.08)	<0.001
GP visits, n (%)	78 (72.90%)	471 (69.88%)	549 (70.38%)	651(69.70%)	(71.00%)	0.089
Mean visits (SE)	1.44 (0.15)	1.47 (0.08)	1.47 (0.07)	1.35 (0.05)	1.32 (0.05)	0.001
Community paediatrician visits, n (%)	9 (8.41%)	35 (5.19%)	44 (5.67%)	29 (3.12%)	(3.05%)	<0.001
Mean visits (SE)	0.14 (0.05)	0.07 (0.01)	0.08 (0.01)	0.04 (0.01)	0.05 (0.01)	<0.001
Physiotherapy visits, n (%)	8 (7.48%)	14 (2.08%)	22 (2.83%)	16 (1.72%)	(1.29%)	0.004
Mean visits (SE)	0.09 (0.03)	0.03 (0.01)	0.04 (0.01)	0.03 (0.01)	0.02 (0.01)	0.001
Community nurse visits, n (%)	7 (6.54%)	27 (4.01%)	34 (4.38%)	31 (3.33%)	(3.06%)	0.001
Mean visits (SE)	0.25 (0.11)	0.10 (0.03)	0.12 (0.03)	0.05 (0.01)	0.05 (0.01)	<0.001
Walk in centre contacts, n (%)	13 (12.15%)	106 (15.73%)	119 (15.32%)	135 (14.50%)	(15.00%)	0.049
Mean contacts (SE)	0.09 (0.02)	0.21 (0.02)	0.19 (0.02)	0.14 (0.01)	0.15 (0.01)	0.001
Telephone calls to NHS Direct, n (%)	27 (25.23%)	180 (26.71%)	207 (26.68%)	217 (23.31%)	(23.43%)	<0.001
Mean (SE)	0.27 (0.05)	0.31 (0.03)	0.31 (0.02)	0.25 (0.02)	0.26 (0.02)	<0.001
Any prescribed medications, n (%)	66 (61.68%)	345 (51.19%)	411 (52.69%)	467 (49.73%)	(50.86%)	0.012
Time off work, n (%)	16 (14.95%)	82 (12.17%)	98 (12.55%)	55 (5.86%)	(5.13%)	<0.001
Days off work, mean (SE)	1.89 (0.99)	2.01 (1.17)	1.99 (1.02)	0.19 (0.04)	0.19 (0.04)	<0.001
Days off work, median (IQR)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-	-
Provided with special equipment, n (%)	11 (10.28%)	34 (5.04%)	45 (5.76%)	19 (2.02%)	(2.29%)	<0.001
Adaptations to home, n (%)	2 (1.87%)	4 9 (0.59%)	6 (0.77%)	9 (0.96%)	(0.95%)	<0.001
6 months to 12 months						
Number of infants	98	605	703	856		

Hospital care						
Inpatient admissions, n (%)	13 (13.27%)	79 (13.06%)	92 (13.09%)	89 (10.43%)	(11.35%)	0.385
No of admissions, mean (SE)	0.10 (0.03)	0.12 (0.01)	0.11 (0.01)	0.08 (0.01)	0.09 (0.01)	0.005
Cumulative inpatient length of stay, mean (SE)	0.41 (0.21)	0.38 (0.23)	0.38 (0.20)	0.11 (0.02)	0.13 (0.03)	<0.001
Cumulative inpatient length of stay, median (IQR)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-	-
Admission to day care, n (%)	11 (11.22%)	63 (10.41%)	74 (10.53%)	61 (7.13%)	(7.53%)	0.002
No of admissions, mean (SE)	0.26 (0.08)	0.24 (0.03)	0.24 (0.03)	0.18 (0.02)	0.20 (0.02)	0.004
A&E visits, n (%)	24 (24.49%)	128 (21.16%)	152 (21.62%)	155 (18.11%)	(20.28%)	0.056
Mean visits (SE)	0.51 (0.10)	0.49 (0.04)	0.49 (0.04)	0.42 (0.03)	0.47 (0.03)	0.187
Other outpatient department visits, n (%)	31 (31.63%)	129 (21.32%)	160 (22.76%)	139 (16.24%)	(15.88%)	<0.001
Mean visits (SE)	0.77 (0.13)	0.52 (0.04)	0.55 (0.04)	0.43 (0.04)	0.44 (0.04)	<0.001
Community care						
Immunisations, n (%)	94 (95.92%)	528 (87.27%)	622 (88.48%)	710 (82.94%)	(85.00%)	0.006
Mean (SE)	1.93 (0.07)	2.07 (0.05)	2.05 (0.05)	2.06 (0.04)	2.12 (0.04)	0.019
Weight checks, n (%)	89 (90.82%)	510 (84.30%)	599 (85.21%)	722 (84.35%)	(84.43%)	<0.001
Mean (SE)	2.38 (0.21)	2.68 (0.10)	2.64 (0.09)	2.80 (0.08)	2.84 (0.09)	0.001
Health Visitor visits, n (%)	74 (75.51%)	438 (72.40%)	512 (72.83%)	603 (70.44%)	(70.38%)	<0.001
Mean visits (SE)	1.78 (0.17)	2.00 (0.08)	1.97 (0.07)	1.93 (0.06)	1.96 (0.06)	0.513
Hearing/developmental checks, n (%)	63 (64.29%)	342 (56.53%)	405 (57.61%)	475 (55.49%)	(55.83%)	<0.001
Mean (SE)	1.31 (0.11)	1.31 (0.05)	1.31 (0.05)	1.35 (0.05)	1.37 (0.05)	<0.001
GP visits, n (%)	75 (76.53%)	448 (74.05%)	523 (74.40%)	612 (71.50%)	(71.97%)	<0.001
Mean visits (SE)	1.88 (0.16)	2.07 (0.08)	2.04 (0.07)	1.98 (0.06)	2.00 (0.06)	0.008
Community paediatrician visits, n (%)	11 (11.22%)	40 (6.61%)	51 (7.25%)	32 (3.74%)	(4.26%)	0.001
Mean visits (SE)	0.21 (0.06)	0.17 (0.03)	0.17 (0.03)	0.11 (0.02)	0.12 (0.02)	0.002
Physiotherapy visits, n (%)	6 (6.12%)	13 (2.15%)	19 (2.70%)	10 (1.17%)	(1.05%)	<0.001
Mean visits (SE)	0.13 (0.05)	0.08 (0.03)	0.09 (0.03)	0.04 (0.02)	0.04 (0.02)	<0.001
Community nurse visits, n (%)	2 (2.04%)	25 (4.13%)	27 (3.84%)	22 (2.57%)	(2.25%)	0.002
Mean visits (SE)	0.11 (0.09)	0.10 (0.02)	0.10 (0.02)	0.07 (0.02)	0.06 (0.02)	0.001
Walk in centre contacts, n (%)	13 (13.27%)	111 (18.35%)	124 (17.64%)	147 (17.17%)	(17.87%)	0.158
Mean contacts (SE)	0.023 (0.06)	0.45 (0.04)	0.42 (0.04)	0.40 (0.03)	0.43 (0.03)	0.083
Telephone calls to NHS Direct, n (%)	30 (30.61%)	165 (27.27%)	195 (27.74%)	233 (27.22%)	(28.07%)	0.118
Mean (SE)	0.62 (0.10)	0.66 (0.05)	0.65 (0.04)	0.64 (0.04)	0.67 (0.04)	0.036
Any prescribed medications, n (%)	53 (54.08%)	277 (45.79%)	330 (46.94%)	405 (47.31%)	(47.95%)	0.009
Time off work, n (%)	22 (22.45%)	141 (23.31%)	163 (23.19%)	179 (20.91%)	(20.75%)	<0.001
Days off work, mean (SE)	2.48 (1.83)	0.93 (0.11)	1.15 (0.27)	0.89 (0.14)	0.91 (0.15)	<0.001
Days off work, median (IQR)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-	-
Provided with special equipment, n (%)	5 (5.10%)	21 (3.47%)	26 (3.70%)	14 (1.64%)	(1.77%)	<0.001
Adaptations to home, n (%)	0 (0.00%)	3 (0.50%)	3 (0.43%)	9 (1.05%)	(1.03%)	<0.001
12 months to 24 months						
Number of infants	93	558	651	771		
Hospital care						
Inpatient admissions, n (%)	12 (12.90%)	76 (13.62%)	88 (13.52%)	66 (8.56%)	(8.39%)	<0.001
No of admissions, mean (SE)	0.15 (0.05)	0.16 (0.02)	0.16 (0.02)	0.10 (0.01)	0.10 (0.01)	<0.001
Cumulative inpatient length of stay, mean (SE)	0.62 (0.39)	0.93 (0.66)	0.89 (0.56)	0.25 (0.07)	0.28 (0.08)	<0.001
Cumulative inpatient length of stay, median (IQR)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-	-
Paediatric outpatient department visits, n (%)	25 (26.88%)	98 (17.56%)	123 (18.89%)	102 (13.23%)	(14.38%)	<0.001
Mean visits(SE)	0.29 (0.05)	0.19 (0.02)	0.20 (0.02)	0.14 (0.01)	0.15 (0.01)	0.001

A&E visits, n (%)	26 (27.96%)	158 (28.32%)	184 (28.26%)	169 (21.92%)	(22.38%)	<0.001
Mean visits (SE)	0.28 (0.05)	0.29 (0.02)	0.29 (0.02)	0.22 (0.02)	0.23 (0.02)	<0.001
Other outpatient department visits, n (%)	17 (18.28%)	107 (19.18%)	124 (19.05%)	90 (11.67%)	(12.36%)	<0.001
Mean visits (SE)	0.18 (0.04)	0.200 (0.02)	0.20 (0.02)	0.12 (0.01)	0.13 (0.01)	<0.001
Community care						
GP visits, n (%)	77 (82.80%)	447 (80.11%)	524 (80.49%)	582 (75.49%)	(75.76%)	<0.001
Mean visits (SE)	0.92 (0.05)	0.96 (0.03)	0.95 (0.03)	0.87 (0.02)	0.86 (0.02)	<0.001
Practice nurse visits, n (%)	16 (17.20%)	112 (20.07%)	128 (19.66%)	161 (20.88%)	(20.51%)	0.004
Mean visits (SE)	0.17 (0.04)	0.20 (0.02)	0.20 (0.02)	0.21 (0.02)	0.21 (0.02)	0.001
Community paediatrician visits, n (%)	4 (4.30%)	19 (3.41%)	23 (3.53%)	19 (2.46%)	(2.28%)	<0.001
Mean visits (SE)	0.04 (0.02)	0.04 (0.01)	0.04 (0.01)	0.03 (0.01)	0.03 (0.01)	<0.001
Physiotherapy visits, n (%)	6 (6.45%)	17 (3.05%)	23 (3.53%)	13 (1.69%)	(1.76%)	<0.001
Mean visits (SE)	0.08 (0.03)	0.06 (0.02)	0.06 (0.02)	0.03 (0.01)	0.03 (0.01)	<0.001
Speech & Language therapist visits, n (%)	9 (9.68%)	32 (5.73%)	41 (6.30%)	13 (1.69%)	(1.46%)	<0.001
Mean visits (SE)	0.15 (0.06)	0.08 (0.02)	0.09 (0.02)	0.02 (0.00)	0.02 (0.00)	<0.001
Occupational therapist visits, n (%)	0 (0.00%)	8 (1.43%)	8.00 (1.23%)	4.00 (0.52%)	(0.63%)	0.002
Mean visits (SE)	0 (0.00)	0.03 (0.01)	0.03 (0.01)	0.01 (0.01)	0.01 (0.01)	0.001
Community nurse visits, n (%)	1 (1.08%)	13 (2.33%)	14.00 (2.15%)	22.00 (2.85%)	(2.91%)	<0.001
Mean visits (SE)	0.01 (0.01)	0.04 (0.01)	0.03 (0.01)	0.03 (0.01)	0.03 (0.01)	0.010
Walk in centre contacts, n (%)	20 (21.51%)	150 (26.88%)	170 (26.11%)	179 (23.22%)	(24.27%)	0.007
Mean contacts (SE)	0.22 (0.04)	0.27 (0.02)	0.27 (0.02)	0.23 (0.02)	0.24 (0.02)	0.005
Telephone calls to NHS Direct, n (%)	25 (26.88%)	179 (32.08%)	204 (31.34%)	190 (24.64%)	(24.82%)	<0.001
Mean (SE)	0.27 (0.05)	0.33 (0.02)	0.32 (0.02)	0.25 (0.02)	0.26 (0.02)	<0.001
Other Services, n (%)	6 (6.45%)	38 (6.81%)	44 (6.76%)	25 (3.24%)	(3.37%)	<0.001
Mean (SE)	0.06 (0.03)	0.09 (0.01)	0.08 (0.01)	0.06 (0.02)	0.06 (0.02)	0.001
Any prescribed medications, n (%)	51 (54.84%)	308 (55.20%)	359 (55.15%)	436 (56.55%)	(56.91%)	<0.001
Time off work, n (%)	24 (25.81%)	159 (28.49%)	183 (28.11%)	200 (25.94%)	(23.88%)	0.006
Days off work, mean (SE)	2.11 (0.71)	2.00 (0.37)	2.02 (0.33)	1.19 (0.12)	1.16 (0.11)	<0.001
Days off work, median (IQR)	0.00 (0.00)	0.00 (2.00)	0.00 (2.00)	0.00 (0.50)	-	-
Provided with special equipment, n (%)	3 (3.23%)	14 (2.51%)	17 (2.61%)	14 (1.82%)	(1.93%)	<0.001
Adaptations to home, n (%)	0 (0.00%)	5 (0.90%)	5 (0.77%)	3 (0.39%)	(0.31%)	0.004

SE, Standard error; IQR, Inter-quartile range; CI, confidence interval; PSS, personal and social services;

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births.
† Comparisons of term vs combined late and moderate preterm groups carried out using Student t-tests

Table S4: Economic costs of late and moderate preterm and term infants from initial hospital discharge to 24 months; Mean (SE) by cost category

	Moderate preterm 32-33 weeks	Late preterm 34-36 weeks	Late and moderate preterm 32-36 weeks	Term ≥ 37 weeks Re-weighted±	P value†
Post discharge to 6 months					
Number of infants	107	674	781	939	
Hospital care costs, mean (SE)					
Inpatient care	570.38 (142.58)	349.86 (46.23)	379.18 (44.36)	185.38 (39.68)	<0.001
Other outpatient department	137.77 (22.42)	75.74 (6.24)	84.04 (6.22)	43.93 (3.92)	<0.001
A&E	38.19 (9.74)	29.59 (2.39)	30.69 (2.45)	20.23 (1.70)	<0.001
Day care	32.43 (7.73)	32.84 (2.68)	32.70 (2.54)	15.55 (1.54)	<0.001
Community care costs, mean (SE)					
Routine checks	27.79 (1.16)	32.26 (0.45)	31.57 (0.43)	33.83 (0.37)	<0.001
Immunisations	53.88 (2.04)	60.91 (0.96)	59.79 (0.89)	62.87 (0.74)	0.001
Weight checks	234.80 (18.15)	239.80 (6.80)	238.50 (6.37)	207.84 (4.88)	<0.001
Health Visitor	155.82 (14.47)	162.44 (5.46)	161.11 (5.11)	129.92 (3.65)	<0.001
Other GP	51.87 (5.48)	53.08 (2.78)	52.78 (2.51)	47.60 (1.71)	0.001
Community paediatrician	18.86 (6.94)	8.97 (1.80)	10.30 (1.82)	6.43 (1.58)	<0.001
Physiotherapy	3.03 (1.11)	1.22 (0.41)	1.46 (0.38)	0.86 (0.33)	0.001
Community nurse	12.39 (5.74)	5.07 (1.55)	6.06 (1.55)	2.29 (0.50)	<0.001
Walk in centre	3.42 (0.95)	7.90 (0.93)	7.27 (0.81)	5.65 (0.56)	0.001
Calls to NHS Direct	7.39 (1.40)	8.71 (0.72)	8.51 (0.65)	7.07 (0.49)	<0.001
Medication costs, mean (SE)	2.92 (0.76)	4.17 (0.60)	3.99 (0.52)	3.88 (1.01)	0.007
Lost earnings, mean (SE)	71.11 (31.45)	47.65 (20.83)	50.74 (18.43)	6.23 (1.66)	<0.001
Special equipment costs, mean (SE)	18.04 (13.42)	2.78 (0.75)	4.86 (1.95)	0.80 (0.51)	0.003
Adaptation costs , mean (SE)	3.36 (3.36)	0.93 (0.66)	1.26 (0.73)	29.85 (14.54)	0.001
NHS & PSS costs	1350.93 (172.40)	1072.56 (53.80)	1107.95 (52.07)	773.32 (42.51)	<0.001
Societal costs	1443.44 (185.60)	1123.91 (59.37)	1164.81 (57.18)	810.20 (45.22)	<0.001
6 months to 12 months					
Number of infants	98	605	703	856	
Hospital care costs, mean (SE)					
Inpatient care	164.00 (70.54)	168.25 (75.08)	167.66 (65.34)	76.97 (11.44)	<0.001
Other outpatient department	125.57 (21.76)	84.10 (7.07)	89.88 (6.82)	71.67 (6.91)	<0.001
A&E	59.53 (12.18)	56.76 (4.91)	57.14 (4.55)	55.33 (3.91)	0.187
Day care	34.97 (11.20)	31.33 (3.97)	31.84 (3.75)	25.95 (3.20)	0.004
Community care costs, mean (SE)					
Immunisations	52.14 (1.80)	55.91 (1.41)	55.38 (1.24)	57.25 (1.20)	0.019
Weight checks	102.35 (8.84)	115.09 (4.20)	113.32 (3.82)	122.31 (3.70)	0.001
Health Visitor	76.61 (7.15)	85.91 (3.34)	84.61 (3.04)	84.45 (2.79)	0.513
Hearing/developmental checks	56.52 (4.70)	56.14 (2.34)	56.20 (2.12)	58.80 (2.00)	0.001
Other GP	67.79 (5.70)	74.44 (2.86)	73.52 (2.59)	72.08 (2.17)	0.008
Community paediatrician	27.56 (8.26)	21.85 (3.67)	22.64 (3.36)	16.10 (3.09)	0.002
Physiotherapy	4.42 (1.77)	2.97 (1.05)	3.17 (0.94)	1.48 (0.70)	<0.001
Community nurse	5.29 (4.29)	5.05 (1.08)	5.09 (1.10)	3.25 (0.79)	0.001
Walk in centre	8.69 (2.42)	17.00 (1.66)	15.84 (1.47)	16.29 (1.24)	0.083
Calls to NHS Direct	17.06 (2.72)	18.11 (1.36)	17.96 (1.23)	18.50 (1.05)	0.036

Medication costs, mean (SE)	6.14 (2.98)	3.02 (0.93)	3.46 (0.90)	1.69 (0.22)	<0.001
Lost earnings, mean (SE)	6.50 (2.91)	25.16 (4.42)	22.56 (3.83)	91.20 (45.93)	0.001
Special equipment costs, mean (SE)	0.69 (0.38)	1.96 (0.87)	1.78 (0.75)	1.00 (0.43)	0.001
Adaptation costs , mean (SE)	0.00 (0.00)	0.12 (0.08)	0.10 (0.07)	16.44 (14.02)	0.005
NHS & PSS costs	808.64 (101.71)	795.95 (82.17)	797.72 (72.11)	682.10 (23.91)	0.001
Societal costs	815.83 (102.06)	823.19 (83.21)	822.17 (72.99)	790.73 (62.89)	0.028
12 months to 24 months					
Number of infants	93	558	651	771	
Hospital care costs, mean (SE)					
Inpatient care	253.00 (135.81)	717.85 (575.93)	651.44 (494.01)	162.68 (51.14)	<0.001
Paediatric outpatient department	36.85 (6.60)	23.61 (2.30)	25.50 (2.19)	19.13 (1.83)	0.001
Other outpatient department	28.79 (6.35)	31.65 (2.85)	31.24 (2.60)	20.74 (2.13)	<0.001
A&E	31.63 (5.29)	33.28 (2.31)	33.04 (2.12)	25.50 (1.72)	<0.001
Community care costs, mean (SE)					
Other GP	32.16 (1.86)	33.33 (1.01)	33.16 (0.91)	29.78 (0.78)	<0.001
Practice nurse	1.99 (0.46)	2.33 (0.20)	2.28 (0.18)	2.45 (0.18)	0.001
Community paediatrician	5.44 (2.68)	5.49 (1.43)	5.48 (1.28)	3.53 (0.99)	<0.001
Physiotherapy	2.55 (1.06)	2.10 (0.59)	2.17 (0.53)	0.91 (0.28)	<0.0001
Speech & Language therapist	5.02 (1.97)	2.73 (0.54)	3.06 (0.54)	0.51 (0.15)	<0.001
Occupational therapist	0.00 (0.00)	1.08 (0.44)	0.92 (0.37)	0.43 (0.22)	0.001
Community nurse	0.52 (0.52)	1.78 (0.59)	1.60 (0.51)	1.46 (0.31)	0.010
Walk in centre	7.90 (1.57)	10.07 (0.71)	9.76 (0.65)	8.97 (0.57)	0.005
Calls to NHS Direct	7.19 (1.24)	8.86 (0.57)	8.63 (0.52)	6.85 (0.44)	<0.001
Other services	7.68 (3.37)	9.95 (1.71)	9.62 (1.54)	3.91 (0.86)	<0.001
Medication costs, mean (SE)	3.51 (2.33)	1.70 (0.49)	1.96 (0.53)	2.23 (0.50)	<0.001
Lost earnings, mean (SE)	201.31 (78.04)	184.58 (44.93)	186.97 (40.07)	101.62 (11.07)	<0.001
Special equipment costs, mean (SE)	0.81 (0.62)	1.15 (0.46)	1.10 (0.40)	1.50 (0.56)	0.006
Adaptation costs , mean (SE)	0.00 (0.00)	24.13 (13.28)	20.68 (11.39)	0.83 (0.70)	<0.001
NHS & PSS costs	424.22 (143.93)	885.81 (577.73)	819.87 (495.59)	289.08 (53.48)	<0.001
Societal costs	626.34 (197.56)	1095.66 (579.60)	1028.62 (497.57)	393.02 (59.27)	<0.001

SE, Standard error; IQR, Inter-quartile range; CI, confidence interval; PSS, personal and social services;

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births.

† Comparisons of term vs combined late and moderate preterm groups carried out using Student t-tests

Table S5: Economic costs of late and moderate preterm and term infants from initial hospital discharge to 24 months; Mean (SE) by cost category and complete cases

	Moderate preterm 32-33 weeks	Late preterm 34-36 weeks	Late and moderate preterm 32-36 weeks	Term ≥ 37 weeks Re-weighted±	P value†
Post discharge to 6 months					
Number of infants	85	509	594	716	
Hospital care costs, mean (SE)					
Inpatient care	552.28 (172.93)	316.9 (50.89)	350.58 (50.18)	173.35 (44.75)	<0.001
Other outpatient department	123.49 (25.29)	73.15 (6.86)	80.36 (6.93)	43.54 (3.99)	<0.001
A&E	26.21 (5.34)	24.72 (2.41)	24.94 (2.20)	17.71 (1.84)	0.001
Day care	23.87 (5.52)	32.08 (3.01)	30.90 (2.70)	14.00 (1.80)	<0.001
Community care costs, mean (SE)					
Routine checks	24.99 (1.62)	31.3 (0.57)	30.39 (0.55)	33.83 (0.45)	<0.001
Immunisations	49.12 (2.92)	58.98 (1.15)	57.57 (1.08)	62.90 (0.88)	<0.001
Weight checks	214.53 (21.5)	233.92 (8.09)	231.14 (7.58)	207.77 (5.93)	0.001
Health Visitor	144.07 (17.31)	157.16 (6.34)	155.29 (5.97)	129.44 (4.19)	<0.001
Other GP	44.84 (5.71)	47.41 (2.94)	47.04 (2.64)	45.74 (2.11)	0.009
Community paediatrician	17.09 (7.47)	7.32 (1.82)	8.72 (1.89)	6.80 (1.83)	<0.001
Physiotherapy	2.51 (1.16)	0.79 (0.33)	1.04 (0.33)	0.99 (0.41)	0.082
Community nurse	15.09 (7.19)	3.68 (1.04)	5.31 (1.37)	2.13 (0.59)	<0.001
Walk in centre	2.03 (0.89)	7.61 (1.02)	6.81 (0.89)	5.52 (0.62)	0.002
Calls to NHS Direct	5.8 (1.35)	8.41 (0.80)	8.03 (0.71)	6.91 (0.56)	<0.001
Medication costs, mean (SE)	2.54 (0.80)	3.44 (0.51)	3.31 (0.45)	4.07 (1.15)	<0.001
Lost earnings, mean (SE)	35.32 (19.44)	37.39 (25.13)	37.09 (21.71)	4.56 (1.4)	<0.001
Special equipment costs, mean (SE)	5.36 (2.15)	2.19 (0.67)	2.64 (0.66)	0.86 (2.14)	0.022
Adaptation costs , mean (SE)	4.24 (4.24)	0.46 (0.41)	1.00 (0.70)	18.61 (14.59)	0.001
NHS & PSS costs	1248.45 (203.19)	1006.87 (58.04)	1041.44 (57.64)	754.70 (48.43)	<0.001
Societal costs	1293.36 (205.66)	1046.9 (65.66)	1082.17 (63.52)	778.72 (50.89)	<0.001
6 months to 12 months					
Number of infants	85	509	594	716	
Hospital care costs, mean (SE)					
Inpatient care	144.02 (71.64)	172.27 (88.09)	168.23 (76.16)	67.73 (10.77)	<0.001
Other outpatient department	121.18 (23.99)	81.51 (7.64)	87.19 (7.41)	68.02 (6.67)	<0.001
A&E	43.82 (10.59)	53.03 (5.28)	51.71 (4.77)	52.49 (4.01)	0.369
Day care	21.00 (7.89)	30.86 (4.34)	29.45 (3.89)	24.31 (3.25)	0.002
Community care costs, mean (SE)					
Immunisations	46.78 (2.67)	53.54 (1.39)	52.58 (1.25)	55.87 (1.25)	0.005
Weight checks	84.95 (8.26)	107.23 (4.32)	104.04 (3.89)	121.15 (3.82)	<0.001
Health Visitor	64.76 (8.01)	80.96 (3.4)	78.64 (3.13)	83.77 (2.86)	0.001
Hearing/developmental checks	54.27 (5.19)	54.10 (2.39)	54.12 (2.18)	58.25 (2.17)	0.001
Other GP	62.76 (6.46)	72.75 (3.03)	71.32 (2.76)	70.49 (2.22)	0.021
Community paediatrician	28.92 (9.11)	17.89 (3.3)	19.47 (3.11)	16.68 (3.09)	0.007
Physiotherapy	5.10 (2.03)	2.20 (0.87)	2.61 (0.80)	0.90 (0.36)	<0.001
Community nurse	6.10 (4.94)	4.00 (1.08)	4.30 (1.16)	3.55 (0.94)	0.013
Walk in centre	6.52 (2.25)	15.12 (1.61)	13.89 (1.42)	16.34 (1.29)	0.008
Calls to NHS Direct	13.43 (2.68)	17.90 (1.43)	17.26 (1.29)	18.77 (1.14)	0.005

Medication costs, mean (SE)	6.77 (3.43)	2.05 (0.38)	2.72 (0.59)	1.74 (0.23)	<0.001
Lost earnings, mean (SE)	4.58 (2.66)	21.15 (4.32)	18.78 (3.73)	45.21 (15.04)	0.001
Special equipment costs, mean (SE)	0.80 (0.44)	1.43 (0.78)	1.34 (0.67)	1.05 (0.46)	0.003
Adaptation costs , mean (SE)	0.00 (0.00)	0.06 (0.06)	0.06 (0.06)	18.03 (14.70)	0.001
NHS & PSS costs	710.38 (104.55)	765.41 (95.42)	757.53 (83.1)	660.03 (22.35)	0.001
Societal costs	715.76 (105.01)	788.05 (96.54)	777.71 (84.06)	724.30 (33.59)	0.007
12 months to 24 months					
Number of infants	85	509	594	716	
Hospital care costs, mean (SE)					
Inpatient care	262.85 (148.04)	770.3 (631.34)	697.68 (541.38)	150.48 (48.51)	<0.001
Paediatric outpatient department	35.85 (6.92)	23.64 (2.43)	25.39 (2.31)	18.24 (1.70)	<0.001
Other outpatient department	27.79 (6.55)	31.28 (2.96)	30.78 (2.70)	18.64 (1.88)	<0.001
A&E	29.29 (5.41)	32.47 (2.40)	32.02 (2.20)	25.26 (1.76)	<0.001
Community care costs, mean (SE)					
Other GP	28.64 (2.19)	32.36 (1.09)	31.82 (0.99)	29.43 (0.80)	<0.001
Practice nurse	2.05 (0.48)	2.35 (0.21)	2.30 (0.19)	2.48 (0.18)	<0.001
Community paediatrician	5.96 (2.92)	5.27 (1.46)	5.37 (1.32)	2.91 (0.76)	<0.001
Physiotherapy	2.78 (1.16)	2.31 (0.65)	2.37 (0.58)	0.67 (0.19)	<0.001
Speech & Language therapist	5.10 (2.12)	2.56 (0.55)	2.92 (0.56)	0.42 (0.15)	<0.001
Occupational therapist	0.00 (0.00)	1.18 (0.48)	1.01 (0.41)	0.24 (0.12)	<0.001
Community nurse	0.57 (0.57)	1.83 (0.64)	1.65 (0.55)	1.47 (0.36)	0.012
Walk in centre	6.48 (1.53)	10.03 (0.75)	9.52 (0.68)	9.13 (0.59)	0.033
Calls to NHS Direct	6.61 (1.26)	8.67 (0.60)	8.37 (0.55)	6.80 (0.44)	<0.001
Other services	8.39 (3.68)	10.52 (1.85)	10.21 (1.67)	3.91 (1.06)	<0.001
Medication costs, mean (SE)	3.82 (2.55)	1.66 (0.52)	1.97 (0.58)	2.19 (0.48)	0.009
Lost earnings, mean (SE)	212.97 (85.2)	197.4 (49.01)	199.63 (43.71)	106.09 (11.23)	<0.001
Special equipment costs, mean (SE)	0.89 (0.68)	1.26 (0.5)	1.2 (0.44)	1.41 (0.52)	0.015
Adaptation costs , mean (SE)	0 (0)	26.45 (14.56)	22.66 (12.48)	0.06 (0.05)	<0.001
NHS & PSS costs	426.18 (157.01)	936.42 (633.31)	863.4 (543.12)	272.27 (50.13)	<0.001
Societal costs	640.05 (215.8)	1161.53 (635.32)	1086.9 (545.25)	379.83 (55.59)	<0.001

SE, Standard error; IQR, Inter-quartile range; CI, confidence interval; PSS, personal and social services;

± All estimates were additionally recalculated following weighting of the random sample of term births to adjust for the over-sampling of term multiple births.

† Comparisons of term vs combined late and moderate preterm groups carried out using Student t-tests

Table S6: Relationship between gestational age at birth and total birth to initial hospital discharge costs; Generalised Linear Model (Gamma distribution with log link)

	Model 1		Model 2		Model 3	
Variable (unit)	**Relative Cost (SE)**	**P>|t|**	**Relative Cost (SE)**	**P>|t|**	**Relative Cost (SE)**	**P>|t|**
GA Status (Referent= Term)						
Late preterm	1.98 (0.07)	<0.001	1.92 (0.06)	<0.001	1.87 (0.1)	<0.001
Moderate preterm	5.02 (0.22)	<0.001	4.94 (0.23)	<0.001	4.42 (0.33)	<0.001
Place of delivery (Referent= Centre 1)						
Centre 2	1.23 (0.04)	<0.001	1.21 (0.03)	<0.001	1.12 (0.05)	0.011
Other	1.14 (0.12)	0.218	0.95 (0.07)	0.462	0.97 (0.09)	0.762
Mode of delivery (Referent= Spontaneous Vaginal)						
Assisted/instrumental	1.34 (0.05)	<0.001	1.34 (0.05)	<0.001	1.42 (0.1)	<0.001
CS labouring	2.07 (0.08)	<0.001	2.17 (0.08)	<0.001	1.98 (0.12)	<0.001
CS not in labour	2.03 (0.09)	<0.001	2.11 (0.08)	<0.001	1.98 (0.1)	<0.001
Baby Status (Referent= Alive)						
Stillbirth	0.66 (0.12)	0.025	0.72 (0.14)	0.079	0.74 (0.16)	0.156
Early neonatal death	1.16 (0.57)	0.754	1.09 (0.51)	0.851	1.91 (0.64)	0.055
Late neonatal death	1.03 (0.05)	0.546	1.06 (0.08)	0.429	0.00	(-)
Infant death	1.83 (0.73)	0.134	1.84 (0.76)	0.137	0.77 (0.14)	0.163
Multiplicity (Referent= Singleton)						
Multiple	0.90 (0.05)	0.038	0.85 (0.04)	0.001	0.82 (0.06)	0.007
Gender (Referent= Male)	0.97 (0.03)	0.277	0.98 (0.03)	0.438	0.97 (0.04)	0.530
***Small for gestational age (Referent= No)**	1.26 (0.07)	<0.001	1.26 (0.07)	<0.001	1.33 (0.12)	0.001
Congenital Anomaly (Referent= No)	5.91 (2)	<0.001	5.86 (1.75)	<0.001	5.28 (1.73)	<0.001
First Born (Referent= No)	1.05 (0.03)	0.144	1.03 (0.03)	0.311	1.03 (0.06)	0.682
Maternal age			1.00 (0.00)	0.909	1.00 (0.01)	0.676
Maternal BMI (Referent= Normal)						
Underweight			0.97 (0.06)	0.625	0.86 (0.07)	0.066
Overweight			1.02 (0.04)	0.593	1.11 (0.07)	0.070
Obese			1 (0.04)	0.923	1.07 (0.06)	0.216
Maternal Ethnicity (Referent= White)						
Mixed			0.93 (0.14)	0.630	1.03 (0.23)	0.897

Asian or Asian British	0.97 (0.04)	0.386	0.85 (0.06)	0.038
Black or Black British	0.91 (0.06)	0.126	1.06 (0.14)	0.668
Chinese or Other	0.96 (0.1)	0.698	1.11 (0.19)	0.553
Not known	1.12 (0.15)	0.386	0.93 (0.1)	0.530
Highest Qual (Referent= Higher Degree)				
Degree	0.91 (0.04)	0.022	0.9 (0.06)	0.123
A levels, Voc level 3 and equivalent	0.95 (0.05)	0.331	0.94 (0.07)	0.444
GCSE A*-C, Voc level 2 and equivalent	1.02 (0.06)	0.769	1.06 (0.1)	0.515
GCSE D-G, Voc level 1 and below	0.99 (0.07)	0.899	0.95 (0.1)	0.622
Qualification level unknown	0.96 (0.06)	0.540	1.04 (0.1)	0.669
No qualifications	0.99 (0.07)	0.943	1.06 (0.12)	0.640
Not known	1.11 (0.13)	0.360	0.78 (0.13)	0.128
Marital Civil Status (Referent= Living as part of a couple)	1.05 (0.07)	0.466	1.12 (0.11)	0.242
National Statistics Socio-economic Classification (Referent = Managerial and professional occupations)				
Intermediate occupations	0.97 (0.04)	0.469	1.01 (0.06)	0.901
Routine and manual occupations	0.99 (0.05)	0.801	1.01 (0.07)	0.895
Never worked and long term unemployed	1.01 (0.06)	0.833	0.98 (0.08)	0.814
Looking after family	0.95 (0.05)	0.321	0.99 (0.06)	0.844
Not known	0.85 (0.08)	0.097	1.00 (0.09)	0.983
Home ownership (Referent= Own)				
Rent	1.06 (0.03)	0.077	1.03 (0.05)	0.611
Live rent free	1 (0.06)	0.989	0.78 (0.08)	0.015
EQ-5D Utility Score	1.10 (0.1)	0.286	1.14 (0.17)	0.389
Chronic health problems (Referent= No)	1.00 (0.03)	0.888	0.95 (0.04)	0.182
Deprivation Score (Referent = First Quintile)				
Second quintile	1.04 (0.04)	0.311	0.98 (0.05)	0.678
Third quintile	1.12 (0.05)	0.007	1.1 (0.07)	0.137
Fourth quintile	1.04 (0.05)	0.477	1.12 (0.09)	0.172
Fifth quintile	1.05 (0.05)	0.274	1.07 (0.09)	0.398
Recreational drugs during pregnancy (Referent= No)	1.09 (0.14)	0.473	0.97 (0.14)	0.824
Smoke during pregnancy (Referent= No)	0.91 (0.04)	0.039	0.88 (0.07)	0.084
Previous premature baby (Referent= No)			1.08 (0.07)	0.236

Drink during pregnancy (Referent= No)					0.99 (0.05)	0.861
Constant	7.12 (0.03)	<0.001	7.05 (0.16)	<0.001	7.09 (0.24)	<0.001
N	2403		2281		958	
Adjusted R_2	42082.25		39998.57		16557.93	

*Based on Fetal weight centile <0.10

Table S7: Relationship between gestational age at birth and total birth to initial hospital discharge costs; Ordinary Least Squares model

	Model 1		Model 2		Model 3	
Variable (unit)	**Coefficient (SE)**	**P>|t|**	**Coefficient (SE)**	**P>|t|**	**Coefficient (SE)**	**P>|t|**
GA Status (Referent= Term)						
Late preterm	2224.13 (287.66)	<0.001	2054.33 (227.07)	<0.001	1798 (348.57)	<0.001
Moderate preterm	8340.15 (610.12)	<0.001	8266.45 (725.69)	<0.001	6991.9 (657.22)	<0.001
Place of delivery (Referent= Centre 1)						
Centre 2	582.41 (240.46)	0.016	637.89 (223.19)	0.004	429.57 (274.46)	0.118
Other	872.02 (340.57)	0.011	405.05 (347.15)	0.243	212.72 (496.93)	0.669
Mode of delivery (Referent= Spontaneous Vaginal)						
Assisted/instrumental	533.53 (194.04)	0.006	527.95 (201.8)	0.009	940.51 (288.25)	0.001
CS labouring	2126.07 (211.91)	<0.001	2398.17 (289.88)	<0.001	2052.6 (316.36)	<0.001
CS not in labour	3108.33 (665.05)	<0.001	3265.59 (734.67)	<0.001	2094.08 (322.76)	<0.001
Baby Status (Referent= Alive)						
Stillbirth	-3382.54 (897.48)	<0.001	-2685.53 (1046.48)	0.010	-2874.38 (1148.48)	0.012
Early neonatal death	-5776.21 (5455.49)	0.290	-6202.47 (5157.73)	0.229	74.08 (1708.77)	0.965
Late neonatal death	441.64 (276.55)	0.110	784.53 (597.82)	0.190	0.00	(-)
Infant death	16793.02 (11957.47)	0.160	16085.18 (12321.6)	0.192	-1462.16 (1269.91)	0.250
Multiplicity (Referent= Singleton)						
Multiple	-875.76 (502.61)	0.082	-1025.19 (448.49)	0.022	-607.27 (436.82)	0.165
Gender (Referent= Male)	143.15 (302.72)	0.636	142.21 (297.99)	0.633	-315.15 (267.05)	0.238
***Small for gestational age (Referent= No)**	754.49 (433.11)	0.082	741.47 (440.7)	0.093	1112.49 (617.64)	0.072
Congenital Anomaly (Referent= No)	20152.19 (9366.73)	0.032	21195.51 (9913.49)	0.033	16855.27 (5375.79)	0.002
First Born (Referent= No)	488.86 (258.11)	0.058	344.78 (180.79)	0.057	3.25 (358.23)	0.993
Maternal age			-3.09 (25.81)	0.905	0.41 (42.98)	0.992
Maternal BMI (Referent= Normal)						
Underweight			-498.5 (502.29)	0.321	-702.39 (472.28)	0.137
Overweight			-233.68 (305.81)	0.445	404.38 (345.26)	0.242
Obese			-521.05 (367.44)	0.156	-10.36 (300.92)	0.973
Maternal Ethnicity (Referent= White)						
Mixed			-1525.48 (1295.2)	0.239	-445.25 (1524.02)	0.770
Asian or Asian British			122.01 (272.4)	0.654	-440.25 (353.65)	0.213
Black or Black British			15.3 (675.2)	0.982	1729.81 (1793.95)	0.335

Chinese or Other		-92.09 (452.9)	0.839	215.33 (659.85)	0.744
Not known		1116.51 (762.84)	0.143	-384.87 (597.6)	0.520
Highest Qual (Referent= Higher Degree)					
Degree		-326 (260.84)	0.211	-151.4 (272.24)	0.578
A levels, Voc level 3 and equivalent		124.15 (326.04)	0.703	-118.49 (295.07)	0.688
GCSE A*-C, Voc level 2 and equivalent		155.35 (320.03)	0.627	351.75 (396.52)	0.375
GCSE D-G, Voc level 1 and below		1123.68 (1048.78)	0.284	466.25 (859.85)	0.588
Qualification level unknown		-174.58 (375.64)	0.642	338.83 (342.68)	0.323
No qualifications		177.56 (399.99)	0.657	381.2 (599.54)	0.525
Not known		516.81 (539.49)	0.338	-877.33 (962.2)	0.362
Marital Civil Status (Referent= Living as part of a couple)		654.84 (865.04)	0.449	761.25 (651.05)	0.243
National Statistics Socio-economic Classification (Referent = Managerial and professional occupations)					
Intermediate occupations		-195.83 (243.94)	0.422	-49.3 (272.15)	0.856
Routine and manual occupations		64.38 (265.24)	0.808	422.41 (457.77)	0.356
Never worked and long term unemployed		740.88 (762.66)	0.331	118.93 (411.57)	0.773
Looking after family		-151.88 (285.25)	0.594	217.12 (373.04)	0.561
Not known		-65.44 (599.9)	0.913	447.58 (531.93)	0.400
Home ownership (Referent= Own)					
Rent		279.55 (217.97)	0.200	-181.34 (236.03)	0.443
Live rent free		-420.96 (709.18)	0.553	-691.58 (531.74)	0.194
EQ-5D Utility Score		-166.64 (868.02)	0.848	1190.31 (1431.53)	0.406
Chronic health problems (Referent= No)		405.06 (394.61)	0.305	247.3 (291.1)	0.396
Deprivation Score (Referent = First Quintile)					
Second quintile		353.49 (249.31)	0.156	24.39 (247.47)	0.922
Third quintile		982.79 (570.52)	0.085	499.7 (369.01)	0.176
Fourth quintile		80.75 (239.5)	0.736	401.02 (335.01)	0.232
Fifth quintile		-31.82 (292.79)	0.913	263.86 (425.77)	0.536
Recreational drugs during pregnancy (Referent= No)		137.84 (499.02)	0.782	-178.63 (539.08)	0.740
Smoke during pregnancy (Referent= No)		-879.71 (656.28)	0.180	-700.4 (545.59)	0.200
Previous premature baby (Referent= No)				741.75 (484.88)	0.126
Drink during pregnancy (Referent= No)				177.04 (250.43)	0.480

Constant	399.81 (261.05)	0.126	378.66 (1232.69)	0.759	-742.62 (2411.1)	0.758
N	2403		2281		958	
R^2	0.2532		0.2651		0.3992	

*Based on Fetal weight centile <0.10

Table S8: Relationship between gestational age at birth and total birth to 24 months costs; Generalised Linear Model (Gamma distribution with Log link), complete cases

	Model 4		Model 5	
Variable (unit)	**Cost Ratio (SE)**	**P>|t|**	**Cost Ratio (SE)**	**P>|t|**
GA Status (Referent= Term)				
Late preterm	1.55 (0.07)	<0.001	1.57 (0.07)	<0.001
Moderate preterm	2.72 (0.20)	<0.001	2.70 (0.19)	<0.001
Place of delivery (Referent= Centre 1)				
Centre 2	1.13 (0.04)	0.003	1.11 (0.05)	0.013
Other	0.94 (0.1)	0.594	1.01 (0.13)	0.911
Mode of delivery (Referent= Spontaneous Vaginal)				
Assisted/instrumental	1.15 (0.06)	0.008	1.17 (0.06)	0.002
CS labouring	1.48 (0.07)	<0.001	1.45 (0.07)	<0.001
CS not in labour	1.65 (0.09)	<0.001	1.63 (0.08)	<0.001
Multiplicity (Referent= Singleton)				
Multiple	1.02 (0.06)	0.775	1.01 (0.06)	0.814
Gender (Referent= Male)	0.95 (0.04)	0.168	0.95 (0.04)	0.146
***Small for gestational age (Referent= No)**	1.10 (0.07)	0.121	1.10 (0.06)	0.093
Congenital Anomaly (Referent= No)	4.41 (1.61)	<0.001	4.24 (1.26)	<0.001
First Born (Referent= No)	1.09 (0.04)	0.023	1.10 (0.05)	0.024
Maternal age			1.01 (0.00)	0.075
Maternal Ethnicity (Referent= White)				
Mixed			1.01 (0.15)	0.927
Asian or Asian British			0.96 (0.07)	0.524
Black or Black British			1.05 (0.13)	0.677
Chinese or Other			1.33 (0.18)	0.036
Not known			0.73 (0.12)	0.065
Highest Qual (Referent= Higher Degree)				
Degree			0.96 (0.05)	0.451
A levels, Voc level 3 and equivalent			1.03 (0.07)	0.642

GCSE A*-C, Voc level 2 and equivalent			1.05 (0.09)	0.572
GCSE D-G, Voc level 1 and below			0.94 (0.09)	0.516
Qualification level unknown			1.06 (0.1)	0.523
No qualifications			0.98 (0.1)	0.875
Not known			0.92 (0.15)	0.602
Marital Civil Status (Referent= Living as part of a couple)			0.88 (0.06)	0.056
National Statistics Socio-economic Classification (Referent = Managerial and professional occupations)				
Intermediate occupations			0.95 (0.05)	0.395
Routine and manual occupations			1.07 (0.08)	0.373
Never worked and long term unemployed			0.95 (0.07)	0.451
Looking after family			0.88 (0.07)	0.098
Not known			0.77 (0.17)	0.237
Home ownership (Referent= Own)				
Rent			1.05 (0.06)	0.366
Live rent free			1.07 (0.1)	0.433
EQ-5D Utility Score			0.82 (0.12)	0.165
Chronic health problems (Referent= No)			0.97 (0.04)	0.413
Deprivation Score (Referent = First Quintile)				
Second quintile			1.07 (0.06)	0.229
Third quintile			1.05 (0.06)	0.407
Fourth quintile			1.01 (0.07)	0.846
Fifth quintile			1.09 (0.08)	0.236
Recreational drugs during pregnancy (Referent= No)			0.93 (0.12)	0.592
Smoke during pregnancy (Referent= No)			1.10 (0.08)	0.172
Constant	7.98 (0.05)	<0.001	7.89 (0.23)	<0.001
N	1310		1310	
AIC	24830.35		24873.01	

*Based on Fetal weight centile <0.10

Table S9: Relationship between gestational age at birth and total birth to 24 months societal costs; Ordinary Least Squares Model (complete cases)

	Model 4		Model 5	
Variable (unit)	**Coefficient (SE)**	**P>|t|**	**Coefficient (SE)**	**P>|t|**
GA Status (Referent= Term)				
Late preterm	2078.88 (369.87)	<0.001	2138.39 (373.44)	<0.001
Moderate preterm	7730.43 (886.31)	<0.001	7788.48 (847.29)	<0.001
Place of delivery (Referent= Centre 1)				
Centre 2	616.07 (275.32)	0.025	548.06 (284.55)	0.054
Other	58.32 (499.15)	0.907	111.08 (641.63)	0.863
Mode of delivery (Referent= Spontaneous Vaginal)				
Assisted/instrumental	600.61 (280.65)	0.033	700.76 (279.2)	0.012
CS labouring	1929.33 (353.14)	<0.001	1695.92 (399.23)	<0.001
CS not in labour	2768.95 (531.81)	<0.001	2453.28 (667.31)	<0.001
Multiplicity (Referent= Singleton)				
Multiple	669.07 (500.89)	0.182	601.85 (505.7)	0.234
Gender (Referent= Male)	-199.39 (273.93)	0.467	-241.19 (322.14)	0.454
***Small for gestational age (Referent= No)**	622.8 (453.88)	0.170	692.92 (446.25)	0.121
Congenital Anomaly (Referent= No)	18341.49 (7677.14)	0.017	18328.6 (7329.08)	0.013
First Born (Referent= No)	426.42 (323.17)	0.187	591.78 (319.72)	0.064
Maternal age			99.66 (49.09)	0.043
Maternal Ethnicity (Referent= White)				
Mixed			26.92 (2242.26)	0.990
Asian or Asian British			-239.99 (449.63)	0.594
Black or Black British			2322.8 (2876.89)	0.420
Chinese or Other			1143.25 (756.88)	0.131
Not known			-1494.92 (1104.69)	0.176
Highest Qual (Referent= Higher Degree)				
Degree			267.78 (351.89)	0.447
A levels, Voc level 3 and equivalent			733.87 (432.88)	0.090
GCSE A*-C, Voc level 2 and equivalent			615.73 (461.62)	0.182
GCSE D-G, Voc level 1 and below			1426.14 (1549.52)	0.358

Qualification level unknown			418.81 (601.18)	0.486
No qualifications			658.2 (745.07)	0.377
Not known			-197.28 (962.37)	0.838
Marital Civil Status (Referent= Living as part of a couple)			-893.83 (636.6)	0.161
National Statistics Socio-economic Classification (Referent = Managerial and professional occupations)				
Intermediate occupations			-448.65 (347.72)	0.197
Routine and manual occupations			376.04 (567.77)	0.508
Never worked and long term unemployed			-661.67 (540.05)	0.221
Looking after family			-958.02 (598.27)	0.110
Not known			-1819.99 (1128.99)	0.107
Home ownership (Referent= Own)				
Rent			497.76 (423.43)	0.240
Live rent free			595.64 (604.52)	0.325
EQ-5D Utility Score			-1261.04 (1546.2)	0.415
Chronic health problems (Referent= No)			-4.54 (473.53)	0.992
Deprivation Score (Referent = First Quintile)				
Second quintile			425.74 (359.87)	0.237
Third quintile			451.13 (550.89)	0.413
Fourth quintile			14.04 (394.47)	0.972
Fifth quintile			322.74 (531.63)	0.544
Recreational drugs during pregnancy (Referent= No)			-193.12 (693.01)	0.781
Smoke during pregnancy (Referent= No)			509.95 (450.94)	0.258
Constant	2518.23 (376.16)	<0.001	-45.94 (2442.42)	0.985
N	1310		1310	
R^2	0.3211		0.3421	
*Based on Fetal weight centile <0.10				

Table S10: Relationship between gestational age at birth and total birth to 24 months societal costs; Ordinary Least Squares Model (inverse probability weighted)

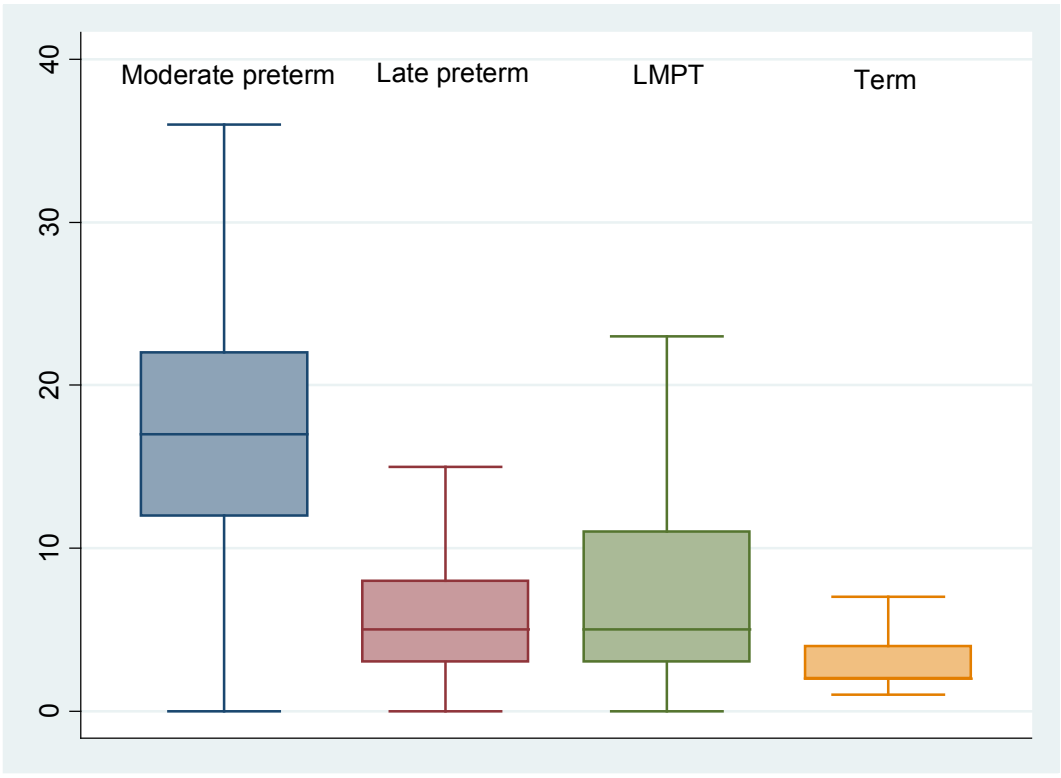
	Model 4		Model 5	
Variable (unit)	**Coefficient (SE)**	**P>|t|**	**Coefficient (SE)**	**P>|t|**
GA Status (Referent= Term)				
Late preterm	1859.63 (323.12)	<0.001	1962.59 (336.56)	<0.001
Moderate preterm	7606.67 (875.4)	<0.001	7583.32 (874.31)	<0.001
Place of delivery (Referent= Centre 1)				
Centre 2	640.35 (272.15)	0.019	519.27 (274.53)	0.059
Other	339.04 (628.8)	0.590	337.79 (779.25)	0.665
Mode of delivery (Referent= Spontaneous Vaginal)				
Assisted/instrumental	638.37 (322.01)	0.048	723.79 (305.36)	0.018
CS labouring	1915.96 (361.78)	<0.001	1735.21 (409.7)	<0.001
CS not in labour	2850.57 (482.66)	<0.001	2536.41 (623.21)	<0.001
Multiplicity (Referent= Singleton)				
Multiple	484.95 (408.38)	0.235	937.26 (502.13)	0.062
Gender (Referent= Male)	1025.93 (509.95)	0.044	-247.19 (333.94)	0.459
***Small for gestational age (Referent= No)**	-152.41 (254.13)	0.549	565.52 (425.64)	0.184
Congenital Anomaly (Referent= No)	17920.28 (7422.65)	0.016	18105.89 (7291.62)	0.013
First Born (Referent= No)	501.08 (300.03)	0.095	628.4 (311.26)	0.044
Maternal age			84.37 (42.2)	0.046
Maternal Ethnicity (Referent= White)				
Mixed			-1086.73 (1517.67)	0.474
Asian or Asian British			-308.54 (393.67)	0.433
Black or Black British			1460.1 (1720.18)	0.396
Chinese or Other			530.33 (821.91)	0.519
Not known			-1695.58 (1039.12)	0.103
Highest Qual (Referent= Higher Degree)				
Degree			313.85 (365.21)	0.390
A levels, Voc level 3 and equivalent			794.72 (416.66)	0.057
GCSE A*-C, Voc level 2 and equivalent			713.1 (460.8)	0.122
GCSE D-G, Voc level 1 and below			1018.11 (1234.38)	0.410

Qualification level unknown			507.36 (579.02)	0.381
No qualifications			656.95 (713.13)	0.357
Not known			341.21 (1048.26)	0.745
Marital Civil Status (Referent= Living as part of a couple)			-446.9 (484.01)	0.356
National Statistics Socio-economic Classification (Referent = Managerial and professional occupations)				
Intermediate occupations			-342.8 (365.47)	0.348
Routine and manual occupations			73.03 (513)	0.887
Never worked and long term unemployed			-507.1 (477.08)	0.288
Looking after family			-856.15 (555.45)	0.123
Not known			-1418.2 (1011.61)	0.161
Home ownership (Referent= Own)				
Rent			541.6 (375.41)	0.149
Live rent free			479.49 (540.36)	0.375
EQ-5D Utility Score			-835.85 (1084.75)	0.441
Chronic health problems (Referent= No)			-71.99 (398.36)	0.857
Deprivation Score (Referent = First Quintile)				
Second quintile			383.55 (392.94)	0.329
Third quintile			484.44 (537)	0.367
Fourth quintile			147.28 (398.85)	0.712
Fifth quintile			362.22 (472.69)	0.444
Recreational drugs during pregnancy (Referent= No)			630.68 (797.82)	0.429
Smoke during pregnancy (Referent= No)			54.98 (382.79)	0.886
Constant	2435.39 (314.03)	<0.001	46.55 (1969.24)	0.981
N	1310		1310	
R^2	0.3249		0.3419	

*Based on Fetal weight centile <0.10

Figure S1: Duration of initial hospitalisation by gestational age group

a) Median duration of initial hospitalisation by gestational age group



b) Median length of stay in neonatal unit by gestational age group