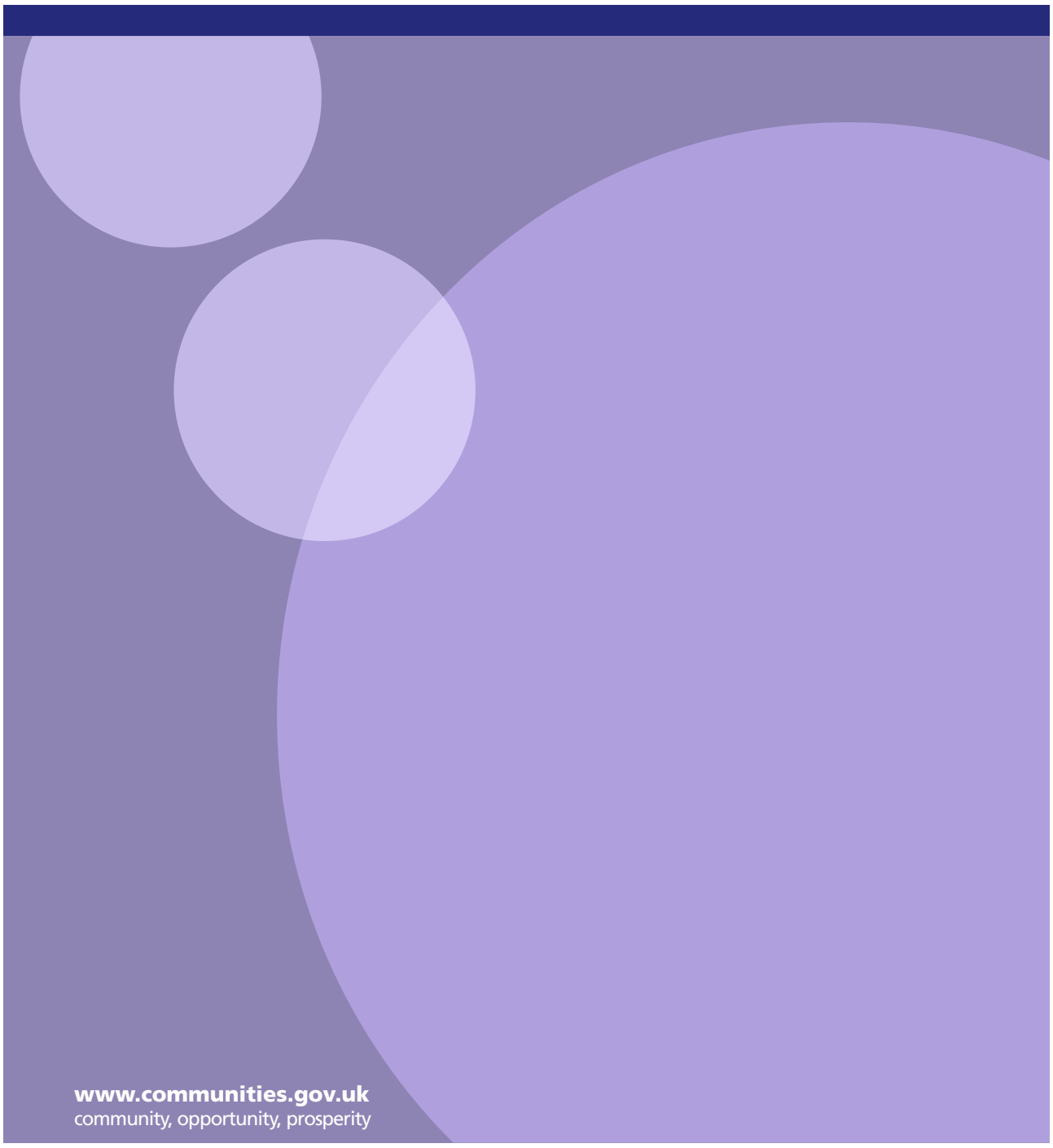
Communities and Local Government

Narrowing the gap?

Analysing the impact of the New Deal for Communities Programme on educational attainment



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Analysing the impact of the New Deal for Communities Programme on educational attainment

February 2010

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The findings and recommendations in this report are those of the authors and do not necessarily represent the views of the Department for Communities and Local Government.

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Executive summary

- This report uses individual level longitudinal data to analyse the impact of the New Deal for Communities (NDC) Programme on educational attainment for children living in the NDC areas between 2002 and 2007.
- The approach taken is to use a difference-in-difference estimation method to match children living in NDC partnership areas with similar children living in similarly deprived areas thereby controlling for time-varying observable characteristics and time-invariant unobservable characteristics. The approach followed is able to determine if educational attainment outcomes have improved over and above any improvements that might have been expected in the absence of the NDC Programme.
- There was little evidence of a Programme-wide improvement in attainment outcomes although there has been a significant positive improvement in key stage 3 science results at the Programme-wide level. Given that the NDC Programme may not have reached all children in an NDC partnership area and not all children in each partnership area had low educational attainment at the start of the Programme, it is perhaps not surprising that few Programme-wide effects were observed.
- Analyses were also carried out at the sub-group level and significant changes in attainment outcomes were observed for some sub-groups and some NDC partnerships. The vast majority of changes were positive; however, a few negative impacts were also observed for particular ethnic groups and children with the highest attainment levels in earlier examinations.
- An encouraging finding is that children living in areas with the highest levels of income deprivation and children with the lowest levels of educational attainment at the start of the NDC Programme have seen some of the most positive improvements in educational attainment.
- NDC partnership areas have high rates of pupil mobility and children living in the NDC partnership areas often attend a large number of different schools. Both of these factors could potentially hinder effective implementation of interventions to improve educational attainment. However, the analyses here indicate that these factors did not appear to cause differences in the improvement of educational attainment outcomes between NDC areas.
- The findings from this report raise some general policy implications for area-based initiatives. One key implication is that although rigorous statistical analysis gives reliable and accurate information about change, it does not inform us about causality. We do not have sufficient information about Programme interventions – particularly how interventions relate to the outcomes analysed – to attribute perceived success or failure to specific types of projects.
- Furthermore, it is important to consider that comparing NDC partnerships against a control group is essentially assessing what the NDC Programme can add in addition to mainstream policy and any other local initiatives that may be happening in the control areas. It is essential to understand the nature and overlap between mainstream and local policy to fully set the impact of the NDC Programme in context.

1. Introduction

One of the main aims of the New Deal for Communities (NDC) Programme is to narrow the gap between the 39 NDC partnership areas and the rest of the country by improving the outcomes for people living in the NDC partnerships on the key themes of: employment; crime; education and skills; health; and housing and the physical environment. Cross-sectional data analyses conducted by the National Evaluation Team have shown that the NDC partnerships are making progress on a variety of indicators, and some positive improvements are observed when comparing NDC partnerships with their local authorities and the rest of the country.[1] However, the evaluation has also shown that many other deprived areas have also experienced positive changes over time.[2] Thus, it is not clear whether the improvements seen in the NDC partnerships can be attributed to the NDC Programme. This report goes beyond simple cross-sectional analysis by using statistical modelling. By doing this it is possible to asses how the educational attainment outcomes of children living in the NDC partnership areas have improved relative to those of children living in other similarly deprived areas. The key question addressed is:

- Has the educational attainment of children living in the NDC partnerships improved relative to what would have happened in the absence of the NDC Programme?

To answer this question the report draws upon individual level longitudinal data which are available for children's educational attainment. These data contain a wealth of information on children in England including individual characteristics, attainment outcomes, the school they attend and their area of residence. The data allow children in NDC partnerships to be identified and compared with children in other similarly deprived areas (these areas are referred to as comparator areas). The results of the analyses are presented in this report across the following categories:

- Overall Programme change in attainment outcomes
- Change in attainment outcomes for sub-groups of children and NDC partnership areas
- Change in attainment outcomes for individual NDC partnerships.

It is worth noting that this report focuses specifically on the improvements in the educational attainment of young people living in the NDC areas. However, across the theme of education and skills NDC partnerships may have invested in projects that might not have impacted on the educational attainment outcomes of young people. For example, funding has also been directed towards pre-school learning, adult education and improving

[1] Beatty, C. et al. (2007), *New Deal for Communities National Evaluation: An Overview of Change Data: 2006, (Research Report 33)*.

[2] Smith, G. et al. (2005) *New Deal for Communities National Evaluation: Education and Skills.* Noble et al. (2005)*, Worklessness in New Deal for Communities Areas: Findings from Stage 1 of the National Evaluation.*

infrastructure (for example upgrading school buildings). The extent to which NDC partnerships have directed funding towards the educational attainment outcomes of young people will depend upon the competing priorities both within the education theme and in the NDC area more broadly. An analysis of the key outcome measures across the education theme in **Section 2.2** indicates that improving attainment at key stage 4 (which is one of the outcome measures tested here) was the most popular outcome across the NDC Programme within the education theme. Thus, in the majority of NDC areas it is likely that improving the educational attainment of young people was considered to be a key objective.

Another issue of relevance to this report is the extent to which NDC interventions were school-based or area-based. In some cases support has been provided through schools, for example by employing additional learning support staff. Other interventions may be area-based, for example homework clubs. Whilst all NDC partnerships could have implemented area-based interventions, the extent to which school-based interventions are feasible tends to vary between the NDC areas.

In a recent National Evaluation report, *Raising educational attainment in deprived areas: the challenges of geography and residential mobility for area-based initiatives*,[3] it was found that the patterns of school attendance found in NDC partnerships meant that it was generally only realistic for around 50 to 80 per cent of the school-age population to be targeted through school-based initiatives. In addition, pupil turnover rates are high in most NDC partnerships. The percentage of children living in an NDC partnership area in 2002 who remained in the same area until 2006 is generally between 50 and 70 per cent. However, in some NDC partnerships more than half of the children resident in the area in 2002 had moved out by 2006. Both of these findings have implications for the extent to which area-based initiatives can successfully tackle educational deprivation. This report also investigates if differences in rates of pupil turnover and the spatial distribution of pupils amongst schools serving the NDC partnership area (pupil concentration) has a differential impact on the changes observed in educational attainment outcomes.

The remaining sections of the report are structured as follows:

Section 2 presents cross-sectional descriptive data on the performance of the NDC partnerships compared to their local authorities and outlines the types of interventions undertaken within the education theme.

Section 3 describes the data and methodology used in the analyses.

Section 4 presents the findings from the analyses at the Programme-wide, sub-group and individual partnership level.

Section 5 outlines the key conclusions and policy implications relevant to the NDC Programme and other area-based initiatives.

[3] Whitworth, A. et al. (2009), *Raising educational attainment in deprived areas: the challenges of geography and residential mobility for area-based initiatives*. London: DCLG.

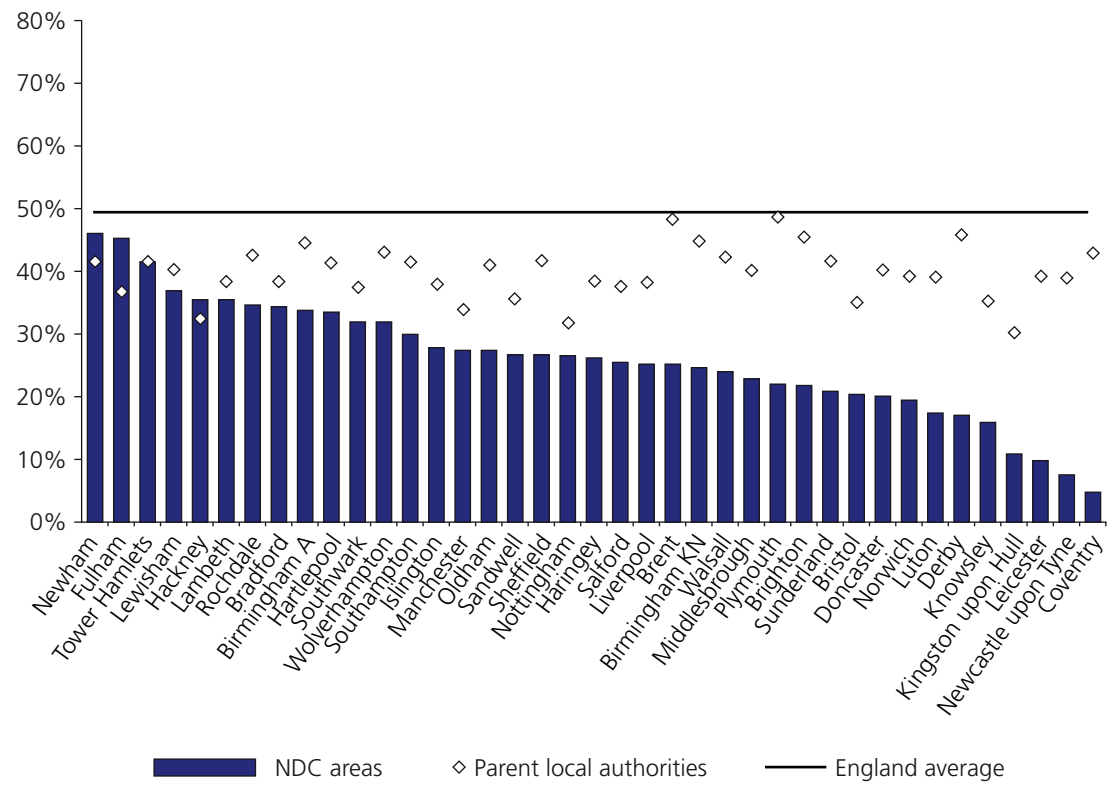
2. Background

This section contextualises the multivariate analyses presented in **Section 4** by giving a cross-sectional view of the performance of the NDC areas relative to England as a whole and their parent local authorities. Whilst this does not tell us how the NDC areas have performed relative to other similar areas it does give an indication of the size of the 'gap' and the extent of educational deprivation that the NDC Programme is attempting to address.

2.1 Educational attainment in NDC partnerships

Key stage 4 attainment in the majority of the NDC areas was lower than in the NDC parent local authorities in 2002[4] as can be seen in **Figure 2.1**. All NDC partnerships and the vast majority of NDC parent local authorities also performed below the national average. Although a few NDC partnerships are close to their local authority and even national results at key stage 4, a number of partnerships had very poor results with less than 20 per cent of children achieving five or more A*–C grades at key stage 4.

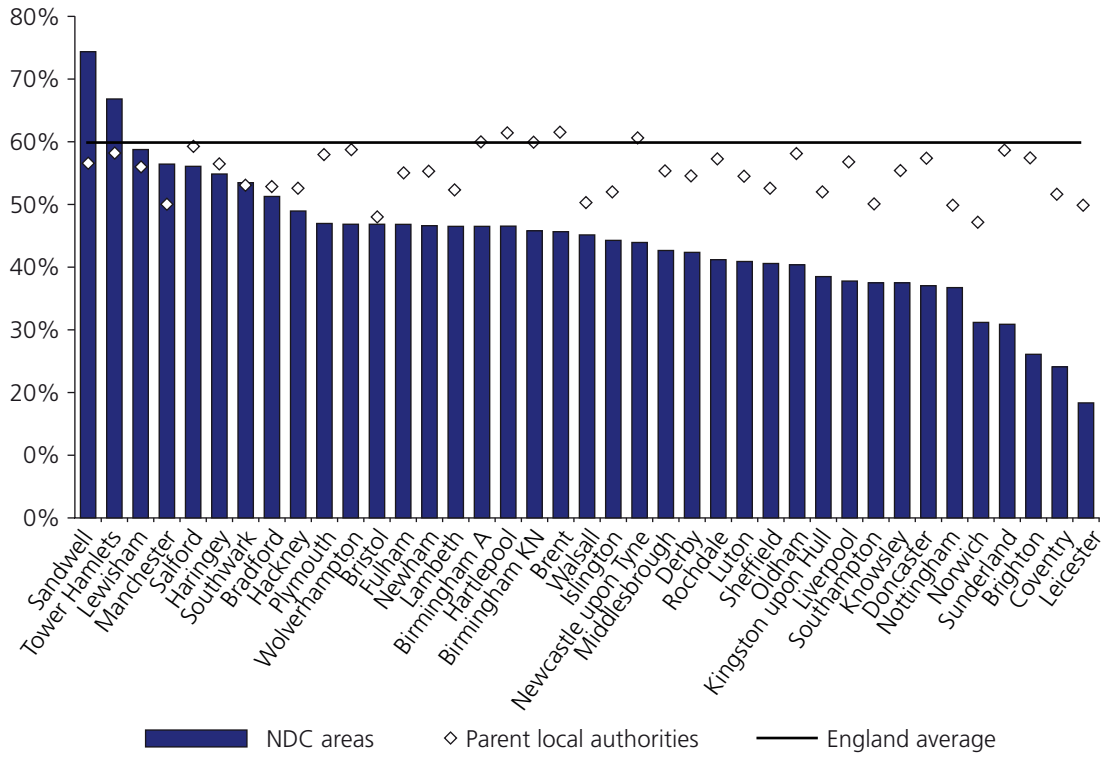
Figure 2.1: Percentage of pupils achieving five or more A*–C grades at key stage 4, NDC partnerships, NDC[a] parent local authorities and England, 2002



[4] Even though the NDC Programme began prior to 2002, this is the first year for which attainment data is available by NDC partnership.

The same data are presented for 2007 in **Figure 2.2**. It is clear that the majority of NDC partnerships have improved in relation to the national average and their parent local authority. Even though the national average has also increased, two NDC partnerships (Sandwell and Tower Hamlets) are performing well above the national average and one NDC partnership (Lewisham) is close to the national average. The improvement seen in key stage 4 attainment between 2002 and 2007 in the Sandwell NDC Partnership is exceptional and is discussed further in **Section 4.4.7**.

Figure 2.2: Percentage of pupils achieving five or more A*–C grades at key stage 4, NDC partnerships, NDC parent local authorities and England, 2007



Thus, in assessing the extent to which NDC partnerships have 'narrowed the gap' it is important to consider that the actual size of the gap varies significantly; some partnerships have further to go than others. However, as discussed previously, this report focuses upon whether or not the NDC partnerships have made progress compared to what would have happened if there had been no NDC Programme.

2.2 Interventions in education

Ideally programme evaluation should seek to link interventions and outcomes. For example, in the NDC case it would be helpful to know what types of interventions in education have been associated with improvements in educational attainment outcomes. Linking NDC interventions with programme impact is not straightforward for a number of reasons. First,

children living in the NDC areas may also have benefited from mainstream initiatives or other local initiatives aimed at improving educational attainment. These other initiatives may be completely separate from the NDC partnership but, nevertheless, may have had an impact on the educational attainment of children living in the NDC areas. The use of comparator areas is helpful in controlling for the impact of non-NDC interventions but only if the same non-NDC interventions have been implemented in both the NDC and comparator areas.

Second, the NDC Programme is multi-dimensional and interventions not directly associated with the education theme may have also had an impact on educational attainment. For example, improving employment opportunities in and around an NDC area might provide more motivation to children taking key stage 4 exams to obtain better qualifications. The design of the NDC Programme is intended to encourage cross-theme impacts as these can help to reinforce positive cycles of improvement. However, quantitative evaluation of such impacts is very difficult.

Third, there is considerable variation in educational attainment within NDC partnerships. There is also considerable variation in the amount of NDC funding spent on education and the type of projects that this funding is directed towards. The resources devoted to the education stream within the NDC Programme are spread over many different types of initiatives. The focus here is on the educational attainment of young people, but funding covers the entire age spectrum from pre-school to adult so the full range of potential education outcomes are not tested in this report. In addition, NDC partnerships may have higher priorities than tackling educational disadvantage and so spend less on this theme. **Table 2.1** shows how total spend on the education theme to 2007 varies between projects and NDC partnerships. The four categories with the highest spend are shown as well as the highest, lowest and average spend for individual NDC partnerships. Not surprisingly, two of the largest spend categories are related to improving buildings and other facilities used for educational purposes. These types of interventions, particularly improving the physical environment of schools, may improve the NDC area and may impact upon pupil attainment in the long run. However, it may take several years for the impact of this type of spending to be reflected in educational attainment outcomes.

Table 2.1: Total spend on the education theme to January 2007 by project type and NDC partnership

Category	Amount of spend (£ million)
By Project	
Extra curricula activities	44.37
New and improved school facilities	43.57
New and improved community facilities	27.38
Educational support posts	24.17
By NDC Partnsership	
Average NDC spend on education theme	6.44
Highest NDC spend on education theme	15.75
Lowest NDC spend on education theme	2.24

Source: System K

In terms of the outcomes that were chosen as priorities across the education theme, the most frequently selected outcome was to improve key stage 4 attainment. Twenty-six NDC partnerships set this as a target outcome. Other popular outcomes were: to improve key stage 2 attainment; to improve school-leavers destinations and staying on rates; and, to improve attendance and reduce school exclusion.[5]

Given that there are inevitably differences in the type of interventions and amount of funding invested in tackling educational disadvantage in each NDC partnership, differential effects between partnerships would be expected. However, given that the majority of NDC partnerships have chosen to focus on key stage 4 attainment, this is clearly a good outcome to investigate to determine if the NDC Programme has had an effect on educational attainment.

[5] As reported in Marshall, F. (2005), *Analysis of Delivery Plans 2004: Outcomes, targets and projects*, NDC National Evaluation.

3 Data and methods

3.1 Individual level education data

Individual pupil level attainment data from 1996 to 2007 are obtained from the National Pupil Database (NPD). From 2002 to 2007, data from the Pupil Level Annual School Census (PLASC) allows linking of the NPD records to a pupil's home postcode thus enabling identification of pupils resident in NDC partnership areas. As all pupils keep a unique pupil reference number throughout their compulsory education it is possible to match current pupil records with previous attainment records thereby providing an important source of contextual information (prior attainment in examinations is a key predictor of future attainment). The presence of each pupil's home postcode and a school identification code also allows the matching of other area-level and school-level information from the 2001 Census, the Local Education Authority Schools Information Services and Edubase (database of schools maintained by the Department for Children, Schools and Families). Thus, for each pupil resident in the NDC partnership areas between 2002 and 2007 data is available on current test results, prior attainment, school attended and area of residence. It should be noted that in some cases important information, such as prior attainment or postcode, is missing in the NPD or PLASC data. When this occurs the children must be dropped from the model as the analyses can only be carried out where all the information is complete. The impact of missing data on the analyses is further discussed in **Section A.1** in **Appendix A**.

3.2 Key outcomes

Educational attainment is assessed using seven outcome measures at key stage 3 (age 14) and key stage 4 (age 16). Outcomes at key stage 4 are arguably the most important as these represent the end of compulsory schooling and have significant implications for access to future educational and career opportunities. However, key stage 3 outcomes are also important in order to assess how NDC partnerships are performing in particular skill areas such as English and maths. The outcome measures used here relate to achievement of particular target levels and continuous measures of attainment such as average key stage 4 points score. The outcome measures are listed in **Section 4.1**.

3.3 Methodology

One of the main challenges in the evaluation of the NDC Programme is to determine whether the changes observed in NDC partnerships can be

attributed to the NDC Programme or to other factors such as national trends. To robustly assess the impact of the NDC Programme it is necessary to know what would have happened to the educational attainment outcomes of children living in the NDC partnership areas if the NDC Programme had not been implemented. Constructing this unobserved scenario is the central issue that evaluation methods address. It is impossible to observe the outcome that children would have experienced had they not been resident in an NDC area. Instead, Programme impacts are measured by comparing a treatment group's (NDC residents) outcomes to those of a control group (comparator area residents). The control group consists of individuals similar to those in the treatment group who have not been subject to the NDC Programme.

Special comparator areas have been constructed for the National Evaluation. Each of the NDC partnership areas has a respective comparator area. These comparator areas were selected due to their similarity to the NDC partnership areas on various indicators including the extent of deprivation (as measured by the Index of Multiple Deprivation 2004) and the population size.[6] All comparator areas are within the same local authority as their respective NDC partnership.

Having selected the comparator areas, the second step in the evaluation is to choose the methodology to assess the changes in educational attainment occurring in the NDC partnerships. In broad terms, there are three main types of programme evaluation methods. The first method consists of comparing the differences in outcome, for example the proportion of children obtaining five or more A*–C grades at key stage 4, between NDC partnerships and their respective comparator areas *after* the implementation of NDC Programme. A drawback of this method is that it neglects the fact that NDC partnerships could have started from a worse situation than the comparator areas and therefore this method could underestimate the improvements occurring in the NDC partnerships.

A second method is to take into account the changes observed in NDC partnerships before and after the implementation of the NDC Programme. A limitation of this method is that the comparison group (e.g. the comparator areas) may have improved between the pre and post-policy time periods. Hence, there may be external factors acting on everyone – both NDC and comparator groups – that lead to better outcomes. These factors could include national level programmes that aim to improve educational attainment, or even local programmes that focus on deprived areas as both the NDC partnerships and the comparator areas will have similar levels of educational disadvantage. In these situations, this method cannot distinguish whether the changes in outcomes are due to external factors, the effect of time, or, to the Programme itself.

The third method, known as difference-in-difference (DD) estimation, is a more robust approach. DD estimation evaluates the impact of a programme by comparing the difference in indicators between two groups (NDC partnerships and comparator areas) at two points in time (e.g.

[6] Please see **Appendix A** for discussion of the suitability of the comparator areas for the education analyses.

at the beginning and at various stages after the implementation of the programme). DD estimation is carried out in three steps. First, the difference in an outcome (e.g. the proportion of children achieving five or more A*–C grades at key stage 4) is estimated for NDC partnerships before and after Programme implementation. Second, the difference in the same outcome is also estimated for the comparator areas before and after the Programme. Third, the difference between these two differences is obtained (the DD estimator). This third step controls for the changes in the outcome that would have occurred regardless of the NDC Programme. Therefore the DD estimator isolates changes only occurring in NDC partnerships from changes unrelated to the NDC Programme.

Mathematically the DD estimator is represented as in equation (1):

$$DD = E(Y_{10} - Y_{11} \mid NDC = 1) - E(Y_{01} - Y_{00} \mid NDC = 0) \qquad \text{eq. (1)}$$

where Y_{it} denotes the outcome in treatment status i and period t. A child in state $i = 1$ lives in an NDC partnership area and a child in state $i = 0$ lives in a comparator area.

One issue in the DD estimation process is the presence of heterogeneity. The impact of the NDC Programme on educational attainment is unlikely to be uniform across all children, but rather vary as a function of individual characteristics. For instance, the impact of the NDC Programme may be greater for children with lower educational attainment prior to the start of the Programme as these children may have been identified as being in particular need of support. If children in the NDC partnership areas differ significantly from children in the comparator areas this may introduce bias in the results and the DD estimator (as presented above) will not truly reflect the impact of the NDC Programme.

Observable differences between children living in the NDC and comparator areas can be controlled for by a multi-variate regression model. Differences in individual educational attainment are predicted by a range of factors including prior attainment, pupil characteristics, school characteristics and area characteristics and these factors are controlled for within the models. For example, an attainment outcome ($\underline{Y}$) for a pupil (p) in school (s) at time (t) is specified according to equation (2) as:

$$Y_{pst} = \alpha + \beta_0 \cdot NDC + \beta_1 \cdot NDC \cdot T + P_{pst} + S_{st} + A_p + \alpha_t + \varepsilon \qquad \text{eq. (2)}$$

Where α is a constant, NDC is a dummy variable indicating whether or not the pupil is resident in an NDC area, T is a dummy variable indicating the post-policy period, P_{pst} represents pupil characteristics (including prior attainment), S_{st} represents school characteristics, A_p represents area characteristics (for the pupil's area of residence), α_t is a set of year dummy variables and ε is a random error term. Hence, the DD estimator in this case is given by the coefficient β_1 which is the effect of being resident in an NDC partnership area in a post-policy year. Of course there may be other unobservable factors, such as school quality, which cannot be controlled for and may impact on educational attainment. However, given that the NDC

and comparator areas are very similar it is anticipated that there are no major differences in unobservable characteristics that might impact on educational attainment.

3.4 Selecting children into the treatment (NDC) and control (comparator) groups

As discussed previously the patterns of school attendance in NDC partnerships and the extent of pupil mobility may impact upon the potential of the Programme to address educational disadvantage. These two factors also have implications for the method used to analyse Programme impact.

3.4.1 Accounting for the concentration of NDC-resident children in local schools

For the majority of the analyses in **Section 4** the treatment group is comprised of all children living in NDC partnerships who sit a particular examination (i.e. key stage 4 or key stage 3) in the year of interest. However, to asses the impact of patterns of school attendance and pupil mobility on Programme impact, the analyses also focus on certain sub-groups of pupils who are more likely to have been exposed to the NDC Programme.

If children living in an NDC partnership area attend a large number of different schools it may be difficult for the NDC Programme to provide support to all these schools through school-based interventions. As such it might not be realistic for the Programme to reach every child resident in the NDC partnership area through school-based interventions. It is not possible to examine the impact of the geographical patterns of school attendance on the educational attainment of *every* child. The approach taken here is to group NDC partnerships into three groups according to the proportion of children who attend the three 'main' secondary schools serving each NDC partnership[7] in 2002. Thus, the 13 NDC partnerships with the highest proportions of NDC children in the main three secondary schools are classified as 'high concentration' NDC partnerships. The higher the concentration of NDC pupils within a small number of schools the easier it will be for NDC partnerships to reach NDC children through school-based interventions. Thus, it might be expected that these 'high concentration' NDC partnerships are able to achieve more impact on attainment outcomes than 'low concentration' partnerships. Each group of NDC partnerships (high, medium and low) is compared to their respective comparator areas to determine if, for example, the 'high concentration' group performs better than their respective comparator areas compared to the 'low concentration group'. The results are discussed in **Section 4.4.6**.

[7] The three main schools are defined as the three secondary schools attended by the highest percentage of children resident in the NDC partnership area.

The composition of the groups is shown in **Table 3.1** below. The percentage of NDC children aged 11–15 attending the three main schools in each NDC partnership is shown in parentheses.

Table 3.1: NDC partnerships grouped by percentage of children aged 11 to 15 in three main schools, 2002

High concentration	Medium concentration	Low concentration
Rochdale (92.5)	Hartlepool (75.8)	Knowsley (59.4)
Sunderland (89.9)	Coventry (75)	Liverpool (56.3)
Luton (89.8)	Tower Hamlets (74.7)	Islington (55.5)
Kingston upon Hull (87.4)	Bristol (72.7)	Walsall (53.2)
Doncaster (85.7)	Birmingham KN (69.9)	Newham (52.8)
Salford (83.9)	Newcastle upon Tyne (68.3)	Nottingham (49.9)
Middlesbrough (82.5)	Birmingham A (67.3)	Fulham (44)
Leicester (79.6)	Manchester (67.1)	Haringey (44)
Sandwell (78.8)	Southampton (65.7)	Southwark (42.6)
Derby (78.6)	Plymouth (64.3)	Lewisham (42.5)
Oldham (77.9)	Brighton (63.9)	Hackney (39.2)
Wolverhampton (77.9)	Bradford (63.5)	Brent (38.2)
Norwich (77.8)	Sheffield (62.4)	Lambeth (28)

Note: Data obtained from Table A.2 in Whitworth et al. (2009), Raising educational attainment in deprived areas: the challenges of geography and residential mobility for area-based initiatives.

3.4.2 Accounting for pupil mobility

Pupil mobility can be measured at the individual level as the PLASC data contains each child's home postcode so it is possible to determine whether a child is resident in an NDC partnership area over a number of years. When children move to and from an NDC partnership area this may lessen the Programme impact as any children who have benefited from the NDC Programme who then leave the area may not be captured in the impact analysis. Conversely, children moving into an NDC partnership area after the start of the Programme will have a shorter period of exposure to the NDC Programme than children who have lived in an NDC partnership area since the start of the Programme. Thus, in order to isolate children who are most likely to have benefited from the NDC Programme, the analyses in **Section 4.4.8** are limited to a sub-set of children who have lived continuously in an NDC partnership area between their key stage 3 exams and their key stage 4 exams, and are therefore more likely to have had a sustained period of exposure to the NDC Programme. This group covers children who took key stage 4 examinations in 2006 and 2007. The control group is also limited to the same sub-set of pupils, i.e. those who have lived continuously in a comparator area between their key stage 3 and key stage 4 examinations. Selecting the same group of children from the comparator areas reduces the possibility than any differences in educational attainment

are due to unobserved differences between the NDC and comparator children.

Whilst this approach does control for the possibility of 'dilution' of Programme impact due to children moving *into* NDC partnership areas, it does not account for 'lost' Programme impact due to children moving *away from* NDC partnership areas. However, as the evaluation calculates the average change in attainment outcomes, rather than the total change, the exclusion of the second group is not problematic unless it is believed that the average impact on this group differs from the average impact on children who stay resident in an NDC partnership area.

4 Narrowing the gap in educational attainment: what impact has the NDC Programme had?

This chapter presents the results from the analyses of educational attainment data to assess the impact of the NDC Programme on educational attainment across the key outcomes described in **Section 3.1**. After presenting the results for the outcomes for each theme for the whole NDC cohort, **Section 4.4.8** repeats some of the analyses for the targeted cohort (i.e. only children resident in an NDC partnership area for three years or more between key stage 3 and key stage 4) to asses if differences in pupil mobility result in differences in the changes observed in the educational attainment outcomes. Finally, **Section 4.5** considers the key findings across all the outcome measures.

4.1 Outcome measures, treatment and control groups

This section explores the results of the analyses carried out on educational attainment data for NDC and comparator areas.[8] The children included in the NDC and comparator groups are all children sitting a particular examination (i.e. key stage 3 or key stage 4) in the relevant year. The outcomes of interest, as previously discussed, are:

Key Stage 3

- Achieving level 5 or above in English at key stage 3
- Achieving level 5 or above in maths at key stage 3
- Achieving level 5 or above in science at key stage 3
- Average key stage 3 points score

[8] It is important to note that the descriptive statistics presented throughout this report for the education theme do not match previously presented data at NDC and comparator area level. This is because a modelling analysis can only include children with no missing values for any of the control variables. The most common reason that a child will be dropped from the analysis is due to missing prior attainment data where pupil reference codes have failed to match between years. As there appears to be no systematic difference in the areas for which data is missing (children are equally likely to be missing from NDC partnerships than from comparator areas) the analysis is valid in terms of making comparisons between NDC partnerships and comparator areas. For further details please refer to **Appendix A**.

Key Stage 4

- Achieving five or more A*–C grades at key stage 4
- Achieving five or more A*–G grades at key stage 4
- 'Best of 8'[9] total points score at key stage 4

First, findings are presented in relation to the overall NDC Programme effect on the above outcomes; this compares all NDC children with all children living in the NDC comparator areas. Then, a more detailed analysis looks at the performance of various sub-groups of children and NDC partnerships. Results are presented on outcomes by gender, ethnicity, local area income deprivation, prior attainment, patterns of school attendance and NDC partnership spend on education programmes. Finally, each individual NDC partnership's performance is compared to its comparator area's performance across the key outcomes.

4.2 How to interpret the findings on educational attainment

All the analyses presented in this section take the year 2002 (or sometimes a combination of 2002 and 2003) as the pre-policy year(s) and compare the change in an outcome measure with a post-policy year. Post-policy years are 2004 to 2007, or aggregate results for a combination of years, for example 2006 and 2007. Further details on the selection of pre and post-policy time points are given in **Appendix A**.

Coefficients and standard errors for binary outcomes, for example whether or not a child achieved a level 5 in English, are presented as percentage points. The coefficient reported represents the percentage point increase or decrease in the probability that a child living in an NDC partnership area achieves the relevant outcome relative to a child in a comparator area over the pre- to post-policy time period. Coefficients on points score outcomes (key stage 3 average points score and key stage 4 'best of 8' points score) represent actual points differences. For example, a coefficient of 2.4 for the key stage 3 average points outcome would mean that, on average, a child in an NDC partnership area increased their key stage 3 points score by 2.4 points over the pre- to post-policy period relative to a child living in a comparator area.

Statistically significant results are indicated by an asterisk in the results tables.[10] Results that are not statistically significant do not enable us to assess whether or not the changes in the attainment outcomes in the NDC partnerships are significantly different from the changes observed in the comparator areas because they are too imprecise (the smaller the difference between the NDC partnerships and the comparator areas, the more observations are required before the result becomes statistically significant).

[9] This is the total points score achieved for the eight subjects taken at key stage 4 for which the highest grades were obtained.
[10] A single asterisk (*) indicates the result is significant at the 95% level, a double asterisk (**) indicates the result is significant at the 99% level.

4.3 Has the NDC Programme overall had an impact on educational attainment?

Table 4.1 presents simple descriptive statistics showing the change in attainment outcomes for the NDC partnerships and the comparator areas between 2002 and 2007. The DD estimate is calculated for the time period 2002 to 2007; however, in this case this estimate does not take account of differences in the characteristics of children living in the NDC partnerships and the comparator areas. Both NDC partnerships and comparator areas have shown an improvement across the majority of outcomes between 2002 and 2007 (see **Table 4.1**). The differences between the change in the NDC partnerships and change in the comparator areas over this time period are relatively small. The differences in attainment outcomes are also largely statistically insignificant except for the result for key stage 3 science in 2007. The probability that a child living in an NDC partnership area will achieve a level 5 in science increased by 3.76 percentage points compared to a child in a comparator area.

The simple analyses presented in **Table 4.1** only take account of systematic differences between the NDC and comparator areas and common trends over time and so do not provide a complete picture of relative performance because there is no control for characteristics that vary over time. **Section 3.3** listed some of the factors that may impact upon educational attainment, for example attainment in previous exams. The models presented in **Table 4.2** control for a variety of these factors in order to account for any differences between the NDC partnerships and comparator areas that may affect the outcomes. The simple difference-in-difference results presented in **Table 4.1** are included in the first column so they can be compared with the results from the regression models with full controls (columns 2 and 3). Note that only results from 2005 onwards are presented in **Table 4.2**. The results presented in the final column allow for fixed effects by school. This means that the model controls for school level factors that are constant over time even though they cannot actually be observed in the data (teaching quality is an example of a school level time invariant unobservable factor).[11] Fixed effects do appear to be significant in the data so the model specification used in the 'full controls and fixed effects' model is used for the remainder of the analyses. Further details on the model specifications are provided in **Appendix A**.

The coefficients presented in **Table 4.2** are the difference-in-difference estimators. These can be interpreted as described above; for example, between 2002 and 2005 the probability that a child in an NDC partnership would achieve a level 5 in maths increased 2.14 percentage points compared to a child in a comparator area (according to the 'full controls' model).

Overall, the results from the regression models in **Table 4.2** show that controlling for differences in pupil, school and area characteristics between children in NDC areas and children in the comparator areas (in the full controls and full controls and fixed effects models) makes little difference to

[11] Whilst the data suggest that fixed effects are important, including them can result in a less efficient model with increased standard errors so it is important to consider the results with and without fixed effects.

Table 4.1: Key outcomes 2002 to 2007, simple difference-in-difference, no controls for differences in pupil characteristics									
	2002	2003	2004	2005	2006	2007	Percentage point change (2002–2007)	2002–2007 difference-in-difference	Number of observations
% achieving level 5 in English (KS3)									
NDC areas	51.66%	53.21%	58.40%	62.00%	58.96%	60.52%	8.87	–2.38 (1.99)	25,894
Comparator areas	52.92%	56.55%	59.57%	63.12%	62.69%	64.16%	11.25		27,656
% achieving level 5 in maths (KS3)									
NDC areas	50.08%	55.35%	59.03%	62.37%	64.23%	65.10%	15.02	3.36 (1.88)	26,177
Comparator areas	53.24%	56.55%	60.94%	63.02%	66.32%	64.89%	11.66		27,966
% achieving level 5 in science (KS3)									
NDC areas	46.60%	48.33%	48.28%	52.23%	55.15%	57.73%	11.13	3.76 (1.88)*	26,124
Comparator areas	50.64%	51.21%	49.96%	55.19%	57.58%	58.01%	7.37		27,979
Key stage 3 average points score									
NDC areas	48.19	48.70	50.06	50.55	51.16	51.25	3.06	0.11 (0.49)	26,917
Comparator areas	48.87	49.68	50.69	51.01	52.22	51.82	2.95		28,662
Key stage 4 'best of 8' total points score									
NDC areas	238.38	233.60	228.95	240.62	251.04	260.69	22.30	–0.08 (4.19)	24,478
Comparator areas	246.82	245.14	239.72	249.87	259.03	269.20	22.38		26,138
% achieving 5 or more A*–C grades (KS4)									
NDC areas	30.00%	31.24%	33.85%	39.68%	42.93%	46.49%	16.49	–1.32 (2.2)	24,478
Comparator areas	33.28%	36.43%	36.45%	41.78%	46.48%	51.09%	17.81		26,138
% achieving 5 or more A*–G grades (KS4)									
NDC areas	87.86%	83.83%	82.30%	83.14%	84.84%	86.55%	–1.31	–0.42 (1.22)	24,478
Comparator areas	88.94%	86.45%	84.78%	84.87%	86.60%	88.05%	–0.89		26,138

Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level.

the results. This is not entirely surprising given that a descriptive analysis of the NDC and comparator areas shows them to be very similar across many of the control variables.[12]

Table 4.2: Key outcomes 2005 to 2007, with controls for differences in pupil characteristics

Outcome	Year	No controls, simple difference-in-difference		Full controls		Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	2005	0.13	(2.17)	0.12	(1.73)	–0.49	(1.73)	53,550
	2006	–2.47	(2.15)	–1.06	(1.81)	–1.49	(1.86)	
	2007	–2.38	(1.99)	–2.47	(1.6)	–2.71	(1.59)	
% achieving level 5 in maths (KS3)	2005	2.51	(1.62)	2.14	(1.28)	1.93	(1.28)	54,143
	2006	1.07	(1.71)	2.1	(1.36)	1.95	(1.38)	
	2007	3.36	(1.88)	2.59	(1.43)	2.66	(1.46)	
% achieving level 5 in science (KS3)	2005	1.09	(1.74)	1.28	(1.53)	0.96	(1.51)	54,103
	2006	1.61	(1.78)	2.53	(1.41)	1.86	(1.41)	
	2007	3.76	(1.88)*	3.4	(1.42)*	3.15	(1.46)*	
Key stage 3 average points score	2005	0.22	(0.45)	0.19	(0.30)	0.05	(0.28)	55,579
	2006	–0.38	(0.46)	–0.07	(0.30)	–0.18	(0.30)	
	2007	0.11	(0.49)	–0.03	(0.30)	–0.08	(0.29)	
Key stage 4 'best of 8' points score	2005	–0.81	(4.08)	3.40	(3.05)	1.93	(3.02)	50,616
	2006	0.45	(3.97)	2.19	(3.31)	2.17	(3.17)	
	2007	–0.08	(4.19)	2.01	(3.47)	1.43	(3.36)	
% achieving 5 or more A*–C grades (KS4)	2005	1.18	(1.87)	2.77	(1.65)	2.17	(1.6)	50,616
	2006	–0.28	(1.88)	0.55	(1.79)	0.42	(1.77)	
	2007	–1.32	(2.2)	–0.37	(2.09)	–0.69	(2.0)	
% achieving 5 or more A*–G grades (KS4)	2005	–0.65	(1.31)	0.04	(1.21)	–0.42	(1.21)	50,616
	2006	–0.67	(1.26)	–0.43	(1.17)	–0.48	(1.19)	
	2007	–0.42	(1.22)	–0.11	(1.13)	–0.14	(1.2)	

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics; for a full list of controls refer to* ***Appendix A****.*

Even after controlling for the differences between the NDC and comparator areas there is little evidence of a statistically significant Programme-wide impact. The exception is key stage 3 science which remains significant after controlling for differences between the NDC partnerships and comparator areas although the size of the effect drops slightly to 3.15 percentage points (according to the full controls and fixed effects model).

It is worth noting that changes at the Programme-wide level measure the average change in educational attainment outcomes for all children taking a key stage 3 or key stage 4 exam in each year. Given that not all children living in an NDC partnership area will have had exposure to the Programme, and not all children living in NDC partnerships have low educational attainment, it is perhaps unrealistic to expect to see an overall Programme-wide change in attainment outcomes. The subsequent sections explore the extent to which significant change has occurred beneath the Programme-wide level.

[12] See **Appendix B** for further descriptive details of NDC pupils and comparator area pupils.

4.4 Has the NDC Programme had any differential impacts on educational attainment by population group or partnership?

The analysis presented above suggests that the *average* change in educational attainment outcomes of 14 and 16 year olds in the NDC partnerships relative to the comparator areas is statistically insignificant for most outcome measures. A significant Programme-wide improvement has been seen in the results for key stage 3 science. However, even though the overall effect is small it is possible that there has been an impact on particular groups of children or in particular NDC partnerships. **Section 2.2** highlighted that there is considerable variability in educational spend, the types of projects implemented within the NDC partnerships and the target outcomes. Given this, it might be expected that the impact will vary between groups and between NDC partnerships.

As well as providing a more complete picture of the NDC partnerships' performance on educational attainment outcomes, sub-group analyses also highlight if there are groups who have experienced large improvements, or, groups whose performance has been below average. This type of analysis can therefore be useful in considering how funding should be targeted to best address educational disadvantage. It is possible to identify many different sub-groups within the NDC partnerships using pupil characteristics such as, for example, gender, ethnicity or school attended. However, with relatively small numbers of children in any one cohort in any one year, some groupings are too small to produce reliable results. For this reason groups of children have been analysed at the Programme-wide level only and not within individual NDC partnerships.

In all cases, for the sub-groups analysed, average results are presented for children taking key stage examinations in 2006 and 2007. Although results were obtained for two groups of children (those taking exams in 2004 or 2005 and those taking exams in 2006 or 2007), in the majority of cases the trends observed for these two groups were similar. As the interest lies in observing the most recent trends, only the results for children taking exams in 2006 and 2007 are presented here. In all cases children taking exams in 2002 and 2003 are considered to be in the control group, i.e. these two years are taken to represent the pre-NDC Programme time point.[13] Even though the NDC Programme began prior to 2002 it would be anticipated that there would be a time lag between the start of Programme activity and any associated improvements in educational attainment. As no significant Programme effects were observed in 2003 it is also reasonable to assume that this year can accurately represent the pre-policy period. Increasing the size of the pre-policy control group by adding children taking exams in 2003 improves the robustness of the models and reduces the size of the standard errors. Further details on the model specifications for the sub-group analyses can be found in **Appendix A**.

[13] Note that no postcoded attainment data was available prior to 2002 so children resident in an NDC or comparator area could not be identified before this point in time.

4.4.1 Does the impact of the NDC Programme on educational attainment vary by gender?

An analysis of the differential impact by gender indicates that the Programme-wide improvement in key stage 3 science results is due to the improvement of males rather than females. As indicated in **Table 4.3**, there was an increase in the probability that boys in NDC partnerships would achieve a level 5 or above in key stage 3 science of nearly 2.54 percentage points. No significant effect was observed for girls. Boys also had significant improvements in key stage 3 maths and 'best of 8' points score at key stage 4. The attainment of boys tends to be lower than girls, particularly in areas with high levels of educational deprivation;[14] however, it is not known whether boys have been especially targeted by the NDC Programme.

Table 4.3: Analysis by gender, average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	females	–1.77	(1.5)	26,691
	males	–0.8	(1.4)	26,859
% achieving level 5 in maths (KS3)	females	0.23	(1.23)	26,972
	males	2.68	(1.26)*	27,171
% achieving level 5 in science (KS3)	females	0.87	(1.22)	26,949
	males	2.54	(1.22)*	27,154
Key stage 3 average points score	females	–0.19	(0.26)	27,604
	males	0.24	(0.25)	27,975
Key stage 4 'best of 8' points score	females	0.31	(3.20)	25,540
	males	6.00	(3.0)*	25,076
% achieving 5 or more A*–C grades (KS4)	females	–0.38	(1.76)	25,540
	males	1.44	(1.93)	25,076
% achieving 5 or more A*–G grades (KS4)	females	–0.07	(1.11)	25,540
	males	1.20	(1.06)	25,076

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

4.4.2 Does the impact of the NDC Programme on educational attainment vary by local area income deprivation?

NDC and comparator area children have been grouped according to the level of income deprivation in the Lower Super Output Area (LSOA)[15] in which they live. The measure of income deprivation used is the percentage of children in an LSOA living in income deprived households in 2001 (the IDACI score).[16] Children are grouped into high (4th quartile), medium (2nd and 3rd

[14] See for example, Menash, F. and Kiernan, K. (2009), Gender differences in educational attainment: influences of the family environment, *British Educational Research Journal*.

[15] LSOAs are designed to be roughly homogenous areas of approximately equal population size. The average LSOA population was 1,500 in 2001. There are 32,482 LSOAs in England.

[16] See Noble, M. et al. (2004) *The English Indices of Deprivation 2004*. London: Office of the Deputy Prime Minister.

quartiles) and low (1st quartile) income deprivation groups. The grouping is based on the range of IDACI scores of children living in the NDC partnership areas rather than nationally.

A key finding is that the largest improvements in the percentage of children achieving a level 5 in key stage 3 maths and the percentage of children obtaining five or more A*–C grades at key stage 4 in 2006 and 2007 has occurred for children living in the most income deprived areas. Similar results were also found in the 2004 to 2005 period.

In **Table 4.4** the probability that a child living in a neighbourhood in the most income-deprived quartile within the NDC partnership areas would achieve five or more A*–C grades increased by 4.03 percentage points between 2002–03 and 2006–07 compared to a child living in a similarly income-deprived neighbourhood in a comparator area. A similar result was seen for key stage 3 maths: the probability that a child living in an income-deprived area in an NDC partnership would achieve a level 5 in key stage 3 maths increased by 4.26 percentage points.

Table 4.4: Analysis by income deprivation affecting children, average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	Low income deprivation	–0.74	(1.55)	11,148
	Medium income deprivation	–1.96	(1.59)	26,686
	High income deprivation	–0.43	(1.77)	15,716
% achieving level 5 in maths (KS3)	Low income deprivation	–1.37	(1.4)	11,295
	Medium income deprivation	1.45	(1.23)	26,986
	High income deprivation	4.26	(1.54)**	15,862
% achieving level 5 in science (KS3)	Low income deprivation	1.63	(1.27)	11,264
	Medium income deprivation	0.72	(1.57)	27,003
	High income deprivation	2.88	(1.58)	15,836
Key stage 3 average points score	Low income deprivation	0.72	(1.57)	11,711
	Medium income deprivation	1.63	(1.27)	27,695
	High income deprivation	0.51	(0.32)	16,173
Key stage 4 'best of 8' points score	Low income deprivation	4.36	(5.21)	10,661
	Medium income deprivation	0.79	(2.9)	25,108
	High income deprivation	6.50	(3.57)	14,847
% achieving 5 or more A*–C grades (KS4)	Low income deprivation	–1.30	(1.65)	10,661
	Medium income deprivation	0.52	(3.25)	25,108
	High income deprivation	4.03	(2.05)*	14,847
% achieving 5 or more A*–G grades (KS4)	Low income deprivation	1.17	(1.33)	10,661
	Medium income deprivation	0.29	(1.01)	25,108
	High income deprivation	0.52	(1.49)	14,847

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

4.4.3 Does the impact of the NDC Programme on educational attainment vary by pupil prior attainment?

One of the key findings from the analyses of the educational attainment data carried out in Phase 1 of the National Evaluation is that children in NDC partnership areas tend to fall further behind in educational attainment as they get older so that the differences between children in NDC partnerships and the rest of England tend to be greatest at key stage 4.[17] A key aim for the NDC Programme is to try to prevent this widening of the attainment gap; this is particularly important for those with low attainment at key stage 2 and key stage 3 as they face the highest risk of obtaining no qualifications at the end of their compulsory schooling.[18]

To analyse how the NDC Programme has impacted upon children according to their attainment in previous exams children in NDC partnerships were grouped into high (4th quartile), medium (2nd and 3rd quartiles) and low (1st quartile) attainment groups using their average points score at key stage 2 and key stage 3 (prior attainment at key stage 3 could only be considered for key stage 4 pupils). The results are shown for key stage 4 outcomes only in **Table 4.5**, below, (see **Appendix B**, **Table B.2** for key stage 3 outcomes).

Table 4.5: Analysis by prior attainment, key stage 4 outcomes, average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
Key stage 4 'best of 8' points score	Low key stage 2 attainment	13.28	(3.77)**	12,452
	Medium key stage 2 attainment	0.68	(3.12)	25,074
	High key stage 2 attainment	–3.73	(2.98)	13,090
% achieving 5 or more A*–C grades (KS4)	Low key stage 2 attainment	6.34	(1.76)**	12,452
	Medium key stage 2 attainment	–0.15	(2.04)	25,074
	High key stage 2 attainment	–4.87	(1.91)*	13,090
% achieving 5 or more A*–G grades (KS4)	Low key stage 2 attainment	0.18	(1.65)	12,452
	Medium key stage 2 attainment	0.14	(1.01)	25,074
	High key stage 2 attainment	1.59	(0.99)	13,090
Key stage 4 'best of 8' points score	Low key stage 3 attainment	12.69	(3.74)**	12,290
	Medium key stage 3 attainment	1.47	(3.33)	25,192
	High key stage 3 attainment	–2.36	(2.84)	13,134
% achieving 5 or more A*–C grades (KS4)	Low key stage 3 attainment	1.7	(1.42)	12,290
	Medium key stage 3 attainment	3.24	(2.35)	25,192
	High key stage 3 attainment	–6.94	(1.74)**	13,134
% achieving 5 or more A*–G grades (KS4)	Low key stage 3 attainment	1.27	(1.76)	12,290
	Medium key stage 3 attainment	–0.09	(0.98)	25,192
	High key stage 3 attainment	1.36	(0.88)	13,134

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

[17] Smith et al. (2005) *National Evaluation of the New Deal for Communities Programme: Education & Skills*.
[18] See for example, Webber, R. and Butler, T. (2007) Classifying Pupils by Where They Live: How Well Does this Predict Variations in Their GCSE Results? *Urban Studies*, 44 (7).

There is a clear trend that those with low achievement at key stage 2 and key stage 3 in NDC partnerships are performing significantly *better* than similar children in the comparator areas at key stage 4; a similar pattern is also seen at key stage 3. Both the 'low key stage 3 attainment' group and the 'low key stage 2 attainment' group see an improvement in the 'best of 8' points score of more than 12 points: this represents an improvement in one GCSE subject of approximately 2 grades (for example moving from a B to an A*, or an E to a C). Similarly, children in the 'low key stage 2 attainment' group are significantly more likely to achieve five or more A*–C grades. Despite these improvements, it is a concern that children with high key stage 2 attainment or high key stage 3 attainment are performing significantly less well than equivalent children in the comparator areas at key stage 4. For example, children with a high key stage 3 result in the NDC partnerships are nearly 7 percentage points less likely to obtain five A*–C grades at key stage 4 than similar children in the comparator areas.

4.4.4 Does the impact of the NDC Programme on educational attainment vary by ethnic group?

Table 4.6, below, shows the significant results for different ethnic groups[19] (see **Appendix B**, **Table B.3** for the full set of results). There were no significant effects observed at key stage 4 for different ethnic groups; however, some significant effects were seen at key stage 3. It should be noted that, aside from the white British group, the number of children in every other group is fairly small, thus the standard errors tend to be large and the results can fluctuate from year to year.

Table 4.6: Analysis by ethnic group, key stage 3 outcomes, average impact for 2006 and 2007

Outcome	Ethnic Group	Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	White British	–2.73	(1.36)*	31,518
	Indian	–8.42	(3.03)**	1,861
% achieving level 5 in maths (KS3)	Black Caribbean	7.62	(3.07)*	2,571
	Other Black	17.98	(4.59)**	989
% achieving level 5 in science (KS3)	Other Black	15.49	(4.89)**	990
Key stage 3 average points score	Other Black	1.771	(0.68)**	1008
	Indian	–1.6128	(0.44)**	1874
	Bangladeshi	1.4957	(0.58)**	2554

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

At key stage 3 significant improvements have occurred for children from black Caribbean, other black and Bangladeshi ethnic groups. The analysis also shows that white British and Indian children in NDC partnerships do significantly *less well* in key stage 3 English than their comparator area

[19] Pupils were grouped according to ethnicity into the following categories: white British, other white, black African, black Caribbean, other black, Indian, Bangladeshi, Pakistani, Chinese and other ethnic group.

counterparts. Although these results do show some differential outcomes by ethnic group, it cannot be concluded that this is due to the NDC Programme because we do not know whether the groups that have experienced significant positive changes have been specifically targeted or have had higher participation rates in the NDC Programme. Further linkage of outcomes with interventions is needed to understand these results.

4.4.5 Does the impact of the NDC Programme on educational attainment vary by spend on educational programmes?

Spend on the education theme varies considerably between NDC partnerships. Spend data from System K has been used to group NDC partnerships into equal sized groups of high, medium and low spend according to their spending up to the start of 2007 (see **Table A.2** in **Appendix A** for a list of NDC partnerships in each group). The analysis excludes projects that are related to adult education and training and also capital build projects. The grouping is only approximate as it is not possible to know the time lag between spend and Programme implementation and the extent to which any project is designed to address the outcomes assessed. Each group of NDC partnerships is compared with the respective group of comparator areas to assess if NDC partnerships spending more on educational projects have had larger improvements relative to their comparator areas across the educational outcomes.

It appears that there is no association between the level of spending and the performance of the NDC partnerships. This is perhaps not surprising as it is very difficult to attribute levels of spending to the specific outcomes analysed here. The full results for spend are presented in **Appendix B**, **Table B.4**.

4.4.6 Does the impact of the NDC Programme on educational attainment vary according to the geographical patterns of school attendance?

As discussed in **Section 3.4**, the geographical patterns of school attendance in the NDC partnership areas might affect the ability of the Programme to successfully target a high proportion of NDC-resident children. The NDC partnerships were grouped as described in **Table 3.1** and the key stage 3 and key stage 4 outcomes analysed for each group. The results are presented in **Table B.5** in **Appendix B**. The results indicate that there does not appear to be a relationship between the geographical patterns of school attendance and the impact of the NDC Programme on the outcomes analysed. Thus, larger impacts have not been observed in NDC partnerships where children can be more easily targeted due to the fact that a high proportion of NDC children are concentrated in a small number of schools. However, it should be noted that it is difficult to determine the threshold at which the proportion of children resident in an NDC partnership who attend the three main secondary schools might impact upon Programme effectiveness. Thus, there may be alternative (and perhaps better) methods of grouping the NDC partnerships other than the groups suggested in **Section 3.4**. The findings here do *not* suggest that patterns of school attendance do not have any impact on Programme effectiveness, rather, that there appears to be no

differential impact of attendance on Programme effectiveness when the NDC partnerships are grouped as shown in **Table 3.1**.

4.4.7 How well have individual NDC partnerships performed in terms of narrowing the gap on educational performance outcomes?

In this section the changes in attainment outcomes in each NDC partnership are compared to the changes in the respective comparator area. **Table 4.7** shows the NDC partnerships that experienced an improvement relative to their comparator areas on any one of the seven outcome measures. Significant positive improvements are shown in bold. As there are small numbers of pupils in some NDC partnerships the results from 2005 to 2007 have been grouped for the analyses presented in this section. It should also be noted that the NDC partnerships are compared with their respective comparator areas and not to each other. Only results for NDC partnerships with at least one significant (positive or negative) outcome are shown in this section, for the full set of results see **Appendix B**, **Table B.6**.

Nineteen NDC partnerships have experienced an increase relative to their comparator areas on at least one of the outcome measures and 11 NDC partnerships have experienced a positive change for two or more outcomes. Only 10 NDC partnerships have performed significantly less well than their comparator area on any of the key outcomes. These NDC partnerships are shown in **Table 4.8**.

Considering that more emphasis was placed on improving key stage 4 attainment in the NDC partnerships' delivery plans, there does not appear to be evidence of more improvement at key stage 4 compared to key stage 3. Comparing the significant positive impacts on the key stage 3 average points score with the 'best of 8' points score at key stage 4, seven NDC areas had significant improvements at key stage 3 and six NDC areas had significant improvements at key stage 4.

There also does not appear to be any relationship between the original levels of educational attainment in an NDC partnership area in 2002 and the progress made in improving attainment outcomes. For example, of those NDC partnerships showing only significant positive improvements at key stage 4 (Luton, Salford, Coventry, Kingston upon Hull, Sandwell, Birmingham Kings Norton and Manchester), only three of these (Luton, Coventry and Hull) were in the bottom third in terms of key stage 4 performance in 2002 (see **Figure 2.1**).

One of the largest improvements in key stage 4 attainment has occurred in the Sandwell NDC Partnership. Here the probability that a child living in the NDC Partnership will achieve five or more A*–C grades is 25 percentage points higher than in the Sandwell comparator area. Further investigation of educational provision in this NDC partnership shows that 61 per cent of the 2007 key stage 4 cohort attended the same school. This school has shown a dramatic improvement in attainment in recent years and is one of the fastest improving schools in England. In this case, the NDC Partnership may have benefited from working with an excellent school. In addition, the

Table 4.7: NDC areas with a significantly positive coefficient on any outcome, 2005 to 2007 average result

	% achieving level 5 in English (KS3)	% achieving level 5 in maths (KS3)	% achieving level 5 in science (KS3)	Key stage 3 average points score	Key stage 4 'best of 8' points score	% achieving 5 or more A*–C grades (KS4)	% achieving 5 or more A*–G grades (KS4)	Number of positive outcomes	Number of negative outcomes
Luton	2.77	5.13	6.02	0.65	23.33	9.14	3.68	5	0
	(1.76)	(2.97)	(1.97)**	(0.26)*	(6.08)**	(2.79)**	(1.63)*		
Tower Hamlets	9.59	–3.17	9.5	2.38	6.84	0.03	4.93	4	0
	(3.96)*	(6.27)	(3.60)**	(0.66)**	(4.8)	(2.41)	(1.94)*		
Sunderland	6.86	8.22	6.63	1.39	9.09	1.91	3.96	4	0
	(3.40)*	(2.93)**	(3.24)*	(0.44)**	(6.95)	(2.66)	(3.61)		
Plymouth	12.62	9.36	10.32	2.33	10.86	9.63	–3.27	3	0
	(7.56)	(4.29)*	(4.17)*	(0.73)**	(11.23)	(7.38)	(3.79)		
Southwark	9.94	6.12	8.22	2.15	–15.18	–4.4	–4.12	2	0
	(6.17)	(2.76)*	(4.42)	(0.87)*	(8.22)	(3.64)	(3.44)		
Newcastle upon Tyne	3.25	6.15	17.12	1.67	–2.74	5.5	-1.02	2	0
	(4.98)	(3.75)	(2.94)**	(0.71)*	(11.43)	(3.95)	(3.51)		
Birmingham KN	–5.22	1.86	–0.08	–0.70	15.05	13.38	5.79	2	0
	(4.37)	(2.4)	(2.3)	(0.71)	(7.50)*	(7.95)	(2.46)*		
Salford	3.24	–2.82	–0.97	0.28	19.63	7.44	2.52	2	0
	(3.53)	(2.04)	(3.18)	(0.59)	(7.53)**	(1.59)**	(3.82)		
Coventry	–1.84	10.89	3.89	1.34	18.79	3.03	4.48	2	0
	(4.96)	(3.67)**	(4.01)	(1.59)	(7.36)*	(5.28)	(3.73)		
Hull	–5.05	3.81	–6.24	0.68	4.91	11.41	–9.01	2	2
	(5.5)	(1.87)*	(2.15)**	(0.39)	(6.57)	(3.98)**	(1.63)**		
Sandwell	–3.16	–9.55	–0.22	–1.78	38.92	25.86	3.79	2	2
	(1.83)	(2.02)**	(2.07)	(0.37)**	(12.77)**	(9.08)**	(2.78)		

continued

Table 4.7: NDC areas with a significantly positive coefficient on any outcome, 2005 to 2007 average result

	% achieving level 5 in English (KS3)	% achieving level 5 in maths (KS3)	% achieving level 5 in science (KS3)	Key stage 3 average points score	Key stage 4 'best of 8' points score	% achieving 5 or more A*–C grades (KS4)	% achieving 5 or more A*–G grades (KS4)	Number of positive outcomes	Number of negative outcomes
Nottingham	–7.06	10.69	7.19	0.11	–15.52	–5.37	–6.17	1	0
	(4.7)	(5.32)*	(5.34)	(1)	(13.17)	(8.18)	(6.44)		
Hackney	7.4	0.33	1.34	0.99	–5.35	-1.76	-1.52	1	0
	(2.65)**	(2.41)	(3.41)	(0.61)	(5.81)	(3.25)	(2.05)		
Bristol	10.08	–0.19	5.5	0.21	–6.16	–0.46	–3.88	1	0
	(4.64)*	(5.36)	(5.42)	(0.55)	(10.48)	(5.01)	(6.33)		
Knowsley	–6.45	6.32	0.1	0.04	6.88	7.15	3.01	1	0
	(4.39)	(2.91)*	(3.24)	(0.69)	(9.01)	(4.68)	(3.58)		
Fulham	3.11	4.88	1.25	1.49	–8.25	-10.82	-1.94	1	0
	(4.36)	(2.65)	(3.89)	(0.45)**	(7.62)	(5.65)	(2.35)		
Birmingham A	1.49	6.07	1.83	0.83	4.45	–2.58	2.94	1	0
	(6.78)	(2.01)**	(3.42)	(0.65)	(6.29)	(2.24)	(1.77)		
Newham	5.51	–2.39	1.59	0.08	–7.04	–8.92	4.33	1	1
	(3.47)	(4.63)	(3.74)	(0.66)	(5.62)	(3.51)*	(1.95)*		
Manchester	–8.86	6.48	3.87	0.68	15.68	9.95	3.07	1	1
	(2.65)**	(5.12)	(3.33)	(0.36)	(5.19)**	(7.63)	(3.68)		

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

Table 4.8: NDC areas with only significantly negative coefficients, 2005 to 2007 average result

	% achieving level 5 in English (KS3)	% achieving level 5 in maths (KS3)	% achieving level 5 in science (KS3)	Key stage 3 average points score	Key stage 4 'best of 8' points score	% achieving 5 or more A*–C grades (KS4)	% achieving 5 or more A*–G grades (KS4)	Number of positive outcomes	Number of negative outcomes
Norwich	1.56	1.87	–3.94	–1.17	–19.69	–1	–10.23	0	1
	(3.74)	(3.32)	(3.98)	(0.78)	(5.75)**	(3.46)	(5.25)		
Southampton	–0.28	–5	–0.06	–0.59	3.97	–5.80	1.69	0	1
	(2.19)	(2.79)	(3.76)	(0.62)	(5.98)	(2.60)*	(1.94)		
Islington	–0.53	1.9	–3.71	0.37	–6.07	–9.86	0.48	0	1
	(4.7)	(3.78)	(4.52)	(0.58)	(3.73)	(2.95)**	(2.14)		
Derby	5.64	–0.45	–4.38	0.60	–5.54	–11.48	3.96	0	1
	(4.34)	(4.75)	(9.59)	(0.92)	(10.29)	(4.41)**	(4.08)		
Lambeth	2.31	4.25	4.84	0.33	–7.79	–13.18	–0.32	0	1
	(3.74)	(5.31)	(5.62)	(0.93)	(13.88)	(6.38)*	(4.08)		
Middlesbrough	–9.50	–1.78	2.52	–1.57	11.10	10.37	–2.66	0	2
	(3.88)*	(4)	(3.86)	(0.64)*	(8.2)	(5.86)	(2.85)		
Bradford	–11.75	–5.58	0.61	–1.34	–9.99	3.03	–1.26	0	2
	(3.49)**	(2.92)	(2.56)	(0.76)	(4.52)*	(2.9)	(2.34)		
Hartlepool	–4.00	4.58	0.27	0.40	–14.88	–4.91	0.72	0	2
	(1.96)*	(4.73)	(3.27)	(0.42)	(6.65)*	(3.28)	(2.42)		
Wolverhampton	–7.96	–3.81	–7.47	–1.23	–4.73	–2.23	1.13	0	3
	(3.05)**	(2.47)	(3.07)*	(0.48)*	(6.38)	(5.01)	(2.33)		
Doncaster	–12.08	–7.43	–3.38	–2.45	10.14	–2.42	5.34	0	3
	(3.58)**	(2.72)**	(3.01)	(0.94)**	(12.14)	(2.17)	(4.82)		

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

fact that a large number of NDC-resident children attend this school might have facilitated joint working between the partnership and the school. However, it would be incorrect to attribute all of the improvement seen in attainment outcomes to the NDC Programme as this may be due to other factors. The evaluation of the Neighbourhood Renewal Fund has also noted the improvements seen in the Sandwell local authority and identified that some of these can be attributed to innovative use of the Neighbourhood Renewal Fund to support education projects. This example illustrates that the evaluation results need to be interpreted by also understanding the local context in each NDC partnership. In this case the patterns of school attendance, the quality of the main school and the influence of other funding streams have influenced the change in attainment outcomes observed in the NDC partnership.

4.4.8 How does population turnover affect the impact of the NDC Programme on educational attainment?

Population turnover could reduce the observed impact of the NDC Programme as children moving into the NDC partnership area after the start of the Programme might not benefit as much as children who have lived in the area since the start of the Programme. Similarly, if children in NDC partnerships benefit from the NDC Programme and subsequently move out of NDC partnership areas then these positive impacts will not be captured in the Programme evaluation. The report *Raising educational attainment in deprived areas: the challenges of geography and residential mobility for area-based initiatives*[20] reported retention rates of 50 to 70 per cent for the whole cohort between 2002 and 2006. Thus, there is a considerable amount of population turnover in some NDC areas.

In this section the aim is to investigate if a greater improvement in attainment outcomes is observed for children who have lived in an NDC partnership continuously over the period between their key stage 3 and key stage 4 exams. Thus, any children who have only lived in an NDC partnership for a short time (less than three years) are not included. Whilst this controls the potential dilution of Programme impact due to children moving into the NDC partnership area, it does not account for pupils moving out of NDC partnership areas. This group is harder to capture as it is difficult to determine what criteria could be used to decide whether or not the NDC Programme is likely to have had an impact on any particular child. For example, this may depend upon the length of time spent in an NDC partnership area and the age of the child when they were resident in an NDC partnership area. However, as discussed in **Section 3.4.2**, the method estimates the average impact, rather that the total Programme impact. Hence the exclusion of this group does not present a serious problem unless it is thought that the average impact of the Programme on the group of children who leave NDC areas differs from the average impact on those who stay.

[20] Whitworth, A. et al. (2009) *Raising educational attainment in deprived areas: the challenges of geography and residential mobility for area-based initiatives*. London: DCLG.

Table 4.9 compares the characteristics of the full NDC cohort with the sub-set of children who remain in an NDC partnership area between their key stage 3 and key stage 4 exams. Note that this relates to children taking key stage 4 in 2006 and 2007 only. Around 15 per cent of the full NDC key stage 4 cohort in 2006 and 2007 have been resident in an NDC partnership area for less than three years. The longer term resident group of children are very similar to the full NDC cohort in terms of attainment, IDACI[21] score and eligibility for free school meals. Comparing the number of children in each group it is clear that the majority of children resident in NDC partnership areas in 2006 and 2007 have lived in those NDC partnerships for at least three years.

Table 4.9: Comparing the characteristics of all NDC resident children with long-term NDC residents, 2006 and 2007 key stage 4 cohorts

Group	Total number of children	Key stage 3 average points score	Key stage 4 'best of 8' points score	Average IDACI score (2001)	% of children eligible for free school meals (2002)
Resident in NDC for at least 3 years	14,923	51.2	264.3	51.5%	43.3%
Full NDC cohort	17,450	50.9	260.1	51.5%	43.7%

The changes in the key stage 3 and key stage 4 educational attainment outcomes of the sub-group of long-term NDC residents are assessed using the same model specifications that are used for the full NDC cohort (i.e. the group of children analysed in **Sections 4.4.1** to **4.4.8**). Overall, there is little evidence that the Programme impact varies between all children resident in an NDC area in 2006 and 2007 and the sub-group of children who are long-term residents. At the Programme-wide level no overall impact is observed for the long-term resident sub-group. As was seen for the full NDC cohort in **Section 4.4.2** and **4.4.3**, significant impacts were found for children living in areas with high levels of income deprivation and children with low prior attainment scores at key stage 2 and key stage 3. The results relating to income and prior attainment for the long-term resident sub-group are presented in Tables **4.10** and **4.11**. Programme-wide results and results for the concentration and spend sub-groups for long-term resident children are presented in **Tables B.7** to **B.9** in **Appendix B**.

Comparing the results in **Table 4.10** with those in **Table 4.4**, a positive improvement in both the key stage 4 'best of 8' outcome and the five A*–C outcome is observed for the long-term resident group whilst only the five A*–C outcome is significant for the whole cohort. However, comparing the results relating to levels of income deprivation, **Table 4.5** and **Table 4.11** show a very similar pattern. It was not possible to repeat the analyses for each ethnic group and each NDC partnership individually as the number of children in the long-term resident group is too small to obtain robust results. However, there is no indication that the results for the long-term

[21] IDACI is the Income Deprivation Affecting Children Index. This measures the proportion of children resident in income deprived households in an LSOA in 2001.

resident group differ significantly from those for the whole NDC cohort. Thus, there is little evidence to suggest that the long-term resident group has benefited more from the NDC Programme than children who have moved into NDC partnership areas more recently. However, it is of course difficult to determine the length of time required for a child to benefit from the Programme as this will depend upon the individual characteristics of the child, the type of intervention and the level of exposure. As already seen in relation to patterns of school attendance, it is not possible to say that pupil mobility does not have an impact on the Programme's effectiveness.

Table 4.10: Analysis by income deprivation affecting children, average impact for 2006 and 2007 key stage 4 outcomes, long-term resident sub-group only

Outcome	Group	Full controls and fixed effects by school		Number of observations
Key stage 4 'best of 8' points score	Low income deprivation	4.10	(5.47)	6,483
	Medium income deprivation	–0.54	(3.05)	15,423
	High income deprivation	9.24	(3.69)*	9,004
% achieving 5 or more A*–C grades (KS4)	Low income deprivation	0.56	(3.35)	6,483
	Medium income deprivation	–2.22	(1.75)	15,423
	High income deprivation	4.37	(2.19)*	9,004
% achieving 5 or more A*–G grades (KS4)	Low income deprivation	1.01	(1.38)	6,483
	Medium income deprivation	0.02	(1.01)	15,423
	High income deprivation	1.60	(1.51)	9,004

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

One issue in these analyses is that children with the highest rates of mobility are the most likely to be excluded because they often have previous attainment (or other data fields) missing. It is noticeable that much higher rates of pupil mobility are observed when considering the whole NDC cohort (i.e. including children who have missing attainment data). For example, the report *Raising educational attainment in deprived areas: the challenges of geography and residential mobility for area-based initiatives*[22] reported retention rates of 50 to 70 per cent for the whole cohort between 2002 and 2006. The data in **Table 4.9** show that 85 per cent of the children taking key stage 4 in 2006 and 2007 have lived in an NDC partnership area for three years or more. The main difference in the calculation of pupil mobility is that the data used in the first report included all children whilst the data in this report can only include children who do not have missing data for any of the variables used in the attainment models. Thus it is possible that pupils with high rates of mobility have not been captured in these analyses (because they have missing data on certain key variables). Other research has suggested that pupil mobility does impact upon educational attainment;[23] however it is impossible to fully explore these trends here given the often incomplete data on children who frequently move.

[22] Whitworth, A. et al. (2009) *Raising educational attainment in deprived areas: the challenges of geography and residential mobility for area-based initiatives*. London: DCLG.

[23] See for example, Stand, S. and Demie, F. (2007) Pupil mobility, attainment and progress in secondary school. *Educational Studies*, 33 (3).

Table 4.11: Analysis by prior attainment, average impact for 2006 and 2007 key stage 4 outcomes, long-term resident sub-group only

Outcome	Group	Full controls and fixed effects by school		Number of observations
Key stage 4 'best of 8' points score	Low key stage 2 attainment	15.37	(3.99)**	7,619
	Medium key stage 2 attainment	1.39	(3.38)	15,355
	High key stage 2 attainment	–4.35	(3.14)	7,936
% achieving 5 or more A*–C grades (KS4)	Low key stage 2 attainment	5.88	(1.92)**	7,619
	Medium key stage 2 attainment	–0.2	(2.21)	15,355
	High key stage 2 attainment	–4.25	(2.01)*	7,936
% achieving 5 or more A*–G grades (KS4)	Low key stage 2 attainment	0.75	(1.74)	7,619
	Medium key stage 2 attainment	0.38	(1.03)	15,355
	High key stage 2 attainment	0.69	(0.99)	7,936
Key stage 4 'best of 8' points score	Low key stage 3 attainment	12.56	(3.87)**	7,646
	Medium key stage 3 attainment	2.14	(3.58)	15,295
	High key stage 3 attainment	–3.64	(2.92)	7,969
% achieving 5 or more A*–C grades (KS4)	Low key stage 3 attainment	1.22	(1.53)	7,646
	Medium key stage 3 attainment	3.05	(2.49)	15,295
	High key stage 3 attainment	–6.87	(1.82)**	7,969
% achieving 5 or more A*–G grades (KS4)	Low key stage 3 attainment	1.82	(1.83)	7,646
	Medium key stage 3 attainment	0.22	(0.99)	15,295
	High key stage 3 attainment	0.44	(0.89)	7,969

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

4.5 Narrowing the gap in educational attainment: key findings

The main findings from analysis of attainment outcomes at key stage 3 and key stage 4 are summarised below:

- At a Programme-wide level, there has been a statistically significant improvement in the proportion of children achieving level 5 or above in key stage 3 science in the NDC partnerships. There were no statistically significant improvements in any of the other attainment outcomes at the Programme-wide level. The improvement in key stage 3 science has only occurred for boys living in NDC partnership areas. No significant improvement in this measure is observed for girls.
- Significant improvements in attainment do occur for some sub-groups of children resident in NDC partnership areas:
  - Children living in LSOAs with high levels of income deprivation have experienced the most improvement relative to the comparator areas
  - Children with low prior attainment at key stage 2 and key stage 3 have experienced the most improvement relative to the comparator areas, particularly at key stage 4

  - Children from other black, black Caribbean and Bangladeshi ethnic groups have seen significant improvements at key stage 3
  - Some negative changes in attainment outcomes were observed for children from white British and Indian ethnic groups and children with high prior attainment scores
  - Differences in the level of spend on education interventions and the geographical patterns of school attendance did not result in differences in Programme impact. However, it is not possible to conclude that these factors have not had any influence on Programme impact.
- There is no evidence that NDC partnerships with positive outcomes at key stage 3 also experience positive outcomes at key stage 4 and vice versa.
- There also does not appear to be any relationship between the initial levels of educational deprivation in each NDC partnership area and progress in improving educational attainment outcomes. NDC partnerships with both low and high attainment in 2002 have seen positive improvements.

5. Conclusions and policy implications

This report has used statistical modelling of longitudinal educational attainment data to make a thorough assessment of the impact of the NDC Programme on educational attainment outcomes in the NDC partnership areas. The analyses go beyond the cross-sectional data analyses carried out for Phase 1 of the National Evaluation by moving from aggregate area level indicators towards assessing changes in the attainment outcomes of children living in NDC partnership areas compared to changes in the attainment outcomes of similar children living in comparator areas. Thus, the key question addressed is the extent to which the changes occurring in the NDC partnership areas would have happened regardless of the NDC Programme.

The overall findings support, to some extent, the findings from Phase 1 of the National Evaluation in that although there is improvement in the NDC partnerships, this is in a context where deprived areas across the country are improving and so there is little difference in the Programme-wide changes occurring within the NDC partnerships and their non-NDC comparator areas. However, it is recognised that it may be unrealistic to expect to see an impact at the Programme-wide level. Focussing the analyses on sub-groups of children in NDC partnerships and individual NDC partnerships shows that there have been significant changes in the educational attainment outcomes of NDC-resident children taking key stage 3 and key stage 4 exams in 2006 and 2007 and the vast majority of these are positive.

The lack of overall Programme-wide impact found here contrasts with significant positive improvements found in the analysis of the impact of the Neighbourhood Renewal Fund on educational attainment outcomes[24] at key stage 3 and key stage 4. However, this is not to say that the NDC Programme has been less effective, it is possible that this difference in impact is due to the different methods used to select control areas in each case. Whilst the NDC comparator areas are very similar to the NDC areas in terms of levels of deprivation, the broader coverage of the Neighbourhood Renewal Fund limits the choice of similarly deprived control areas.

Section 2 highlighted how there is considerable variation in the initial levels of educational deprivation in the NDC partnerships and that, in absolute terms, most NDC partnerships have seen a reduction in educational deprivation between 2002 and 2007.

NDC partnerships have differed in the types of interventions they have chosen to implement and the resources devoted to these. It is important to remember also that interventions may only focus on a particular subset of the population and some children will have benefited more than others. Given

[24] See Wilkinson, K., Whitworth, A. and McLennan, D. (2008), *Improving Educational Attainment in Deprived areas: Evaluating the Impact of the Neighbourhood Renewal Fund*. SDRC working paper.

this, it is perhaps not surprising that the overall Programme-wide effects are small.

The real strength of the analyses has been the ability to look at individual NDC partnerships and subsets of the NDC population. The findings from this work show that there has been significant change within individual NDC partnership areas and for particular population sub-groups. Particularly encouraging is that some of the NDC partnerships facing the highest initial levels of educational deprivation have made significant progress. However, it is also crucial to link interventions with outcomes. The example taken from the Sandwell NDC Partnership, where a large positive improvement in key stage 4 attainment has occurred due to the considerably improved performance of the local secondary school, illustrates that the results of the analyses here must be interpreted taking into account the local context. Thus, it is important to understand the initial starting position of each NDC partnership in terms of educational attainment, the targets and interventions planned as part of the NDC Programme, the interaction of the NDC Programme with local educational provision and the duration and coverage of any interventions.

The findings of the analyses give rise to several policy implications for the NDC Programme and area-based interventions in general. These relate to:

- Linking interventions and outcomes
- Data collection for area-based policy evaluation
- Interactions between the NDC Programme and other local or mainstream interventions; and
- Evidence for and against area-based approaches.

This report has addressed the question of whether or not the educational attainment outcomes of children living in the NDC partnerships have improved relative to what would have occurred without the NDC Programme. By controlling for as many background contextual factors as possible, the possibility that any of the effects observed are not attributable to the NDC Programme is reduced but not entirely removed. Thus, it is not possible to say conclusively that the Programme has had a positive effect although it is very likely that at least some of the improvements observed are due to the NDC Programme.

One major problem is that it is not possible to link interventions to outcomes in a straightforward way, so even if a positive improvement can be identified it is difficult to identify which interventions are driving the change. As there appears to be no evidence that the NDC partnerships that have spent more on educational attainment related activities have had more impact on educational attainment outcomes this suggests that other factors account for the differential impacts observed between NDC partnerships. These factors could relate to the type of interventions used (including the coverage and frequency of these interventions) or other factors such as the extent to which an NDC area was able to work jointly with local schools. Case study

approaches are better placed than quantitative analyses to explore these issues further.

Programme evaluation is always limited by the outcomes for which appropriate data are available; however, if outcome measures could be identified and linked with interventions at an early stage in the programme this would facilitate evaluation. For example, if it were possible to know which interventions were targeted at key stage 4 pupils and how much had been spent on these then it would be easy to identify links between improvements at key stage 4 and interventions targeted at this group and assess the cost effectiveness of these projects.

Further analysis of the NDC comparator areas would also be worthwhile; although the comparator areas have not received NDC funding they will have benefited from mainstream policy initiatives and, possibly, other locally targeted interventions. Thus, this report is really assessing if the NDC Programme has had an impact in addition to any impact that may have resulted from mainstream and any other locally based interventions that may have been implemented in comparator areas. For example, many of the children resident in the NDC areas and comparator areas attend schools which have been involved in the Excellence in Cities programme[25] which has also attempted to improve educational attainment outcomes in deprived areas.

Finally, two of the main challenges to successful implementation of education interventions, pupil mobility and patterns of school attendance, did not appear to cause differences in Programme impact between NDC partnership areas.

Whilst it may be the case that NDC partnerships have not seen these factors as barriers to successful Programme implementation, it is also clear that the data available make it very difficult to evaluate the influence of these issues. Future area-based initiatives aiming to tackle educational deprivation should ensure that these factors are taken into account in both Programme planning and evaluation.

[25] Excellence in Cities provided extra resources to Local Education Authorities to tackle educational underachievement in deprived areas. A variety of projects were implemented within secondary schools, for example, learning mentors, learning support staff and programmes for gifted students.

Appendix A: Technical appendix

This technical appendix provides additional notes and clarifications related to the analyses of the educational attainment data.

A.1 Missing variables

Within any statistical model individuals can only be included if they have non-missing values for all of the variables required by the model. As noted previously, due to missing values within various control variables, the descriptive statistics presented in this report do not match previously presented data. This is because in this report children are only included in the analyses when they have no missing data for any of the control variables. The most common cause of missing data is an inability to match the current pupil reference code with prior attainment data. This can be because the pupil changed school (and the pupil's reference code became lost in the process), moved to this country from abroad or moved from the private to the state education sector. Nationally around 8 per cent of cases have missing prior attainment data for one of the above reasons; however, in the NDC and comparator areas it is closer to 15 per cent. This characteristic seems to apply across all deprived areas and is possibly linked to the fact that more children in these areas tend to have unsettled childhoods and change schools more frequently; these areas also have higher proportions of immigrants than average.[26] As the percentage of cases with missing data is approximately equal for the NDC and comparator areas this is not seen to be a problem for the analysis as the judgements upon which the analyses are based are relative and not absolute.

A.2 Suitability of comparator areas

Table B.1 in **Appendix B** shows the characteristics of the NDC and comparator areas relating to pupils, schools and the areas themselves. The table indicates that the NDC and comparator areas are very similar and so it seems valid to assume that the children in these areas share many similar observed and unobserved characteristics.

As the NDC partnerships and the comparator areas can sometimes be reasonably close geographically, some of the children in the NDC partnerships may attend the same schools as children in the comparator areas. Whilst, on the one hand, this characteristic is beneficial to the analysis as it suggests that the NDC and comparator area children experience similar educational influences, on the other hand, it could be argued that NDC and comparator area children will be *too* similar as they attend the same schools

[26] See for example Demie, F., Lewis, K. and Taplin, A. (2005) Pupil mobility in schools and implications for raising achievement. *Educational Studies,* 31(2).

and therefore may have benefited from the same policy interventions. Hence, it will be difficult to affect the performance of children in the NDC area whilst having no effect on their peers at school and in nearby areas. However, as funding for the NDC Programme is meant to be spent only on NDC residents, and, analysis of the PLASC data shows that the extent of overlap in schooling provision between the NDC and comparator areas is fairly small, children in comparator areas should not have directly benefited from the NDC Programme even if they did receive indirect benefits. For the purposes of assessing whether or not the comparator areas are a valid control in this report, 'spillover' of NDC impact to children in the comparator areas is not considered to be a significant issue.

A.3 Selection of pre- and post-policy time periods

Ideally the DD analysis should be based on a pre-policy time point (prior to any programme intervention) and a post-policy time point (after the intervention has taken place). However, individual level postcoded attainment data only became available from 2002, so, for the purposes of the educational analyses, 2002 must be taken as the base year. Analysis of the System K data was used to check whether this was a valid assumption to make given that the NDC Programme actually began several years prior to this. Excluding money spent on improving infrastructure, only around 5 per cent of the total educational spend that would have potentially impacted upon the outcomes analysed in this report was spent prior to 2002. The majority of spend also occurred within relatively few areas with 10 areas spending nothing on education projects related to young people during this time. In the light of these findings, 2002 is considered to be an appropriate approximation to the pre-policy time point, especially as we might expect there to be a time lag between spend and any Programme effects being observed. For the majority of the analyses the 2002 data are linked to the 2003 data to construct a pre-treatment group. This increases the sample size and reduces the size of the standard errors in the statistical models. As initial investigations indicated that no significant impacts were observed in 2003, and, as this is still relatively early in the NDC Programme, 2003 is also considered to be a valid proxy for a pre-policy time point.

A.4 Model specifications and control variables

As noted in **Section 3.3** the DD model used to assess educational attainment outcomes is of the following form:

$$Y_{pst} = \alpha + \beta_0 \cdot \text{NDC} + \beta_1 \cdot \text{NDC} \cdot T + P_{pst} + S_{st} + A_p + \alpha_t + \varepsilon \qquad \text{eq. (2)}$$

Where α is a constant, NDC is a dummy variable indicating whether or not the pupil is resident in an NDC area, T is a dummy variable indicating the post-policy time period, P_{pst} represents pupil characteristics (including prior attainment), S_{st} represents school characteristics, A_p represents area characteristics

(for the pupil's area of residence), α_t is a set of year dummy variables and ε is a random error term. **Table A.1** lists the control variables used in the model.

For the sub-group analyses presented in **Section 4.4** the control variables are identical and dummy variables are added to the regression to control for belonging to a particular sub-group. For example, to examine how the attainment outcomes vary with income deprivation each pupil is assigned to a low, medium or high income deprivation category and the model is specified as follows:

$$Y_{pst} = \alpha + \beta_0 \cdot NDC + \beta_1 \cdot low + \beta_2 \cdot med + \beta_3 \cdot high + \beta_4 \cdot low.NDC + \beta_5 \cdot med \cdot NDC + \beta_6 \cdot high \cdot NDC + \beta_7 \cdot low \cdot NDC \cdot T + \beta_8 \cdot med \cdot NDC \cdot T + \beta_9 \cdot high \cdot NDC \cdot T + P_{pst} + S_{st} + A_p + \alpha_t + \varepsilon \quad \text{eq. (3)}$$

Where low, med and high are dummy variables for belonging to a particular income group. In this case the DD estimators of interest are β_7, β_8 and β_9 which show the impact of being in a particular income group in an NDC partnership in the post-policy period. This model specification is used for all sub-group analyses including the analysis for individual NDC partnerships.

Table A.1: Control variables used in the education analyses

Pupil characteristics	School characteristics	Area characteristics
– Age[1] – Gender[1] – Ethnicity[1] – Prior attainment[1] – Special educational needs status[1] – Free school meals entitlement[1]	– Average key stage 2 score for pupil's primary school[1] – % pupils eligible for free school meals[1] – % non-white pupils[1] – % pupils with special educational needs[1] – Pupil to teacher ratio[2] – School size[2] – Type of school[3] – Involvement in Excellence in Cities[2] – Dissimilarity index*	– % children in income deprived households[5] – % adults with no or low qualifications[4] – % people living in rented accommodation[4] – % adults in managerial occupations[4] – % adults in routine or semi-routine occupations[4] – % single parents[4] – % overcrowded housing[4]

Source: 1) PLASC/NPD, 2) LEASIS, 3) Edubase, 4) 2001 Census, 5) English Indices of Deprivation 2004

* The dissimilarity index is a measure of segregation at the local education authority (LEA) level used to show how pupils eligible for free school meals are distributed between the schools in an LEA. It takes the values from 0 (each school has the same share of pupils eligible for free school meals) to 1 (all pupils eligible for free school meals are concentrated in particular schools).

A.5 Categorisation of NDC partnerships into high, low and medium spend groups

Spend data from System K on the education theme was aggregated from the start of the Programme until January 2007. The spending categories included in the calculation were: youth capacity building; youth support services; youth diversionary projects; extra curricula activities; arts, dance and music; educational equipment enhancement; community chest – education; educational support posts; educational trips and activities; targeted health projects for young people; and, family support.

NDC partnerships were classified according to level of spending as high (top 13), low (bottom 13) and medium (middle 13). **Table A.2** shows the area groupings:

Table A.2: Grouping of NDC areas by level of spend on education to 2007

Low spend	Medium spend	High spend
Liverpool	Norwich	Nottingham
Southwark	Newcastle upon Tyne	Hackney
Walsall	Leicester	Tower Hamlets
Southampton	Brighton	Newham
Sheffield	Bradford	Middlesbrough
Plymouth	Kingston upon Hull	Birmingham KN
Oldham	Sandwell	Bristol
Luton	Sunderland	Manchester
Knowsley	Salford	Wolverhampton
Islington	Lewisham	Brent
Rochdale	Fulham	Haringey
Hartlepool	Doncaster	Derby
Birmingham A	Lambeth	Coventry

Appendix B: Additional data tables

Table B.1: Comparison of NDC partnerships, comparator areas and the rest of England: pupil, school and area characteristics for the 2002 key stage 4 cohort

	NDC partnerships	NDC comparator areas	All non NDC and non NDC comparator
Pupil characteristics			
% Males	49.9%	48.7%	50.3%
Average Key Stage 4 age	15.5	15.5	15.5
% pupils with SEN	24.6%	21.3%	15.7%
% pupils eligible for FSM	37.3%	36.8%	12.0%
% White British	63.3%	59.2%	84.9%
% White other	3.9%	3.0%	2.3%
% Black African	4.0%	2.7%	0.7%
% Black Caribbean	5.0%	5.2%	1.2%
% Indian	3.9%	5.2%	2.5%
% Pakistani	5.9%	12.1%	2.2%
% Black other	2.3%	2.8%	0.7%
% Bangladeshi	5.4%	4.2%	0.7%
% Chinese	0.8%	0.4%	0.3%
% other ethnicity	4.0%	3.6%	1.6%
Average KS2 score	39.4	39.7	43.1
% getting level 4 in English KS2	49.3%	49.7%	67.7%
% getting level 4 in maths KS2	48.2%	48.6%	66.3%
% getting level 4 in science KS2	55.1%	56.2%	73.1%
Average KS3 score	49.1	49.4	55.5
% getting level 5 in English	50.6%	50.3%	70.0%
% getting level 5 in maths	49.1%	49.7%	70.8%
% getting level 5 in science	38.4%	40.0%	65.3%
Average KS4 points (best of 8)	238.4	246.8	295.2
% getting 5 A*–C	30.0%	33.3%	53.9%
% getting 5 A*–G	87.9%	88.9%	95.0%
% no passes at KS4	2.6%	2.3%	0.9%
School characteristics			
Average school KS2 mark	39.9	39.9	43.0
% pupils eligible for FSM in school	32.4%	33.0%	14.3%
% non white pupils in school	31.9%	35.4%	13.7%
% pupils with SEN in school	24.7%	23.5%	18.3%
Average pupil:teacher ratio	16.5	16.2	17.0
Average school size (number of pupils)	1048.0	1034.7	1111.8
% schools in EiC	85.3%	87.1%	36.3%
% community schools	72.5%	75.7%	63.4%
% foundation schools	6.0%	4.1%	18.2%
% voluntary aided schools	19.3%	18.3%	14.5%
% voluntary controlled schools	0.6%	0.7%	3.5%
% religious schools	21.6%	20.4%	20.2%
% selective schools	0.3%	0.4%	3.9%
% single sex schools	13.8%	12.5%	10.8%
% city technology colleges	1.6%	1.2%	0.5%
% specialist schools	21.3%	20.0%	25.0%
Average dissimilarity index	0.26	0.28	0.29

continued

Table B.1: Comparison of NDC partnerships, comparator areas and the rest of England: pupil, school and area characteristics for the 2002 key stage 4 cohort

	NDC partnerships	NDC comparator areas	All non NDC and non NDC comparator
Area characteristics			
% pupils in urban schools	99.0%	99.0%	86.5%
Average % income deprivation affecting children	52.3%	49.5%	19.7%
Average % income deprivation for white British pupils	33.4%	29.6%	15.6%
% adults with no or low qualifications	60.7%	61.1%	48.3%
% adults in managerial occupations	16.1%	17.0%	35.8%
% adults in routine occupations	33.0%	33.0%	23.0%
% in rented accommodation	59.1%	55.2%	25.3%
% lone parents	20.7%	19.5%	10.9%
% overcrowded housing	14.8%	15.2%	6.1%

Notes: Data sourced from PLASC/NPD, 2001 Census, Edubase and LEASIS. Table only includes children with no missing values of any contextual variables i.e the sample is identical to that used for statistical modelling.

Table B.2: Analysis by prior attainment, key stage 3 outcomes, average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	Low key stage 2 attainment	–0.74	(1.61)	12,316
	Medium key stage 2 attainment	0.06	(1.72)	26,802
	High key stage 2 attainment	–4.48	(1.23)**	14,432
% achieving level 5 in maths (KS3)	Low key stage 2 attainment	1.68	(1.36)	12,538
	Medium key stage 2 attainment	4.95	(1.47)**	27,057
	High key stage 2 attainment	–5.68	(0.94)**	14,548
% achieving level 5 in science (KS3)	Low key stage 2 attainment	0.46	(1.28)	12,523
	Medium key stage 2 attainment	4.07	(1.45)**	27,053
	High key stage 2 attainment	–0.62	(1.12)	14,527
Key stage 3 average points score	Low key stage 2 attainment	1.08	(0.35)**	13,236
	Medium key stage 2 attainment	–0.07	(0.27)	27,673
	High key stage 2 attainment	–0.76	(0.24)**	14,670

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

Table B.3: Analysis by ethnic group, average impact for 2006 and 2007

Outcome	Ethnic Group	Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	White British	–2.73	(1.36)*	31,518
	Other White	–0.18	(3.91)	1,499
	Black Caribbean	2.8	(2.99)	2,559
	Black African	–0.2	(3.04)	2,446
	Other Black	2.46	(4.84)	979
	Indian	–8.42	(3.03)**	1,861
	Pakistani	1.84	(5.54)	4,593
	Bangladeshi	7.3	(3.77)	2,522
	Chinese	0.16	(7.22)	233
	Other ethnic group	0	(2.67)	4,378
% achieving level 5 in maths (KS3)	White British	1.02	(1.14)	31,977
	Other White	0.68	(3.24)	1,530
	Black Caribbean	7.62	(3.07)*	2,571
	Black African	1.82	(2.41)	2,458
	Other Black	17.98	(4.59)**	989
	Indian	–3.13	(3.36)	1,857
	Pakistani	0.21	(3.19)	4,616
	Bangladeshi	1.2	(3.67)	2,516
	Chinese	–1.52	(5.06)	236
	Other ethnic group	1.4	(2.03)	4,422
% achieving level 5 in science (KS3)	White British	1.38	(1.2)	31,904
	Other White	2.04	(3.92)	1,528
	Black Caribbean	3.01	(3.04)	2,576
	Black African	1.37	(2.62)	2,466
	Other Black	15.49	(4.89)**	990
	Indian	–1.94	(2.9)	1,864
	Pakistani	2.52	(2)	4,630
	Bangladeshi	3.5	(3.56)	2,518
	Chinese	6.21	(6.39)	238
	Other ethnic group	1.19	(2.24)	4,420
Key stage 3 average points score	White British	–0.14	(0.26)	33,042
	Other White	0.88	(0.66)	1,569
	Black Caribbean	0.52	(0.46)	2,610
	Black African	0.17	(0.44)	2,481
	Other Black	1.77	(0.68)**	1,008
	Indian	–1.61	(0.44)**	1,874
	Pakistani	0.04	(0.81)	4,684
	Bangladeshi	1.50	(0.58)**	2,554
	Chinese	–0.83	(1.27)	238
	Other ethnic group	–0.18	(0.39)	4,516
Key stage 4 'best of 8' points score	White British	4.64	(3.05)	30,671
	Other White	–11.67	(7.49)	1,467
	Black Caribbean	–0.98	(5.13)	2,396
	Black African	–6.04	(4.72)	1,989
	Other Black	14.02	(10.41)	988
	Indian	–2.76	(8.56)	1,904
	Pakistani	2.07	(5.42)	4,146
	Bangladeshi	2.05	(5.46)	2,336
	Chinese	4.66	(9.63)	237
	Other ethnic group	8.15	(6.25)	3,605

continued

Table B.3: Analysis by ethnic group, average impact for 2006 and 2007

Outcome	Ethnic Group	Full controls and fixed effects by school		Number of observations
% achieving 5 or more A*–C grades (KS4)	White British	1.73	(1.81)	30,671
	Other White	–5.5	(4.54)	1,467
	Black Caribbean	–0.45	(3.74)	2,396
	Black African	–4.47	(3.02)	1,989
	Other Black	–2.52	(5.1)	988
	Indian	–1.32	(5.56)	1,904
	Pakistani	1.25	(2.87)	4,146
	Bangladeshi	–2.53	(3.04)	2,336
	Chinese	–2.68	(8.32)	237
	Other ethnic group	–0.42	(3.1)	3,605
% achieving 5 or more A*–G grades (KS4)	White British	0.24	(1.07)	30,671
	Other White	–0.49	(2.64)	1,467
	Black Caribbean	1.39	(2.14)	2,396
	Black African	–2.17	(1.53)	1,989
	Other Black	3.7	(4.35)	988
	Indian	–0.33	(1.51)	1,904
	Pakistani	2.81	(2.02)	4,146
	Bangladeshi	2.98	(1.52)	2,336
	Chinese	–2.84	(2.74)	237
	Other ethnic group	2.35	(2.24)	3,605

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

Table B.4: Analysis by spend on the education theme, average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	Low spend	0	(1.97)	19,201
	Medium spend	–2.77	(1.86)	17,377
	High spend	–1.05	(1.77)	16,972
% achieving level 5 in maths (KS3)	Low spend	2.89	(1.39)*	19,324
	Medium spend	–0.09	(1.55)	17,650
	High spend	1.49	(1.55)	17,169
% achieving level 5 in science (KS3)	Low spend	1.85	(1.41)	19,359
	Medium spend	1.18	(1.48)	17,611
	High spend	2.19	(1.54)	17,133
Key stage 3 average points score	Low spend	0.33	(0.3)	19,852
	Medium spend	–0.37	(0.32)	18,164
	High spend	0.13	(0.34)	17,563
Key stage 4 'best of 8' points score	Low spend	2.62	(3.48)	18,415
	Medium spend	2.64	(5.19)	16,593
	High spend	4.34	(3.59)	15,608
% achieving 5 or more A*–C grades (KS4)	Low spend	-1	(1.98)	18,415
	Medium spend	2.18	(2.96)	16,593
	High spend	0.43	(2.7)	15,608
% achieving 5 or more A*–G grades (KS4)	Low spend	1.04	(1.2)	18,415
	Medium spend	–1.04	(1.49)	16,593
	High spend	1.88	(1.16)	15,608

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

Table B.5: Analysis by concentration of NDC pupils in three main secondary schools average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
% achieving level 5 in English (KS3)	Low concentration	–0.18	(1.69)	18,538
	Medium concentration	–1.35	(2.1)	18,671
	High concentration	–2.1	(1.82)	16,341
% achieving level 5 in maths (KS3)	Low concentration	2.34	(1.43)	18,789
	Medium concentration	2.67	(1.55)	18,876
	High concentration	–0.62	(1.49)	16,478
% achieving level 5 in science (KS3)	Low concentration	1.66	(1.48)	18,769
	Medium concentration	3.02	(1.51)*	18,847
	High concentration	0.44	(1.42)	16,487
Key stage 3 average points score	Low concentration	0.18	(0.28)	19,351
	Medium concentration	0.31	(0.34)	19,394
	High concentration	–0.39	(0.33)	16,834
Key stage 4 'best of 8' points score	Low concentration	–2.29	(3.59)	18,039
	Medium concentration	1.55	(3.3)	17,592
	High concentration	8.96	(5.02)	14,985
% achieving 5 or more A*–C grades (KS4)	Low concentration	–3.76	(2)	18,039
	Medium concentration	1.05	(2.3)	17,592
	High concentration	3.44	(3.01)	14,985
% achieving 5 or more A*–G grades (KS4)	Low concentration	0.45	(1.36)	18,039
	Medium concentration	0.79	(1.16)	17,592
	High concentration	0.39	(1.41)	14,985

*"Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

Table B.6: Results for key outcomes for each NDC partnership, 2006 to 2007 average

	% achieving level 5 in English (KS3)	% achieving level 5 in maths (KS3)	% achieving level 5 in science (KS3)	Key stage 3 average points score	Key stage 4 'best of 8' points score	% achieving 5 or more A*–C grades (KS4)	% achieving 5 or more A*–G grades (KS4)	Number of positive outcomes	Number of negative outcomes
Luton	2.77	5.13	6.02	0.65	23.33	9.14	3.68	5	0
	(1.76)	(2.97)	(1.97)**	(0.26)*	(6.08)**	(2.79)**	(1.63)*		
Tower Hamlets	9.59	–3.17	9.50	2.38	6.84	0.03	4.93	4	0
	(3.96)*	(6.27)	(3.60)**	(0.66)**	(4.8)	(2.41)	(1.94)*		
Sunderland	6.86	8.22	6.63	1.39	9.09	1.91	3.96	4	0
	(3.40)*	(2.93)**	(3.24)*	(0.44)**	(6.95)	(2.66)	(3.61)		
Plymouth	12.62	9.36	10.32	2.33	10.86	9.63	–3.27	3	0
	(7.56)	(4.29)*	(4.17)*	(0.73)**	(11.23)	(7.38)	(3.79)		
Southwark	9.94	6.12	8.22	2.15	–15.18	–4.4	–4.12	2	0
	(6.17)	(2.76)*	(4.42)	(0.87)*	(8.22)	(3.64)	(3.44)		
Newcastle upon Tyne	3.25	6.15	17.12	1.67	–2.74	5.5	–1.02	2	0
	(4.98)	(3.75)	(2.94)**	(0.71)*	(11.43)	(3.95)	(3.51)		
Birmingham KN	–5.22	1.86	–0.08	–0.70	15.05	13.38	5.79	2	0
	(4.37)	(2.4)	(2.3)	(0.71)	(7.50)*	(7.95)	(2.46)*		
Salford	3.24	–2.82	–0.97	0.28	19.63	7.44	2.52	2	0
	(3.53)	(2.04)	(3.18)	(0.59)	(7.53)**	(1.59)**	(3.82)		
Coventry	–1.84	10.89	3.89	1.34	18.79	3.03	4.48	2	0
	(4.96)	(3.67)**	(4.01)	(1.59)	(7.36)*	(5.28)	(3.73)		
Hull	–5.05	3.81	–6.24	0.68	4.91	11.41	–9.01	2	2
	(5.5)	(1.87)*	(2.15)**	(0.39)	(6.57)	(3.98)**	(1.63)**		
Sandwell	–3.16	–9.55	–0.22	–1.78	38.92	25.86	3.79	2	2
	(1.83)	(2.02)**	(2.07)	(0.37)**	(12.77)**	(9.08)**	(2.78)		
Nottingham	–7.06	10.69	7.19	0.11	–15.52	–5.37	–6.17	1	0
	(4.7)	(5.32)*	(5.34)	(1)	(13.17)	(8.18)	(6.44)		
Hackney	7.4	0.33	1.34	0.99	–5.35	–1.76	–1.52	1	0
	(2.65)**	(2.41)	(3.41)	(0.61)	(5.81)	(3.25)	(2.05)		

continued

Table B.6: Results for key outcomes for each NDC partnership, 2006 to 2007 average

	% achieving level 5 in English (KS3)	% achieving level 5 in maths (KS3)	% achieving level 5 in science (KS3)	Key stage 3 average points score	Key stage 4 'best of 8' points score	% achieving 5 or more A*–C grades (KS4)	% achieving 5 or more A*–G grades (KS4)	Number of positive outcomes	Number of negative outcomes
Bristol	10.08	–0.19	5.5	0.21	–6.16	–0.46	–3.88	1	0
	(4.64)*	(5.36)	(5.42)	(0.55)	(10.48)	(5.01)	(6.33)		
Knowsley	–6.45	6.32	0.1	0.04	6.88	7.15	3.01	1	0
	(4.39)	(2.91)*	(3.24)	(0.69)	(9.01)	(4.68)	(3.58)		
Fulham	3.11	4.88	1.25	1.49	–8.25	–10.82	–1.94	1	0
	(4.36)	(2.65)	(3.89)	(0.45)**	(7.62)	(5.65)	(2.35)		
Birmingham A	1.49	6.07	1.83	0.83	4.45	–2.58	2.94	1	0
	(6.78)	(2.01)**	(3.42)	(0.65)	(6.29)	(2.24)	(1.77)		
Newham	5.51	–2.39	1.59	0.08	–7.04	–8.92	4.33	1	1
	(3.47)	(4.63)	(3.74)	(0.66)	(5.62)	(3.51)*	(1.95)*		
Manchester	–8.86	6.48	3.87	0.68	15.68	9.95	3.07	1	1
	(2.65)**	(5.12)	(3.33)	(0.36)	(5.19)**	(7.63)	(3.68)		
Liverpool	–0.62	0.86	2.98	–0.48	10.00	3.19	–2.49	0	0
	(2.73)	(3.29)	(2.79)	(0.79)	(7.8)	(3.06)	(3.51)		
Leicester	–3.23	2.89	–1.57	0.13	–1.14	–2.69	–0.5	0	0
	(4.26)	(1.94)	(2.14)	(0.71)	(8.02)	(3.15)	(2.89)		
Brighton	–3.66	–0.51	0.33	–0.66	–6.26	–0.59	–3.92	0	0
	(3.04)	(2.13)	(3.95)	(0.41)	(8.54)	(3.74)	(2.59)		
Walsall	3.56	2.88	4.76	0.21	–4.46	–2.55	0.08	0	0
	(2.99)	(2.63)	(5.54)	(0.74)	(11.96)	(5.8)	(4.08)		
Sheffield	–0.23	–0.78	–2.49	0.75	5.28	4.71	3.44	0	0
	(4.23)	(4.96)	(4.35)	(0.83)	(7.14)	(2.79)	(3.11)		
Oldham	–3.2	–1.61	0.25	0.39	–8.31	–3.5	–3.52	0	0
	(3.28)	(2.27)	(2.62)	(0.36)	(7.17)	(2.25)	(3.06)		
Lewisham	1.42	2.87	–0.9	0.57	2.67	–2.76	2.51	0	0
	(3.66)	(3.67)	(3.51)	(0.59)	(8.78)	(5.3)	(2.68)		
Brent	7.06	0.39	1.51	0.36	–1.21	–6.32	4.75	0	0
	(7.45)	(4.84)	(5.3)	(0.87)	(6.98)	(4.76)	(4.19)		

continued

Table B.6: Results for key outcomes for each NDC partnership, 2006 to 2007 average

	% achieving level 5 in English (KS3)	% achieving level 5 in maths (KS3)	% achieving level 5 in science (KS3)	Key stage 3 average points score	Key stage 4 'best of 8' points score	% achieving 5 or more A*–C grades (KS4)	% achieving 5 or more A*–G grades (KS4)	Number of positive outcomes	Number of negative outcomes
Rochdale	3.5	–0.18	0.05	0.66	12.65	–3.14	1.1	0	0
	(5.4)	(1.75)	(4)	(0.69)	(9.23)	(2.23)	(5.66)		
Haringey	–3.86	3.74	1.45	–0.36	7.99	–0.47	2.39	0	0
	(3.13)	(2.38)	(2.95)	(0.39)	(7)	(4.15)	(1.87)		
Norwich	1.56	1.87	–3.94	–1.17	–19.69	–1	–10.23	0	1
	(3.74)	(3.32)	(3.98)	(0.78)	(5.75)**	(3.46)	(5.25)		
Southampton	–0.28	–5	–0.06	–0.59	3.97	–5.8	1.69	0	1
	(2.19)	(2.79)	(3.76)	(0.62)	(5.98)	(2.60)*	(1.94)		
Islington	–0.53	1.9	–3.71	0.37	–6.07	–9.86	0.48	0	1
	(4.7)	(3.78)	(4.52)	(0.58)	(3.73)	(2.95)**	(2.14)		
Derby	5.64	–0.45	–4.38	0.60	–5.54	–11.48	3.96	0	1
	(4.34)	(4.75)	(9.59)	(0.92)	(10.29)	(4.41)**	(4.08)		
Lambeth	2.31	4.25	4.84	0.33	–7.79	–13.18	–0.32	0	1
	(3.74)	(5.31)	(5.62)	(0.93)	(13.88)	(6.38)*	(4.08)		
Middlesbrough	–9.5	–1.78	2.52	–1.57	11.10	10.37	–2.66	0	2
	(3.88)*	(4)	(3.86)	(0.64)*	(8.2)	(5.86)	(2.85)		
Bradford	–11.75	–5.58	0.61	–1.34	–9.99	3.03	–1.26	0	2
	(3.49)**	(2.92)	(2.56)	(0.76)	(4.52)*	(2.9)	(2.34)		
Hartlepool	–4	4.58	0.27	0.40	–14.88	–4.91	0.72	0	2
	(1.96)*	(4.73)	(3.27)	(0.42)	(6.65)*	(3.28)	(2.42)		
Wolverhampton	–7.96	–3.81	–7.47	–1.23	–4.73	–2.23	1.13	0	3
	(3.05)**	(2.47)	(3.07)*	(0.48)*	(6.38)	(5.01)	(2.33)		
Doncaster	–12.08	–7.43	–3.38	–2.45	10.14	–2.42	5.34	0	3
	(3.58)**	(2.72)**	(3.01)	(0.94)**	(12.14)	(2.17)	(4.82)		

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A****.*

Table B.7: Key outcomes 2006 and 2007 for long-term NDC residents, with controls for differences in pupil characteristics

Outcome	Year	No controls, simple difference-in-difference		Full controls		Full controls and fixed effects by school		Number of observations
Key Stage 4 'best of 8' points score	2006	4.12	(3.92)	4.28	(3.3)	3.37	(3.22)	14,923
	2007	2.12	(4.15)	4.26	(3.6)	2.81	(3.48)	
% achieving 5 or more A*–C grades (KS4)	2006	1.06	(1.89)	1.09	(1.81)	0.61	(1.8)	14,923
	2007	–0.57	(2.36)	0.19	(2.3)	–0.34	(2.2)	
% achieving 5 or more A*–G grades (KS4)	2006	0.75	(1.13)	0.82	(1.05)	0.54	(1.06)	14,923
	2007	0.58	(1.13)	1.08	(1.05)	0.80	(1.13)	

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

Table B.8: Analysis by spend on the education theme for long-term NDC residents, average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
Key stage 4 'best of 8' points score	Low spend	4.16	(3.68)	11,287
	Medium spend	2.65	(5.43)	10,077
	High spend	2.38	(3.78)	9,546
% achieving 5 or more A*–C grades (KS4)	Low spend	–0.73	(2.08)	11,287
	Medium spend	2.05	(3.09)	10,077
	High spend	–0.98	(2.9)	9,546
% achieving 5 or more A*–G grades (KS4)	Low spend	1.27	(1.17)	11,287
	Medium spend	–0.67	(1.5)	10,077
	High spend	1.52	(1.14)	9,546

*Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

Table B.9: Analysis by concentration of NDC pupils in three main secondary schools for long-term NDC residents, average impact for 2006 and 2007

Outcome	Group	Full controls and fixed effects by school		Number of observations
Key stage 4 'best of 8' points score	Low concentration	–2.72	(3.71)	11,026
	Medium concentration	0.98	(3.51)	10,759
	High concentration	9.66	(5.25)	9,125
% achieving 5 or more A*–C grades (KS4)	Low concentration	–3.97	(2.14)	11,026
	Medium concentration	0.03	(2.37)	10,759
	High concentration	3.57	(3.15)	9,125
% achieving 5 or more A*–G grades (KS4)	Low concentration	0.39	(1.38)	11,026
	Medium concentration	0.81	(1.15)	10,759
	High concentration	0.67	(1.4)	9,125

*"Notes: Standard errors in parentheses clustered on schools, * indicates significant at 95% level, ** indicates significant at 99% level. Control variables include pupil, school and area characteristics, for a full list of controls refer to* ***Appendix A***.

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