

# final report

Indicator 1	Indicator 2	Indicator 3	Indicator 4
Infant mortality rate: deaths up to 1 year per 1,000 live births (2005)	U18 Conception Rate (2004)	5+ A*-C inc. English & Mathematics (2006)	Total absence rate at secondary schools (2005/06)
3.70	71.80	37.60	8.12
6.56	54.40	33.27	9.02

Name	"Closeness"	Infant mortality rate: deaths up to 1 year per 1,000 live births (2005)	Indicator 1
Nottingham City	Close	7.50	9.87
Sandwell	Close	7.70	9.72
Greenwich	Close	3.80	9.33
Southampton	Close	5.00	8.96
Hull	Close	4.40	10.74
Middlesbrough...	Close		10.12
Birmingham			3.70
Walsall			6.56
Coventry			7.69
Peterborough			7.99
			8.24

the development of the Children's Services Statistical Neighbour Benchmarking Model

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Tom Benton, Tamsin Chamberlain, Rebekah Wilson and David Teeman



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# 1 Introduction and aims

## 1.1 About the research

The Government's proposals for reforming children's services were set out in the 2003 Green Paper *Every Child Matters* (HM Treasury, 2003). The proposals aimed to combine the development of an overall framework for universal children's services with the need for targeted services to protect vulnerable children. The Green Paper introduced five outcomes for children's services, proposed by children and young people through extensive consultation, as being of key importance during childhood and adult life:

- being healthy
- staying safe
- enjoying and achieving
- making a positive contribution
- achieving economic well-being.

Together, the five outcomes encompass the overall aims for every child and young person. Following *Every Child Matters* (ECM) there was wide consultation with all the key agencies and with children and families, which led to the publication of *Every Child Matters: Next Steps* (DfES, 2004). *The Children Act 2004* (England and Wales Statutes, 2004) then made some of the ECM proposals statutory. *Every Child Matters: Change for Children* (HM Government, 2004) was published following *The Children Act 2004* (England and Wales Statutes, 2004) and set out the national outcomes framework for change in local authorities (LAs) and their partner organisations. This included 26 aims related to the five outcomes for children and young people, as well as the priority national targets and other indicators.

Alongside the introduction of the changes at LA level were changes to the inspections of children's services. The new inspections aim to be more outcome-focused and involve both the Office for Standards in Education (Ofsted) and the Commission for Social Care Inspection (CSCI) conducting joint Annual Performance Assessments (APAs) and Joint Area Reviews (JARs). The inspection criteria also form part of the ECM outcomes framework. In line with the

new outcomes framework, the 150 LAs in England require a new tool for benchmarking progress against the ECM outcomes.

Statistical neighbour models provide one method for benchmarking progress. For each LA these models designate a number of other LAs deemed to have similar characteristics. These designated LAs are known as statistical neighbours. Any LA may compare its performance (as measured by various indicators) against its statistical neighbours to provide an initial guide as to whether their performance is above or below the level that might be expected.

Currently, Ofsted provide a statistical neighbour model based on census data and the Institute of Public Finance comparator councils provide a model based on deprivation and demography data. But there is now a need for a new model based on the five ECM outcomes, which embraces the key elements of the existing models and provides LAs and their partner agencies with a tool for assessing and comparing their performance with their statistical neighbours. Ideally this new model would supersede the existing models within the context of children's services and provide a single starting point for benchmarking performance.

In April 2006, the DfES commissioned the NFER to conduct an independent external review in order to develop a single 'statistical neighbour' model. This single model aimed to combine the key elements of the different models currently available and be relevant to children and young people's services, to support LAs with the ECM agenda.

The new model, described in this report, was developed to ensure that it is appropriate for use in benchmarking across the range of indicators that are defined in the ECM Outcomes framework. This necessary focus for the model is distinct from previously developed methodologies and provided a guide for the decisions that determine how statistical neighbours are defined.

## 1.2 Aims of research

The research aims to deliver a single statistical neighbour model by combining, and enhancing, the key elements of the different models currently available which are relevant to children and young people's services. The specific objectives of the research were to:



- develop a robust model of statistical neighbours for all 150 LAs in England
- provide reasoned criteria for the decisions made in the development of the statistical neighbours model
- develop an easy to use tool in Excel format for displaying individual LAs with their statistical neighbours, as well as all 150 groups in one place for ease of comparative analysis.

## 1.3 Structure of report

The research was broken down into two main areas: consultation with stakeholders (via an online bulletin board and telephone interviews); and technical research relating to grouping LAs into statistical neighbours.

[Section 2](#) provides a brief description of the work that was undertaken as part of the consultation exercise and summarises the key findings. [Section 3](#) discusses the technical issues raised by the consultation and presents a summary of the technical approach used to develop the statistical neighbour model. [Section 4](#) explores the similarities and differences between the new model and the model developed by Ofsted in 1998. Further details on the consultation and technical exercises, along with details of the statistical neighbours designated to each LA and information about the Excel tool developed for presenting statistical neighbours can be found in the [appendices](#).

## 2 Consultation

The first, and crucial, stage of the present research involved gathering the views of a range of key stakeholders, including the end-users of statistical neighbours, to inform the development of the new model. This section of the report outlines the consultation activities and emerging findings. There were three main activities that formed part of the consultation with stakeholders:

- focused discussions with stakeholders via an online ‘bulletin board’
- one-to-one interviews with representatives from key national agencies
- piloting the draft models with LAs.

### 2.1 About the bulletin board

The online bulletin board approach to consultation ensured the burden on individuals, LAs and other key agencies was kept to a minimum, but provided regular opportunities for stakeholders to comment upon the key issues and share their opinions on potential statistical models (anonymously) throughout the development stage in a time-efficient manner. The bulletin board was hosted on the NFER’s website from May to July 2006 and was accessed via a secure login and password by stakeholders who chose to participate.

The aim was to recruit a group of approximately 150 participants who would represent both those likely to be required to provide and update the data used to define statistical neighbours, and those who make use of statistical neighbours in their work. A total of 204 individuals signed-up to participate in the bulletin board discussions. Each member was allocated a unique user identification and password and received instructions for logging on to the bulletin board via email. Although 204 individuals signed-up to participate in the consultation, not all posted a response on the bulletin board. Encouraging participants to post their comments and views was the main difficulty with the consultation. By the end of July 2006, 63 individuals had posted at least one response (but usually more) on the bulletin board. Additionally, the research team also received and responded to a number of queries and collected some comments through email and telephone contact with individuals. Telephone calls to those who signed up to the bulletin board but had not posted a response, suggested that the main reason individuals were not posting responses was because they had limited time

due to other work pressures. See [Appendix 1](#) for further information regarding the bulletin board consultation process.

The NFER research team initially posted three questions, shortly followed by a fourth, for discussion and consultation on the bulletin board. These were:

- [Q1]: There are a number of statistical neighbour benchmarking models in use (such as those designed by CSCI and Ofsted). What do you think of them?
- [Q2]: The purpose of this study is to create a single common statistical model that's applicable across children's services. How realistic is this?
- [Q3]: What types of information do you think are most important for defining statistical neighbours?
- [Q4]: How often should the information, used to create statistical neighbours, be updated in order for the model to remain relevant?

A further set of questions and an example of the NFER's statistical tool were later added to the bulletin board. This strategy allowed the research team to take a developmental approach to the research. As data were collected, it was possible to ask more targeted questions. Subsequent questions included:

### **Relevance for children's services**

- [Q5]: Some people suggested it would be useful to have a model which creates statistical neighbours separately for each of the five Every Child Matters outcomes. Would you prefer a model that creates statistical neighbours for each of the five outcomes separately, or a model that creates overall statistical neighbours, which bring together the five outcomes?

### **Updating the information**

- [Q6]: We asked for comments on how often information used to create statistical neighbours should be updated, in order for the new model to remain relevant. A five-year cycle is preferred by those who have left comments so far, as this ensures some stability in groups of neighbours and allows for year-on-year comparisons to be made. However, a few respondents suggested that the model should be updated more regularly to ensure it reflects up-to-date data. Which do you consider to be more important:

stability (i.e. through updates every five years) or up-to-date data (i.e. through updates annually)?

## Types of information

- [Q7]: We asked for comments on the types of information that are most important for defining statistical neighbours. The comments so far suggest that deprivation, ethnic diversity, population density and population size are the most important for defining statistical neighbours. Do you agree with this, or are there other measures that you think are more important?
- [Q8]: We have received responses that suggest that some demographic indicators are inappropriate for rural areas. Do you agree with this? And if so, which indicators do you feel are inappropriate?

## Example tool

- [Q9]: The tool is based on a number of demographic variables. Are any of the variables included inappropriate for defining statistical neighbours?
- [Q10]: Do you think that there is any information not included here that is crucial?
- [Q11]: The current set of weights were selected by giving greater weight to variables that are more strongly correlated with the outcome variables. Do you have any views on the amount of weight different variables should be given?

## 2.2 About the interviews with key stakeholders

Ten interviews with key stakeholders were also conducted during May and June 2006. These included representatives of national organisations (government and non-government) relating to services for children and young people, as well as two Directors of Children's Services (from one large shire county and one unitary authority). Three of the interviewees were from organisations that produce statistical neighbour models. The interviews explored the ways in which statistical neighbours are currently used, and how interviewees would like them to be used in future, as well as what they viewed the most important features of any system of statistical neighbours to be.

## 2.3 About the piloting

Following the bulletin board consultation and stakeholder interviews, a summary of the key findings was made available to bulletin board users and all users were invited to comment on the findings to date. A few individuals chose to do so: some made specific suggestions, but generally, the feedback suggested that the developments were ‘heading in the right direction’.

Piloting of the draft models took place in September 2006. Four LAs were invited to pilot the two potential versions of the tool, and the accompanying user guidelines. The LAs were selected to represent the different types of authorities (unitary, metropolitan, shire county and London borough) and were spread across the country. Representatives from all four LAs had already participated in the earlier consultations and were therefore familiar with the purpose of the work. Three of the four LAs agreed to participate in the piloting and each provided written feedback, which informed the final version of the model.

## 2.4 Summary of key findings from the consultation

See [Appendix 1](#) for further information regarding the findings from the bulletin board consultation and [Appendix 2](#) for detailed findings from the interviews with key stakeholders. Below is a summary of the key findings from both aspects of the consultation.

- Stakeholders recognised the need for a new single model that is relevant across children’s services, but as there are currently a number of existing models in use, the relevance and capabilities of a new model needs to be widely promoted to potential users. Concerns were raised regarding the challenge of creating a model that would satisfy all parties and cover all five ECM outcomes.
- There was a general consensus that stakeholders would prefer a model that brings together the five ECM outcomes, rather than a model that creates statistical neighbours for each of the five outcomes separately.
- Stakeholders made both positive and negative comments about the existing Institute of Public Finance (CSCI) and Ofsted models. Generally, they were valued for supporting performance improvement work.
- Aspects of the Ofsted model that were highlighted as positive were that it defines the relative degrees of closeness (e.g. very close, close) and has pro-

vided consistent comparisons for statistical neighbours. The fact that Euclidean distances were used was something the model was both appreciated for and criticised for.

- The Ofsted model was criticised for being out of date, relying on data that was considered no longer relevant. The methodology was felt to be difficult to understand and the model was considered to lack reciprocity.
- Stakeholders suggested that a new model should:
  - incorporate smaller geographical areas within the model
  - ensure there is reciprocity between statistical neighbours
  - have a set maximum distance for statistical neighbours to still be considered ‘neighbours’
  - include degrees of closeness (similar to the Ofsted model)
  - give LAs the opportunity to compare their authority with all other LAs, rather than just their statistical neighbours.
- Stakeholders felt it was important for users to have confidence in the model, given there are a number of models currently in use. It was suggested that the model should produce statistical neighbours which are those LAs ‘see’ as similar. There was a general view that the process of developing a new model needs to be transparent and the model needs to be accessible and understandable.
- Stakeholders considered socio-demographic data, socio-economic data and health data to be important indicators for defining statistical neighbours. There were also suggestions to include a broad range of other types of data, including crime data, number of people with English as an additional language (EAL), economic activity, number of refugees, and education-related data including student mobility, special educational needs (SEN) and free school meals (FSM). Geographical closeness of neighbours was not generally considered to be of importance.
- In terms of the frequency with which information should be updated, the stakeholders raised issues regarding the stability of the model, if it were updated too frequently, but also regarding the accuracy of the model, if it were updated too infrequently. The responses focused on where to find the balance between accuracy and stability. Overall, maintaining stability (i.e. through updates every five years) was considered to be more important than

ensuring the data was updated annually. But, it was suggested that an indication of potential changes that could affect the model would be useful mid-cycle.

- Overall, stakeholders thought it was important to both compare a LAs performance over time and compare its performance against similar LAs, depending on what was being measured. Stakeholders suggested that the model should make use of existing data that LAs use already.
- Interviewees commented on using either a single-year or three- to five-year averages within the model. The latter was thought to be particularly beneficial if LAs had spent a year establishing a new system or service, but the main point made was that the decision should depend on the type of indicators being used.

## 2.5 Implications for the future model

The data collected through the consultation, both via the online bulletin board and the one-to-one interviews, suggested the following should be considered when developing the new statistical model and tool:

- Time should be taken to communicate the rationale for the model to ensure ‘buy in’. Users must have confidence in it. This is particularly true with respect to explaining how the model will work across all five ECM outcomes.
- The statistical model should produce overall statistical neighbours, which bring together the five ECM outcomes, rather than producing separate neighbours for each outcome.
- The model may need to evolve over time.
- Socio-economic and socio-demographic data is important for defining statistical neighbours and existing data sources should be utilised in this respect. A number of variables should be used to determine deprivation, rather than a single indicator. The model should also use existing data that LAs currently use.
- LAs would find it helpful to be able to compare districts (or small geographical areas) with similar districts in other LAs.
- Reciprocity between statistical neighbours needs to be considered.
- There should be a set maximum distance for defining a neighbour, and degrees of closeness should be defined to show how statistically close LAs are.

- The choice of weightings for different variables needs to be considered carefully and explained clearly to users.
- The model should be updated every five years, to ensure some stability and allow for year-on-year comparisons, but also to ensure it remains relatively accurate.



## 3 Technical discussion

### 3.1 Issues arising from the consultation

The national consultation with stakeholders led to a range of issues being raised. Many were not directly related to the techniques used to define statistical neighbours, for example, a number of responses related to more general details of performance assessment. However, some of the emerging findings from the consultation have immediate relevance for the way in which the statistical neighbour model is constructed. This section discusses some of the issues raised.

The consultation findings suggested that a single statistical model should be produced which brings together the five outcomes, rather than separate models for each of the ECM outcomes. But it is important to be able to demonstrate that the single model works well across a range of different outcomes. This issue is explored in [section 3.3](#).

A number of LAs suggested that they would find it helpful to be able to compare districts (or small geographical areas) with similar districts in other LAs. Although, this clearly would be a valuable resource, the project team felt that the analysis involved in constructing such a tool would be somewhat different to the work required to produce statistical neighbours for LAs as a whole. This idea is recommended for further work.

The findings from the consultation also suggested that there should be a set maximum distance for defining a neighbour, and degrees of closeness should be defined to show how statistically close LAs are. After further consideration, the idea of setting a maximum distance for defining a neighbour was rejected. Work looking at the ideal number of statistical neighbours to assign to each authority revealed the danger of assigning small numbers of statistical neighbours. Benchmarks based on less than five neighbours can be misleading as these place too much emphasis on the performance of too few neighbouring authorities. But conversely, the degree of closeness of each statistical neighbour has been calculated and incorporated into the model to enable LAs to understand the nature of their statistical neighbours in greater detail.

The consultation revealed a general concern that the process of developing the new model needed to be transparent and the model needed to be accessible and understandable. In order to make the process of choosing and weighting variables transparent, a largely empirical process has been followed. This is fully detailed in [section 3.2](#) and [appendix 5](#). Findings from the consultation and literature review informed the variables that were initially considered to be used to define statistical neighbours.

The literature review suggested that variables used to define statistical neighbours should only include those variables which are clearly beyond the control of children's services at the local level. As a result certain variables such as the percentage of children with special educational needs were removed before the empirical work was started.

It was recommended during the consultation process that socio-economic and socio-demographic data is important for defining statistical neighbours and a number of variables should be used to determine deprivation, rather than a single indicator. As suggested, a range of variables covering both material and service deprivation were included in the empirical analysis. In order to maintain simplicity, each variable was included as a stand alone measure of deprivation rather than being combined to form new indices of deprivation. Although some use was made of the ODPMs Indices of Multiple Deprivation, many of these indices were inappropriate for use since they made use of ECM outcome data in their definitions. For example, since the Education, Skills and Training deprivation domain score uses results of national tests in its definition, defining statistical neighbours using this index would lead to circular reasoning.

The literature review raised the issue that the effectiveness of various deprivation indices could be different within rural settings. For this reason, a number of measures relating to the rurality of LAs were included in the empirical analysis. Including these variables in the statistical neighbour model increases the propensity for LAs with large rural populations to be compared to LAs in similar circumstances and so should effectively deal with this issue.

During the consultation process a number of stakeholders commented that it was desirable that every statistical neighbour they were compared to, was also compared to them (resulting in reciprocity between statistical neighbours). This would involve splitting LAs into groups, rather than having a separate set of statistical neighbours for each LA. Each LA would then be the statistical neighbour

of every other local authority within their group. It was proposed that defining statistical neighbours this way would help to improve information sharing between neighbours. In order to explore this possibility, a second statistical neighbour model was developed that split LAs into groups. This model was then compared to the more conventional statistical neighbour model, to explore the impact of this approach on the amount of difference between LAs and the statistical neighbours they were compared to. A decision on whether to ensure ‘reciprocity’ between statistical neighbours was then made. This exercise is described in [section 3.4](#).

## 3.2 Defining statistical neighbours

The process of defining statistical neighbours is described in detail in appendix 5. The main part of the process involved deciding what information should be used to define statistical neighbours and how much weight should be given to different pieces of information in this process. A number of sources of information were explored through a data mapping exercise. This process was informed by the consultation with local authorities and other stakeholders, the literature review and by examining which variables were used in existing statistical neighbour models.

Once data from all the suggested sources had been collated, a four-stage process was used to produce the final statistical neighbour model.

1. [Regression analysis of performance indicators on the proposed background variables](#). This process was used to reveal which performance indicators were appropriate for benchmarking using a statistical neighbour model and which background variables had little or no association with performance. Variables found to have a weak association with outcomes were discarded.
2. [Analysis of correlations between background variables](#). Where high correlations existed between two background variables, one of these was removed. The variable kept in the model was chosen on the basis of ease of calculation, regularity of updating and strength of relationship with outcomes revealed in stage 1.
3. [Calculating the appropriate number of statistical neighbours](#) to assign to each local authority. Analysis explored the robustness of models which assigned differing numbers of statistical neighbours to each LA. It was decided that

assigning ten statistical neighbours to each LA provided a robust model whilst maintaining simplicity.

4. **Assigning weights** to each of the remaining background variables in order to define statistical neighbours. Weights were assigned to background variables so as to minimise the expected difference between each LA and its statistical neighbours across a range of outcome indicators.

The variables included in the final statistical neighbour model and the weight assigned to each variable is shown in appendix 5.

### 3.3 Further validation

It is clearly desirable that the newly derived model provides a sensible benchmark across all potential outcome indicators. This issue was explored by calculating the average squared difference between the performance of each LA on each outcome indicator and the average performance of its statistical neighbours. Results for the new model were compared to the results for the IPF comparator councils, Ofsted's statistical neighbours and a model based on assigning equal weights to each background variable. This analysis revealed that for all outcomes, with the exception of two, the new proposed model provided benchmarks for local authorities that were at least as accurate as any other statistical neighbour model. In the two cases where the model was less accurate than others, the differences were very slight.

From this evidence it can be assumed that the statistical neighbour model derived through this process will provide a reasonable benchmark for performance across most ECM outcomes. Further details on this analysis can be found in appendix 5.

### 3.4 Using local authority 'families' rather than a statistical neighbour model

As mentioned in [section 3.1](#), a second statistical neighbour model was created that split LAs into families of authorities and thus ensured reciprocity between statistical neighbours. This model was based on the same variables and variable weights as the statistical neighbour model already described in this section.

The two models were compared to explore the extent to which the average distance between statistical neighbours and the overall expected difference in the performance of statistical neighbours increased, when families were used in place of conventional statistical neighbours. The analysis revealed that the average Euclidean distance between statistical neighbours increased by 44 per cent and the expected difference in outcome measures increased by around 12 per cent. This result is perhaps to be expected as many LAs will be near the boundaries of families. Subsequent to this analysis, the use of LA families for defining statistical neighbours was rejected.

## 4 Comparison of the new model with Ofsted's model

At present the most widely used statistical neighbour model is the one developed by Ofsted in 1998. This section explores the ways in which the new model developed by NFER differs from this.

It is worth noting that the Ofsted model was devised with the aim of providing LAs with comparative information for purely educational outcomes. This is in contrast to the new model which is intended to provide comparisons across a range of indicators relevant to the ECM agenda. This change in the intended purpose of the model results in some important differences in the ways in which statistical neighbours are defined.

### 4.1 Variables used

In total seven of the variables used to define statistical neighbours in the new model are in common with variables used in the Ofsted model, six variables from the Ofsted model have been replaced with alternative but similar measures and five have been discarded. Table 4.1 gives more detail on which variables have been kept, discarded and replaced. It should be noted that the Ofsted model is based on data from the 1991 census whereas the new model uses 2001 census data. As a result, even where identical measures are used the actual data included in the model is likely to be different. For more details on the methods used for variable selection see [section 3](#) and [appendix 5](#).

In addition to the changes noted above, six entirely new variables have been included in the model. Each of these variables is strongly related to outcome measures and not greatly correlated with any of the other variables in the model. These variables are:

- % of dependent children in households where household reference person is in any professional or managerial occupation
- mean gross weekly pay
- % of vehicles that are three years old or less
- % of dependent children in one adult households

- % of people in good health
- % of households owned outright or owned with mortgage.

**Table 4.1 Variables included in the Ofsted model**

Variable used in Ofsted model	Kept/Replaced/Discarded
% of households where HOH is in Registrar Generals Group IV or V	Replaced with % dependent children in households where household reference person is in any routine occupation.
% of households with dependent children and no car	Replaced with % dependent children in households with 2 or more cars.
% of pupils in maintained schools eligible for free school meals	Variable kept in new model.
% of households in dwellings with 7 or more rooms	Replaced with % dependent children living in households with occupancy rating of +2 or more.
% of households with 3 or more children	Variable kept in new model.
% of households with more than 1.5 persons per room	Replaced with % dependent children living in overcrowded households.
% of households with dependent children, moved in the previous 12 months	Discarded from model due to weak relationship with outcomes.
% of adults with higher educational qualifications	Variable kept in new model.
Ethnicity information (% of people of white, black, Indian, Pakistani, Bangladeshi, other Asian ethnicity)	Black ethnicity split into Caribbean, African and other. Mixed ethnicity included in new model. White ethnicity dropped as a separate category since information on other ethnic groups defines this.
Population density	Discarded from model due to weak relationship with outcomes.
Population growth/decline: % change	Discarded from model due to weak relationship with outcomes.
% of population in rural areas or urban settlements of less than 20,000	Replaced with % of the population living in villages, hamlets or isolated settlements.
Number of pupils in state maintained schools	Discarded from model due to weak relationship with outcomes.

## 4.2 Changes for individual authorities

Given the changes noted above, it is to be expected that individual authorities' statistical neighbours will change somewhat. Having said this, it would be alarming if there was no relationship between the statistical neighbours produced by Ofsted and those defined by the new model.

In order to investigate this issue, the team counted the number of statistical neighbours that were assigned by both the Ofsted model and the new model, for each LA. Of the 1500 statistical neighbours that are assigned in total by the new model (10 for each LA) 683 (46%) had also been assigned to the same LAs by the Ofsted model. Further details on this can be seen in table 4.2.

**Table 4.2 Degree of change from Ofsted model for individual LAs**

<b>Number of similar neighbours</b>	<b>Number of LAs with this number of neighbours in common between the Ofsted model and the new model</b>
0	1
1	3
2	9
3	28
4	31
5	34
6	29
7	10
8	5
<b>Total</b>	<b>150</b>

Generally there is reasonable agreement between the models with over half of LAs having five or more statistical neighbours in common in both models. Only one LA (Medway) has been assigned a completely changed set of statistical neighbours. This apparent disparity could be caused by the fact that there are 33 local authorities defined as being ‘Very Close’ (see [appendix 8](#)) to Medway and it is difficult for any model to pick between these.



# References

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# Appendix 1 The bulletin board consultation

## A1.1 About the bulletin board

For the statistical model to be useful to the end-users, a crucial part of this research involved gathering the views of a range of key stakeholders, including the end-users. One way in which this was achieved was through an online discussion forum or ‘bulletin board’. This approach to consultation ensured the burden on individuals, LAs and other key agencies was kept to a minimum, but provided regular opportunities for stakeholders to comment upon the key issues and share their opinions on potential statistical models throughout the development stage in a time-efficient manner. The bulletin board was hosted on the NFER’s website and accessed via a secure login and password by selected stakeholders. This enabled stakeholders to participate in the consultation at any time, as convenient. The bulletin board was monitored by the research team on a regular basis.

## A1.2 Recruitment

The bulletin board went live on 5 May 2006. A total of 495 individuals working in organisations related to children and young people’s services were emailed and invited to take part. This included individuals from the following organisations: Community Foundations, Crime Reduction Partnerships, Drug Action Teams, Learning and Skills Council, Neighbourhood Renewal Teams, Regional Government Offices, Strategic Health Authorities, Sure Start and Youth Offending Teams. These individuals were asked to open the invitation to their colleagues.

A message was posted on EMIE at NFER’s eddie discussion forum for LAs, inviting bulletin board participation<sup>1</sup>. The discussion forum reaches 480 individuals. The research team also made use of contacts in various networks. Eighty people within the Local Education Authorities Research Group (LEARG) and London Education Research Network (LERN) were emailed and invited to take part. An email was also sent to 150 EMIE link officers (one per LA)<sup>2</sup>. In addition, flyers advertising the consultation were distributed to delegates who

attended children's services data workshops at the NFER (approximately 80 individuals). Lastly, an advert was posted directly on the EMIE website.<sup>3</sup>

On 19 May (two weeks after the bulletin board went live), the research team posted a new question on the bulletin board. An email was sent to all individuals who had signed-up to inform them of this change and to remind them to post their comments. A further week later, on 26 May, a short email reminding individuals to post their comments was sent, emphasising that the initial consultation must end on 14 June. On 2 June, all Directors of Children's Services (who had not already been directly contacted via other means) were emailed and invited to participate in the bulletin board. They were also given opportunity to feed their comments directly to the research team or to pass the invitation on to their colleagues. On the same day, an advert was placed in Confed's (The Confederation of Education and Children's Services Managers) electronic newsletter to members, inviting participation in the consultation.

On 16 June a new set of questions were added to the bulletin board for further discussion. This also included an example model for stakeholders to download trial and comment upon. Table A1.1 summarises these activities.

### **A1.3 Response rate**

The aim was to recruit a group of approximately 150 participants who would represent both those likely to be required to provide and update the data used to define statistical neighbours, and those who make use of statistical neighbours in their work. A total of 204 individuals signed-up to take part in the bulletin board consultation. Each member was allocated a unique user identification and password and received instructions for logging on to the bulletin board. Although over 200 individuals signed-up to participate in the consultation, not all posted a response on the bulletin board. Encouraging participants to post their comments and views was the main difficulty.

As of 30 June, 58 individuals had posted at least one response on the bulletin board. The research team also responded to a number of queries and collected some comments through email and telephone contact with individuals. This was additional to the bulletin board responses. In order to increase the response rate, telephone calls were made to 101 individuals who signed up to the board, but had not posted a response. This acted as a gentle reminder, and has also helped

to determine the reasons for the non-response. The information gleaned from these telephone calls suggested that the main reasons individuals were not posting responses were time constraints. Table A1.2, in the subsequent section, shows the number of users who responded, by question.

**Table A1.1 Recruitment activity**

Week	Date	Activities
1	5 May	<ul style="list-style-type: none"> <li>• Bulletin board went live</li> <li>• 495 individuals from a range of organisations were emailed and invited to take part</li> <li>• A message was posted on the eddie discussion forum inviting participation</li> <li>• 80 people within LEARG and LERN were invited to take part</li> <li>• 150 link officers were emailed</li> <li>• Flyers were distributed to 80 delegates at children’s services data workshops</li> <li>• Individuals who wished to take part were sent login details (continuous)</li> </ul>
3	19 May	<ul style="list-style-type: none"> <li>• A new question was added to the bulletin board for discussion</li> <li>• All individuals who had signed-up to the bulletin board were emailed again and informed of this</li> </ul>
4	26 May	<ul style="list-style-type: none"> <li>• A short email reminder was sent to all individuals who had signed-up</li> </ul>
5	2 June	<ul style="list-style-type: none"> <li>• All directors of children’s services (who had not already been contacted) were emailed and invited to take part</li> </ul>
6	9 June	<ul style="list-style-type: none"> <li>• Telephone calls were made to individuals who had signed-up but not posted a response</li> </ul>
7	16 June	<ul style="list-style-type: none"> <li>• A new set of questions, including an example tool for download, were added to the bulletin board and all individuals who had signed-up were emailed about this</li> </ul>
9	30 June	<ul style="list-style-type: none"> <li>• All bulletin board responses were transferred for qualitative analysis</li> </ul>

## A1.4 Questions asked

The NFER research team initially posted three questions, shortly followed by a fourth, for discussion and consultation on the bulletin board. These were:

- [Q1]: There are a number of statistical neighbour benchmarking models in use (such as those designed by CSCI and Ofsted). What do you think of them?
- [Q2]: The purpose of this study is to create a single common statistical model that’s applicable across Children’s Services. How realistic is this?
- [Q3]: What types of information do you think are most important for defining statistical neighbours?

- [Q4]: How often should the information, used to create statistical neighbours, be updated in order for the model to remain relevant?

A further set of questions and an example of the statistical tool were added to the board on 16 June. Again, stakeholders were informed of these changes by email. This strategy has allowed the research team to take a developmental approach to the research. As data has been collected, it has been possible to ask more targeted questions. Subsequent questions included:

### Relevance for children's services

- [Q5]: Some people suggested it would be useful to have a model which creates statistical neighbours separately for each of the five Every Child Matters outcomes. Would you prefer a model that creates statistical neighbours for each of the five outcomes separately, or a model that creates overall statistical neighbours, which bring together the five outcomes?

### Updating the information

- [Q6]: We asked for comments on how often information used to create statistical neighbours should be updated, in order for the new model to remain relevant. A five-year cycle is preferred by those who have left comments so far, as this ensures some stability in groups of neighbours and allows for year-on-year comparisons to be made. However, a few respondents suggested that the model should be updated more regularly to ensure it reflects up-to-date data. Which do you consider to be more important: stability (i.e. through updates every five years) or up-to-date data (i.e. through updates annually)?

### Types of information

- [Q7]: We asked for comments on the types of information that are most important for defining statistical neighbours. The comments so far suggest that deprivation, ethnic diversity, population density and population size are the most important for defining statistical neighbours. Do you agree with this, or are there other measures that you think are more important?

- [Q8]: We have received responses that suggest that some demographic indicators are inappropriate for rural areas. Do you agree with this? And if so, which indicators do you feel are inappropriate?

## Example tool

- [Q9]: The tool is based on a number of demographic variables. Are any of the variables included inappropriate for defining statistical neighbours?
- [Q10]: Do you think that there is any information not included here that is crucial?
- [Q11]: The current set of weights were selected by giving greater weight to variables that are more strongly correlated with the outcome variables. Do you have any views on the amount of weight different variables should be given?

**Table A1.2 Number of respondents by question**

Question number	Number of respondents
1	12
2	13
3	9
4	12
5	11
6	10
7	6
8	1
9	5
10	1
11	2

## A1.5 Analysis

The data collected through the bulletin board was copied and transferred from the bulletin board for qualitative analysis. The responses are summarised below in [sections A1.6](#) through to [A1.10](#).

## A1.6 Views on existing models

One of the initial questions that was posted on the bulletin board was designed to prompt discussion about existing statistical neighbour models, in order to understand both the ways in which stakeholders found the models useful, and where they had concerns, to inform the development of the new model. Stakeholders who chose to respond to this question tended to be individuals based in local authorities (from both education and social care backgrounds), and were predominantly responsible for either performance management or information and statistics.

- The respondents made both positive and negative comments about the CSCI and Ofsted models and they also made suggestions about specific criteria that they felt needed to be taken into consideration when designing a new model.
- Whilst commenting on existing models, it is worth noting that a number of stakeholders chose to make comments about the need for a new single statistical neighbour model relevant across children's services, illustrating support for the overall aims of this project. Some of the comments were related to it being confusing having several models with different sets of neighbours within each; others merely stated that with the advent of children's services, it was preferable to have a single model that is relevant across children's services. For example, one respondent wrote 'given the range around, we really need one model used by all agencies involved with children's services' and another noted 'we need just one agreed set of neighbours'.
- A few respondents were questioning the purpose of statistical benchmarking more generally and felt that it was the use that was made of statistical neighbour comparisons that was problematic rather than the models themselves, particularly when the comparisons were used by those outside of the LA to make judgements. This suggests that when disseminating the new model, the explanations and caveats that accompany it will be of utmost importance, if the model is to be widely accepted and used across authorities.
- Existing models were appreciated by stakeholders for supporting performance improvement work generally and specifically for highlighting areas where a LA was performing well and areas where improvements were needed. One stakeholder remarked 'whilst the statistical neighbour data cannot provide the only basis for comparison, they are an important tool in benchmarking ourselves against the performance of "LAs like us"'.



- Aspects of the Ofsted model which were particularly highlighted as positive were that it:
  - defines the relative degrees of closeness (e.g. very close, close)
  - has provided consistent comparisons for statistical neighbours
  - uses Euclidean distances<sup>4</sup>.
- Aspects of the Ofsted model which were felt to be problematic were that:
  - it was considered out of date (e.g. using 1991 Census data) and therefore ‘inflexible’ and it does not match other national datasets
  - it relies on data considered to be of limited value or no longer relevant
  - the methodology was considered difficult to understand
  - lacks reciprocity, as each LA has a unique grouping so LA X may have LA Y as a statistical neighbour, but LA Y may not have LA X as their neighbour<sup>5</sup>.
- A general criticism of statistical neighbour models made by respondents was that they struggled to balance the different input variables appropriately.
- Whilst commenting upon the existing statistical neighbour models, many stakeholders made suggestions on specific criteria they would like included in a new model. The main suggestions included:
  - incorporating smaller geographical areas within the model, such as districts within a LA, to enable LAs to ‘drill down’ and identify variation within the authority. Stakeholders suggested that it would also be useful to be able to compare these smaller areas/districts with those in other LAs. As one respondent explained:
 

*Our LA is demographically very polarised, containing some very deprived areas and also some of the most affluent in the region. We could better evaluate our performance if we could compare these areas separately with similar areas in other LAs.*
  - ensuring some degree of reciprocity within the comparisons. One respondent explained why this was important:
 

*I turn down most requests from other LAs for joint benchmarking work as although my authority is included in their group, the other authority is not included in mine. This needs to be sorted out if authorities are to use benchmarking for qualitative work rather than just numerical comparison.*

- having a set maximum distance (using the Euclidean measure), to prevent LAs being compared with statistical neighbours that are too different from themselves, thereby reducing the number of statistical neighbours in some cases
  - incorporating degrees of closeness into the model (e.g. close, extremely close) so it is clear how similar other LAs are
  - giving LAs the opportunity to compare their authority with all other authorities, rather than just their statistical neighbours.
- Other responses included discussion about having confidence in the model. It was felt important that the users have confidence in the model, in that their statistical neighbours are those that they ‘see’ as similar. To address this would require piloting the model with a sample of LAs.

## A1.7 Views on information types

Stakeholders were asked about what types of information they thought were most important for defining statistical neighbours. Generally, respondents thought that socio-economic data like deprivation, ethnic diversity, population density and population size were the most important types of information for defining statistical neighbours. However, respondents to the bulletin board entered an extensive debate about issues such as which indicators could be used to provide such measures and the need to make appropriate use of existing sources, such as that available through ACORN, Ofsted, ODPM, CSCI and other sources. This was summarised by one stakeholder’s plea for the new model to avoid the need to ‘reinvent the wheel’.

Respondents also debated the level and sophistication of the measures needed – which linked to previous responses in that overall the implication was a need to consensually decide the focus for the model to identify appropriate measures.

To further explore the types of data stakeholders wanted the new model to contain, they were asked a supplementary question about whether there were ‘other’ types of data (other than socio economic measures) that would be useful. Among the suggestions left on the bulletin board were:

- A suggestion that a more extensive list would enable LAs to look at the specifics for individual departments or services, e.g. education.

- A broad agreement that more educationally orientated data would be useful such as special educational needs (SEN) and free school meals (FSM) information.
- Suggestions for a broad range of types of data covering health, crime, number of people with English as an additional language (EAL), student mobility, economic activity and the number of refugees.
- A suggestion that using demographic data for rural areas might not prove a fair and useful measure on which to base comparisons.

## A1.8 Views on updating the information

Stakeholders were invited to respond to a question about the frequency with which information used to create statistical neighbours should be updated in order for the new statistical model to remain relevant.

- The respondents raised issues regarding the stability of the model, if it were updated too frequently, but also regarding the accuracy of the model, if it were updated too infrequently. The responses focused on where to find the balance between accuracy and stability.
- More than half of the respondents suggested that the model would need updating every five years, to ensure some stability. For example, one stakeholder noted that ‘robust statistical data is not available promptly enough to facilitate regular updating of well-defined statistical neighbours, so a five yearly update feels appropriate’.
- A small number of respondents argued that updates would need to be more regularly than every five years, for example, to link in with PLASC updates. Or as one stakeholder noted: ‘more frequent data is never bad, but you do need to know your data and your area’.
- None of the respondents suggested less frequent updates than five-yearly, although one respondent was unconvinced that it would be possible to update even as frequently as every five years.

Following on from these findings, a further question was posted on the bulletin board asking specifically whether stability (i.e. through updates every five years) or up-to-date data (i.e. through updates annually) was more important. These further responses confirmed what the initial responses suggested:

- Maintaining stability was clearly considered by the stakeholders to be more important than ensuring the data was updated annually. One reason for this was that ‘constant changes make year on year comparisons very difficult’.
- Some stakeholders also noted the importance of the model, and its cycle, remaining simple.
- It was suggested that although a five-yearly cycle would be most appropriate, an indication of potential changes, perhaps at the mid-point of the cycle would also be helpful, e.g. if there were variables that were likely to affect the neighbour model that changed significantly during the cycle.

## A1.9 Views on relevance for children’s services

Stakeholders were asked if they would prefer a model that creates statistical neighbours for each of the five outcomes separately, or a model that created overall statistical neighbours, which would bring together the five outcomes. All respondents said that they wanted one model; one respondent said including all five outcomes would be more accurate, but lead to confusion among the ‘troops’.

Stakeholders were also asked whether creating one model was a realistic ambition. Generally, respondents agreed that creating a single model was a ‘necessity’ to facilitate common and informed debate – although several respondents said that the model was part of the answer rather than an end in its self. Respondents entered into an extensive discussion on this issue, such as:

- Questioning whether the model should provide ten neighbours and not more.
- Stating that in creating a single model, compromise would be a key element.
- Highlighting the pitfalls of not having one model, such as the problems posed if one LA should be compared with one set for one aspect of its performance and another set for another aspect.
- Raising the challenges posed in creating a single model, summarised by one respondent thus:

*...the model will be difficult to achieve. It can only be developed over-time rather than introducing new PI’s / key indicators. Perhaps we should carry on with some of our tried & tested PI’s and gradually phase in additional ones? Each LA is different and in some circumstances it maybe difficult to compare themselves with Statistical neighbours & nationally due to small*

*number of children involved e.g. looked after children; ethnic minority groups; & other vulnerable groups. Also issues around the frequency & availability of stat. neigh. & national datasets – LAs need access to this information much earlier?*

- A suggestion that with increasing coterminosity of PCTs with LAs as a result of PCT reorganisation, the statistical benchmarking ought to reflect this.
- A general view that the process of development needs to be transparent.
- The need to update the model to reflect changing needs and priorities.
- An extensive debate about the level of and number of factors to be included and their relevance and the sophistication of the model. Overall, this debate highlighted the importance of agreeing a starting point or principles with an explicit focus and clarity about what the model is intending to achieve and perhaps what it can not achieve.

## **A1.10 Views on the example tool**

Stakeholders were provided with a ‘downloadable’ example of a model, and a list of potential variables that might be included in a model and asked which they thought would be appropriate for defining statistical neighbours. Comments posted on the bulletin board showed that respondents thought that:

- The model should attempt to use and retain consistency with existing data that LAs use, such as PANDA.
- To indicate levels of deprivation it would be preferable to use ‘representative’ measures that bring together certain variables associated with deprivation, rather than single variables such as free school meals. Suggestions for examples of a more sophisticated approach included ACORN, IMD and IDACI.
- A number of additional variables facilitating neighbour comparison/differentiation were suggested, including local Gross Domestic Product (GDP), access to authority services domains, health and crime.
- The link between ‘input’ variables and ‘outcome’ indicators should be made clear.
- To accompany any new model there should be a clear and transparent discussion about how decisions about the model had been reached.

Following on from these responses, stakeholders were asked if there were any variables that were not included in the list of responses discussed above, that they would like included. There was only one response, which suggested that the number of children living in ‘areas identified as deprived’ would be a useful measure to include.

A summary of the key findings from the bulletin board consultation and the implications of the findings can be found in [Section 2](#) of the report.

## Notes

- 1 EMIE at NFER is an information service supporting LAs responsible for children’s services. The service is widely used by LA staff, particularly those involved in research and statistics in children’s services. eddie is an email discussion forum, managed by EMIE at NFER, for staff working in education and children’s services departments within LAs.
- 2 EMIE at NFER has a liaison officer in each LA with responsibility for children’s services in England.
- 3 There was a small overlap of about 10 people between LERN, LEARG and link officers; about 45 between eddie and the others.
- 4 However, this was also an aspect the model was criticised for.
- 5 The CSCI model (Institute of Public Finance model) was also criticised for a lack of reciprocity.

# Appendix 2 Interviews with stakeholders

## A2.1 About the interviews

Ten one-to-one interviews were conducted with key stakeholders representing national organisations (government and non-government) relating to services for children and young people, as well as two Directors of Children's Services (from one large shire county and one unitary authority). The interviews explored the ways in which statistical neighbours are currently used and how interviewees would like them to be used in future, as well as what they perceive to be the most important features of any system of statistical neighbours. The interviews were conducted during May and June 2006 and the interview notes were transferred to MaxQDA, a qualitative analysis tool, to facilitate the analysis of the data.

## A2.2 Roles and responsibilities in relation to data collection and use

In order to gain an overall picture of the nature of involvement that each of the stakeholders had in relation to data collection and use of the data, the interviewees were asked to give a brief description of their roles and responsibilities. The interviewees were all involved in quantitative data collection/use to a greater or lesser extent. This included:

- making use of data collected by approximately ten inspectorates, including the Home Office, CSCI, Audit Commission, Youth Justice Board and Adult Learning Inspectorate. The data was used to focus on areas for further investigation
- looking at data in order to further develop LA services, working with other agencies to establish a common data set by which to monitor performance
- managing those who were responsible for data collection or analysis
- validating the data collected by colleagues and managing the organisation of the analysis. Although not directly involved in data collection, this interviewee did make use of data in his role
- holding discussions with other bodies about data collection processes and performance measures, particularly in relation to the data sets used across social care, but increasingly health and education too

- using data sets to gain information about trends and current issues. This interviewee regarded his knowledge of statistical neighbour models as ‘very limited’
- making use of secondary statistical data to inform discussions and policy development.

## **A2.3 Organisational use of statistical neighbour models**

All but one of the interviewees reported that their organisation made use of existing statistical neighbour models, either the Ofsted model, the IPF (CSCI) model or both. There was, however, variety in the level of usage. Three interviewees, for example, worked for organisations producing one of the statistical neighbour models. One of these interviewees commented that his organisation’s model was used in virtually all areas of its work. A further interviewee considered statistical neighbours critical to her organisation’s work in order for it to monitor its own performance. This organisation also used statistical models for the purposes of comparisons, performance management and evaluating value for money.

One interviewee mentioned that his organisation also made use of ODPM benchmarking to analyse its own performance. He commented that a benchmarking system was useful, but felt using three models was ‘quite confusing’. Another interviewee reported that her organisation also made use of the IPF model, in order to carry out comparative work. Yet, a further interviewee, a policy adviser, explained that statistical data was used in a limited way in his organisation. One organisation was not making use of such models as it was only recently established. The interviewee from this organisation explained that models may be used in the future, if thought useful to specific projects.

## **A2.4 Usefulness of current statistical neighbour models**

Generally, the interviewees thought the current statistical neighbour models were useful, although this was not necessarily in relation to children’s services. The interviewee most confident about the usefulness of current models in relation to children’s services worked for an organisation which maintained its own



model. He felt that, although the model needed updating, it was a good model for inspecting certain elements of children's services. One interviewee simply said current models had a 'role to play' in judging performance, and another remarked they were useful because they provided 'a pattern of data'. A further interviewee was somewhat apathetic, commenting that current models were 'very useful because they are the only ones we have got'. She said not having any sort of tool would defeat the object of performance management.

Three interviews pointed out that while it was useful for LAs to compare themselves to others, some caution needed to be applied. They felt local factors needed to be taken into account, as 'apples were not being compared with apples'. For example, one interviewee said a LA could cover a large geographical area, but serve a small population. Therefore, she felt a new model should work on the basis of pupil numbers not percentages. Similarly, she thought a new model should consider population distributions. For example, one rural authority may have a thinly spread population, whereas another could have densely populated pockets. She felt these situations would have implications for the delivery of services. Also, the interviewee was of the opinion that a new model should consider the amount of funding LAs receive per pupil, because this can differ. Another interviewee said 'we need to identify where the points of differences are and where the data diverge', for example, across age groups. The mobility of a population was also mentioned as a factor to be considered.

With regards to local context, one interviewee commented that the ODPM model was particularly useful. He explained that this model is based on smaller areas rather than whole LAs, i.e. census wards. The interviewee thought this type of information was very important for LAs, especially large shire authorities, because it takes into consideration local factors, such as urbaness/ruralness. Making reference to other models currently available, he said the IPF model constrained the statistical analysis of the different types of authorities. For example, metropolitan authorities could be compared with unitary authorities, but shires could not be compared with London. He said this drawback would become irrelevant if a new model used smaller areas instead of whole LAs. Overall, this interviewee was of the opinion that 'disagrability' was the 'gold standard' of any statistical model. He suggested this might be possible if unique pupil identification numbers were used.

From the perspective of an interviewee who worked as a policy consultant, he felt the data used in current statistical neighbour models might connect to ECM

indicators, but he had reservations. He commented that a clear link was needed between neighbour indicators and the five ECM outcomes. This interviewee remarked that a review was needed in order to determine what data would be most useful in informing and/or providing measurements to support improvement. He felt the data used to create statistical neighbour models needed to be 'more rounded'. For instance, data could be used to show how educational achievement data interacts with child protection data (e.g. is a child with low educational achievement more likely to be an 'at risk' from illness, neglect or abuse than a child with higher educational achievement). The interviewee was also of the opinion that any statistical neighbour model should serve as an internal benchmarking tool, as well as a tool for comparisons between LAs.

## **A2.5 Possibility of creating a single common statistical model**

Overall, interviewees thought it was realistic to create a single common statistical model that would be applicable across Children's Services. One interviewee explained that, as the JAR document already collects data on approximately 290 performance indicators, there would be no problem using a single model. She said this information would just have to be categorised into the five ECM outcomes. In terms of combining existing models, a second interviewee predicted that similar factors would affect education and social services outcomes, but this was difficult to determine without looking at the neighbours being produced. He felt a single model could only work if education/social service/other factors were shown to have similar results.

There were, however, some reservations. One interviewee remarked that a single model was never going to be perfect. Two commented that a single model would never satisfy all parties. One of these interviewees thought 'each of the people who have devised their own [statistical model] will argue their corner quite strongly'. The advice given was to consult on the characteristics that should define a statistical neighbour model. It was suggested that, while a single model would be useful, caveats would be needed about what the model could and could not achieve. A further reservation was related to a 'whole system' (i.e. the multi-agency) attempt to improve LA outcomes. The interviewee was concerned that there was a danger that outcomes for children would become 'divorced' from the development of a model. To possibly avoid such a pitfall the interviewee suggested ensuring that the model could be used to focus on spe-

cific ‘groups’ of children, such as looked after children. In this way he also felt that statistical data and local/national policy could be taken into account, which would make the model more practical and useful in helping achieve and address the five outcomes.

## A2.6 Making the model relevant

The interviewees were of the opinion that consultation (at strategic level and service manager level) was the key factor in ensuring that a new model was relevant to, and accepted by, agencies involved in Children’s Services. One interviewee commented that any model would need to have, and build, credibility with its users. Therefore, discussion would be needed within and between LAs to ensure the model were useful, and that it had practical (e.g. implicit links to inspection work) and demonstrable advantages to models currently available. In his opinion, this would lead to legitimacy and credibility among users, and would ensure the data would be used as intended. He also advised that the rationale for the collection of data should be carefully considered in terms of how it could be used (e.g. within LAs, between groups of LAs or nationally).

This opinion was echoed by other interviewees. One interviewee said that a new model could be ‘imposed’ on users, but this might not result in buy-in or ownership. She said thorough consultation would facilitate buy-in, and would also help to clarify how the new model was better than existing versions. This interviewee also advised that the new model be kept simple. The straightforward nature of the new model was also stressed by four other interviewees. One of these said it needed to be ‘accessible and understandable’. He also thought some consistency, particularly with the ODPM model, would be helpful because people were aware of how such a system works. Another remarked that some users of statistical models are not familiar with Euclidean statistics. Therefore, a new model would need to specify why authority A has authority B as its neighbour, but not vice versa.

In addition, two reservations were put forward. One interviewee thought it would be difficult to include issues related to policing because the national picture was quite complicated. Another interviewee warned that a new model had the potential to be disruptive for LAs. For example, a LA could be placed at the bottom or middle of a group when they previously outperformed their neighbours. The LA would then need to explain this to its elected members and community.

## **A2.7 Consideration of statistical neighbours in local authority inspections**

Generally speaking, interviewees felt LA inspections should give some consideration to statistical neighbours, but that other evidence should be taken into account. There was a feeling that statistical neighbours were useful to determine the progress being made by an authority, the questions that should be asked of an authority and the areas of future focus. However, there was also a feeling that statistical neighbours need to be used in a positive way and assist people in moving forward. One interviewee said statistical neighbours ‘should be part of the evidence base, but not a definitive because there are always local stories which explain things’. Another said attention should be given to statistical neighbours, but it should not be a disproportionate focus. Other factors may need to be considered, such as a LA’s starting point, national averages, performance over time and the quality of LA personnel and leadership.

One interview gave an example about the need for qualitative data, as well as quantitative data. She explained that, if a LA is struggling with a particular service, it would be useful to look historically at LAs which have been in a similar position, but have progressed upwards. If only quantitative data were considered, it may reveal that improvements have been made, but it would not give details about the quality of a LA’s work and its impact. For example, the LA may have reduced its number of looked-after children from 15 to ten. In terms of statistics, this would show that the LA was moving in the right direction. However, it would not reveal what had happened to the five children no longer being looked-after. The interviewee remarked, ‘were they just thrown out’, or did the LA have a carefully planned strategy for exiting looked-after children and moving into independent/semi independent arrangements? A different LA might have moved from looking after 15 children to 12, but it may have looked more carefully at how these children were moved. Statistically, this LA would be seen as achieving less well to the LA which moved from 15 children to ten.

## **A2.8 Future use of statistical neighbours for children’s services**

Thinking about the future of children’s services, interviewees generally said they would like statistical neighbours to be used in a similar way to the current

situation. That is, statistical neighbours being used for comparisons when LAs are looking at performance, a way to identify areas for improvement and a resource to help inspectors make better judgements about services. However, the new model would need to support the ECM agenda. One interviewee said she would like to see the same comparator groups used across all five ECM outcomes. She thought there would be ‘tremendous’ logic in this type of approach. Another interviewee commented that the new model need not produce one set of neighbours per LA, but could produce five relating to the five ECM outcomes<sup>1</sup>. She thought this issue should form part of the consultation process<sup>2</sup>. Two further interviewees said they would like to see a simpler, more user-friendly model. One of these interviewees added that he would like the new model to focus on the practical and applied use of data.

## **A2.9 Basis for local authority comparisons**

Overall, interviewees thought it was important to both compare a LA’s performance over time and compare its performance against similar LAs. For example, it might be useful to know that a LA has outperformed others, but if attention is paid to the LA in isolation, it might become apparent that it has been allocated more government money. Four interviewees mentioned that the decision to look at performance over time or performance against similar LAs would depend on what they were trying to measure. One interviewee said it was important not to be ‘totally obsessed’ with the position of a LA in either case, as this could result in losing sight of the LA’s impact on children.

## **A2.10 Most important indicators in defining statistical neighbours**

Interviewees were asked to report on the indicators they felt were most important in the definition of statistical neighbours. The responses given largely reflected interviewees’ personal and/or their organisation’s interest. For example, one interviewee was particularly interested in variables related to education, such as free school meals. The range of responses given was also dependent on an interviewee’s level of knowledge about the indicators currently used. One interviewee thought the indicators used to define statistical neighbours were of equal importance because each one formed part of the ‘whole picture’. She did

not think it possible to exclude any indicators because each could have a major impact on the overall picture.

The most commonly cited indicators were related to socio-demographics (age; ethnicity; single/dual parent families; population density), socio-economics (house prices; average wage; nature of local economy; presence of local university, transport links) and health (disability; mental health; drug use). It was noted, however, that some of these indicators were more comparable than others. A reason why these indicators were thought to be important was for financial comparisons between LAs (such as the reasons why LAs are allocated different levels of funding). One interviewee commented that social deprivation is known to have impacts on education results and the need for social care. A further interviewee mentioned the possibility of double counting some of the indicators (mentioned above), and that one may be a proxy for another, but this could be ruled out if an appropriate methodology was adopted.

## **A2.11 Importance of geographical closeness**

In general, interviewees did not think it was important for statistical neighbours to be geographically close. However, one interviewee commented, in creating a new model, it should be acknowledged that some people think geographical closeness is important. He said LAs may prefer being physically close to their neighbour to make visits easier, but such endeavours would be of little value if the LAs were not statistically alike. It was also noted that unitary and metropolitan authorities tend to be located next to shire authorities, which are likely to have different circumstances<sup>3</sup>. Another interviewee said the decision to include geographical closeness as a factor should be based on the aim of the comparison, e.g. a particular theme or intended outcome. It was also noted that members of the public may think it useful for statistical neighbours to be geographically close.

## **A2.12 Strengths and weaknesses of using different types of data**

In terms of the strengths of using different types of data within a single common statistical model, only one interviewee gave an opinion. He felt the most obvious strength was having consistent and common data. Two interviewees

commented on the difficulties of using different types of data within a single common statistical model. One remarked that it would be difficult to find data that were updated annually. A second interviewee thought a single model could be strong, as long as variables were only measured once. She said, because services collect data at different times (e.g. based on financial or academic years), a new model must ensure the same children are being measured, otherwise data would be gained from different cohorts. A further interviewee thought that a ‘trade off’ was needed between timeliness and precision. Two interviewees mentioned that a common language among LA services would be helpful in the creation of a single statistical model.

## **A2.13 Use of inputs or outputs**

Five interviewees thought statistical neighbours should be based on inputs, but three thought outcomes were more important<sup>4</sup>. Of those who favoured inputs, one interviewee said this was his preference because inputs were known, but the outputs were trying to be determined. However, some caution was given. One interviewee said, inputs could easily be counted, but measuring outcomes was more difficult. A second interviewee said inputs should be factors that a LA has no control over, so they could not be manipulated. He also said some factors could be both inputs and outcomes, such as attendance, and suggested excluding such factors. A further interviewee remarked that inputs needed to be focused on what outcomes were being sought and how these will make a difference.

## **A2.14 Recalculating data for a statistical neighbour model**

The interviewees did not give a fixed timeframe for the recalculation of the information used to create statistical neighbours, but it was generally agreed that consistency and a degree of certainty was needed. One interviewee said stability was needed when using a comparative system and suggested data be recalculated every five years, for example following the five-yearly census review carried out by the ONS. He said ‘certainty of the outcome’ was an important issue when making comparisons. For example, if a LA was inspected against certain LAs during one year, and the inspection team returned the following year looking at a different group of neighbours, their job would be made

more difficult. Another interviewee remarked that, while it was tempting to use the most current data, this made evaluation over time more difficult because the comparator groups would keep changing. In addition, it was noted that regular recalculation could be burdensome for LAs.

A five-year cycle was also mentioned by other interviewees. However, other alternatives to a five-year cycle were offered. One interviewee said a compromise would be every three to five years, but the ability to do this was dependent on when the information used to create statistical neighbours was updated. A second interviewee thought that annual recalculations should be carried out because performance assessments are now performed once a year. A further interviewee said information should be recalculated fairly regularly to take into consideration regeneration, and shifts in population (such as immigration patterns). She thought ten-yearly data, as in the case of the UK Census, would not be sensitive to interim change. It was also noted that data used when creating statistical neighbours would always be one year behind. The interviewee suggested this could be partly resolved by using a central database where LAs could conduct some of their own analysis, and perhaps data awaiting validation could be used.

## **A2.15 Using single-year or three- to five-year averages**

Five interviewees commented on the advantages and disadvantages in using either single-year or three- to five-year averages. Two interviewees preferred three- to five-year averages. This was seen as being particularly helpful if a LA had spent a year establishing a new system or service, as the impact could be ascertained in the following years. Another interviewee expressed the view that if a factor was volatile to change, it ought not to be included in a statistical neighbour model. It was also noted that the decision to use either a single-year or three- to five-year averages would depend on the indicators being used.

## **A2.16 Additional comments**

Interviewees were given the opportunity to provide further comments. These included:

- being clear about the underlying agenda for the new model
- a new statistical neighbour model needs to be practical and useful for both statisticians and policy makers



- deciding on the number of statistical neighbours to be allocated to each LA (i.e. fixed, not fixed or up to a certain number)
- testing whether or not there is an overall set of statistical neighbours that are good enough to use for all purposes
- trialling the new model with LAs prior to implementation
- considering the best strategy for small authorities such as the Isles of Scilly, Rutland and City of London
- examining how benchmarking (internal and external) fits with the creation of the new model
- connecting the present study with existing work to avoid duplication and to benefit from other findings.

A summary of the overall key findings from the stakeholder interviews (and bulletin board consultation) as well as the implications of the findings can be found in [Section 2](#) of the report.

## Notes

- 1 In response to another question, another interviewee warned against this approach.
- 2 This issue was addressed as part of the bulletin board consultation.
- 3 It was noted in response to a different question that similar LA type did not necessarily imply similar circumstances.
- 4 During analysis, it became clear than one of these interviewees had taken inputs to mean resources rather than demographic variables.

# Appendix 3 Literature review

## A3.1 Introduction

To determine which variables should be used to create statistical neighbours, the research team reviewed the latest writings in this field to evaluate the advantages and disadvantages of using particular indicators. The research team is of the opinion that, in practice, not all stakeholders will agree as to which indicators should be used, and stakeholders' expressed preferences may not be validated by the statistical modelling. Therefore, the final model or models proposed will have to be based on sound evidence obtained from other research, as well as from statistical analysis and the consideration of stakeholders' views.

## A3.2 Searching the literature

In collaboration with the NFER's Library and Information Service, the research team located a range of relevant literature. The databases searched included: ASSIA (Applied Social Sciences Index and Abstracts); BEI (British Education Index); CERUK (Current Educational Research in the UK); ERIC (Education Resources Information Center); PsycINFO and Social Policy and Practice, as well as the Library's own internal bibliographical databases. Internet searches were also carried out on relevant subject gateways and websites. By looking at what has been done in the past, the research team was able to consider the usefulness of methods adopted by other organisations, agencies and departments.

## A3.3 Relevant findings

Statistical neighbour methodology sits within the wider area of performance assessment. A set of desirable characteristics for performance indicators was developed by Bird *et al.*, (2005). Amongst these was the importance of 'adjusting for context to achieve comparability' (Bird *et al.*, 2005, p. 13). It stated that this process of adjustment 'must be transparent to be convincing to the user' (Bird *et al.*, 2005, p. 13).

The development of statistical neighbours certainly has the potential to meet this criterion. However, the choice of contextual variables used to define statistical neighbours is clearly key:

*A clear issue is the choice of context variables on which to base adjustment. They should represent external features outside the control, judgement or influence of the organization under assessment. This can be difficult to determine without local knowledge or audit.*

(Bird *et al.*, 2005, p. 15)

The only previous published methodology for defining statistical neighbours for benchmarking that was obtained through the literature searches, related to the work of Ofsted. Statistical neighbours were defined by a three stage process of:

- proposing a large number of variables that could be used to define neighbours
- removing those variables that were highly correlated with other possible variables or did not correlate well with educational outcomes
- defining statistical neighbours using the remaining variables giving equal weight to each one.

No justification was made for giving equal weight to each of the remaining variables.

It should be noted that, although there is relatively little published work on the use of statistical neighbours within benchmarking and performance assessment literature, statistical neighbours is a well established technique within the area of statistical prediction models. Within this framework statistical neighbour models are designed as a technique for predicting the likely behaviour of a new individual or observation and have been used in a wide range of medical and commercial applications. A summary of the research in this area can be found in Dasarathy (1991).

One of the common features of these models is the optimisation of model parameters (such as the amount of weight given to different variables) with regard to the performance of the model. There are number of methods suggested for weighting variables including those suggested by Short and Fukunaga (1981), and Paredes and Vidal (2000). Although the new statistical neighbour model developed by NFER is not primarily intended for predictive purposes,

the principle of choosing model parameters to maximise the performance of the model can be extended to a benchmarking situation.

Although, as noted above, there has been little published work in the area of choosing statistical neighbours for benchmarking, there has been much work published in the related area of deprivation indices. The most obviously applicable and widely used of the reports are the definitions of multiple deprivation indices as reported by the Office for the Deputy Prime Minister (2004). This work identified a number of different aspects of deprivation including income, employment, health, education, barriers to housing and services, living environment and crime. A total of 37 indicators were used to measure deprivation across these seven domains. Shrinkage (that is, adjusting the values of indicators within small areas towards the average level for these indicators to improve accuracy) was applied to some indicators as part of this process. The resulting seven indices of deprivation were combined to form a single measure by ranking areas, using these ranks to transform data to the exponential distribution and summing the resulting seven numbers. As part of this process more weight was given to the income and employment domains and less to the domains of barriers to housing and services, crime, and living environment. No empirical justifications were made for this decision.

Some of the more technical aspects of this work were commented on in the evaluation of Scottish indices of deprivation by Weir and McConnachie (2005). With regard to the issue of shrinkage (adjusting the values of indicators within small areas towards the average level for these indicators), they commented that:

*It has little effect on the resultant indices and by shrinkage towards LA averages, introduces a small bias that penalises data zones within otherwise less deprived areas*

(Weir and McConnachie, 2005, p. 57)

In terms of the relative weights given to different indicators the authors recommend that:

*the methods by which domain weights are derived are made more explicit reflecting the importance of each domain in terms of its prevalence.....and its severity*

(Weir and McConnachie, 2005, p. 57)

The practice of transforming indicators to the exponential distribution before combining them into single measures was generally supported as it reduced the incidence of low scores on one indicator, cancelling out high levels of deprivation on another.

Concerns about the usefulness of many deprivation indices within rural areas were raised by Higgs and White (2000). They noted that certain indicators of deprivation were not appropriate for rural areas. For example in the case of car ownership:

*The necessity for a car in rural areas in the face of costly, or non-existent public transport services leads to higher than average levels of car ownership, often at the expense of low-income households not being able to afford other types of household goods.*

(Higgs and White, 2000, p. 15)

As a replacement for these types of indicators the authors recommended that indicators of the availability of services to residents are used.

Questions about whether various deprivation indices had equal effects on men and women were raised by Stafford *et al.*, (2005). However, since the present study is dealing with relatively large population areas, gender imbalance is unlikely to be a problem and these issues can be safely ignored.

## A3.4 Conclusions from the literature review

From the above literature, the following points were taken forward when developing the methodology for the children's services model.

- Adjustment context is an important part of performance assessment. This could be achieved by the use of statistical neighbours. The methods used to define these need to be transparent.
- Variables used in the development of statistical neighbours should only include those variables which are clearly beyond the control of children's services at the local level.
- The model devised by Ofsted provides a good basis upon which to base this work, although it would be good to have a clearer justification for the amount of weight given to different variables. Weighting variables to optimise model performance is common practice within statistical prediction literature and may provide a method for approaching this.

- Consideration needs to be given to the effectiveness of deprivation indices within areas containing large rural communities.
- Information about availability of services should be considered as part of the statistical neighbour model.
- It may be worth transforming indicators to the exponential distribution if these are to be combined to form summary measures prior to use in the statistical neighbours model.

# Appendix 4 Criteria for comparing models

## A4.1 Introduction

It is clear from reviewing current practice that a number of statistical neighbour models are available for, and in use in, local authorities in England. Each of these models makes use of different sets of data, combined in different ways to produce neighbours. Whilst some decisions about the ways statistical neighbours are defined are justified empirically (such as using the correlations of various socio-economic and demographic variables with outcomes to determine which variables should be included in the model) there are other areas where the decisions made appear arbitrary. For example, both the Institute of Public Finance comparator councils and Ofsted statistical neighbour models give equal weight to all background variables. Currently there is no empirical justification for this practice. Similarly the Ofsted model provides local authorities with ten or fewer statistical neighbours whilst the IPF model provides 15. Once again, there is currently no empirical justification for the differences between these models.

In order to address this situation, and to base any future statistical neighbour model on a more empirical basis it is necessary to develop a method for comparing the effectiveness of one statistical neighbour model with another. A possible criterion for doing this is developed below.

It is important to note that the criterion developed below is not intended as a criterion for defining statistical neighbours in and of itself. The aim here is to produce an empirical measure for comparing different methodologies so that if we are presented with two differing methodologies for producing statistical neighbours we can tell which of these is more appropriate in our given context. The validity of this criterion is dependent upon the purpose for which statistical neighbours are to be used. Therefore, the criterion derived below may not be appropriate in other contexts.

## A4.2 A single assessment criterion

In order to devise a criterion for assessing statistical neighbour methodologies it is important to keep in mind the main purpose for which these models are used.

Statistical neighbours are intended to provide an indication of whether local authorities are performing above or below the level that might be expected. For this reason, it is our opinion that it is necessary that the performances of a local authority's statistical neighbours provide a reasonable indicator of what might be expected from that local authority. In other words, a good statistical neighbour model should be such that the expected performance of each local authority is close to the expected average performance of its statistical neighbours. This rationale for assessing the performance of a statistical neighbour model can be realised in terms of a quantitative criterion. In theory we might measure this by the average squared difference between the expected performance of each local authority and the average expected performance of its statistical neighbours.

In practice, unfortunately, this approach cannot be applied directly because the precise relationship between the demographics of a particular local authority and the *expected* value of each performance indicator is not known. However, it has been shown in other contexts that there is a close relationship between the differences in the expected values of outcomes within a given grouping of individual units and the differences between the *actual* values of outcomes (Benton and Hand, 2002). It is reasonable to assume that this finding would equally apply to statistical neighbour models. As a result we can infer that the model that produces statistical neighbours such that the performance of each local authority is closest to the average actual performance of its statistical neighbours, is the model that is performing best in terms of matching the expected values of performance.

Using this logic, the effectiveness of any statistical neighbour model can be assessed using a simple formula. Suppose we have  $J$  separate performance indicators for each of  $N$  local authorities. In the context of providing statistical neighbours appropriate for children and young people's services these might be indicators such as the rate of conceptions amongst young people under the age of 18 within the local authority, or the total number of half days absence from school per pupil of statutory age. In order for differences in performance on different indicators to be meaningfully compared, it is important that these outcomes are standardised. Let us denote the standardised performance of the  $i$ th local authority on the  $j$ th performance indicator as  $I_{ij}$ . Now we can define our measure as:

$$Measure = \left( \sum_{ij} (Y_{ij} - \bar{Y}_{ij})^2 \right) NJ$$



Where:

$Y_{ij}$  = Standardised performance of LA  $i$  on performance indicator  $j$

$\bar{Y}_{ij}$  = Average standardised performance of statistical neighbours of LA  $i$  on performance indicator  $j$  for the given statistical neighbour model

$J$  = Number of performance indicators

$N$  = Number of local authorities

In plain language our measure is the average squared difference between the performance of each local authority and the average performance of its statistical neighbours across all performance indicators. If presented with two different statistical neighbour models we now choose the model that results in the lowest value for this measure.

Aside from the justification given above, this criterion has some face validity. Generally speaking, if the performances of individual local authorities were closer to national averages than to the average for their statistical neighbours, the statistical neighbour method of benchmarking would be at best inappropriate and at worst misleading. There would be little point in comparisons to statistical neighbours being made if we did not expect there to be similarities in outcomes.

In some ways using this criterion to define the parameters of a statistical neighbour model has similarities to the value added approach used for assessing schools. Each school's performance is compared to their expected performance given their prior attainment. The expected performance of each school is defined in terms of the prior attainment of their pupils such that nationally school performance tends to be close to the expected performance. Within this framework, individual schools may differ substantially from their expected performance but nationally most schools will be close. In other words the standard value added methodology defines the parameters of its underlying model such that nationally, performance is close to what was expected from the model. This same idea can be applied to local authorities in the way the criterion described is used to define statistical neighbours.

Once again it is important to reiterate that this criterion cannot be used to directly produce statistical neighbours. The statistical neighbours of each local

authority are defined in terms of various demographic and socio-economic indicators as in the various existing models. The idea here is to provide a criterion for comparing different methodologies for compiling lists of statistical neighbours rather than to produce a particular methodology.

As such, although under this approach the effectiveness of any statistical neighbour model is assessed in terms of performance indicators, statistical neighbours themselves are not defined by performance indicators. That is, statistical neighbours are defined by a selection of demographic and socio-economic variables as in the Ofsted and IPF models. However, using this criterion, it is possible to compare models that include different combinations of variables and that give different amounts of weight to different variables.

## Appendix 5 Defining statistical neighbours

The first step in defining statistical neighbours was determining which variables should be used in the model. This process began with a list of 63 potential background indicators describing the characteristics of each local authority. This list of suggested variables was informed by the consultation with local authorities and other stakeholders, the literature review and examining which variables are used in existing statistical neighbour models.

Potential background variables were collated from the following sources:

- The 2001 census
- Annual population surveys between 2001 and 2005
- Labour force survey four quarterly averages – June 2004 to May 2005
- Annual survey of hours and earnings 2005
- The ODPM indices of multiple deprivation
- The local authority data matrix
- DVLA information on vehicle numbers and ages
- CIPFA information on availability of services

One important decision made at this stage was the decision not to use percentage of students with a statement of special educational needs as a potential indicator as policies on these varied too greatly between local authorities.

In order to reduce this list of 63 to a more manageable amount of data and produce the final definitions for statistical neighbours, a four step process was used.

1. Regression analysis of performance indicators on the proposed background variables. This process was used to reveal which performance indicators were appropriate for benchmarking using a statistical neighbour model and which background variables had little or no association with performance and could be discarded.
2. Analysis of correlations between background variables. Where high correlations existed between two variables, one of these was removed.

3. Calculating the appropriate number of statistical neighbours to assign to each local authority.
4. Assigning weights to each of the remaining background variables in order to define statistical neighbours.

## A5.1 Regression analyses

Of particular interest was ascertaining which of the many variables that had been proposed were important in determining what we might expect the level of the Every Child Matters performance indicators to be for each authority. In order to explore this, data was collected for the following indicators:

- Infant mortality rate
- Under 18 conception rate
- Re-registrations on the Child Protection Register
- % of children who have been looked after for more than two and a half years and of those, have been in the same placement for at least two years or placed for adoption
- Number of 0-15 year olds injured or killed in road traffic accidents
- Half days missed through absence
- % of 7 year olds achieving L2+ at KS1
- % of 11 year olds achieving L4+ in English, Maths & Science
- % of 14 year olds achieving L5+ in English, Maths & Science
- % of 16 year olds achieving the equivalent of 5 A\*-C at GCSE
- % of pupils permanently excluded
- % of pupils who had 1 or more episodes of fixed period exclusion
- % of 10-17 year olds living in the local police force area who had been given a final warning / reprimand / caution
- % of 16-18 year olds not in education, employment and training

A stepwise regression procedure of each of the above indicators on all 63 proposed background characteristics was performed. This process fulfilled two purposes. Firstly this process revealed three outcomes that had extremely weak relationships with the proposed background variables. The following outcomes all had an

adjusted R2 coefficient of around 0.1 or less (that is, less than ten per cent of the variation in these outcomes could be explained by the background variables):

- Re-registrations on the Child Protection Register
- % of children who have been looked after for more than two and a half years and of those, have been in the same placement for at least two years or placed for adoption
- % of pupils permanently excluded

As a result, it is recommended that statistical neighbour methodology is not used to benchmark performance on these indicators. These indicators were not included in any further analysis.

Regression of all other performance indicators on the proposed background variables led to an adjusted R2 coefficient of around 0.3 or greater. Using the results of the regression analyses for these outcomes, all proposed background indicators were ranked by their largest standardised coefficient in any regression. A number of variables with small values of largest standardised coefficients were removed from further analysis. Some variables defining the ethnic make up of the local authority were kept for further analysis despite having small largest standardised coefficients since they were known to be of particular interest to practitioners. There were 43 remaining potential background variables after this process.

## A5.2 Analysis of correlations

Amongst the remaining variables, pairwise correlations were examined in order to discover which variables were highly correlated with other potential variables. Where two variables were found to have a correlation of 0.9 or higher one of these variables was selected for further analysis based on the following three criteria which were applied in order.

1. Simple measures (i.e. simple percentages) were preferred to measures that were the result of complex manipulation (such as the indices of deprivation derived by the ODPM) since these would be easier to update in future.
2. Measures that were updated regularly were preferred to census variables that are only updated once a decade.
3. If the other two criteria did not separate the variables, the variable with the higher largest standardised coefficient across the regression analyses was chosen.

For reasons of interpretation a few additional variables were removed at this stage if they were deemed to have a meaning sufficiently similar to the meaning of another remaining variable to cause confusion. Each of these variables had a correlation with one of the other remaining variables of just less than 0.9. This process reduced the number of potential variables to 25. These variables were analysed further to assign appropriate weights and are listed Table A5.1.

**Table A5.1 Variables taken into weighting process**

<b>Variables (25)</b>	<b>Source</b>
Mean Weekly pay - gross	Annual Survey of Hours and Earnings 2005
Population density (per km2)	Annual Population Survey 2004
% of the population living in villages, hamlets or isolated settlements	2001 Census
% dependent Children - Occupancy Rating - +2 or more	2001 Census
% dependent children living in overcrowded households	2001 Census
% dependent Children - Two or more cars or vans in households	2001 Census
% dependent children not in a family	2001 Census
% dependent children in one adult households	2001 Census
% dependent children in households where HRP is in any managerial and professional occupations	2001 Census
% dependent children in households where HRP is in routine occupations	2001 Census
% people with mixed ethnicity	2001 Census
% people with Indian ethnicity	2001 Census
% people with Pakistani ethnicity	2001 Census
% people with Bangladeshi ethnicity	2001 Census
% people with other Asian ethnicity	2001 Census
% people with Black Caribbean ethnicity	2001 Census
% people with Black African ethnicity	2001 Census
% people with other Black ethnicity	2001 Census
% people in good health	2001 Census
% of working age people with higher qualifications	2001 Census
% households owned outright or with mortgage	2001 Census
% of households with dependent children living at same address one year ago	2001 Census
% households with 3 or more dependent children	2001 Census
% know to be eligible for FSM (2005)	DfES (NPD 2005)
% vehicles that are 3 years old or less	DVLA 2004

### **A5.3 Criterion for choosing number of neighbours for each local authority and the weight given to each variable**

In order to tackle these issues, use was made of a criterion for comparing statistical neighbours (defined in appendix 4). This criterion was defined as the average squared difference between the performance of each local authority and the mean performance of its statistical neighbours across all outcomes and local authorities. The basis of this criterion is that statistical neighbour models are primarily designed to provide a reasonable benchmark for the performance of local authorities. For this reason it desirable that, generally speaking, the performance of local authorities is close to the expected performance derived from their statistical neighbours. This does not preclude the possibility of individual local authorities having a performance very different from that of their statistical neighbours, but does ensure that this occurrence is not the norm.

### **A5.4 How many statistical neighbours to assign to each local authority**

Using the criterion defined in appendix 4, it was possible to compare the performance of statistical neighbour models which assigned different numbers of neighbours to each local authority. This analysis was performed on the basis that each variable in the model had equal weight. The results are shown in the table A5.2. It should be noted that all outcome variables have been scaled such that the criterion has a value of one, when we compare each local authority's performance to the national mean. Hence the figures essentially show the average squared difference between each LA's performance and that of its statistical neighbours as a percentage of the averaged squared difference between each LAs performance and the national mean.

It can be seen from the table that the differences between a local authority's performance and that of its statistical neighbours tend to be substantially less than differences with the national mean, regardless of the number of neighbours chosen. This fact provides some validation for the idea of using statistical neighbours to provide context adjustment as a whole.

**Table A5.2 Exploring different numbers of statistical neighbours**

Number of neighbours assigned to each local authority	Value of criterion
2	0.84
5	0.71
10	0.68
20	0.69
148 (Comparison to national mean)	1.00

*Note: Outcome variables scaled such that each of the five Every Child Matters Outcomes were given roughly equal weight. Variables scaled so that criterion has a value of 1 when we compare each local authority's performance to the national mean.*

As can be seen from the table, the optimal performance was achieved by assigning ten statistical neighbours to each local authority. In this case the average squared difference in performance between each LA and that of its statistical neighbours is just 68 per cent of the difference between each LA's performance and the national mean. For this reason, further analysis assumed that each local authority would be assigned ten neighbours.

## A5.5 Weighting variables

An important decision at this stage was how much importance each variable should be assigned in the statistical neighbour model relative to other variables. A search of many possible sets of weights was performed to minimise the criterion defined above. This analysis revealed that three of the variables that were examined in this process should be assigned a weight of zero or close to zero. These variables were removed from the statistical neighbour model and the final weight assigned to each variable is shown in table A5.3.

These weights were used to define the final model. The performance of this model is compared to the performance of a model assigning equal weights to all variables as well as to the performance of Ofsted's statistical neighbours and to the Institute of Public Finance comparator councils. The results of this comparison are shown in table A5.4.



**Table A5.3: Weight assigned to each variable**

<b>Variable</b>	<b>Weight</b>
Mean Weekly pay – gross	3
% pupils known to be eligible for FSM (2005)	17
% vehicles that are 3 years old or less	15
% dependent Children – Occupancy Rating – +2 or more	4
% dependent children living in overcrowded households	19
% dependent Children – Two or more cars or vans in households	8
% dependent children in one adult households	12
% dependent children in households where HRP is in any managerial & professional occupations	5
% dependent children in households where HRP is in routine occupations	9
% people with mixed ethnicity	5
% people with Indian ethnicity	9
% people with Pakistani ethnicity	2
% people with Bangladeshi ethnicity	7
% people with other Asian ethnicity	16
% people with Black Caribbean ethnicity	30
% people with Black African ethnicity	14
% people with other Black ethnicity	8
% of working age people with higher qualifications	27
% people in good health	6
% households owned outright or with mortgage	24
% households with 3 or more dependent children	9
% of the population living in villages, hamlets or isolated settlements	4
Population density (per km2)	Removed
% dependent children not in a family	Removed
% of households with dependent children living at same address one year ago	Removed

**Table A5.4 Relative performance of different statistical neighbour models**

Statistical neighbour model	Value of criterion
Final Model	0.63
Equal Weights Model	0.68
Ofsted's Statistical Neighbours	0.72
Institute of Public Finance comparator councils	0.71
Comparison to national means	1.00

*Note: Outcome variables scaled such that each of the five Every Child Matters Outcomes were given roughly equal weight. Variables scaled so that criterion has a value of 1 when we compare each local authority's performance to the national mean.*

## A5.6 Further validation

Although it has been shown above that the newly derived statistical neighbour model provides a reasonable benchmark when we average this performance looking across different outcome indicators, it is clearly desirable that the model provides a sensible benchmark not just on average but across all potential outcome indicators. This issue is explored in table A5.5. The table shows the average squared difference between the performance of each local authority on each outcome indicator and the average performance of its statistical neighbours.

A number of points can be noted from this table. Firstly it can be seen that for each model, the outcomes removed from analysis earlier (see [section A5.1](#)) are not well predicted by statistical neighbours. In each case local authorities' performances on these indicators tend to be closer to the national mean than to the average performance of their statistical neighbours. For all other outcomes, with the exception of two, the new proposed model provides benchmarks for local authorities that are at least as accurate as any other statistical neighbour model. The two exceptions are in the cases of key stage 1 writing (where the performance of the equal weights model is slightly superior) and key stage 1 maths (where Institute of Public Finance comparator councils appear to be unusually close).

From this evidence it can be assumed that the statistical neighbour model derived here will provide a reasonable benchmark for performance across most Every Child Matters outcomes.

**Table A5.5 Mean square error of each model in assigning expected performance for each outcome indicator**

Variable	Final Model	Equal Weights Model	Ofsted's Statistical Neighbours	Institute of Public Finance comparator councils
Infant mortality rate: deaths up to 1 year per 1,000 live births	0.74	0.81	0.87	0.87
U18 Conception Rate 2004	0.39	0.45	0.50	0.56
Percentage of children who have been looked after for more than two and a half years and of those, have been in the same placement for at least two years or placed for adoption*	1.11	1.09	1.09	1.04
Percentage of children registered on the child protection register, previously registered 2004/05*	1.11	1.09	1.03	1.02
Total number of child casualties in road accidents per 1000 U16s (2003)	0.74	0.81	0.81	0.74
KS1 % L2 Reading	0.38	0.38	0.45	0.45
KS1 % L2 Writing	0.45	0.42	0.49	0.49
KS1 % L2 Maths	0.45	0.44	0.57	0.37
KS2 % L4 English	0.40	0.40	0.50	0.50
KS2 % L4 Maths	0.46	0.47	0.57	0.60
KS2 % L4 Science	0.46	0.47	0.59	0.48
KS3 % L5 English	0.34	0.36	0.41	0.43
KS3 % L5 Maths	0.32	0.34	0.34	0.40
KS3 % L5 Science	0.30	0.31	0.31	0.37
KS4 % 5+ A*-C	0.56	0.57	0.57	0.66
Total absence rate at primary schools 2004/05	0.40	0.40	0.53	0.42
Total absence rate at secondary schools 2004/05	0.57	0.59	0.62	0.58
Percentage of the total school population permanently excluded*	1.08	1.00	1.02	1.04
Percentage of pupils who had 1 or more episodes of fixed period exclusion as a percentage of the school population	0.85	0.89	1.00	0.98
The % of all children aged 10-17 living in the local police force area who had been given a final warning / reprimand / caution or convicted during the previous calendar year	0.64	0.71	0.70	0.85
% of 16 & 17 year olds in education and WBL	0.70	0.76	0.73	0.78

\*Variable not used in process of assigning weights.

Note: Variables scaled so that mean square error has a value of 1 when we compare each local authority's performance to the national mean.

# Appendix 6 Screenshot of the new model

## Children's Services Statistical Neighbour Benchmarking Tool

(Highlighted boxes can be edited)

Select Local Authority	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Indicator 5
Barking & Dagenham	Infant mortality rate: deaths up to 1 year per 1,000 live births (2005) 3.70	U18 Conception Rate (2004) 71.80	5+ A*-C inc. English & Mathematics (2006) 37.60	Total absence rate at secondary schools (2005/06) 8.12	The % of all children aged 10-17 living in the local police force area who had been given a final warning / reprimand / caution or convicted during twelve months ending 30 September 2005 3.25
Average for statistical neighbours	6.56	54.42	33.27	9.02	3.99

Rank (1=Closest)	Name	"Closeness"	Infant mortality rate: deaths up to 1 year per 1,000 live births (2005)	U18 Conception Rate (2004)	5+ A*-C inc. English & Mathematics (2006)	Total absence rate at secondary schools (2005/06)	The % of all children aged 10-17 living in the local police force area who had been given a final warning / reprimand / caution or convicted during twelve months ending 30 September 2005
1	Nottingham City	Close	7.50	72.80	28.10	9.87	4.19
2	Sandwell	Close	7.70	56.60	29.60	9.72	4.10
3	Greenwich	Close	3.80	64.70	31.30	9.33	3.25
4	Southampton	Close	5.00	56.10	35.90	8.96	4.47
5	Hull	Close	4.40	25.60	25.80	10.74	4.35
6	Middlesbrough	Close	7.80	61.60	30.10	10.12	4.53
7	Birmingham	Close	7.80	51.50	40.70	7.69	4.10
8	Walsall	Close	10.20	48.70	34.80	7.99	4.10
9	Coventry	Close	4.40	52.80	37.50	8.24	4.10
10	Peterborough City	Close	7.00	53.80	38.90	7.50	2.74

### Note on distance measure

The distance between any two local authorities is defined as the weighted Euclidean distance between the authorities using each of the background variables. "Closeness" as displayed in the above table is defined as follows:

**Extremely Close:** Weighted Euclidean distance between local authorities is equivalent to less than 0.25 per standardised variable

**Very Close:** Weighted Euclidean distance between local authorities is equivalent to less than 0.55 per standardised variable

**Close:** Weighted Euclidean distance between local authorities is equivalent to less than 0.85 per standardised variable

**Somewhat Close:** Weighted Euclidean distance between local authorities is equivalent to less than 1.15 per standardised variable

**Not Close:** Weighted Euclidean distance between local authorities is equivalent to 1.15 per standardised variable or more

For a description of Euclidean distance see the analytical user guide.

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## Appendix 7 List of local authorities' statistical neighbours

Each local authority's statistical neighbours are listed below. Local authorities are listed in alphabetical order. The ten statistical neighbours for each authority are listed with the closest statistical neighbour first and the most different listed last.

**BARKING** – Nottingham City, Sandwell, Greenwich, Southampton, Hull, Middlesbrough, Birmingham, Walsall, Coventry, Peterborough City.

**BARNET** – Kingston on Thames, Merton, Hillingdon, Reading, Sutton, Hounslow, Redbridge, Bromley, Richmond upon Thames, Enfield.

**BARNSLEY** – Hartlepool, Rotherham, Redcar & Cleveland, Wakefield, Doncaster, Sunderland, Durham, St Helens, Stoke on Trent, Gateshead.

**BATH & NORTH EAST SOMERSET** – Gloucestershire, Cambridgeshire, Oxfordshire, West Sussex, Hampshire, Wiltshire, North Somerset, Shropshire, Dorset, East Sussex.

**BEDFORDSHIRE** – Hertfordshire, Hampshire, Essex, Warwickshire, Solihull, Kent, Bracknell Forest, Cheshire, West Berkshire, Worcestershire.

**BEXLEY** – Havering, Medway, Swindon, Essex, Kent, Thurrock, Southend, Stockport, Sutton, Bedfordshire.

**BIRMINGHAM** – Luton, Sandwell, Wolverhampton, Nottingham City, Barking, Coventry, Enfield, Bradford, City of Derby, Walsall.

**BLACKBURN** – Bradford, Walsall, Coventry, Rochdale, Bolton, Oldham, Kirklees, City of Derby, Peterborough City, Middlesbrough.

**BLACKPOOL** – Torbay, Tameside, Redcar & Cleveland, Plymouth, Hartlepool, North East Lincolnshire, Barnsley, Isle of Wight, Doncaster, Stoke on Trent.

**BOLTON** – Kirklees, Coventry, Calderdale, Stockton on Tees, Tameside, City of Derby, Leeds, Dudley, St Helens, Telford & Wrekin.

BOURNEMOUTH – Southend, Torbay, Isle of Wight, Portsmouth, Poole, East Sussex, Plymouth, Swindon, Devon, Kent.

BRACKNELL FOREST – Hertfordshire, West Berkshire, Buckinghamshire, Hampshire, Surrey, Bedfordshire, Windsor & Maidenhead, Oxfordshire, Cambridgeshire, Cheshire.

BRADFORD – Rochdale, Oldham, Blackburn, Kirklees, Walsall, Bolton, City of Derby, Coventry, Calderdale, Peterborough City.

BRENT – Ealing, Waltham Forest, Haringey, Croydon, Lewisham, Newham, Enfield, Merton, Harrow, Redbridge.

BRIGHTON & HOVE – Bristol, Bournemouth, Portsmouth, Reading, Sheffield, Southampton, Bath & North East Somerset, Southend, City of York, Plymouth.

BRISTOL – Southampton, Portsmouth, Brighton & Hove, Reading, City of Derby, Peterborough City, Sheffield, Plymouth, Bournemouth, Southend.

BROMLEY – Hertfordshire, Trafford, Sutton, Stockport, Bedfordshire, Bracknell Forest, Solihull, West Sussex, Hampshire, Bath & North East Somerset.

BUCKINGHAMSHIRE – Surrey, West Berkshire, Bracknell Forest, Windsor & Maidenhead, Hertfordshire, Oxfordshire, Bedfordshire, Hampshire, Cambridgeshire, Wokingham.

BURY – Lancashire, Stockton on Tees, Calderdale, Sefton, Stockport, Warrington, Nottinghamshire, Darlington, Solihull, Bolton.

CALDERDALE – Lancashire, Bury, Stockton on Tees, Kirklees, Bolton, Dudley, Darlington, St Helens, Nottinghamshire, Leeds.

CAMBRIDGESHIRE – Oxfordshire, Bath & North East Somerset, Wiltshire, Hampshire, Gloucestershire, West Berkshire, Hertfordshire, Worcestershire, Bedfordshire, West Sussex.

CAMDEN – Westminster, Hammersmith & Fulham, Islington, Kensington & Chelsea, Wandsworth, Greenwich, Haringey, City of London, Manchester, Barnet.

CHESHIRE – Warwickshire, Warrington, Stockport, Hampshire, Solihull, Worcestershire, Bedfordshire, North Yorkshire, East Riding of Yorks, Staffordshire.

CITY OF DERBY – Peterborough City, Coventry, Telford & Wrekin, Bolton, Sheffield, Walsall, Leeds, Portsmouth, Dudley, Tameside.

CITY OF LONDON – Kensington & Chelsea, Westminster, Camden, Wandsworth, Hammersmith & Fulham, Richmond upon Thames, Islington, Brighton & Hove, Barnet, Newcastle upon Tyne.

CITY OF YORK – Stockport, Warrington, Cheshire, Nottinghamshire, Warwickshire, Trafford, Staffordshire, Bury, Swindon, Lancashire.

CORNWALL – Norfolk, Devon, Somerset, Herefordshire, Suffolk, Shropshire, Cumbria, Lincolnshire, Dorset, Isle of Wight.

COVENTRY – City of Derby, Bolton, Walsall, Peterborough City, Telford & Wrekin, Tameside, Kirklees, Leeds, Sheffield, Thurrock.

CROYDON – Enfield, Waltham Forest, Redbridge, Merton, Birmingham, Ealing, Reading, Hillingdon, Luton, Greenwich.

CUMBRIA – Derbyshire, Lincolnshire, Norfolk, Nottinghamshire, Staffordshire, Lancashire, Devon, Cornwall, North Lincolnshire, Shropshire.

DARLINGTON – Stockton on Tees, North Tyneside, St Helens, Durham, Wigan, Bury, Lancashire, Tameside, Halton, Calderdale.

DERBYSHIRE – Nottinghamshire, Staffordshire, Cumbria, Lincolnshire, Lancashire, Wigan, Northamptonshire, Dudley, Kent, Warwickshire.

DEVON – Somerset, Shropshire, Suffolk, Cornwall, Dorset, Herefordshire, Gloucestershire, Norfolk, East Sussex, Worcestershire.

DONCASTER – Rotherham, Redcar & Cleveland, Wigan, St Helens, Tameside, Wakefield, Dudley, North East Lincolnshire, Barnsley, North Lincolnshire.

DORSET – Shropshire, Devon, Gloucestershire, Worcestershire, West Sussex, Somerset, East Sussex, Suffolk, North Somerset, Poole.

DUDLEY – Wigan, Doncaster, Nottinghamshire, Thurrock, Rotherham, Lancashire, Derbyshire, Telford & Wrekin, Stockton on Tees, Bolton.

DURHAM – Wakefield, North Tyneside, Sunderland, St Helens, Darlington, Gateshead, Barnsley, Stockton on Tees, Wigan, Doncaster.

EALING – Hounslow, Merton, Harrow, Redbridge, Enfield, Barnet, Slough, Croydon, Brent, Hillingdon.

EAST RIDING OF YORKS – North Yorkshire, Staffordshire, Warwickshire, Cheshire, Worcestershire, Warrington, Derbyshire, Nottinghamshire, Leicestershire, Essex.

EAST SUSSEX – Kent, Dorset, West Sussex, Gloucestershire, Devon, Essex, North Somerset, Worcestershire, Shropshire, Suffolk.

ENFIELD – Croydon, Hillingdon, Redbridge, Waltham Forest, Reading, Merton, Luton, Birmingham, Sutton, Barnet.

ESSEX – Kent, West Sussex, Hampshire, Worcestershire, Bedfordshire, Swindon, North Somerset, Warwickshire, Staffordshire, Leicestershire.

GATESHEAD – Sunderland, South Tyneside, Durham, North Tyneside, Barnsley, Wakefield, Hartlepool, St Helens, Halton, Salford.

GLOUCESTERSHIRE – Shropshire, Dorset, Bath & North East Somerset, Wiltshire, West Sussex, Suffolk, Devon, Worcestershire, Somerset, Cambridgeshire.

GREENWICH – Barking, Manchester, Nottingham City, Enfield, Birmingham, Waltham Forest, Islington, Bristol, Southampton, Hammersmith & Fulham.

HACKNEY – Southwark, Lambeth, Haringey, Lewisham, Newham, Islington, Waltham Forest, Hammersmith & Fulham, Greenwich, Brent.

HALTON – Hartlepool, St Helens, Tameside, Redcar & Cleveland, Sunderland, Stockton on Tees, Darlington, North East Lincolnshire, Salford, South Tyneside.

HAMMERSMITH & FULHAM – Wandsworth, Islington, Westminster, Camden, Kensington & Chelsea, Haringey, Greenwich, Waltham Forest, Southwark, Lambeth.



HAMPSHIRE – West Sussex, South Gloucestershire, Bedfordshire, North Somerset, Essex, Worcestershire, West Berkshire, Hertfordshire, Cambridgeshire, Leicestershire.

HARINGEY – Lewisham, Lambeth, Hackney, Waltham Forest, Southwark, Islington, Hammersmith & Fulham, Wandsworth, Greenwich, Croydon.

HARROW – Ealing, Redbridge, Merton, Hounslow, Barnet, Hillingdon, Kingston on Thames, Slough, Enfield, Croydon.

HARTLEPOOL – Halton, Redcar & Cleveland, Barnsley, Tameside, Rotherham, St Helens, Doncaster, North East Lincolnshire, Sunderland, South Tyneside.

HAVERING – Bexley, Essex, Medway, Kent, Swindon, Thurrock, Bury, Solihull, Stockport, Staffordshire.

HEREFORDSHIRE – Somerset, Devon, Shropshire, Cornwall, Suffolk, Norfolk, Wiltshire, Dorset, Gloucestershire, East Sussex.

HERTFORDSHIRE – Bracknell Forest, Bedfordshire, Hampshire, Oxfordshire, Cambridgeshire, West Berkshire, Buckinghamshire, Cheshire, Trafford, Surrey.

HILLINGDON – Sutton, Coventry, Reading, Redbridge, Hounslow, Barnet, Bexley, Slough, City of Derby, Milton Keynes.

HOUNSLOW – Ealing, Hillingdon, Slough, Redbridge, Barnet, Merton, Enfield, Harrow, Leicester, Reading.

HULL – Stoke on Trent, Middlesbrough, Hartlepool, Salford, South Tyneside, Southampton, Plymouth, Barnsley, Rotherham, Halton.

ISLE OF WIGHT – Torbay, Southend, Bournemouth, East Sussex, Cornwall, Devon, Norfolk, Cumbria, Nottinghamshire, Poole.

ISLES OF SCILLY – Herefordshire, Cornwall, Wiltshire, Norfolk, Shropshire, Somerset, Devon, Suffolk, Rutland, Cambridgeshire.

ISLINGTON – Hammersmith & Fulham, Camden, Westminster, Haringey, Greenwich, Southwark, Wandsworth, Manchester, Lambeth, Kensington & Chelsea.

KENSINGTON & CHELSEA – Westminster, Wandsworth, Hammersmith & Fulham, Camden, City of London, Islington, Barnet, Richmond upon Thames, Merton, Greenwich.

KENT – Essex, Swindon, East Sussex, Northamptonshire, Worcestershire, Warwickshire, West Sussex, Staffordshire, Lancashire, Bedfordshire.

KINGSTON ON THAMES – Barnet, Sutton, Merton, Richmond upon Thames, Bromley, Windsor & Maidenhead, Hillingdon, Hertfordshire, Surrey, Reading.

KIRKLEES – Bolton, Calderdale, Rochdale, Bury, Leeds, Stockton on Tees, Oldham, Dudley, City of Derby, Lancashire.

KNOWSLEY – Salford, Middlesbrough, Liverpool, South Tyneside, Halton, Hartlepool, Newcastle upon Tyne, Rochdale, Tameside, Gateshead.

LAMBETH – Haringey, Lewisham, Southwark, Hackney, Islington, Hammersmith & Fulham, Waltham Forest, Wandsworth, Greenwich, Brent.

LANCASHIRE – Nottinghamshire, Bury, Calderdale, Sefton, Derbyshire, Stockton on Tees, Kent, Staffordshire, Northamptonshire, Dudley.

LEEDS – Sheffield, Bolton, Stockton on Tees, Darlington, Calderdale, St Helens, Kirklees, City of Derby, North Tyneside, Bury.

LEICESTER – Wolverhampton, Hounslow, Sandwell, Blackburn, Slough, Coventry, Hillingdon, Walsall, Birmingham, Southampton.

LEICESTERSHIRE – South Gloucestershire, Warwickshire, Worcestershire, North Somerset, Hampshire, Staffordshire, Essex, West Sussex, Bedfordshire, Cheshire.

LEWISHAM – Haringey, Lambeth, Waltham Forest, Hackney, Southwark, Croydon, Brent, Hammersmith & Fulham, Islington, Greenwich.

LINCOLNSHIRE – Cumbria, Derbyshire, Norfolk, Suffolk, Shropshire, Nottinghamshire, Worcestershire, Staffordshire, Northamptonshire, Dorset.

LIVERPOOL – Salford, Knowsley, South Tyneside, Newcastle upon Tyne, Middlesbrough, Halton, Gateshead, Hartlepool, Sunderland, Hull.

LUTON – Birmingham, Bradford, Slough, Enfield, Coventry, Walsall, City of Derby, Sandwell, Blackburn, Peterborough City.

MANCHESTER – Nottingham City, Greenwich, Liverpool, Barking, Birmingham, Salford, Middlesbrough, Hull, Southampton, Newcastle upon Tyne.

MEDWAY – Thurrock, Swindon, Kent, Bexley, Northamptonshire, Havering, Telford & Wrekin, Lancashire, Dudley, Southend.

MERTON – Barnet, Kingston on Thames, Ealing, Redbridge, Enfield, Hounslow, Hillingdon, Croydon, Reading, Sutton.

MIDDLESBROUGH – Salford, Hartlepool, Rochdale, South Tyneside, Halton, Knowsley, Hull, Redcar & Cleveland, Stoke on Trent, Tameside.

MILTON KEYNES – Northamptonshire, Trafford, Swindon, Kent, Bedfordshire, Leeds, Bury, Hertfordshire, Stockport, Essex.

NEWCASTLE UPON TYNE – Salford, South Tyneside, Leeds, Gateshead, Sunderland, Sheffield, Liverpool, Middlesbrough, Hartlepool, Halton.

NEWHAM – Hackney, Waltham Forest, Haringey, Brent, Southwark, Greenwich, Lewisham, Ealing, Islington, Birmingham.

NORFOLK – Cornwall, Devon, Cumbria, Somerset, Lincolnshire, Suffolk, Shropshire, Herefordshire, Dorset, Derbyshire.

NORTH EAST LINCOLNSHIRE – Doncaster, Redcar & Cleveland, Hartlepool, Tameside, Telford & Wrekin, Halton, Rotherham, St Helens, Wigan, North Lincolnshire.

NORTH LINCOLNSHIRE – Wigan, Doncaster, Derbyshire, Nottinghamshire, Rotherham, Cumbria, Telford & Wrekin, Dudley, Lincolnshire, Lancashire.

NORTH SOMERSET – West Sussex, South Gloucestershire, Hampshire, Leicestershire, Essex, Worcestershire, Dorset, East Sussex, Gloucestershire, Poole.

NORTH TYNESIDE – Darlington, Durham, Stockton on Tees, St Helens, Gateshead, Sunderland, Northumberland, Wakefield, Leeds, Wigan.

NORTH YORKSHIRE – East Riding of Yorks, Warwickshire, Cheshire, Worcestershire, Rutland, West Berkshire, Staffordshire, Essex, Warrington, Hampshire.

NORTHAMPTONSHIRE – Swindon, Kent, Staffordshire, Nottinghamshire, Warwickshire, Essex, Lancashire, Derbyshire, Worcestershire, Lincolnshire.

NORTHUMBERLAND – North Tyneside, Stockton on Tees, Durham, Darlington, East Riding of Yorks, Derbyshire, Nottinghamshire, Staffordshire, Calderdale, Warrington.

NOTTINGHAM CITY – Manchester, Barking, Sandwell, Hull, Southampton, Wolverhampton, Birmingham, Salford, Middlesbrough, Liverpool.

NOTTINGHAMSHIRE – Derbyshire, Staffordshire, Lancashire, Cumbria, Northamptonshire, Swindon, Kent, Dudley, Wigan, Lincolnshire.

OLDHAM – Rochdale, Kirklees, Tameside, Walsall, Bradford, Bolton, St Helens, Calderdale, Redcar & Cleveland, Halton.

OXFORDSHIRE – Cambridgeshire, Bath & North East Somerset, West Berkshire, Hertfordshire, Wiltshire, Hampshire, Gloucestershire, Bracknell Forest, Bedfordshire, Buckinghamshire.

PETERBOROUGH CITY – City of Derby, Telford & Wrekin, Portsmouth, Coventry, Southampton, Sheffield, Plymouth, Southend, Walsall, Bolton.

PLYMOUTH – Portsmouth, Torbay, Southampton, Telford & Wrekin, Peterborough City, Southend, Bournemouth, Rotherham, Sheffield, Isle of Wight.

POOLE – West Sussex, Dorset, North Somerset, East Sussex, Swindon, South Gloucestershire, Gloucestershire, Bournemouth, Kent, Essex.

PORTSMOUTH – Plymouth, Southampton, Peterborough City, Southend, Bournemouth, Torbay, Bristol, Telford & Wrekin, Sheffield, City of Derby.

READING – Bristol, Sutton, Brighton & Hove, Milton Keynes, Bromley, City of Derby, Bath & North East Somerset, Sheffield, Trafford, Hillingdon.

REDBRIDGE – Hillingdon, Slough, Hounslow, Enfield, Merton, Barnet, Harrow, Ealing, Croydon, Sutton.

REDCAR & CLEVELAND – Doncaster, Rotherham, Tameside, Hartlepool, St Helens, Barnsley, Wigan, North East Lincolnshire, Halton, Stockton on Tees.

RICHMOND UPON THAMES – Windsor & Maidenhead, Kingston on Thames, Surrey, Oxfordshire, Barnet, Wokingham, Bromley, Hertfordshire, Bracknell Forest, Buckinghamshire.

ROCHDALE – Oldham, Kirklees, Middlesbrough, Bradford, Tameside, Bolton, St Helens, Walsall, Halton, Calderdale.

ROTHERHAM – Doncaster, Redcar & Cleveland, Wigan, Barnsley, Tameside, Hartlepool, St Helens, Wakefield, Dudley, Telford & Wrekin.

RUTLAND – North Yorkshire, West Berkshire, Wiltshire, Worcestershire, Cambridgeshire, East Riding of Yorks, Oxfordshire, Cheshire, Buckinghamshire, Warwickshire.

SALFORD – South Tyneside, Middlesbrough, Newcastle upon Tyne, Hartlepool, Halton, Liverpool, Knowsley, Gateshead, Tameside, Sunderland.

SANDWELL – Wolverhampton, Walsall, Coventry, City of Derby, Birmingham, Barking, Nottingham City, Stoke on Trent, Peterborough City, Middlesbrough.

SEFTON – Lancashire, Bury, Wirral, Stockton on Tees, Stockport, Nottinghamshire, Kent, Darlington, Southend, Swindon.

SHEFFIELD – Leeds, City of Derby, Peterborough City, Portsmouth, Southampton, Plymouth, Dudley, Rotherham, Telford & Wrekin, Tameside.

SHROPSHIRE – Devon, Somerset, Dorset, Suffolk, Gloucestershire, Wiltshire, Worcestershire, Herefordshire, Norfolk, Lincolnshire.

SLOUGH – Hillingdon, Luton, Hounslow, Redbridge, Enfield, Coventry, Birmingham, Blackburn, Bradford, Wolverhampton.

SOLIHULL – Warrington, Stockport, Cheshire, Trafford, Bedfordshire, Essex, Hertfordshire, Warwickshire, Bury, Hampshire.

SOMERSET – Devon, Suffolk, Herefordshire, Shropshire, Cornwall, Dorset, Norfolk, Gloucestershire, East Sussex, Wiltshire.

SOUTH GLOUCESTERSHIRE – Hampshire, North Somerset, Leicestershire, West Sussex, Essex, Gloucestershire, Bedfordshire, Worcestershire, Poole, Kent.

SOUTH TYNESIDE – Salford, Gateshead, Sunderland, Hartlepool, Newcastle upon Tyne, Halton, Middlesbrough, Barnsley, Knowsley, Liverpool.

SOUTHAMPTON – Portsmouth, Bristol, Plymouth, Peterborough City, Sheffield, City of Derby, Telford & Wrekin, Coventry, Hull, Salford.

SOUTHEND – Isle of Wight, Bournemouth, Torbay, Swindon, East Sussex, Portsmouth, Sefton, Kent, Medway, Telford & Wrekin.

SOUTHWARK – Hackney, Lambeth, Haringey, Islington, Lewisham, Hammersmith & Fulham, Greenwich, Waltham Forest, Camden, Newham.

ST HELENS – Stockton on Tees, Tameside, Darlington, Halton, Redcar & Cleveland, Doncaster, Wigan, Wakefield, Durham, Rotherham.

STAFFORDSHIRE – Derbyshire, Nottinghamshire, Warwickshire, Northamptonshire, East Riding of Yorks, Worcestershire, Essex, Kent, Leicestershire, Lancashire.

STOCKPORT – Solihull, Cheshire, Trafford, City of York, Warrington, Kent, Warwickshire, Essex, Bury, Lancashire.

STOCKTON ON TEES – Darlington, St Helens, Bury, Calderdale, Wigan, Lancashire, North Tyneside, Sefton, Doncaster, Durham.

STOKE ON TRENT – Barnsley, Hartlepool, Redcar & Cleveland, Rotherham, Hull, Doncaster, Middlesbrough, Tameside, North East Lincolnshire, Wakefield.

SUFFOLK – Somerset, Devon, Shropshire, Gloucestershire, Norfolk, Dorset, Cornwall, Herefordshire, Lincolnshire, Wiltshire.

SUNDERLAND – Gateshead, Wakefield, Durham, Barnsley, Hartlepool, South Tyneside, St Helens, Halton, North Tyneside, Tameside.

SURREY – Windsor & Maidenhead, Buckinghamshire, Bracknell Forest, Hertfordshire, West Berkshire, Wokingham, Hampshire, Oxfordshire, Cambridgeshire, Bedfordshire.

SUTTON – Bromley, Bexley, Hillingdon, Hertfordshire, Reading, West Sussex, Bedfordshire, Swindon, Kent, Stockport.

SWINDON – Kent, Northamptonshire, Essex, Medway, Nottinghamshire, Lancashire, Staffordshire, Poole, Stockport, West Sussex.

TAMESIDE – St Helens, Redcar & Cleveland, Halton, Doncaster, Hartlepool, Rotherham, Stockton on Tees, Bolton, North East Lincolnshire, Wigan.

TELFORD & WREKIN – Peterborough City, City of Derby, Thurrock, Lancashire, Doncaster, Dudley, Rotherham, Bolton, North East Lincolnshire, Medway.

THURROCK – Medway, Dudley, Telford & Wrekin, Swindon, Havering, Lancashire, Kent, Wigan, Northamptonshire, Bolton.

TORBAY – Isle of Wight, Southend, Bournemouth, Plymouth, Portsmouth, Blackpool, Telford & Wrekin, Cornwall, Poole, North Lincolnshire.

TOWER HAMLETS – Camden, Newham, Islington, Westminster, Manchester, Hammersmith & Fulham, Hackney, Greenwich, Birmingham, Barking.

TRAFFORD – Stockport, Solihull, Hertfordshire, Bromley, Bedfordshire, Cheshire, Warrington, Milton Keynes, City of York, Bury.

WAKEFIELD – Durham, Sunderland, St Helens, Barnsley, Doncaster, Rotherham, Wigan, Redcar & Cleveland, Stockton on Tees, Hartlepool.

WALSALL – City of Derby, Bolton, Coventry, Rotherham, Peterborough City, Tameside, Telford & Wrekin, Doncaster, Rochdale, Dudley.

WALTHAM FOREST – Croydon, Enfield, Haringey, Lewisham, Greenwich, Birmingham, Brent, Ealing, Merton, Luton.

WANDSWORTH – Hammersmith & Fulham, Kensington & Chelsea, Westminster, Camden, Merton, Barnet, Islington, Greenwich, Reading, Enfield.

WARRINGTON – Cheshire, Solihull, Stockport, Staffordshire, Warwickshire, City of York, Bury, East Riding of Yorks, Essex, Nottinghamshire.

WARWICKSHIRE – Worcestershire, Cheshire, Staffordshire, Leicestershire, Essex, Bedfordshire, Kent, Northamptonshire, East Riding of Yorks, Hampshire.

WEST BERKSHIRE – Hampshire, Buckinghamshire, Bracknell Forest, Cambridgeshire, Oxfordshire, Bedfordshire, Hertfordshire, Wiltshire, Cheshire, Surrey.

WEST SUSSEX – North Somerset, Hampshire, Essex, Gloucestershire, Dorset, South Gloucestershire, East Sussex, Worcestershire, Kent, Poole.

WESTMINSTER – Camden, Kensington & Chelsea, Hammersmith & Fulham, Wandsworth, Islington, City of London, Greenwich, Haringey, Ealing, Barnet.

WIGAN – Doncaster, Dudley, Rotherham, St Helens, Stockton on Tees, North Lincolnshire, Redcar & Cleveland, Wakefield, Nottinghamshire, Derbyshire.

WILTSHIRE – Shropshire, Gloucestershire, Cambridgeshire, Worcestershire, Suffolk, Dorset, Hampshire, Oxfordshire, West Berkshire, Somerset.

WINDSOR & MAIDENHEAD – Surrey, Buckinghamshire, Bracknell Forest, Hertfordshire, Wokingham, West Berkshire, Oxfordshire, Cambridgeshire, Hampshire, Bromley.

WIRRAL – Sefton, Darlington, Stockton on Tees, Lancashire, Telford & Wrekin, Bury, St Helens, Halton, Tameside, Leeds.

WOKINGHAM – Surrey, Windsor & Maidenhead, Buckinghamshire, Bracknell Forest, West Berkshire, Hertfordshire, Hampshire, Oxfordshire, Cheshire, Bedfordshire.

WOLVERHAMPTON – Sandwell, Walsall, Coventry, City of Derby, Birmingham, Peterborough City, Nottingham City, Southampton, Sheffield, Bolton.

WORCESTERSHIRE – Warwickshire, Shropshire, Dorset, Gloucestershire, Essex, Hampshire, Leicestershire, Kent, West Sussex, Wiltshire.



# Appendix 8 Practitioner user-guide

## What are statistical neighbours?

Statistical neighbour models provide one method for benchmarking progress. For each local authority (LA), these models designate a number of other LAs deemed to have similar characteristics. These designated LAs are known as statistical neighbours. Any LA may compare its performance (as measured by various indicators) against its statistical neighbours to provide an initial guide as to whether their performance is above or below the level that might be expected.

Currently, Ofsted provide a statistical neighbour model based on census data and the Institute of Public Finance comparator councils provide a model based on deprivation and demography data. But there is now a need for a new model based on the five Every Child Matters (ECM) outcomes, which embraces the key elements of the existing models and provides LAs and their partner agencies with a tool for assessing and comparing their performance with their statistical neighbours. Ideally, this new model would supersede the existing models within the context of children's services and provide a single starting point for benchmarking performance.

## What is the tool?

This tool has been specifically designed for children's services authorities so that the statistical neighbours assigned to each LA are appropriate for comparing performance in terms of the five ECM outcomes.

The National Foundation for Educational Research (NFER) was commissioned by DfES to develop this tool, to enable LAs to identify other LAs similar to themselves in terms of the socio-economic characteristics of their area. These comparative authorities are termed statistical neighbours.

## How do I use the tool?

The tool has been created in Excel. In order to identify the statistical neighbours for your LA, open the Excel Tool and go to the sheet labelled 'Neighbour Finder'.

**Neighbour Finder** Regional Metadata

Select your LA from the box highlighted in yellow on the left hand side of the upper table.

Select Local Authority
Barking & Dagenham
Average for statistical neighbours

The lower table will automatically update and display your statistical neighbours, together with a measure of 'closeness' (explained below).

Rank (1=Closest)	Name	"Closeness"	Infant mortality rate: deaths up to 1 year per 1,000 live births (2005)	U18 Conception Rate (2004)	5+ A*-C inc. English & Mathematics (2006)	Total absence rate at secondary schools (2005/06)	The % of all children aged 10-17 living in the local police force area who had been given a final warning / reprimand / caution or convicted during twelve months ending 30 September 2005
1	Nottingham City	Close	7.50	72.80	28.10	9.87	4.19
2	Sandwell	Close	7.70	56.60	29.60	9.72	4.10
3	Greenwich	Close	3.80	64.70	31.30	9.33	3.25
4	Southampton	Close	5.90	56.10	35.90	8.96	4.47
5	Hull	Close	4.40	25.60	25.80	10.74	4.35
6	Middlesbrough	Close	7.80	61.60	30.10	10.12	4.53
7	Birmingham	Close	7.80	51.50	40.70	7.69	4.10
8	Walsall	Close	10.20	48.70	34.80	7.99	4.10
9	Coventry	Close	4.40	52.80	37.50	8.24	4.10
10	Peterborough City	Close	7.00	53.80	38.90	7.50	2.74

It is currently possible to compare the performance of your LA to the performance of your statistical neighbours for a number of outcome measures (e.g. infant mortality rate). To select the outcome measure you wish to compare performance for, click on any of the boxes highlighted in yellow on the right hand side of the upper table (labelled Outcomes 1 to 5).

Select Local Authority	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Indicator 5
Barking & Dagenham	Infant mortality rate: deaths up to 1 year per 1,000 live births (2005) 3.70	U18 Conception Rate (2004) 71.80	5+ A*-C inc. English & Mathematics (2006) 37.60	Total absence rate at secondary schools (2005/06) 8.12	The % of all children aged 10-17 living in the local police force area who had been given a final warning / reprimand / caution or convicted during twelve months ending 30 September 2005 3.25
Average for statistical neighbours	6.56	54.42	33.27	9.02	3.99

The outcomes information displayed in the corresponding column of the lower table will automatically update enabling you to make comparisons. The last row of the upper table displays the average for the chosen outcome measures across all ten of your statistical neighbours.

Average for statistical neighbours	6.56	54.42	33.27	9.02	3.99
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It should be noted that the display of outcome information is intended as a simple starting point for viewing performance to support benchmarking work. This is not to imply that further analysis of performance information such as comparison with targets or looking at trends over time is not required.

The sheet labelled ‘Regional’ provides information on the similarity of your LA to all other LAs in the same government office region. This sheet is automatically updated to match the LA selected in the upper table of the first sheet. Each LA in the same region is listed in order of similarity. A measure of dissimilarity (explained below) is also shown.

Neighbour Finder	<b>Regional</b>	Metadata
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### [Children’s Services Statistical Neighbour Benchmarking Tool](#)

*Note: This sheet automatically updates based on selections in "Neighbour Finder"*

Local Authority	Region
Barking & Dagenham	London
Other Local Authorities in Region	"Closeness"
Greenwich	Close
Enfield	Somewhat close
Hillingdon	Somewhat close
Bexley	Not Close
Sutton	Not Close
Hounslow	Not Close
Havering	Not Close
Waltham Forest	Not Close
Croydon	Not Close
Bromley	Not Close
Redbridge	Not Close
Barnet	Not Close
Merton	Not Close
Islington	Not Close
Ealing	Not Close
Hammersmith & Fulham	Not Close
Wandsworth	Not Close
Kingston on Thames	Not Close
Camden	Not Close
Haringey	Not Close
Newham	Not Close
Lewisham	Not Close
Westminster	Not Close
Southwark	Not Close
Richmond upon Thames	Not Close
Harrow	Not Close
Kensington & Chelsea	Not Close
Hackney	Not Close
Brent	Not Close
Lambeth	Not Close
City of London	Not Close
Tower Hamlets	Not Close

## Which outcomes can be explored using these statistical neighbours?

The tool defines a single set of statistical neighbours for each LA. These neighbours should be appropriate for use in benchmarking performance in most of the outcomes described in the ECM outcomes framework, but it does not provide a reasonable benchmark for the following outcomes:

- Re-registrations on the Child Protection Register
- % of children who have been looked after for more than two and a half years and of those, have been in the same placement for at least two years or placed for adoption
- % of pupils permanently excluded from school.

The reason for this is that the relationship between the levels of performance on these measures and the kind of socio-economic variables used to define statistical neighbours is extremely weak. Because of this, these outcomes should be benchmarked against national averages rather than the performance of statistical neighbours. The reason for the weak relationship between these outcomes and the demographic information used to define statistical neighbours is probably due to the very small numbers of children involved in these outcomes. It is expected that the statistical neighbours that have been provided would be appropriate for use in benchmarking almost any outcome based on a reasonably large number of children or young people.

It should also be noted that since statistical neighbours are largely defined by the economic characteristics of local authorities, they should not be used to benchmark outcomes concerned with levels of material deprivation, low income or unemployment.

## What does ‘Closeness’ signify?

The third column in the lower table of the tool expresses the degree of similarity between your chosen LA and its statistical neighbours in terms of the measure defined above. The five levels of closeness are defined to match roughly the categorisation of similarity used by a previous set of statistical neighbours defined by Ofsted. Local authorities with a greater degree of similarity to your own LA might be expected to provide the best comparison in

terms of performance. However, in order to avoid undue emphasis on the performance of a few statistical neighbours, it is advised that generally speaking a comparison with all ten of the designated statistical neighbours will provide the most robust benchmark for performance measures.

## **How does this model compare to Ofsted's statistical neighbours?**

Forty-six percent of the 1,500 statistical neighbours that have been defined in total were also defined as statistical neighbours for the same local authorities by the model devised by Ofsted in 1998. In other words for most local authorities about half of their statistical neighbours will have changed from those defined by the Ofsted model. This degree of change is to be expected as the data used to define neighbours is somewhat different in each model.

## **Where can I find further details?**

Further details on the process of variable selection and weighting are available in the full report on the development process.



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