

The public service costs of child poverty

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This report aims to provide an estimate of the extra cost to public services of the existence of child poverty. It brings together existing data on how child poverty affects spending on selected services and considers other factors driving expenditure levels.

The effects of child poverty are reflected in spending on a range of public services. Often, the amount of extra spending on poor children is not sufficient to ensure they receive an adequate, fair or equal standard of service. Poorer outcomes are also likely to create further costs 'downstream'.

Services funded by public spending fall into different generic categories, so the way child poverty may impact on spending varies. This report focuses on:

- services provided to individuals or families on a basis of need or demographic eligibility, including education, most health services, subsidised housing and social care services;
- services which provide local 'public goods' such as policing and the criminal justice system, fire and rescue and environmental maintenance;
- area-based regeneration initiatives and more general supplementary expenditure targeted on deprived neighbourhoods.

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Executive summary

This report estimates the financial burden child poverty places on public services. It looks at systematic data on actual spending on selected services in geographical areas which have greater or lesser concentrations of child poverty. By examining these relationships, and considering other key factors driving expenditure levels, inferences are made about the extra costs of child poverty.

Combined analysis of the areas covered below gives a total cost of child poverty to UK public expenditure of between £11.6 billion and £20.7 billion. It is important to bear in mind the assumptions and limitations underlying all the estimates given here.

Personal social services

Personal social services (PSS) provide care, support, guidance and regulation in relation to children in need due to abuse, neglect, disability, low income, family stress or dysfunction or simple lack of parents. A key group are 'Looked After Children', whose care and upbringing is the statutory responsibility of the local authority.

PSS is strongly associated with poverty and deprivation; this has been reflected in financial distribution formulae for local authority grants for decades. Evidence in this report suggests that over two thirds of children's PSS spending may be attributable to poverty. A further analysis of 'excess costs' by type of need suggests a slightly lower total, but still a majority of spending.

It is implausible to expect that all problems of family dysfunction, stress, poor parenting and disability would disappear if child poverty were ended, or that services would wither away completely. It is more likely that they would re-orientate themselves to preventative and educational work.

Health services

Health services account for a large part of total public expenditure. Most of this spending goes on the NHS, of which a large share goes to older people. However, spending on children and young people is not trivial and is related to child poverty. Taking into account maternity services and outpatient episodes of those aged 0–18, child poverty costs around 2% of total acute sector expenditure.

Analysis in this report also implies that the use of GP health services by families is positively related to individual and area poverty. This is consistent with wider evidence on the effects of poverty on ill-health and shows that this feeds through into demand for and use of primary healthcare services. The rough estimate of expenditure for the UK is nearly £860 million.

It is sometimes argued that poorer people or areas do not make use of services commensurate with the extent to which they suffer poor health. Evidence presented here suggests this may be so, because GP usage between top and bottom deprivation bands varies less than measures of poor health. In any case, the relationship between activity and expenditure remains.

School education

Education is another major service where issues of the effects of poverty are important, particularly in terms of achievement. The principal concern in this report is with present patterns of expenditure and cost. Evidence on school budgets and expenditure can be related to poverty or deprivation levels of their pupils or the area which they serve.

Factors which drive distribution of resources in schools systems, such as deliberate policies and formulae, are important here. Allocations may also reflect factors which pick up deprivation indirectly. For example, the incidence of Special Educational Need is likely to have some relationship with deprivation. Other indirect factors may arise from the varying size and occupancy of schools.

Figures from Wales show an overall cost of poverty to school education of around £80 million or 6% of the budget. Further analysis using selected data from England and Scotland indicate that poverty accounts for about 6.7% of primary spending and 7% of secondary spending in the UK.

Housing

The main elements of public expenditure on housing are capital investment on social housing and housing benefit paid to low income tenants. Another component is investment by local authorities and related organisations on repairing and improving housing stock. Poor families are significant beneficiaries of this investment but it is also motivated by wider social concerns.

Social housing has become increasingly targeted on low income households and families with children traditionally have priority in allocation. Analysis in this report leads to an estimate of 72% of expenditure on social housing being attributable to poverty. In the UK, this would mean £1,654 million per year.

Previous studies have found the total amount of housing benefit claimed by families with children in the UK to be £3,650 million (32.2% of total UK housing benefit in 2005/05). Council tax benefit adds a further 23.5% to this total.

It may be argued that the cost of local authority upgrades would not be avoided if poor families were lifted out of poverty, since the government is

committed to raising housing standards anyway. But given that social housing is so bound up in having lots of poor people, the cost of these upgrades should be regarded as part of the cost of poverty. The proportion of households living in non-decent local authority homes is between 21.6% and 25.9%. The cost of upgrades to this housing works out at £1,697 million per year for the UK.

Police and criminal justice

Crime and disorder and the associated expenditures on policing and criminal justice is another important area. The incidence of crime is clearly associated with deprivation and children and young people are heavily involved in some areas of crime and disorder. This is an area which has seen many government initiatives and much policy debate, and therefore a heavy load of public expenditure.

Estimates made here of the cost of child poverty for policing and criminal justice range from £1.06 billion to £4.16 billion. Where the true figure lies in this range depends on how far crime by 18- to 24-year-olds is attributed to experiences before the age of 18 and to the exact share of policing activity attributable to crime. The figures are also affected by whether drivers of crime and disorder are better represented by a simple model or fuller regression model.

As with other services, the causal processes linking child poverty with policing and criminal justice costs may be questioned. For example, certain families might have psychological/cultural predisposition to crime and claiming low income benefits may be a choice as well as a consequence of imprisonment and criminal records affecting family members. Ending child poverty may entail interventions which change family circumstances and behaviour beyond mean amounts of money.

Fire and rescue

There are grounds for thinking much of the demand on fire and rescue services is related directly or indirectly to poverty and deprivation. Children and young people generate a lot of fire callouts, including malicious calls, through engagement in acts of vandalism and arson, and the children

involved are typically from deprived homes and neighbourhoods. These neighbourhoods also have environments creating more opportunities for such acts. Classic causes of domestic fires, e.g. chip pans left on stoves, are associated with low income homes. Domestic fires require a stronger response when they occur in tenements or flats.

Figures from the Scottish Household Survey 1999–2000 show that the number of fires was five times higher in the most deprived areas than in the least deprived areas for families. While families with children make up only a minority of all households, this suggests they are at much higher risk of experiencing domestic fires. There will also be neighbourhood effects.

Fire and rescue services provide coverage to a whole geographical area and its population. Resource allocation formulae reflect the fact that services have to provide high level cover to high risk areas (industrial and commercial) as well as general fire prevention and education services. Making inferences from the English resource allocation formula, around half the budget is attributable to risk and activity factors associated with deprivation. Making use of additional data on fire incidents in Fife, this leads to a UK estimate of up to £926 million.

Local environmental services

Local environmental services comprise a range of services such as waste collection and disposal, street cleaning, maintenance of parks and open spaces, and planning. This report does not provide a detailed analysis of the costs associated with these services, but draws on some ongoing JRF research at Glasgow University which shows that around 21.5% average local authority expenditure is on local environmental services.

For the whole of the UK, spending on local environmental services associated with poverty works out around £790 million. As with other services, there is an issue of how much of this can be attributed to child/family poverty as opposed to poverty as a whole. However, some of the problems with neighbourhood environments, such as vandalism and graffiti, are strongly associated with children and young people. As a guide, this report estimates that around half

of the overall figure should be treated as a lower estimate of the spending related to child poverty.

Area-based programmes and grants

Governments have made considerable use of selective area-based initiatives over recent years and these have often focussed on deprived neighbourhoods. Many initiatives target children and young people who are deprived or at risk in some way, or address the collective environmental or community problems which can stem from concentrations of deprivation involving families, children and young people.

This report considers programs which appear to be selective in favour of more deprived communities. It is estimated that 43% of these programmes is attributable to child poverty, giving a UK total spend estimate on area-based programmes and grants associated with child poverty of £478 million.

Introduction

This report has been prepared at the request of the Joseph Rowntree Foundation to fill a gap in its current programme of work concerned with child poverty in the UK. The aim is to produce a working paper which will provide 'an estimate of the extra cost to selected public services of the existence of child poverty'. The approach entails looking at systematic data on actual spending on the selected services in geographical areas which have greater or lesser concentrations of child poverty. By examining these relationships, and considering other key factors driving expenditure levels, inferences are made about the extra costs of child poverty.

An initial attempt was made to do this by Donald Hirsch in studies for the JRF and the Scottish Government. These drew heavily on previous research by Glen Bramley, in particular a 2005 study for H M Treasury, the Neighbourhood Renewal Unit and the Scottish Executive entitled *Mainstream Services and their impact on Neighbourhood Deprivation*. This built on an earlier pioneering study for DETR (1988) entitled *Where Does Public Spending Go?* This line of research into small area spending and service outcomes has been continued in several studies, some looking across a range of services and some looking more narrowly at particular services, particularly school education (Bramley *et al.* 2007).

The purpose of this study is to draw this existing material together, and to interrogate some other contemporary secondary data sources, in order to provide some more focussed estimates, building on the expertise developed in these previous studies. The exercise is time-limited and does not permit new primary data collection, but it has enabled the re-analysis of existing data and some modelling work to extrapolate from local findings to national scale estimates.

Conceptual framework

Services funded by public spending fall into different generic categories, so the way child poverty may impact on spending varies.

- A. *Social security and similar cash transfers*, some of which go to families with children. Many but not all of these are income-related, and it is these which are used in practice as our primary markers of the incidence of child poverty. Currently, a lot is spent on these transfers but they do not fully succeed in lifting children out of poverty. One of the ways of eliminating child poverty would be to spend significantly more on these transfers. Estimating the amount required provides a primary means of measuring the cost of eliminating child poverty. Of course, there are other ways of reducing child poverty, notably through increasing the number of parents in work and the level of income earned, for example through active labour market policies. These alternative also carry public and private costs. It is difficult in practice to separate the amounts paid in respect of children and the amounts paid for other household members. This study is not concerned with measuring these costs, except possibly in the case of Housing Benefit.
- B. *Services provided to individuals or families on a basis of need or demographic eligibility*, including education, most health services, subsidised housing, and social care services. These services involve large volumes of public expenditure, but the extent to which they are targeted towards children and families varies. The identifiable flows to these groups may be mainly driven by demographic eligibility, but to varying degrees there may be extra spend associated with poor children and families, because of extra take-up or because poorer individuals need more support from the service. In education, these increments relating to poverty are relatively modest; in health they are rather larger; in social housing and social care services, they are much more dominant. Although the main emphasis for these services is on the individual recipient, there may be some wider 'public good' effects and may be some tendencies for the clustering of poor children to affect costs or outcomes.
- C. *Services which provide local 'public goods' in the economic sense*: policing and the legal/criminal justice system; roads and transport; fire and rescue; parks and public spaces; environmental maintenance, cleansing and waste collection/disposal. For public goods, the particular concern is that child poverty, particularly where clustered, may place excessive demands on these services through higher crime rates, antisocial behaviour, fire incidents, vandalism, or wear and tear on the environment.
- D. *Leisure, culture and information services* provide a mixture of individual user benefits and wider collective benefits: libraries, leisure/sports centres, arts, community facilities. In principle, these may incur expenditures relating to individual usage by poor children/families or through wider collective processes. In practice, previous research has shown a tendency for such services to be used less by poorer people.
- E. *Area-based regeneration initiatives (ABIs) and more general supplementary expenditures targeted on deprived neighbourhoods* as funded in recent years through programmes such as the Neighbourhood Renewal Fund (England) and the Better Neighbourhood Services Fund'/Local Outcome Agreements (Scotland). These spends are a mixture of capital projects, innovative new services, labour market and training programmes, community safety initiatives, grants to the voluntary and community sectors, and supplements to mainstream services. There is some danger of double counting with the categories above. The overall levels of such spending and its association with areas of more concentrated

child poverty may be documented, although it may be difficult to isolate spending specifically geared to children and families.

- F. *Other miscellaneous services* where child poverty may impact on costs. Examples include the cost of local tax collection, where a recent study for the Scottish Executive (Bramley *et al.* 2006) suggested that there was a strong relationship of problem cases with poverty.

In estimating the extra spending costs of child poverty, the main emphasis will be on looking at services in categories B, C, E (and F). For B the emphasis will be on extra individual service usage or unit cost; for C it will be about costly 'externality' effects; for E, most or all expenditure relates to poor areas, but the issue is of attribution between children/family poverty and other groups, and of eliminating double counting with B and C.

This approach is inherently limited as a way of comprehending the full costs of child poverty. Often, the amount of extra spending on poor children is not sufficient to ensure that they receive an adequate, fair or equal standard of service. Thus, the outcomes tend to be systematically worse for poorer children and areas with a lot of poor children. These poorer outcomes are likely to create further costs 'downstream' when the children are older. This suggests that a further step in the analysis would be useful to estimate later consequential costs of poorer outcomes at this first stage.

A separate working paper covers some of the most important downstream effects, in terms of labour market participation and lifetime earnings. While there is no point in duplication, some of the specific findings from this work might be relevant here. In addition, some of the downstream effects are closer to childhood, and also entail local service expenditures. For example, poor children with poor school attainment may go on to experience problems with chronic unemployment, criminality, drug abuse, homelessness and ill health. These in turn will impact on local expenditures, but after a time lag.

These second order effects might be termed '*indirect*' or '*consequential*' expenditures. It would seem to be appropriate to estimate some of these.

There is then a third concept of cost to consider. As noted, poor children and families often do not receive an equal standard of public services, particularly in terms of outcomes, to that received by the wider population. It could be argued that the full cost of child poverty, in respect of public services, should be measured as the amount of extra spending which would need to be incurred to raise their outcomes to some appropriate (minimum or average) target level. The kinds of analyses of outcomes which are now possible in some sectors do have the potential to yield estimates of this 'shadow cost'. For example, in education, we can estimate both the shortfall in attainment attributable to poverty and (with some margins of uncertainty) the marginal additional educational spending which would be needed to raise this attainment to a target level. It is not proposed to include costs in this third, 'shadow' category within the estimates produced in this working paper, but we raise the issue as a marker for the wider policy commentary and/or for possible future work.

Elements of the work

A number of elements of work were identified at the outset. We comment here on how far it has been possible to follow up on these.

- Revisit the summary and more detailed spending estimates derived within the Mainstream Services research. Services would be classified within the typology A–F above, and within that broken down to distinguish those elements which are clearly directly related to children, those which may be indirectly related, and those which are not clearly related. The average degree of association of extra spending with poverty would be established. It would also be desirable to adjust if necessary for differences between the distribution of child poverty and the distribution of general deprivation. Although we have done this we have moved beyond this earlier study in many cases.
- Examine the ward level regression models used in this study and other related studies to summarise some of the relationships between service spend or activity and neighbourhood characteristics. This would provide some pointers to the respective role of child/general poverty, other related attributes, and other unrelated attributes. Generally we have re-estimated regression models in more suitable form where appropriate including where newer data available
- Consider other recent studies which may provide additional or complementary evidence of the same general kind. This may lead to some extension of the coverage of services, or some modification of the relationships established. This has been done in a number of cases.
- Examine detailed data within the Indices of Multiple Deprivation (IMD) system and Neighbourhood Statistics:
 - to clarify the relationship between the spatial clustering of child poverty and that of more general deprivation;
 - to provide a basis for grossing up to nationwide estimates, including allowance for type E spending;
 - to highlight other particular indicators within certain domains which may yield additional evidence about the relationship between particular service demands/ costs and child poverty (e.g. prescribing, drug-related measures; crime data). This analysis may be assisted by linking with the comprehensive ward-level dataset assembled in the JRF study *Transforming Places*. With regard to (a), it was found that child poverty (as measured within IMD) is very closely related to general low income poverty, which in turn is the best single predictor of overall IMD scores. The main example of (c) is the use of the IMD crime and disorder measure to estimate the costs of policing and criminal justice system.
- Examine certain other major survey datasets which may enable further analyses of specific service demands or problem incidence and their relationship with child poverty and other drivers. These include: Survey of English Housing; English House Condition Survey; Scottish Household Survey; British Household Panel Survey; Best Value Performance Indicator and other residents' surveys carried out by Ipsos-MORI. These surveys are likely to be more useful where they enable some linkage between respondents and their actual or type of neighbourhood.
- Drawing on the results from all of the above elements, provide tables showing 'grossed up' estimates of the costs of child poverty, service by service, for England and the UK. These tables would draw on and show estimates

of total spending on the relevant services in the UK. These may incorporate some ranges based on different underlying assumptions ('low' and 'high'). A summary table is provided at the end of this report drawing together the estimates across a range of services.

- Certain other approaches have been briefly considered. It would be possible to look at local authority (LA) level expenditure across the country on relevant services and relate this to key drivers including child poverty at LA level. This would be cruder as a method for establishing relationships, and perhaps too dominated by the influence of funding formulae and expenditure limits. However, LA spending totals are relevant to the grossing up process. It would also be possible to look at nationally available administrative datasets, such as the Pupil-Level All-Schools Census (PLASC), Hospital Episode Statistics (HES) or the Children in Need Census (CINC). The LA-level approach is used in the case of local environmental services. LA funding formulae are referred to in the context of police, fire and rescue. National totals for LA spending under Area-based programmes were used. Special data requests were successfully made for HES and CIN and these provide the main basis for findings in relation to social services and acute healthcare. Existing data from PLASC and school budgets held by the authors was re-examined in the case of education.

Comment on the approach

The general approach followed in this study is to process the data in a suitable fashion to enable the relationship between spending and poverty to be established empirically. This may be done by looking at a table of average values of spending per head in areas grouped by poverty/deprivation levels; or it may be done by running a simple (bivariate) regression of spending against poverty; or it may involve a more complicated (multivariate) regression model with poverty as one of a number of explanatory variables. The third approach is intended to tease out the effect of

poverty when controlling for other factors, and so get away from fortuitous apparent relationships.

This remains a fairly coarse approach. Correlation and regression do not establish causality. There has to be a plausible account of the processes involved, which makes sense to people familiar with that service. Correlations may arise because of underlying factors which have not been directly measured, which may be related to both poverty and high service costs.

To take a generalised example, some families or communities may have cultures and attitudes which predispose them to have less stable family structures or a less positive attitude towards education. The cumulative effects of these cultural attitudes may be that these families or communities are more likely to be poor. Equally, they may lead to problems, for example in the social care and education systems, which require more money to be spent. Here, one might argue that it is the culture and attitudes which are causal and that both the poverty and the higher service spending are consequences. It would follow that just lifting these families out of income poverty, for example through transfer payments, would not in itself eliminate the other problems causing extra service costs.

Explanations of this kind tend to be controversial in the social sciences, sometimes being characterised as 'blaming the victim' or stereotyping people. Nevertheless, it would be unrealistic to exclude all processes and factors of this kind. Successful strategies to overcome poverty and deprivation probably require a range of interventions beyond mere financial transfers; getting into areas of aspiration, expectation, skills and competences, and taking rather a long time.

With this in mind, the estimates made in this report are not only fairly crude but more likely to be on the high side than the low side. They are more indicative of what might be saved in the longer run from a successful anti-poverty strategy, rather than of what might be saved next year or the year after.

Personal social services

Personal social services (PSS) for children operate on a statutory basis to provide care, support, guidance and regulation in relation to children who may be in need through a variety of circumstances including abuse, neglect, disability, low income, family stress or dysfunction, or simple lack of parents. A key group are 'Looked After Children' (LAC), formerly known as Children in Care, where the local authority has statutory responsibilities for the child's care and upbringing. LAC may reside with family or relatives, foster families, or in residential homes. PSS for children deal with a wider range of groups, including young families generally and also children and young people involved in crime and antisocial behaviour, where there is an important interface with the criminal justice system.

It has long been clear that activity and spending on children's PSS is strongly associated with poverty and deprivation; this has been reflected in financial distribution formulae for local authority grants for decades. Of all the services reviewed here, this is the one where the strongest relationship with child/family poverty at the local and neighbourhood level would be expected.

In the 'Mainstream' study (Bramley *et al.* 2005) this service was analysed using various local data systems for two Scottish local authorities and a relatively new system known as the Children in Need Census (CINC) for four English authorities. A complete set of 2005 CINC data for England has been available for this study.

CINC has special value for this study, because it is a complete census of children receiving any form of service in one week in 2005 which contains a detailed estimate of the full cost of that service (including allocated indirect and overhead costs). It also has spatial location data for service clients, although this is less than ideal. CINC has a spatial coding at the scale of a broader neighbourhood or locality area, postcode district (i.e. outward postcode, such as BS6 or NW10). These units are smaller than local authorities but larger than wards, amounting to about 2000 units across England. CINC is less useful than it might be in

other respects, because it does not have much data about the family/household background of the children, for example in terms of their income or benefits status. It cannot, therefore, be used for multi-level analysis to tease out the respective role of individual and area-level effects of poverty and deprivation. Despite these limitations, it is still a powerful data source.

The key analysis we have undertaken is to construct a dataset at postcode district level comprising the aggregated CINC data, Census demographic and socio-economic data, and data on key indicators from the IMD system. This dataset includes variables found in previous or related research to have some relationship with service activity, spending or outcomes. Some of the demographic and socio-economic variables are specific to the child population. The key measure used for child/family poverty is the IMD indicator for children living on low income (based on claiming various means tested benefits or tax credits), as derived from the 2007 IMD (data refers to 2004).

The general approach for this and other services is to run at least two regression models, one a simple bivariate model with expenditure (per child, in this case) as the dependent variable and child poverty ('IDACI') as the sole explanatory variable; and the other a multi-variate model including additional demographic and socio-economic variables. The rationale for the second model is to reflect the view that service demands and expenditure are driven by some factors other than poverty, such as demographics, and to control for these effects when trying to estimate the variation due to poverty. This is particularly important where these other drivers are somewhat correlated with poverty.

However, there is a problem where other potential explanatory variables are highly correlated with poverty. Technically, this collinearity problem makes it difficult to estimate the impact of each variable separately and judgements have to be made about which variable has primacy. In this study, where a variable is known to be highly correlated with poverty (e.g.

Table 1: Bivariate regression model for weekly cost per child population at postcode district level for England, 2005 (mean £14.36, range £0 to £163; std dev. £9.55)

Variable	Coefficient	Std Err	Std Coeff	t-stat	Signif.
(Constant)	2.769	0.377		7.340	0.000
IDACI score (Children Low Income propn)	56.309	1.540	0.634	36.565	0.000
Dependent Variable:	costpchild				
Weighted Least Squares Regression - Weighted by popwgt					
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.634	0.402	0.402	8.332	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	92828	1	92828.4	1337.025	0.000
Residual	137886	1986	69.4		
Total	230715	1987			

Note: IDACI score, mean 0.21, range 0.03 to 0.80, std dev 0.12.

unemployment), it is treated as part of the same general phenomenon, i.e. we give primacy to the poverty variable and drop the other variable.

The use of regression models in this way does not explain the mechanisms which link poverty to need. They may include both direct and indirect effects, including processes operating within individual families, processes operating in neighbourhoods/communities, and processes operating across generations.

Table 1 shows that children's PSS expenditure is quite strongly related to child poverty. Just this one variable can explain 40% of the variance. The coefficient of 56.3 means that, if all the children in an area were poor, the service cost would rise by £56.30 per week per child relative to an area where no child was poor – compared with an average service cost of only £14.36. One higher standard deviation of poverty would raise expenditure by 0.63 of a standard deviation.

The multivariate model in Table 2 tries to control for those demographic and socio-economic variables which appear to have some independent influence on expenditure (discarding those which are very closely related to child poverty). Seven additional variables are included, including three ethnic indicators, two housing-related and two demographic variables.

Even with these variables included, the effects of child poverty remain strong, with the coefficients only slightly lower than in the first model. This indicates that the relationship with child poverty is a robust one. None of the additional variables has as strong an effect, but those included are statistically significant. They suggest that additional drivers/predictors of higher levels of spending include children living in cohabiting households, higher residential mobility, children living in flats, and mixed ethnic backgrounds. Factors associated with lower spend per child include the proportions of both Asian and black ethnic population and the proportion of children in the population. The latter is related to the denominator of the dependent variable, so might be regarded as a spurious effect, but it can be rationalised that where there are a lot of children, service resources get spread more thinly.

Other formulations of this model have been explored, including other variables, and also forms which allow for 'non-linear' effects of poverty. These alternatives do not appear to be any better than the basic linear model reported in Table 2.

What do these results indicate for the costs of child poverty? Table 3 calculates the implied cost of poverty, using the results of the model in Table 2. The table breaks down areas using the same deprivation bandings used in the 'Mainstream'

Table 2: Multivariate linear regression model for weekly cost per child population at postcode district level for England 2005

Variable	Coefficient	Std Err	Std Coeff	t-stat	Signif.
(Constant)	2.249	2.034		1.106	0.269
IDACI score (chdrn low inc)	48.685	2.378	0.548	20.477	0.000
pchild (% children)	-0.449	0.098	-0.119	-4.563	0.000
pcohabk (% chdrn cohab cpl)	1.326	0.300	0.112	4.416	0.000
pmobil (% mobility rate)	0.653	0.106	0.113	6.146	0.000
pflatk (% chdn in flats)	0.127	0.021	0.168	6.015	0.000
pasian (% popn Asian)	-0.096	0.029	-0.080	-3.272	0.001
pblack (% popn black)	-0.326	0.063	-0.162	-5.136	0.000
pmixeth (% popn mixed Ethnic)	2.122	0.313	0.225	6.773	0.000
Dependent Variable: costpchild					
Weighted Least Squares Regression – Weighted by popwgt					
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.704	0.495	0.493	7.675	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	114211	8	14276.4	242.386	0.000
Residual	116503	1978	58.9		
Total	230714	1986			

study. The most affluent 25% of areas still have some children in poverty, on average 8.3%. The average spend per resident child in these areas is £146 per year. However, using the regression model, we estimate that the 'effect of poverty' on expenditure in these wards is £87 per head per year. At the other end of the scale, the 10% most deprived areas have a child poverty score of 0.47 (47%), 5.7 times higher than the most affluent areas. They spend £613 per child per year on PSS for children (4.2 times the most affluent ward spend). The model suggests that the poverty effect on spend in the worst wards is £494 per child/year, the same 5.7 ratio as in column 1.

We can then multiply these numbers by the numerical child population living in each band to get the total poverty effect on spending, shown in the next column. This ranges from £159 million in the least deprived quarter of areas to £624 million in the most deprived tenth of areas. The total cost of poverty for this service in England is therefore £2.4 billion. This is about 70% of total spending on this service.

Table 4 breaks down 'excess' poverty costs across the deprivation range by main type of need recorded in CINC. Some types of need are more costly than others, particularly abuse and neglect, followed by family dysfunction. All types of need show some relationship with poverty; although this is (unsurprisingly) strongest for 'low income', it is quite high for abuse and neglect and a range of other needs. Disabled child and absent parent show the lowest ratios of cost per child between the most and least deprived areas, but even for these the ratios are 1.8 and 3.1 respectively.

The extra cost of abuse and neglect of children which is related to poverty adds up to nearly £1 billion in England. The extra costs of family stress and dysfunction related to poverty amount to £362 million. The costs of specific needs as shown in this table may be of some value in putting flesh on the statistics.

This table shows that excess cost is that incurred above the base level found in the most prosperous 25% of areas – this is a more stringent assumption than Table 3.

Table 3: Cost of child poverty on children's personal social services estimates for England

Deprivation band	Child poverty IDACI	Cost per child/week costpchild	Cost per child/year costchpa	Cost effect of poverty	Aggreg effect £m England
Most prosperous 25%	0.083	6.75	146	87	158.6
Mod. prosperous 25%	0.129	9.80	211	135	311.8
Mod. deprived 25%	0.201	14.39	311	211	623.1
Fairly deprived 15%	0.301	20.62	445	317	696.7
Most deprived 10%	0.470	28.40	613	494	624.0
Total	0.213	14.79	319	223	2414.1
Top:Bottom Ratio	5.67	4.21	4.21	5.67	
Total Expenditure					3421.4
Poverty-Related Share					70.6%

Table 4: Excess cost of child poverty by main need category (children's PSS in England 2005)

Deprivation band	Absent parent	Abuse neglect	Not CIN	Disabled child	Family dysfunction
Most prosperous 25%	0.0	0.0	0.0	0.0	0.0
Mod. prosperous 25%	9.5	74.0	1.5	1.1	22.0
Mod. deprived 25%	25.3	247.3	8.4	19.9	61.2
Fairly deprived 15%	34.1	332.4	11.0	23.9	80.1
Most deprived 10%	41.3	282.5	16.0	22.2	52.6
Total	110.4	936.1	36.8	67.1	216.0
Deprivation band	Acute family stress	Low income	Not stated	Disabled/ill parent	Unacceptable behaviour
Most prosperous 25%	0.0	0.0	0.0	0.0	0.0
Mod. prosperous 25%	13.4	1.3	6.3	8.7	11.9
Mod. deprived 25%	36.6	8.0	17.0	21.6	35.2
Fairly deprived 15%	54.6	16.7	16.8	32.4	48.6
Most deprived 10%	41.4	32.5	21.4	35.6	37.0
Total	146.0	58.6	61.6	98.2	132.6

This evidence certainly confirms the character of children's PSS as a service which is almost dominated by the effects of child/family poverty. Our statistical model suggests that over two thirds of spending may be attributable to poverty. A further analysis of 'excess costs' by type of need suggests a slightly lower total, but still a majority of spending.

It might be questioned whether this is a wholly plausible story, by considering what would happen if child poverty were somehow eliminated. It is implausible to expect that all problems of family dysfunction and stress, poor parenting and disability would disappear. These problems do occur in more affluent families but, typically, more (private) resources can be drawn upon to

address them. It is also implausible that, if child poverty were ended, these services would wither away completely – what is more likely is that they would re-orientate themselves to more positive preventative and educational work, while trying to raise standards in the treatment of children still in need or at risk. What to do with resources released is a choice for public authorities at the time.

Health services

Health expenditure is a large element in total public expenditure and has increased its share markedly since 2001. The NHS cost about £81.6 billion in England in 2006/07 and another £9.4 billion in Scotland. Most health expenditure goes on NHS services which predominantly go to people who are ill rather than healthy. Thus a very large share of the total goes to older people. However, spending on children and young people is not trivial, and it can be shown that this

The best data on the use of healthcare services, which can be used to estimate the costs/spending involved, is the Health Episode Statistics (HES). These only cover the acute sector, but can provide a basis for estimating the incidence of a majority of total healthcare spending. The data records all 'episodes' including investigations and consultations as well as treatments, in-patient, day case and outpatient. These can be analysed by specialty or type of diagnosis or treatment, at different levels of detail, and thereby can be indirectly linked to sophisticated costing systems. Alternatively, rather cruder cost proxies can be obtained using numbers and types of episodes or 'bed-days'. They also record the

patient's postcode, and so can be analysed by small area, or type of neighbourhood.

Pending availability of the English data, this report uses analysis on data for one large/varied Scottish local authority, Fife. This data was compiled in a previous project to develop a 'Social Justice Analysis System' for Fife. Expenditure estimates based on the same episodes data and methodology described above were derived for broad age groups, including 0- to 18-year-olds. Four years' data was averaged to smooth the data, and 'cruder' estimates at small area level were controlled to more sophisticated estimates at a divisional area level.

These data may be analysed at the fine spatial scale of Scottish datazones (population 500–1,000), and again the focus is on the relationship with low income deprivation. For this analysis only limited demographic and socio-economic variables were available. In Table 5 below, the model is fitted with just one additional demographic variable, the percentage of children in the population. As in PSS this has a negative association.

Table 5 shows that acute healthcare expenditure on children and young people in

Table 5: Regression model for acute healthcare expenditure for children and young people in Fife 2000–04 (expenditure per resident child, 2000–04 average, £, datazone level; mean £194, range £66–£412)

Variable	Coefficient	Std Err	Std Coeff	t-stat	Significance
(Constant)	204.870	9.192		22.288	0.000
plowinc –% low Income	3.372	0.232	0.595	14.523	0.000
pchild –% aged 0–15	–2.962	0.506	–0.240	–5.857	0.000
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.566	0.321	0.318	45.23	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	434837	2	217418	106.29	1.56E-38
Residual	920473	450	2045		
Total	1355310	452			

Data sources: Social Justice Analysis System for Fife; analysis of SMR data from Fife Health Board; Census; Scottish Neighbourhood Statistics.

Table 6: Regression model for cost of hospital inpatient treatments for 0–14 age group at postcode district level in England 2005–06

Variable	Coefficient	Std Err	Std Coeff	t-stat	Signif.
(Constant)	91.397	12.926		7.071	0.000
IDACI score	164.819	33.671	0.376	4.895	0.000
Idacisq	109.518	53.209	0.148	2.058	0.040
Pchild	-1.429	0.508	-0.076	-2.813	0.005
Pmobil	3.304	0.637	0.116	5.184	0.000
Pflatk	0.640	0.196	0.172	3.265	0.001
Pcrowdk	-1.636	0.396	-0.304	-4.127	0.000
Pnochk	0.640	0.182	0.078	3.520	0.000
Pasian	0.213	0.185	0.036	1.152	0.250
Dependent Variable: ahcostpchild					
Weighted Least Squares Regression – Weighted by popwgt					
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.459	0.211	0.208	47.371	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	1235588.1	8.0	154448.5	68.826	1.8E-100
Residual	4631735.2	2064.0	2244.1		
Total	5867323.3	2072.0			

Fife has a strong relationship with low income poverty. The model fits reasonably well, explaining 32% of variance. The standardised regression coefficient is 0.595, almost as high as that reported for PSS above. Increasing low income by 10 percentage points (76% of mean value of 13.2% poor) would raise expenditure by £33.72 per child. The difference between highest and lowest poverty data zone (47%) would raise expenditure by £158 per child, 82% of mean expenditure.

An alternative model was tested including three additional demographic variables (lone parents, students, long-term illness). However, the effect of low income was not much different in this model.

This can be translated into national estimates of poverty-related costs. Such a translation assumes that Fife is reasonably representative – it is, at least, quite representative of Scotland. Simple grossing up by population would give an expenditure total of £3.5 million for Fife and £590 million for the UK. However, as health expenditure has been shooting up at a very rapid

rate during this period, the current grossed up figure would be higher (£884 million)

Using data subsequently provided from HES for the whole of England we can improve on this estimate. Tabulations were provided for 2005/06 for in-patient and out-patient activity for all ages and for 0- to 14-year-olds (inpatients) or 0 to 18 (outpatients), firstly by decile bandings of IMD (2004) and secondly by postcode district. In the former case a further breakdown by main specialty was provided.

For hospital inpatient episodes we use the analysis of bed-days, a reasonable proxy for cost, by postcode district, and link this to the dataset assembled for the analysis of childrens' personal social services. A representative cost per bed-day (£568) was obtained from DoH reference cost tables (an average across elective and non-elective episodes). A rather similar regression model was developed to predict cost per child resident, and this is shown in Table 6 below. It was found that the relationship with child poverty was nonlinear increasing, represented by the

quadratic term (idacisq). Other variables included in the final model were the proportion of children, population mobility, children in flats, overcrowded children, children in homes without central heating, and Asian population (not quite significant).

We can use the results of this model to estimate the acute inpatient healthcare costs for this age group attributable to child poverty, which totals £453.4 million. This may be grossed up to £574.3 million to allow for the whole age group aged 0 to 18.

Two further elements may be added to the picture. Firstly, outpatient episodes involving 0- to 18-year-olds may be analysed across deprivation deciles, using a representative unit cost of £105. Using the simpler procedure of taking the 'excess cost' in each decile, relative to the least deprived decile, we obtain a cost of poverty for outpatient episodes of £38.1 million. (In doing this we adjust for the varying proportion of children in the different deciles.)

Secondly, maternity services are recorded as episodes involving adults but are clearly related to families. These can also be analysed across deciles in the same fashion, although in this case we use the all ages episodes in the main specialties of obstetrics and midwifery to distribute the England total cost of maternity services of £1.6 billion. Taking the excess cost by decile relative to the least deprived decile, adjusted for child population proportions again, we find that the excess cost of poverty here amounts to £396.6 million for England.

Taking these three elements together we have an overall cost of child poverty in acute health services of £1009 million for England. Grossing up to UK gives a total cost of £1211 million. This is larger than the estimate derived from the Fife analysis alone, mainly because of the allowance for maternity. This is still quite a conservative figure, only just over 2% of total acute sector expenditure. It could be argued that some of the high healthcare costs for people aged over 18 may be attributable to their earlier experiences of child poverty.

Primary healthcare

What about non-acute healthcare costs? Again, evidence is available for Scotland based on the Scottish Household Survey.

This includes an indicator of the frequency of GP consultations which can be considered separately for families with children and which can relate to both individual household and area poverty. This source also provides measures of respondents in poor health and of the use of certain community health services. The analysis presented uses data for 1999–2000. It may also be possible to utilise data from the Health Survey for England to provide a parallel analysis, but this has not been possible so far.

Table 7 shows average scores for these variables across deprivation bandings for areas (derived indirectly from Mosaic clusters linked to 'Breadline Britain' poverty measures), and for households which are individually poor (receiving means tested benefits – 'mtben'), showing family and non-family households separately. It is clear from this table that there are systematic relationships with both area poverty and individual poverty, which apply to both families and other household types.

The GP consultation indicator is most useful, as a proxy for activity and expenditure. The Table shows, for example, that for families the annual frequency of GP consultations rises from 2.74 in the least deprived areas to 4.05 in the most deprived 10% of areas. Families on low income benefits use GPs 4.6 times per year compared with 2.9 times for families not on low income benefits. The table also shows that the incidence of poor health is systematically greater in more deprived areas and poor families. The community health service indicator is partial and data are sparse, particularly for families, but there is a similar pattern.

Table 7: GP consultations, poor health and community health service use by area deprivation and individual poverty by family status, Scotland 1999–2000 (Scottish Household Survey)

Family status	Deprivation band (from Mosaic/Bread)	GP consultations pa	In poor health	Community health service
Non-family	Most deprived 10%	4.777	0.290	0.006
	Fairly deprived	4.453	0.243	0.008
	Mod. deprived	4.141	0.195	0.008
	Mod. prosperous	3.733	0.138	0.005
	Most prosperous	3.449	0.110	0.004
	Total		3.983	0.176
Family	Most deprived 10%	4.054	0.138	0.002
	Fairly deprived	3.956	0.146	0.003
	Mod. deprived	3.683	0.124	0.001
	Mod. prosperous	3.337	0.081	0.000
	Most prosperous	2.744	0.048	0.000
	Total		3.405	0.096
All households	Most deprived 10%	4.578	0.247	0.005
	Fairly deprived	4.311	0.215	0.007
	Mod. deprived	4.037	0.179	0.006
	Mod. prosperous	3.626	0.122	0.004
	Most prosperous	3.223	0.090	0.003
	Total		3.824	0.154
	Indiv hhd poverty			
Non-family	Not poor	3.458	0.118	0.004
	Poor (mtben)	5.316	0.331	0.013
	Total	3.976	0.175	0.006
Family	Not poor	2.888	0.058	0.000
	Poor (mtben)	4.599	0.188	0.004
	Total	3.401	0.096	0.001
All households	Not poor	3.303	0.101	0.003
	Poor (mtben)	5.107	0.289	0.010
	Total	3.817	0.153	0.005

We can fit a regression model to the GP consultation data, at individual household level incorporating the area poverty measure. The model in Table 8 is fitted to family households only and also includes one control variable, for presence of a disabled person in the household. The fit of the model is not very good, but this is typical of individual household level data.

All three variables included are positive and statistically significant. This implies that use of GP health services by families is positively related to

both individual and area poverty. This evidence, and that in the previous table, is consistent with wider evidence of the effects of poverty on ill-health, and further shows that this does feed through into demand for/use of primary healthcare services.

It is sometimes argued that poorer people or areas do not make use of services commensurate with the extent to which they suffer poor health. Table 7 suggests this may be so, because the GP usage between top and bottom area deprivation bands varies by a factor of 1.5 whereas

Table 8: Regression model for GP consultations by families with children, Scotland 1999–2000 (Scottish Household Survey)

Variable	Coefficient	Std Err	Std Coeff	t-stat	Sig.
(Constant)	2.417	0.086		28.109	0.000
Abread	0.010	0.004	0.030	2.459	0.014
Mtben	1.205	0.100	0.149	11.996	0.000
Disabled	2.370	0.110	0.241	21.562	0.000
Dependent Variable: gpcons					
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.320	0.102	0.102	3.529	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	10661	3	3553.665	285.353	0.000
Residual	93402	7500	12.454		
Total	104063	7503			

‘poor health’ varies by a factor of nearly 3.0. Whether or not this is true, there is still a positive relationship with activity and expenditure.

This can be translated into a rough estimate of expenditure, using the same sort of procedure as used above. Table 9 shows the main steps in the calculation. It shows the ‘effects’ of poverty at the mean, in terms of numbers of consultations per year. This is +0.33 for individual poverty and +0.21 for area poverty, making a total of 0.54 for poverty combined at both levels. This is 16% of the overall average GP consultation rate for families (3.4), which itself is similar to non-families. Families make up 28% of Scottish households, so 16% of family usage equates to 4.5% of all GP usage. Using the control totals for health spending, and assuming (based on the ‘Mainstream’ study) that primary healthcare (including prescribing) represents 20% of overall NHS budget, we arrive at the aggregate cost of primary healthcare which is related to family poverty of just over £70 million for Scotland or nearly £860 million for the UK.

All stages of this analysis could in principle be refined, and potentially re-estimated for England, but the order of magnitude of these figures provides a reasonable guide.

Table 9: Poverty effects on GP usage by families and derived expenditure estimates

Components	Poverty effects
Individual poverty effect	0.333
Area poverty effect	0.212
Total poverty effect	0.544
Ave GP consultations pa	3.401
% of family GP use	16.0
% of all GP use	4.5
Scottish expenditure £ million	70.6
UK expenditure £ million	858.7

School education

Education is another major service where issues of the effects of poverty are important, particularly in terms of achievement. However, the principal concern here is with present patterns of expenditure and cost. How far are these affected by poverty? To answer this, evidence on school budgets and expenditure can be related to poverty or deprivation levels of their pupils or the area which they serve. This report draws on a recent study undertaken for Wales as a whole, and on the earlier 'Mainstream' study which looked at selected areas in England and Scotland at a slightly earlier date.

In this exercise, factors which drive the distribution of resources in school systems should

be considered. These comprise both deliberate policies and formulae for distribution and also indirect effects stemming from other aspects of the systems. Distribution formulae operate at two levels, firstly in the distribution of grants and indicative spending targets between local education authorities, and secondly in the 'School Funding Formulae' used by LEAs to distribute to schools. The former systems tend to include a 'deprivation top-up' (current English terminology) to reflect factors including poverty which are believed to be associated with 'additional educational needs' (earlier terminology). However, these extra elements are only a minority part of the overall budget. Local

Table 10: Expenditure per pupil in Welsh schools by poverty band and implied aggregate cost of poverty

Poverty FSM%	Primary bands	Net expenditure 2005/06 /pupil	Net expenditure 3 yr average /pupil	Marginal cost per 1% FSM	Marginal cost 3 yr average
0-5%	0	2734	2555		
5-15%	1	2672	2516	-6.221	-3.941
15-25%	2	2823	2658	15.036	14.216
25-35%	3	2969	2820	14.619	16.206
35-45%	4	2997	2842	2.793	2.159
45% & over	5	3279	3079	28.239	23.705
	Total	2797	2634		
Top over bottom £/pupil				10.893	10.469
Ave cost for whole system (18.1% FSM)				197.172	189.488
Total cost for Wales primary schools (£ million)				48.307	46.425
Poverty FSM%	Secondary bands	Net expenditure 2005/06 /pupil		Marginal cost per 1% FSM	
0-5%	0	3374			
5-15%	1	3425		5.073	
15-25%	2	3557		13.242	
25-35%	3	3728		17.124	
35-45%	4	4025		29.720	
	Total	3508			
Top over bottom £/pupil				14.480	
Ave cost for whole system (12.8% FSM)				185.339	
Total cost for Wales secondary schools (£ million)				32.434	

funding formulae typically also include a poverty element, usually based on 'Free School Meals' (FSM) eligibility. However, it is often the case (and this was clearly true in Wales) that these school level formulae are less redistributive, in respect of poverty, than the national-to-local systems.

School level formulae and ad hoc allocations may also reflect other factors which pick up deprivation indirectly. The role of Special Educational Need (SEN) is potentially important here, as the incidence of SEN is likely to have some relationship with deprivation. Other even more indirect factors may arise from the varying size and occupancy of schools. For example, schools in poor areas with poor reputations may end up with smaller numbers of pupils, and consequently a somewhat higher per pupil spending. Small schools generally have higher unit costs, and this is most noticeable in the primary sector, although the smallest schools are typically rural and as such not usually very deprived.

The outcomes of these various driving factors in Wales are shown in Table 10. This shows per pupil spending in primary and secondary sectors, with schools broken down by bandings in terms of proportions of FSM. In general, schools with more child poverty have higher spending per pupil, but the differences are not very large. For primary, spending per pupil rises from £2734 to £3279 across the poverty bands, a difference of 19% of the mean, in 2005/06. The three-year average figures are similar. The differences are a bit uneven across the bands, but overall can be expressed as a marginal addition of £10–11 for each 1% extra FSM. Given the average FSM score for Welsh primaries (18.1%), this gives an average 'cost of poverty' for Wales of between £189 and £197 per pupil, or between £46 million and £48 million in aggregate.

Repeating the exercise for secondary schools gives a higher marginal cost (£14.5 per 1%), a similar average per pupil (£185), and a somewhat lower aggregate cost of £32 million. The proportion of FSM pupils is markedly lower at secondary level. Quite why this should be so is unclear, but it may reflect a general falling off in school meals take-up for this age group rather than a lower incidence of poverty. The aggregate number of pupils is

lower because there are fewer year groups; sixth form pupils in Wales are funded separately.

So, overall costs of poverty to school education in Wales is about £80 million, about 6% of the budget. It is risky to try to gross up from Wales to the whole of the UK but making heroic assumptions these figures would indicate an aggregate cost of poverty in schooling of £1.9 billion.

The detailed analysis of school costs in the Welsh study indicates that the following factors arise in regression models to predict school costs which are related to some degree to poverty: FSM (through SFFs); various measures of SEN; pupil mobility (secondary), and school size (actual pupil numbers). Separate models to predict the incidence/severity of SEN do not fit the data very well but do indicate positive associations with poverty (FSM), being in care (see PSS 'LAC' discussed earlier), mobility and no qualifications, and in the secondary sector further socio-demographic indicators, after controlling for local policy variation. Therefore, one can say that poverty affects school spending partly directly, through formula allowances, and partly indirectly, through certain types of SEN, through LAC, and possibly through other socio-demographic factors which are related to poverty. We could use the Welsh models to try to quantify these pathways of influence, but that has been beyond the scope of this short project.

England and Scotland

The second set of evidence used is more dated (2001–02) and although it refers to England and Scotland it is in fact based on an analysis carried out within six LEAs (five in England, one in Scotland). The analysis was carried out at ward level and the summary spending figures shown in Table 11 are for wards grouped by broad deprivation banding. It is possible to map these across to the child poverty measure (idaci) and average scores are shown for each band. In these summary tables, figures are in pounds per resident child in the relevant age group.

Expenditure per child is equivalent to the measures used in PSS and healthcare, but there is a further issue raised in education, namely the distorting effect of private schooling. The falling-

off of spend per child in the less deprived bands is partly driven by this rather than by absence of poverty, and indeed private schooling is the dominant factor at the top of the range. A simple way to discount for this factor is to ignore the most affluent band (25% least deprived wards) on the grounds that this is where the private schooling effect is concentrated. We then take the increase in cost between the 'moderately affluent' and most deprived wards, and relate this to the difference in child poverty rate.

The results shown in Table 11 indicate a higher mark-up for poverty in the primary sector than in Wales, but a lower mark-up in the secondary sector. This result is also partly a consequence of taking cost per child, because in this analysis 16+ pupils in schools and associated expenditures are included. Poorer areas tend to have lower staying-on rates, and sixth form schooling tends to attract a higher unit cost.

The results in Table 11 suggest a UK total cost of child poverty in school-based education of £2.5 billion in 2001/02, equivalent to about £3.2 billion today, of which the majority is

in the primary sector. This is larger than the estimate derived from the Welsh analysis.

Going back to the original data from the Mainstream study for England allows a more refined analysis of the drivers of cost per pupil at school level. The results of this analysis are summarised in Table 12. Two regression models are compared, one using just child poverty (measured by FSM) and the other including demographic and other school characteristics variables to control for extraneous influences, excluding those which are closely correlated with poverty. These fuller models explain about 80% of the variance in cost per pupil between schools.

The simple model indicates that poverty appears to account for about 12.5% of primary spending and 21.3% of secondary spending. However, in the fuller models these shares drop to 6.7% and 7.0% respectively. These figures are lower than those derived for primary but higher for secondary than those shown from the cruder analysis in Table 11. The new figures imply national totals of £1,575 million in 2001–02 or £2,300 million in 2006–07.

Table 11: School costs per child by deprivation banding and implied costs of poverty – selected English and Scottish areas 2001–02

Deprivation band	Child poverty Idaci	Primary cost/child	Secondary cost/child	Primary cost per % poverty	Secondary cost per % poverty
Most prosperous 75–100	0.059	1438	1813		
Mod. prosperous 50–75	0.114	2008	2332	104	95
Mod. deprived 25–50	0.222	2312	2647	28	29
Fairly deprived 10–25	0.383	2475	2442	10	–13
Most deprived 10%	0.543	2691	2590	14	9
Overall average	0.210	2344	2458	16	6
Ratio top:bottom	9.258	1.872	1.429		
Ratio top:mod	4.783	1.341	1.111		
Implied total spend per child				334	126
% of average spend				14.2	5.1
Share of age groups in total population				9.4	8.0
Implied UK total 2001/2 £ million				1,879	609

Source: Derived from Bramley *et al.* (2005) 'Mainstream' study.

Scottish schools

A more recent Scottish dataset is that compiled for Edinburgh, Fife and North Lanarkshire for the study of 'Home Ownership and Educational Attainment' (Bramley and Karley, 2005, 2007). This can be aggregated to either school or small area (e.g. datazone) level and the relationship between expenditure (derived from school budgets), poverty and other factors established. This study effectively shares expenditure estimates with the Fife Social Justice Analysis System. Initial interrogation of the latter indicates that in that authority the effects of greater poverty on expenditure were higher than those reported above for Wales or England, particularly in the secondary sector.

Table 12 shows the results of similar regression models for cost per pupil at school level for secondary schools in these Scottish authorities. While the share of expenditure attributable to poverty appears smaller than in English secondaries in the simple model, in the fuller model the share is rather larger, at around 10.8%. It appears Scottish secondary school budgets are more redistributive than their English or Welsh counterparts. Allowing for this would increase the UK total slightly.

Table 12: Impact of poverty (FSM) on spend per pupil based on regression models at school level

	Year	Full model	Simple model
England primary	2001–02		
£ per 1% FSM		5.34	9.89
<i>FSM mean effect £</i>			253.19
% of mean exp/ pupil		6.74	12.49
England secondary	2001–02		
£ per 1% FSM		7.96	24.30
<i>FSM mean effect £</i>			585.07
% of mean exp/ pupil		6.98	21.30
Scotland secondary	2003–04		
£ per 1% FSM		32.21	46.38
<i>FSM mean effect £</i>			768.99
% of mean exp/ pupil		10.84	15.62

The main elements of public expenditure on housing are capital investment on social housing and Housing Benefit (HB) paid to low income tenants. It is debateable whether HB should be counted in this exercise as it may be regarded as a social security transfer. However, it is really a hybrid, having some of the characteristics of a specific subsidy towards reducing housing costs as well as constituting part of the overall income maintenance effort for low income households. A key part of social housing investment is the grant paid to housing associations (RSLs) in respect of new schemes, and this is certainly capable of analysis in this context. Another component is the investment (and related revenue subsidies) by local authorities and related organisations (e.g. ALMOs) on repairing and improving their housing stock. Poor families are significant beneficiaries of this investment but it is also motivated by wider concerns about improving the condition of the public housing 'estate' and contributing to goals such as energy efficiency (although this in turn contributes to reducing fuel poverty).

Expenditure on private sector housing is more limited, with grants for home improvement predominantly targeted towards older and disabled households. Income support for mortgage interest (ISMI) could be likened to HB. Some specific revenue and capital spend is related to dealing with homelessness, and poor families feature strongly in this. Area regeneration (for example Housing Market Renewal) entails substantial capital and revenue spending, predominantly related to housing, but some of this is captured in the above categories. There are also issues in housing concerning implicit subsidies, which may not be counted as public expenditure: key examples are Section 106 planning agreement contributions (in cash or kind) and the implicit subsidy from the fact that social rents are below market rents (see Hills 2007). These cannot all be analysed in detail here.

Social housing has become increasingly targeted on low income households, as a result of the process of 'residualisation' of the tenure. Social housing has increasingly become a tenure for low

income households as a long-term a consequence of needs-based allocations, including the Homeless Persons legislation, and the full coverage of social sector rents by HB (Stephens *et al.* 2005; Stephens 2007). Traditionally, families with children have had priority in allocation, so there is a particular link with family poverty. So although housing expenditure in total is not of the same magnitude as health and education spending, it is clearly much more targeted at low income families and thus an important part of the overall 'cost of child poverty'.

This section includes analysis of:

- the share of new social sector lettings going to poor families, linked to an estimate of the grant costs of this new social housing;
- the distribution of new social housing investment (grant) at ward level, showing its strong geographical link with low income deprivation;
- the cost of HB broken down by household type to identify the part attributable to poor families;
- the incidence of dwellings below the Decent Homes standard by tenure and the share of these occupied by low income families, to indicate the likely share of Decent Homes programme investment attributable to this group.

New social housing investment

New social housing investment by RSLs is analysed in two ways. The first approach is to look at the proportion of new first time lettings going to families with children on low income. The data source is the CORE (Continuous Recording) system for 2005/06, which contains detailed data on most RSL lettings including information about both the dwellings and the households at individual case level. We define low income poverty as (a) being

Table 13: New social housing units, costs and share attributable to poor families in 2005/06

Region	New social rented building units	Grant-funded units 2004/05 (inc sale)	Estimated grant/ unit (social rented) £m	Total cost	Poor families % new lets	Family poverty cost £ mn	Adjusted family poverty cost £ n
North East	885	675	51850	35.0	19.4%	6.8	7.8
Yorkshire & Humber	1301	940	73010	68.6	38.2%	26.2	31.3
North West	1687	1741	72745	126.6	28.0%	34.5	34.0
East Midlands	1184	1527	55385	84.6	41.1%	34.8	30.9
West Midlands	2260	2022	53047	107.3	35.8%	38.4	40.6
South West	1970	2471	37620	93.0	50.6%	47.0	42.3
East	1888	2407	43850	105.5	44.3%	46.7	41.7
South East	2810	4684	45390	212.6	46.9%	99.7	79.8
London	3210	6841	86860	594.2	50.0%	297.3	218.4
England	17195	23308	61242	1427.4	42.3%	631.5	526.7

eligible for HB, or (b) receiving most income from state benefits, or (c) having 'residual net income' after housing costs less than 140% of the Income Support Applicable Amounts. The fifth column of Table 13 below shows the percentage of new lets to poor families (households with dependent children) by region in 2005/06. The average was 42.3% but with wide regional variation, from 19.4% in the North East to 50.0% in London. This reflects the varying overall pressure on social housing lettings between different regions, including pressures of homelessness. Where pressures are less, social landlords let to a larger proportion of non-family households.

Region is also relevant to the cost of provision. Building and land costs are much higher in London and somewhat higher in the South than in the North, while the amount of loans which can be serviced by rents do not vary so much. However, in the South, more implicit subsidies may be attracted from Section 106 agreements. The third column shows the average grant paid per new social rented unit in 2005/06, estimated from Housing Corporation data, varying from £37,620 in the South West to £86,860 in London.

The first two columns show two estimates of the number of units of social rent completions and affordable housing funded in 2005/06. The difference mainly reflects the role of Low Cost

Home Ownership and acquisition of existing stock. The total cost of the programme is shown in column 4, while columns 6 and 7 show the part attributable to poor families. The final adjusted figure attempts to allow for the effects of Low Cost Home Ownership, which has a lower grant cost per unit. The bottom line total cost for poor families is £527 million for England, which is about 37% of the total cost shown.

The second approach is more similar to that adopted with other services, namely to look at the variation between small geographical areas and to relate this to the poverty levels of those areas. It should be remembered in this context that it is very difficult to separate the pattern of family poverty from the pattern of general low income poverty. This approach tends to assume that all of the investment is attributable to undifferentiated poverty. One could rationalise this by arguing that the investment is intended to help improve communities as a whole, recognising the externality or 'area' effects involved. This provides much of the rationale for concentrating investment in the poorest areas, which has been the effect of regeneration-oriented policies in recent years.

Table 14 shows the basic descriptive pattern of levels of new social housing investment (grant) per household and per head by deprivation bandings, alongside the average low income

poverty score for each banding. The data source for this is primarily the ward-level dataset including CORE data on new first lettings compiled within the JRF 'Transforming Places' study (Bramley *et al.* 2007). The grant cost weightings are the same regional figures used in the previous Table, i.e. at 2005/06 values. However, in the ward analysis completion rates have been averaged over a longer period to reduce data lumpiness.

Table 14 shows that grant per household rises from £31.2 in the least deprived 20% of wards to £135.6 in the most deprived 10% of wards, against an overall average of £55.2. This confirms the strong skewing of social housing investment to deprived areas reported in the earlier Mainstream study, but now generalising it to the whole of England. This skew attracted considerable attention from the Hills (2007) review of the role of social housing.

A simple 'slope' relationship with low income poverty may be derived by relating this difference to the difference in poverty percentage, which rises from 4.3% to 37% across these bands. This 'simple

Table 14: New social housing investment grant expenditures by deprivation bandings in England 1998–2005 annual averages

Poverty band IMD 2004	Low income poverty %	Grant per household	Grant per head
Worst 10%	37.0%	135.6	58.1
10–20%	25.8%	117.1	50.0
30–40%	17.4%	68.7	29.3
40–60%	10.9%	47.2	19.9
60–80%	7.1%	36.7	15.4
Least deprived	4.3%	31.6	12.9
England	12.4%	55.2	23.3

Table 15: Regression model for ward level new social housing grant expenditure per household across England

Variable	Coefficient	Std Err	Std Coeff	t-stat	Signif.
(Constant)	-169.575	57.976		-2.925	0.003
Low income	433.633	23.524	0.359	18.434	0.000
Low demand index	0.076	0.032	0.034	2.389	0.017
Log price semi 2003–04	12.147	4.096	0.065	2.966	0.003
RSL homeless% all lets	0.132	0.063	0.023	2.084	0.037
% children in population	2.202	0.364	0.080	6.050	0.000
% long-term illness	-1.155	0.269	-0.081	-4.289	0.000
New private build% households	29.377	1.853	0.171	15.850	0.000
Pathfinder area	-13.446	3.306	-0.047	-4.067	0.000
Density dwelling/ha	-0.233	0.094	-0.039	-2.477	0.013
London	36.611	4.213	0.137	8.690	0.000
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.419	0.176	0.175	87.146	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	12171266	10	1217127	160.2657	2.9E-306
Residual	57049353	7512	7594		
Total	69220619	7522			

slope' of £3.19 per household for every 1% increase in poverty is then used in Table 16 to generate one estimate of the apparent cost of poverty.

A more sophisticated approach is to run a regression model for grant expenditure against a range of explanatory variables, including poverty, across the wards in England. The model used is shown in Table 15. As before, the principle followed is to include demographic, market and geographical variables which are not closely related to poverty. These other variables include a composite index of low demand (which has a small positive effect), house price level (positive, reflecting affordability pressures and costs of provision), homeless share of lets, child population (both positive), long-term illness (negative), new private building (opportunities for development, including Section106 potential), HMR pathfinder areas (apparently negative), density, and a dummy variable for London (exceptional pressures and costs).

The overall proportion of variance explained is quite moderate, but this is for ward level data where there is a lot of 'noise' due to the particular incidence of new housing schemes (many wards would have none or very few). Nevertheless, even when controlling for these other factors, poverty is still the most powerful/significant predictor. Indeed, the size of the coefficient is actually larger than the 'simple slope' derived as above.

Table 16 shows how these results translate into bottom line totals of expenditure attributable to poverty. While the simple slope attributes 72% of expenditure (£857 million) to poverty, the regression model increases this estimate to nearly all of expenditure (98% or £1166 million). Whilst the result of Table 13 might be regarded as a lower estimate, this figure is probably the upper bound estimate.

A UK estimate needs to allow for spending in Scotland, Wales and Northern Ireland. The Scottish budget for Housing & Regeneration in 2006/07 was £607 million, and social housing investment is the largest part of this; taking the 72% share of the estimated investment of £400m would give £288 million. Another £200 million should be allowed for Wales and Northern Ireland, giving a UK total of £1,654 million.

Housing benefit

According to Wilcox (2007; Table 117b) the total amount of HB claimed by families with children was £3,650 million, which is 32.2% of total HB in the UK in 2004/05. Most of this was for lone parent families (£3,050 million). There is a further amount of £770 million in respect of Council Tax Benefit (23.5% of this total). There is a case for including this as a specific subsidy rather than a general income transfer, but this is only included in the upper bound estimate of total costs.

Decent homes

Local authority capital investment provision (outturn) in England was £4,534 million in 2005/06, of which £1,267 was 'LA self-financed' from capital receipts and prudential borrowing (Wilcox, 2007; Table 63). Most of this would be directed towards major repairs and improvements designed to meet the Decent Homes target. One might add to this the total of Large Scale Voluntary Stock Transfers (LSVTs) where the transfer price was negative, giving a total for negative values of £199 million in 2006/07 (Wilcox, 2007; Table 68c). Significant investment in upgrading is financed with the business plans of LSVTs but negative values indicate further public subsidy.

Table 16: Estimation of total social housing investment grant spending attributable to poverty

Element in calculation	Regression model	Simple slope	Units
Marginal effect per 1%	4.34	3.19	£ household
Average poverty effect	53.97	39.66	£ household
Share of average expenditure	97.80	71.88	%
Implied England total	1165.8	856.8	£ million

Note: Regression model based on Table 15; simple slope based on Table 14.

The English House Condition Survey (2005) yields reasonably precise estimates of the number and percentage of poor families living in LA housing which is non-decent. Table 18 shows this analysis. Two different low income definitions are used, the first based on three criteria similar to those used in the analysis of CORE (see note to table), and the second based on equivalised household income below 70% of median before housing costs. While the second comes closer to the official definition of child poverty, it should be noted that this is before housing costs; after housing costs poverty may give a different picture, particularly in the recent period of ‘unaffordability’ and especially in London. The first measure is more likely to pick up after housing cost poverty through the use of

a residual income criterion. It certainly suggests a greater proportion of LA tenants are poor.

The basic result of this analysis is that the proportion of households living in non-decent LA homes (the target of all the above investment) is between 21.6% and 25.9%. This may underestimate the share of costs insofar as families are more likely to live in larger accommodation costing more to upgrade.

This gives aggregate costs of LA investment attributable to poor families as between £1,022 million and £1,226 million for England.

It may be objected that this is not a cost that would be avoided if these poor families living in LA housing were lifted out of poverty. The government is committed to raising all LA housing to above the decency standard anyway. A counter-

Table 17: Number of households in local authority sector in England by family status, low income status and home condition 2005

Family status	Home condition	Not low income	Low income (3 criteria)	Total	Total non-decent	Poor families % all non-decent
Non-families	decent	176,014	733,862	909,876		
	non-decent	91,903	366,449	458,352		
Family	decent	98,982	383,911	482,893		
	non-decent	35,314	172,197	207,511	665863	25.9%
Grand total		402,213	1,656,419	2,058,632		
Family status	Home condition	Not low income	Low equivalised income <70th percentile	Total	Total non-decent	Poor Fam% all non-decent
Non-family	decent	498,675	411,201	909,876		
	non-decent	237,853	220,499	458,352		
Family	decent	159,830	323,063	482,893		
	non-decent	63,884	143,627	207,511	665863	21.6%
Grand total		960,242	1,098,390	2,058,632		

Note: Low income in upper part of table based on three criteria of on HB/receiving Means Tested Benefits/residual income < 120% of Applicable Amount; Low income in lower part of table based on equivalent income before housing costs below 70% of median.

Source: Author's analysis of English House Condition Survey.

argument is that living in non-decent housing is an important element of the experience of being in poverty, making this cost part of the cost of lifting families out of poverty, rather than a cost of them being in poverty. As such, it would enter our third general category, of 'shadow costs'. However, it could be argued then that the cost is really the cost of lifting all families out of non-decency in their housing condition, not just those who are income-poor. That figure would be £1,477 million. All of these figures are annual figures for the duration of the programme to achieve decent housing, which runs over a decade.

Given the general commitment to decent housing standards, and given that social housing with its mediocre standards is so bound up with having a lot of poor people, this cost should be properly regarded as part of the cost of poverty. The counterfactual would be that if these families were living out of poverty (after housing costs), their housing providers could afford to maintain their homes at a decent standard. Reflecting these arguments, £1,477 million could be regarded as an upper bound estimate of this element of the cost of poverty. A lower bound estimate of zero would be implied by accepting the previous arguments.

All of these estimates are for England. The relevant investment totals for LA upgrading are £458 million for Scotland, £140 million for Wales and £106 million for Northern Ireland, making £704 million in all (Wilcox, 2007). Applying the 31.2% share for families to this total would give an addition of £220 million, making an upper bound estimate for the UK of £1,697 million.

The area of crime and disorder and the associated expenditures on policing and criminal justice are another important area to investigate. It is clear that the incidence of crime is associated with deprivation, and that, for many kinds of crime or disorder, children and young people are heavily involved. This is an area which has seen many government initiatives and much policy debate, and therefore a heavy load of public expenditure.

Total expenditure on police and criminal justice

Total (net revenue) spending on the police service in England in 2006/07 was £11,650 million, while there was a spending of £8,680 million by the Department of Justice (DoJ) on related court, legal, prison and offender management services (including capital). The police service is funded half through specific grant and half through the general local government funding settlement. All of the DoJ spend can be reasonably assigned to crime and disorder, whereas part of the cost of policing is arguably not attributable in this way. To gross up from England to UK levels it would be reasonable to add 17% to these figures.

In the course of previous analyses of police activity and spending to inform resource allocation formulae and performance assessment, it was recognised that police performed a range of functions, and activity/cost could be allocated between these (Bramley *et al.* 2005). Underpinning the resource allocation system of the early 2000s was a division of police activity/spend into ten categories including 'call management', 'crime management', 'public order management', 'traffic management', 'community relations', 'patrol', 'pensions' and so forth. Crime management was the largest element, and some other elements (e.g. patrol) were related to this. The factors driving call management (predictors or incidents) were similar to the drivers of crime or disorder. Certain elements, however, had different drivers and a different pattern of distribution (particularly traffic, security, pensions, establishments), while some elements

of policing may be seen as more 'universal', e.g. providing general reassurance. The majority of police expenditure is therefore attributable to crime and disorder but this cannot be precisely quantified. For the purposes of this exercise, a 'low' share is

Crime involving children and young people

How far can crime and disorder directly linked to children and young people? If it is, this reinforces any argument about child/family poverty being critical. The 'Criminal Statistics' produced by the Department of Justice are quite useful in this respect. It is possible to see the numbers of offenders found guilty at courts or cautioned by the police, broken down by age bands and by type of offence. No offenders are recorded under 10 years of age; presumably this group are dealt with through other systems. This may lead to some underestimation of the share of police input in relation to children. Another key point is that offending rates are very high in the teenage years and into the early years of adulthood, before falling off.

Based on Table 3.26 of the Criminal Statistics, 24.6% of offenders are aged under 18 and hence literally 'children' for our purposes. However, it is important to note that another 26.5% are aged between 18 and 24. The situation of this group is likely to be strongly influenced by their family, economic and neighbourhood circumstances in the immediately preceding years, hence offending by this group may be seen as an indirect effect of child/family poverty (and other adverse factors affecting their childhood and teenage year). If this argument were accepted, it would suggest that the proportion of crime/disorder-related policing and criminal justice spending which should be attributable to 'children and young people' in a broader sense would be 51.1%. These proportions (24.6% and 51.1%) feed into the low and high assumptions about attributable costs given here.

A 'weighted' age distribution based on different types of crime having a different importance has

also been examined. This suggests that, while the share attributable to under-18s may be a bit less, the share attributable to 18- to 24-year-olds would be appreciably more due to a high level of more serious crimes (e.g. violence) involving this group. It is difficult to judge a basis for weighting crimes in this context, so this is not used here.

Measuring crime and disorder at neighbourhood level

A great deal of effort has gone into developing statistical recording of reported crime and ‘incidents’ with geographical coding, so that levels may be mapped and monitored. There is now a domain relating to crime and disorder with the IMD, based on this material. However, this indicator is a composite measure which has been transformed into a ‘standardised’ score centred on zero and with unit standard deviation. This is not ideal for the purpose of estimating the extent to which crime and disorder, and related public spending, is related to (child) poverty. The raw data underlying this IMD crime domain has not been published (in England). However, some crime data are published on the Neighbourhood Statistics (NeSS) ONS website for England, and some similar measures are published on the Scottish Neighbourhood Statistics (SNS). The former data do include tables of numbers of offences by ‘medium super output area’ (MSOA), the geography generally used for the crime analysis, but these data are missing for many authorities at this level (although published at LA level). The Scottish data are more complete, and examined here at the broadly equivalent Intermediate Geography Zone (IZ) level.

Owing to problems of many zeroes (or suppressed small numbers) in the tables for specific categories of crime, and uncertainty about how they should be weighted together, we concentrate here on measures of total offences. Table 18 shows the key values derived from the English and Scottish neighbourhood level measures.

This table shows the pattern of variation in total offences in England and Scotland. The lowest MSOA has only 8.5% of the mean rate of offending, while the 5th percentile has a rate only 30% of the mean. At the other end of the spectrum, the 95th percentile has more than double the average rate

Table 18: Key measures of the distribution of total offences at MSOA/IZ level in England and Scotland

Measure	Offences absolute	Off rate /10000	Scotland off rate
Median	456	656.6	
Average	528	760.4	533.9
Minimum	45	64.8	34.0
Min.% average	8.5%	8.5%	6.4%
Maximum	6328	9112.3	8841.0
Stddev	390	562.3	455.3
CV	73.9%	73.9%	85.3
5th percentile	160	230.4	122
% mean	30.3%	30.3%	22.8%
95th percentile	1082	1558.1	1225
% mean	204.9%	204.9%	229.4%

(discounting one extreme outlier). The pattern in Scotland is similar. The data in this table enables us to calibrate a simple model to convert the IMD crime and disorder score into a cardinal measure of the volume of crime, which can then be used as a proxy for expenditure on crime-related policing and criminal justice services. The formula used is $(\text{Crime Rate} = 657 * \exp(\text{IMDCrime}/1.5))$, which gives a reasonably good fit to the above data points for England.

Drivers of neighbourhood variation in crime and disorder

Crime rates are then imputed for each MSOA in England and regressed on child poverty alone (simple model) or child poverty and a range of additional demographic and geographical indicators (full model). The simple model explains 37% of the variance and has a coefficient on child poverty of 1584, meaning that each extra 1% of child poverty raises the crime rate by 15.84 offences per 10,000 population. The fuller model is shown in Table 19 below.

This fuller model explains 47% of the variance. Child poverty is still very significant but the size of the coefficient is reduced by about half once other variables are included. However, a squared term for child poverty is also significant and positive, indicating that there is a non-linear increasing poverty effect on crime.

Demographic factors with additional positive effects include young population, lone and cohabiting parents, and mixed ethnic population.

Crime rates are lower in rural areas and denser areas, but higher where the physical living environment is worse. Allowing for these factors, rates are negatively associated with black population, low occupational composition, no central heating and children in flats, with a small positive effect from long-term illness.

Making lower and higher assumptions for the share of policing expenditure attributable to crime incidence and for the share of crime associated with children and young people (depending on the age cutoff) gives two totals for England, £4.04 billion ('low') and £9.54 billion (high), as shown at the bottom of the

table. The upper part of the table shows the amounts directly attributable to child poverty, based on the regression models, broken down by deprivation bandings and in total. The simple model attributes more crime to child poverty than the fuller model, where more is attributed to other demographic and geographical/physical factors. This gives four estimates of the cost of child poverty for policing and criminal justice, ranging from £1.06 billion to £4.16 billion. Where the true figure lies within this range depends mainly on (a) the judgement about how far to attribute crime by 18- to 24-year-olds to experiences in the under-18 period; (b) the exact share of policing activity attributable to crime; and (c) whether the fuller regression model is regarded as a better representation of drivers of crime

Table 19: Regression model for crime rates at neighbourhood level in England

Variable	Coefficient	Std Err	Std Coeff	t-stat	Signif.
(Constant)	318.230	8.675		36.682	0.000
IDACI score – Children on Low Income	876.438	46.531	0.338	18.836	0.000
Pyoung% aged 11–25	5.343	0.339	0.069	15.776	0.000
Plonepar –% Lone parent households	9.876	0.862	0.092	11.456	0.000
Pcohabk –% Kids cohabiting parents	17.803	1.593	0.063	11.175	0.000
Pmixeth –% mixed ethnic background	24.185	2.311	0.070	10.465	0.000
IMD Geographical barriers score	-115.744	2.954	-0.205	-39.188	0.000
Idacisq Square of IDACI	217.533	58.200	0.055	3.738	0.000
Pblack –% black ethnic	-5.955	0.508	-0.076	-11.733	0.000
Popdens – Population density	-1.666	0.071	-0.140	-23.596	0.000
IMD Living environment domain	10.221	0.208	0.383	49.069	0.000
Ploseck –% Kids Lower occupations	-0.785	0.192	-0.024	-4.079	0.000
Pnochk –% Kids No Central Heating	-10.076	0.353	-0.187	-28.573	0.000
Pltik –% Kids in Hhd with L T Illness	3.289	0.967	0.016	3.402	0.001
Pflatk –% Kids in Flats	-2.810	0.159	-0.106	-17.710	0.000
Weighted least squares regression - Weighted by popwgt					
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.688	0.473	0.473	327.609	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	3127759320	14	223411380	2081.580	0.000
Residual	3484612090	32467	107328		
Total	6612371410	32481			

Note: These results for the effects of child poverty can be combined with the range of estimates for the cost of crime and disorder offences by children and young people. Results are shown in Table 20.

Table 20: Estimates of cost of crime and disorder associated with child poverty

Deprivation band depband5	Cost £ million	Cost £ million	Cost £ million	Cost £ million
	Low assm simple model	High assm simple model	Low assm full model	High assm full model
Most prosperous 25%	123.6	291.9	69.7	164.5
Mod. prosperous 25%	239.1	564.7	136.9	323.3
Mod. deprived 25%	464.4	1096.6	273.4	645.7
Fairly deprived 15%	478.2	1129.3	291.8	689.1
Most deprived 10%	455.6	1075.7	287.7	679.3
Total	1760.9	4158.3	1059.5	2501.9
Total cost Children and young people crime	4,040.0	9,540.0	4,040.0	9,540.0

and disorder than the simple model. Even using the fuller model, one can justify a figure of up to £2.5 billion, accepting the arguments for including crime involving 18- to 24-year-olds.

This analysis confirms that there is a significant cost of child poverty in the policing and criminal justice area. As with some other services, particularly personal social services, one may question the exact nature of the causal processes involved in some cases. For example, certain families might have psychological/cultural predisposition to crime, and claiming low income benefits might be a part of their chosen lifestyle as well as a consequence of imprisonment or criminal records affecting family members. However, children growing up in such circumstances cannot be held fully responsible for this. Nevertheless, this observation reminds us that ‘ending child poverty’ may entail interventions which change aspects of family circumstances and behaviour beyond mere amounts of money.

There are considerable grounds for thinking much of the demand on fire and rescue services is related directly or indirectly to poverty and deprivation. Data were not sufficiently complete to allow inclusion of fire-incidents based indicators within the IMD for England, although they have been used (as an indicator of ‘disorder’) in the Welsh IMD. Children and young people generate a lot of fire callouts, including malicious calls, through engagement in acts of vandalism and arson, and the children involved are typically from deprived homes and neighbourhoods. These neighbourhoods also have environments creating more opportunities for such acts. Classic traditional causes of domestic fires, e.g. chip pans left on stoves, are associated with low income homes. Domestic fires have more serious implications and require a stronger response when they occur in tenements or flats.

Some of these relationships may be observed within data from the Scottish Household and similar surveys.

Resource allocation in England

Total expenditure on fire and rescue services in England in 2006/07 was £2,193 million. This is distributed to fire service authorities (typically upper tier local government or metropolitan area joint authorities) on the basis of a formula which contains a basic amount and five ‘top-ups’. The names of these top ups are shown below, together with proxy indicators used and percentage of the total amounts for England.

- *Basic amount*: an amount per fire authority (30.7%).
- *Coastline*: length of coast per head (1.9%).
- *Deprivation*: children on low income benefits; households not couple no children; rented accommodation; primary pupil absences; room occupancy; ACORN* types (single elderly, council flats, high rise) (50.8%).

- *High risk (areas)*: number of Control of Major Accident Hazard Sites (3.7%).
- *Property and societal risk*: building valuations etc. from toolkit (7.3%).
- *Community fire safety*: pupil numbers; ACORN* groups; aged population (5.3%).

It could be argued from the above that deprivation accounts for half of fire service resources, but it should be noted that the components of deprivation in terms of the related fire risks are more complicated and diverse than just children/families on low income. Without getting into a detailed unpacking of this formula, it should be noted that a majority of the deprivation element (say two-thirds) relates to poverty and closely correlated factors, making one-third of the overall budget (£724 million for England).

Scottish household survey

In its early years, the SHS contained some detailed questions about fire incidents affecting households. Table 21 reports some summary measures, in a similar format to that used for GP consultations. The data show that families were more likely to have experienced fires than non-family households, and that the incidence was markedly higher for more deprived areas (and for individual households on low income benefits). The most common causes of fires, cooking accidents and arson, were particularly associated with deprived areas.

The number of fires was three times higher in the most deprived areas than in the least deprived for non-families, and five times higher for families.

While it can be said that families with children make up only a minority of all households, this evidence suggest that they are at much higher risk of directly experiencing domestic fires themselves. There is also the argument

(*ACORN stands for A Classification of Residential Neighbourhoods and is a geo-demographic system of classification developed by CACI Ltd)

Table 21: Domestic fire incidents reported by Scottish households by area deprivation and family status, 1999–2000 (percentage of households)

Family status	Deprivation band	Fire last year	Number of fires	Brigade called
Non-family	Most deprived 10%	2.9%	3.9%	1.6%
	Fairly deprived	1.6%	2.0%	0.7%
	Mod. deprived	1.4%	1.5%	0.4%
	Mod. prosperous	1.4%	1.6%	0.4%
	Most prosperous	1.2%	1.2%	0.2%
	Total		1.5%	1.8%
Family	Most deprived 10%	5.7%	8.8%	2.6%
	Fairly deprived	3.3%	3.6%	1.0%
	Mod. deprived	2.3%	2.5%	0.9%
	Mod. prosperous	2.9%	3.6%	0.8%
	Most prosperous	1.7%	1.7%	0.6%
	Total		2.8%	3.4%
All households	Most deprived 10%	3.7%	5.3%	1.9%
	Fairly deprived	2.1%	2.5%	0.8%
	Mod. deprived	1.6%	1.8%	0.5%
	Mod. prosperous	1.8%	2.1%	0.5%
	Most prosperous	1.4%	1.4%	0.3%
	Total		1.9%	2.2%

Source: author's analysis of Scottish Household Survey 1999–2000.

that a lot of the neighbourhood effect will in all likelihood be the result of disorderly behaviour by children and young people, primarily from poor backgrounds. These are arguments for taking most of the deprivation-related activity as being a cost of child poverty, rather than just the part directly impacting on families as described here.

Fire incidents analysis for Fife

In the course of the Fife Social Justice System project, Fife Fire Service provided data on numbers of the main types of incident for 2003 and 2004 by location (datazone). Most of the indicators show a similar pattern, with higher rates in certain localities, which were predominantly more deprived urban areas. False calls were also particularly frequent in St Andrews (possibly as a result of student pranks) and Kirkcaldy Central, slight outliers from the general pattern. The worst localities have three times the number of attended incidents

than the best localities, and five or more times the number of secondary fire incidents. It is perhaps the latter which particularly reflect the low level disorders characteristic of some deprived areas.

It appears from this listing that fire incidents tend to be associated with deprived areas, but is it possible to identify relationships with other characteristics in the database? This was explored briefly using both locality data and ward data. The latter provided a more satisfactory set of regression results. All fire attended incidents related positively to low income deprivation, population aged 16–24, and lone parent households. Allowing for these factors there was a negative relationship with children 0–15 and social renting, with private renting not significant. This model explained 54% of the variation at ward level. A similar model can be fitted for primary and secondary fire incidents, but the fit is not as good.

Figure 1 shows the bivariate relationship between all attended incidents and low

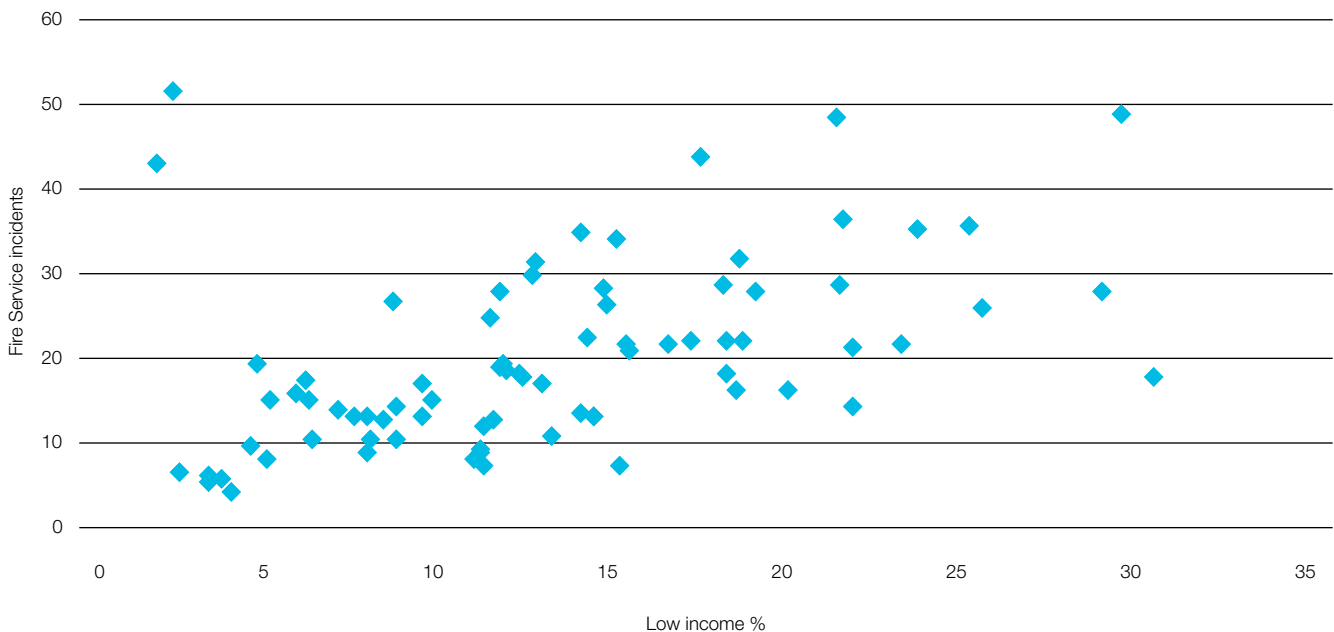
income poverty in Fife. Apart from the two outliers mentioned, there is a fairly clear relationship, although with a wider scatter in the higher deprivation ranges.

Using the regression model, it would appear that low income poverty accounts for most of the variation in incident attendance (84%). However, it is also clear that, as with policing, not all of the cost of the fire service can be attributed to this activity.

The fire and rescue service is a classic case of a joint or 'public' good which provides coverage to a whole geographical area and its population, and indeed is subject to statutory requirements in terms of response times to reach all of that population. As explained above, and reflected in resource allocation formulae, it has

to provide high level cover to high risk (industrial and commercial) areas, as well as general fire prevention and education services. Therefore it would be appropriate to allocate only part of the cost, and possibly only a minority, as being directly caused or driven by poverty/deprivation. There is no official basis for working out what that proportion is, although inferences can be made from the English resource allocation formula. This suggests that, in round terms, half of the budget is attributable to risk and activity factors associated with deprivation. Applying the 84% means that 42% of fire service expenditure in Fife/Scotland was related to poverty. That would be £112 million for Scotland. Allowance for Wales and Northern Ireland would bring the UK figure up to £926 million.

Figure 1: Fire service incidents and poverty in Fife



Source: Bramley *et al.* (2006) *What's Happening in Fife?* Report of research on developing a social justice analysis system for Fife.

Local environmental services

Local environmental services comprise a range of services generally provided by local government including waste collection and disposal, street cleaning, maintenance of parks and open spaces, and planning (including physical regeneration and redevelopment). This report cannot provide a detailed analysis of all of these, but draws on some ongoing research for the JRF in a project with Glasgow University looking particularly at the cost of providing clean streets in differing social and physical environments

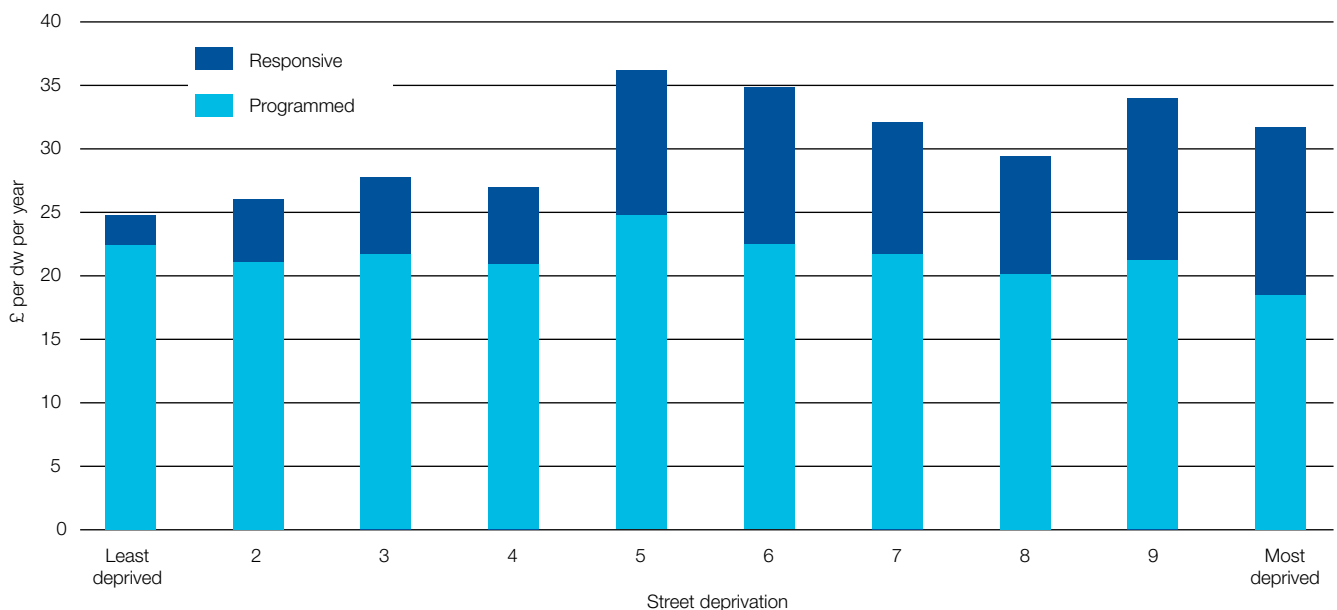
Figure 2 below provides a flavour of the research being carried out within case study areas. In this case study authority, programmed street sweeping did not show much of a systematic relationship with deprivation, although if anything it tended to be an inverse relationship because workloads were higher in deprived areas. However, responsive programmes (special collections, hit squads, etc.) tended to be significantly higher in deprived areas, although the pattern of the relationship was not a smooth linear one.

More useful for the purposes of this report is an analysis of local authority level data on expenditure on local environmental services in 2002-03, also carried out as part of this project. Expenditure modelled here includes the following services: street sweeping/cleansing; waste collection; public open space maintenance; environmental health; crime prevention and community safety (LA activity, excluding mainstream police spending). The regression model shown in Table 22 has been adjusted to follow the general approach followed in this study.

This model seems to fit the data reasonably well, explaining more than two-thirds of the variance (albeit at the fairly aggregated LA level). Poverty has the second strongest effect (after density) and is quite significant. Other effects are broadly as expected, except for overcrowding and the IMD access indicator (which mainly proxies rural areas).

The bottom of the table shows the implied poverty effect, based on the mean poverty rate, which is £10.39 per head or 21.5% of average

Figure 2: In one case study area the level of responsive cleaning was significantly higher in deprived areas



Source: Bramley *et al.* (2007) 'Back to Basics' conference paper.

Table 22: Regression model for expenditure per capita on local environmental services at local authority level for England 2002–03

Variable	Coefficient	Std Err	Std Coeff	t-stat	Signif.
(Constant)	-16.418	10.170		-1.614	0.107
incscr04 – low income propn	85.169	13.415	0.328	6.349	0.000
pchld01 –% children	0.591	0.385	0.069	1.535	0.126
ppya01 –% young adult	0.783	0.223	0.192	3.506	0.001
pvac04 –% housing vacant	0.813	0.387	0.076	2.098	0.037
ddens – density dwelling/ha	0.770	0.130	0.649	5.913	0.000
pflatoa –% flats	0.205	0.106	0.210	1.942	0.053
pcrowd01 –% overcrowded	-0.508	0.284	-0.183	-1.788	0.075
geogbar – IMD access ind	5.859	2.874	0.174	2.039	0.042
lroadrat – ln(roads/dwgs area)	13.008	3.470	0.159	3.749	0.000
Model	R	R-Sq	Adj R-Sq	S E Est	
Summary	0.834	0.695	0.687	10.054	
	SS	Deg Frdm	Mn Sq	F Ratio	Signif.
Regression	78709.0	9.0	8745.4	86.512	0.000
Residual	34563.5	341.9	101.1		
Total	113272.5	350.9			
Poverty effect					
Poverty effect at mean		10.388			
% of average expenditure		21.5%			
England total £ million		519.4			

LA expenditure on this group of services, which would gross up to about £519 million in 2002/03. Allowing for expenditure level increases to 2006/07 would raise this to £675 million. For the whole of UK the figure would be about £790 million.

As with other services, such as fire and rescue, there is an issue about how much of this can be attributed to child/family poverty as opposed to poverty as a whole. Apart from the general point that one cannot statistically separate child poverty from general income poverty, the model reported above confirms that the demographic factors for children and young adults also support the contention that these environmental problems are particularly associated with concentrations of children and young people. Some of the problems with neighbourhood environments, such as vandalism and graffiti, are strongly associated with children and young people. Nevertheless, it is

clear that adults in childless households will also drop litter and commit various other environmental nuisances. It is difficult to say what proportional reduction might be made to allow for this, but a round figure of one half would not be inconsistent with the evidence arising from police and fire services, which have some similarity as local public goods. So the above figure should be treated as a high estimate and half of it as a lower estimate.

Area-based programmes and grants

Governments have made considerable use of selective area-based initiatives (ABIs) over recent years and these have often focussed on more deprived neighbourhoods. A lot of these initiatives target children and young people who are deprived or at risk in some way, or they address the collective environmental or community problems which can stem from concentrations of deprivation involving families, children and young people.

An important example of such a programme was the Neighbourhood Renewal Fund, which consolidated a number of more specific programmes. This has now been relaunched as the Working Neighbourhoods Fund.

A detailed analysis of these programmes is not included here. Instead, a simple spreadsheet provided via LGA contains current figures for all of the Area Based Programmes which pay grants to or through local government. Programmes are selected which appear, on the basis of the distribution between localities and/or their description, to be selective in

favour of more deprived communities. A purely subjective judgement is made of the proportion of this programme which may be attributable to child/family poverty. In some cases these judgements are informed by the findings of other parts of this research where this has been quantified for different sectors of spending. The results are shown in Table 23.

Education-related grant programmes are not included here, as these do not appear to discriminate greatly in favour of deprived areas or schools; the same applies to the Home Office part of Stronger Safer Communities.

The total of the programmes listed comes of £939 million, and on our guesstimated percentage shares we find that on average 43% of these programmes can be attributable to child/family poverty. That would make a cost for these programmes of £405 million. Assuming the relative role of such programmes is similar in the other countries, the UK total would be £478 million.

Table 23: Area-based programme grants in England related to child/family poverty

Name of programme	Department	Total cost £ million	% attributable to child poverty	Attributable expenditure £ million
Stronger Safer Communities	CLG	51.9	50%	26.0
Working Neighbourhoods Fund	CLG	458.8	30%	137.6
Preventing Violent Extremism	CLG	12.0	30%	3.6
Childrens Fund	DCSF	131.8	50%	65.9
Positive Activities for YP	DCSF	52.8	50%	26.4
Teenage Pregnancies	DCSF	27.5	50%	13.8
Chdn Soc Care Workforce	DCSF	18.2	70%	12.7
Care Matters WP	DCSF	34.3	70%	24.0
Chn & Adol Mental Health	DH	92.7	70%	64.9
Learning & Disability Dev Fund	DH	43.8	50%	21.9
Young People Substance Abuse	HO	15.4	50%	7.7
Total		939.2	43%	404.5

Source: Table supplied by M. Heiser, LGA, based on data provided by Communities and Local Government Department, Local Government Finance Directorate.

Percentage attribution to child poverty by author.

The overall picture

The preceding analyses leads to an overall picture of spending related to child poverty. Table 24 presents a summary table, showing figures by service for England and UK, and the share of spending within that programme attributable to child/family poverty, with a high and low estimate distinguished in a number of cases.

The bottom line of this analysis is that the cost of child poverty to UK public expenditure based on reasonable assumptions is at least £11.6 billion and could be up to £20.7 billion.

The largest elements in our lower estimate are Personal Social Services, School Education and Police/Criminal Justice. These are all reasonably conservative figures which are well-evidenced. Our higher estimates include a large allowance for Housing Benefit, a significantly larger figure for Police/Criminal Justice, an allowance for Decent Homes, and a somewhat higher figure for Social Housing investment

In presenting this information in the wider context it is important to bear in mind its underlying assumptions and limitations. In particular, child poverty cannot be separated from family poverty, in

either the analysis or the solutions. In the analysis, it is hard to really separate child and general poverty, because they are very closely correlated at small area level. This report has focused on what costs would be avoided if child/family poverty were eliminated, but it is not always possible to do this other than to make a general assumption about the child/family share of responsibility for the overall problem. Many poor children tend to grow up into relatively deprived and 'at risk' young people, and the problems associated with this young adult group (for example crime) may be both costly and indirectly related to the child poverty experience. But clearly, the impact of solving child poverty on problems associated with this group would show a considerable time lag. Some of the cost generating problems addressed here may reflect underlying cultural and psychological factors rather than a simple lack of money, and it may not be possible to end child poverty in the full sense of the term without dealing with some of these issues.

Table 24: Estimates of the cost of child poverty by service in England and UK in 2006/07 (£ million)

Service	England £ million		UK £ million		Share of expenditure%	
	Low	High	Low	High	Low	High
Personal social services	2,414	2,414	2,849	2,849	71	71
Acute healthcare	1,009	1,009	1,211	1,211	2	2
Primary healthcare	730	730	859	859	5	5
School education	2,300	2,300	2,888	2,888	10	10
New social housing	527	1,166	748	1,654	37	98
Housing benefit & CTB	0	3,757	0	4,420		32
Decent homes invest	0	1,477	0	1,697		31
Police & criminal justice	1,060	2,502	1,240	2,927	5	12
Fire & rescue	724	724	926	926	33	42
Local environmental	338	675	395	790	11	22
Area based programme	405	405	477	478	43	43
Total	9,506	17,159	11,593	20,699		

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