



## Poverty and Social Exclusion in the UK

**Policy Response Series No. 5**

**Measure of Access to Quality  
Services for Children  
- Consultation Response**

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## Poverty and Social Exclusion in the UK

### Overview

The Poverty and Social Exclusion in the UK Project is funded by the Economic, Science and Research Council (ESRC). The Project is a collaboration between the University of Bristol, University of Glasgow, Heriot Watt University, Open University, Queen's University (Belfast), University of York, the National Centre for Social Research and the Northern Ireland Statistics and Research Agency. The project commenced in April 2010 and will run for three-and-a-half years.

The primary purpose is to advance the 'state of the art' of the theory and practice of poverty and social exclusion measurement. In order to improve current measurement methodologies, the research will develop and repeat the 1999 Poverty and Social Exclusion Survey. This research will produce information of immediate and direct interest to policy makers, academics and the general public. It will provide a rigorous and detailed independent assessment on progress towards the UK Government's target of eradicating child poverty.

#### Objectives

This research has three main objectives:

- To improve the measurement of poverty, deprivation, social exclusion and standard of living
- To assess changes in poverty and social exclusion in the UK
- To conduct policy-relevant analyses of poverty and social exclusion

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## Summary recommendations

The University of Bristol-based members of the Poverty and Social Exclusion in the UK project team discussed the consultation and agreed that, on balance, Option 2 – a ‘service deprivation’ measure – was likely to be more feasible and cost effective in the immediate future than Option 1 – an aggregate area level ‘service poverty index’. Option 1 is a good idea but it would require considerable new work and possibly some scientific advances in small area estimation methodology. However, Option 2 could be implemented by including a question module in the Integrated Household Survey and/or Family Resources Survey using tried and tested methods.

Therefore, we recommend that a national ‘service deprivation’ measure is produced based on a social survey question module. Subsequently, the value of this measure can be estimated for Local Authorities (and other areas) by combining relevant Census/administrative statistics and micro-survey data using small area estimation models

Key words: Poverty, social exclusion, poverty measurement

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## Introduction

The Office for National Statistics annual report on *The effects of taxes and benefits on household income* (sometimes called the Redistribution of Income (ROI) series) clearly demonstrates that the in-kind value of services to low income households is considerably greater than the cash benefits they receive or the household's own earnings. The in-kind value of services contributes approximately half the final incomes of poor households.

It is hard to overstate the importance of services for increasing the standard of living of poor children in the UK, yet there is currently no official measure of inadequate service access for children (and their families). Despite the recent advances in the measurement of child poverty in both the UK and Europe, service access has been under-researched and neglected. The *Review on Poverty and Life Chances* (Field review) could have a significant impact on our understanding of child poverty if it recommended the introduction of a child 'service' deprivation measure.

## The value of services

There have been a number of analyses of the value of services to households produced by both academics (e.g. IFS<sup>1</sup>, LSE<sup>2</sup>) and also HM Treasury as part of the Comprehensive Spending Review analyses<sup>3</sup>. However, these analyses have been subject to criticism and political debate. The analysis below (Table 1) is based on the 2008/09 *The effects of taxes and benefits on household income* data (Barnard, 2010). This ONS series has been produced for almost 50 years, without attracting great controversy. Table 1 shows the redistributive effects of taxes and in-cash benefits and the value of in-kind services to the poorest and richest 10% of non-retired UK households<sup>4</sup> in 2008/09. The market income of the poorest 10% of non-retired households is £4,620 per year, the values of cash benefits is £4,917 and the in-kind value of services is £6,938. Therefore, the in-kind value of services for the poorest households is considerably greater than either their market income or the cash benefits they receive. Indeed, the in-kind value of services represents more than 50% of the poorest households' 'final' incomes, once the effects of direct and indirect taxes have been allowed for. In 2008/09, the in-kind value of services represented 57% of the final annual incomes (£12,172) of the poorest 2 million households in the UK.

<sup>1</sup> <http://www.ifs.org.uk/projects/346>

<sup>2</sup> Sefton, T. (2002). *Recent changes in the distribution of the social wage*. CASE Paper 62, London School of Economics <http://sticerd.lse.ac.uk/dps/case/cp/CASEpaper62.pdf>

<sup>3</sup> [http://cdn.hm-treasury.gov.uk/sr2010\\_completereport.pdf](http://cdn.hm-treasury.gov.uk/sr2010_completereport.pdf) - see Appendix B

<sup>4</sup> Households have been ranked by equivalised disposable income using the modified OECD equivalisation scale.

In particular, the average annual value of education services alone was worth £4,494 to the poorest 10% of UK non-retired households, indicating the high number of households with children in this poorest group.

**Table 1: Average Income, Taxes and Benefits for Non-retired UK Households**

	Poorest 10%	Richest 10%
<b>Market income (earnings, investments, etc)</b>	<b>4,620</b>	<b>103,501</b>
Direct taxes	1,165	25,937
Indirect taxes	3,138	8,654
<b>Post tax market income</b>	<b>317</b>	<b>68,910</b>
<b>Total cash benefits</b>	<b>4,917</b>	<b>1,343</b>
<b>Value of in kind services</b>		
Education	4,494	1,319
National health service	2,231	2,040
Housing subsidy	45	2
Rail travel subsidy	30	164
Bus travel subsidy	49	86
School meals and welfare milk	90	1
<b>Total Services (in-kind benefits)</b>	<b>6,938</b>	<b>3,611</b>
<b>Final income</b>	<b>12,172</b>	<b>73,864</b>

It should also be noted from Table 1 that not all services are pro-poor, for example the richest 10% of UK households benefit more from subsidised rail and bus travel than do the poorest 10% of households. The richest 10% of non-retired households also receive almost the same value of health services as the poorest 10% of households despite expenditure on private medicine amongst the richest households and the relatively lower health needs of rich non-retired household members.

## The value of services to children

Unfortunately, *The effects of taxes and benefits on household income* data only includes breakdowns for retired and non-retired households and not households with children. Tom Sefton (2004) has attempted similar analyses for ‘poor’ and ‘non-poor’ children. Table 2 is adapted from his work; poor children were defined as those children living in families who are in receipt of Income Support or income-based Job Seekers Allowance in 2001/02.

**Table 2: Value of public spending on services for children in England, 2001/02**

Service	Poor Children	Non-poor children	Pro-poor ratio
Education	2,570-3,110	2,310-2,430	<b>1.06-1.4</b>
Health	480-610	430-460	<b>1.04-1.4</b>
Social Care	370-810	200-300	<b>1.2-4.1</b>
Housing	1,220-1,650	180-230	<b>6.8-7.0</b>
<b>Total</b>	<b>4,640 – 6,180</b>	<b>3,120 -3,420</b>	<b>1.4 – 2.0</b>

Table 2 estimates that, in 2001/02, ‘poor’ children in England received on average between £4,640 and £6,180 per year in services, which was between 40% and twice what ‘non-poor’ children were estimated to have received (pro-poor ratio of 1.4 - 2.0).

Sefton (2004) found that “*on average, the government spends around £5,000 per child on public services*” which included social security benefits and in-kind services. Universal services like Health and Education were not strongly pro-poor even though poor children have worse health and educational outcomes than ‘non-poor’ children (Bradshaw,2001). Housing was the most pro-poor service from which children benefited.

## Why services do not always meet the needs of the ‘poor’

When the NHS was founded, it was universally believed that making medical care free of charge at the point of use would inevitably reduce/eliminate health inequalities in the UK. However, although the health of the UK population improved dramatically over the next 60 years, the health gap between the ‘richest’ and ‘poorest’ people and the ‘richest’ and ‘poorest’ areas widened

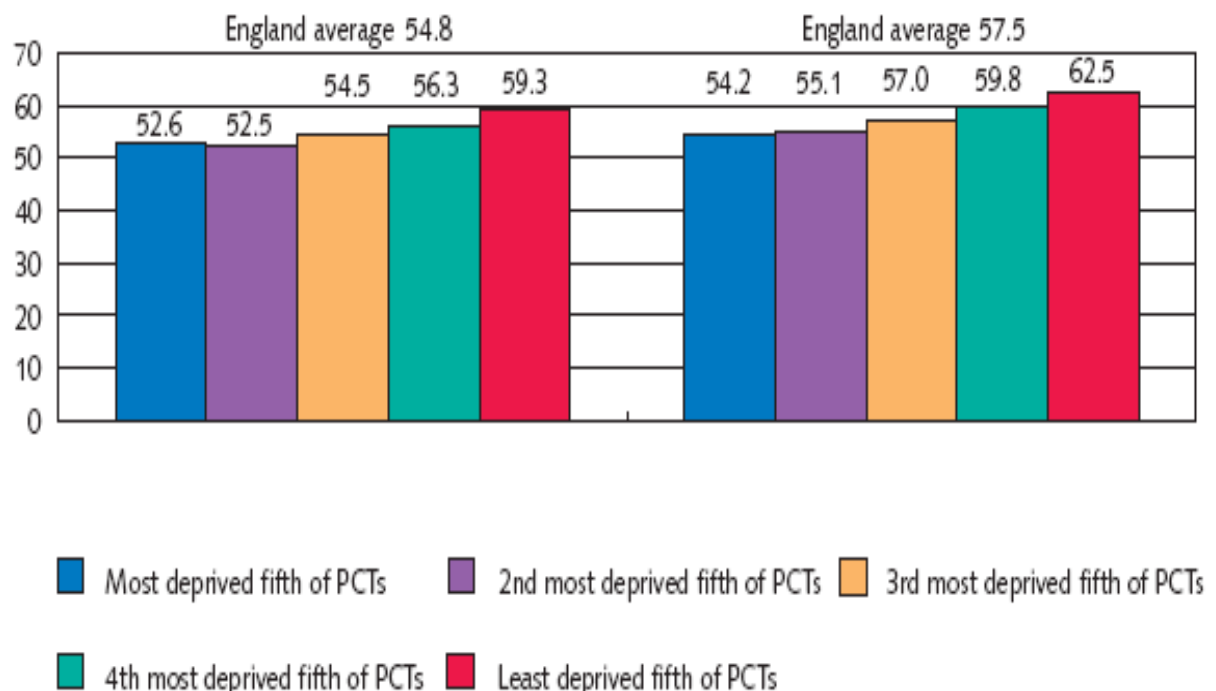
(Thomas, 2010). The health of the richest and middle income groups increased at a faster rate than the health of the poorest groups (Shaw et al, 1999).

There are two main reasons why the richest and middle income groups benefited more than the poorest groups in the UK. Firstly, poverty causes ill health (Marmot et al, 2010) and secondly, the poor receive less high quality health services, relative to their needs, than the richest and middle income groups (Watt, 2002). Julian Tudor Hart has described the reasons for the inadequate health service receipt by the 'poor' in his 'inverse care law' and the 'rule of halves'.

The term 'inverse care law' was coined by Tudor Hart (1971) to describe the general observation that *"the availability of good medical care tends to vary inversely with the need of the population served."* It has been observed with many services, not just health services, and seems to be particularly acute when there is a market or quasi-market element to service delivery. For example, although GP services are free at the point of use they are mostly private businesses and Figure 1 shows that there is a clear inverse gradient in England between the number of GPs per patient and area deprivation (SRGHI, 2005) i.e. the more deprived an area the fewer the number of GPs.

**Figure 1: The Inverse Care Law in Action**

Average number of GPs per 100,000 by area deprivation, 2002 & 2004



Source: SRGHI 2005



The rule of halves describes the outcome when service providers do not actively seek out clients in need of help but wait for them to ask for services. In UK health care, approximately:

- Half of chronic disease is undetected
- Half those detected are not treated
- Half those treated are not controlled/followed up

Therefore, the outcome is that only about 1 in 8 people in a population receive effective medical treatment for their health problems. This 'rule of halves' has been shown to operate in the service provision for a wide range of health conditions including: Type 2 diabetes, visual impairment, deafness, incontinence in older people, glaucoma, coeliac disease, asthma, kidney failure, psychosocial problems in children, vertebral fracture from osteoporosis, suicidal depression, domestic violence, prostatic obstruction, heart failure, atrial fibrillation, schizophrenia and follow-up after strokes and coronary heart attacks (Tudor Hart, 2006).

## Service quality

Any service deprivation measure needs to attempt to measure both service receipt and service quality. However, it should be acknowledged that what are the most important aspects of service quality for adults may not be the most important aspects for children. Wager *et al* (2007; 2010) studied the experiences and perceptions of services of 56 children aged 10 to 14 in Scotland. They found that the important aspects of quality in service provision from children's point of view included:

- factors related to service accessibility (service location, opening times and level of open versus restricted access);
- service provision in safe and welcoming physical environments;
- positive staff attributes (friendly, caring, approachable and welcoming staff; non-judgemental staff attitudes towards young people; staff trustworthiness and confidentiality);
- continuity of staffing, perceived as especially important for services requiring one-to-one contact such as health services; and
- service affordability

## Non-market services

The consultation document lists the following services for potential inclusion in a service deprivation measure:

'Core 'services

- pre-natal services
- primary school
- secondary school
- A&E/hospital
- GPs

Early years services

- Health visitor
- free pre-school education for 3-4 year olds
- Children's Centre
- Children's services

Adult services for parents

- Mental health services
- 16-18 provision
- Worklessness services
- Adult skills provision

Environment & Leisure

- Availability of social housing
- Access to green spaces
- Neighbourhood free from Crime and anti-social behaviour
- Clean neighbourhood
- Pollution levels, road accidents
- playgrounds

There are a number of important services missing from this list which should be included, for example, dentists and opticians are important health services for all children but particularly poor children who frequently suffer from higher rates of dental disease than their richer peers. The 2003 *Dental Health Survey of Children and Young People in the UK* (Lader et al, 2005) found a clear social class gradient in dental health: *'Among both five and eight-year-olds, the probability of having decay into dentine or obvious decay experience of the primary teeth was about 50 per cent higher in the lowest social group than in the highest.* Similarly, the survey also found a pronounced gradient by area deprivation, measured using the prevalence rate of free school meal receipt: *'the proportion of children with obvious decay experience was higher in deprived schools than non-deprived. The difference was most pronounced among 15-year-olds: 72 per cent in deprived schools had obvious decay experience compared to 55 per cent in non-deprived schools.'*

The consultation service list includes Health Visitors but given the recent changes in the nature of this service it might be better to include them under 'Community Health Services/Health Visitors'. The consultation service list also includes 'Mental Health Services' under 'Adult services for parents'. It would seem strange to not also include 'Child and Adolescent Mental Health

Services' (CAMHS)<sup>5</sup>.

Similarly, it would seem a good idea to include 'Youth Work' and 'Public Transport' to the service list which are both important services for children. The environment and leisure service list could also be expanded to include 'Public Libraries', 'Sports Centres' and 'Public Swimming Pools'.

## Option 1: Service poverty index

The consultation response by Professor Glen Bramley, who is a member of the Poverty and Social Exclusion in the UK team, has described the possible data sources and measures which could potentially be used to produce a service poverty index. In order to avoid overlap, this section will only examine the methodological difficulties with producing an index at small area level.

If a service deprivation module was included in the Family Resources Survey (FRS) this would provide a reliable measure at national level. However, the FRS has a stratified multi-phase sample design with an initial sample of about 40,000 households. This may be sufficient to produce reliable estimates of child service poverty at Government Office Region level but it is too small a sample to produce reliable service poverty estimates for local authority areas. The only reliable sources of data at small area level are from the national Census and administrative statistics.

Survey and Census/administrative data can be used in a Small Area Estimation Model which combines:

- 1) Direct Estimation of child service poverty – using the social survey data in each municipality, and
- 2) Indirect Estimation of child service poverty – using Census/administrative data and a synthetic model.

Statistical sampling theory informs us that direct estimates may be unbiased but, if there is little survey data in a local authority area (e.g. 10 or 20 household interviews), then this estimate will have a very high variance (be very unreliable). Conversely, a child service poverty estimate produced using Census/administrative data and a synthetic model may have a low variance but it is likely to be biased (inaccurate).

It can be shown that direct estimates of child service poverty produced from social survey data are unbiased using the Horvitz-Thompson estimator. A composite small area estimate aims to balance the unreliability of a direct

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<http://www.rcpsych.ac.uk/quality/quality.accreditationaudit/qinmaccamhs/youngpersonsguidetocamhs.aspx>

estimate based on a small sample of children in a local authority area against the bias of a synthetic (model based) estimate of the number of service poor children in the same municipality.

$$P_{mC} = \Phi_m P_{mD} + (1 - \Phi_m) P_{mS}$$

Where:

$P_{mC}$  = Composite estimate of the number of service poor children in municipality m

$P_{mD}$  = Direct estimate of the number of service poor children in municipality m

$P_{mS}$  = Synthetic estimate of the number of service poor children in municipality m

$\Phi_m$  = weight ( $0 \leq \Phi_m \leq 1$ )

The key problems with such composite estimates are:

- How do you determine the correct value for the weight  $\Phi_m$
- Can the power of the direct estimate ( $P_{mD}$ ) be increased by borrowing strength from survey sample data in adjacent municipalities.

There are several solutions that have been proposed to try to identify the 'best' value for the weight  $\Phi_m$ .

In the Canadian Labour Force Survey, a weight of 2/3 has been used (Drew, Singh and Choudhry, 1982; Ghosh and Rao, 1994). However, a better statistical solution was developed by Fay and Herriot (1979) which allowed for area level random effects to estimate 1969 per capita income at small area level in the USA. In the Fay-Herriot model, the Best Linear Un-biased Predictor (BLUP) of child service poverty is given by the following linear mixed model:

$$\bar{P}_m = P_m + e_m = X'_m \beta + V_m + e_m$$

Where:

$P_m$  = the 'true' number of service poor children in municipality m

$\bar{P}_m$  = the direct estimate of service poor children in municipality m

$e_m$  = random error (sampling error)

$X'_m$  = the vector of area level covariates (e.g. OFSTED reports, exam results, child mortality rate, etc.)

$V_m$  = area specific random error (e.g. the model error)

The model and sampling errors are assumed to be uncorrelated and the model error term will correct for any bias in the synthetic estimate ( $X'_m \beta$ ) as long as the model is correct. Many small area estimation models are extensions and refinements of the Fay-Herriot model.

### **Synthetic models and Geographically Weighted Regression**

The Office for National Statistics is a world leader in the field of small area estimation and they are one of the few national statistical offices which produce official statistics using these methods to estimate income<sup>6</sup> and unemployment rates<sup>7</sup>.

However, the ONS Small Area Estimation methods do not incorporate geographical distribution of the areas (municipalities) into the model and assume that observations within an area (local authority) may be correlated but that observations in different areas are uncorrelated (Singh, Shukla and Kundu, 2006). This assumption is known to be incorrect due to the phenomenon of spatial autocorrelation, i.e. service provision in areas close to each other (adjacent local authorities) is usually more alike than service provision in areas that are geographically far apart. Spatial autocorrelation can be defined as the clustering pattern in the spatial distribution of a variable which is due to the very fact that the occurrences are physically close together, that is, that they are in geographical proximity. They are not independent of each other but are linked. The data are spatially dependent.

Recent research has shown that Geographically Weighted Regression (GWR) methods can be used to extend and enhance small area estimation models to both allow for spatial autocorrelation and also to borrow strength over geographic space. Salvati et al (2007) concluded that small area models which include geographically weighted regression “*have the potential to lead to significantly better small area estimates in important application areas where geo-referenced data are available, such as financial and economic statistics, environmental and public health modelling.*”

Geographically Weighted Regression is a technique which was invented by Professors Chris Brunsdon, Stewart Fotheringham and Martin Charlton (Brunsdon, Fotheringham and Charlton, 1996). The Government of Mexico

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<sup>6</sup> [http://neighbourhood.statistics.gov.uk/HTMLDocs/images/Model-Based\\_Income\\_Estimates%28V2%29\\_tcm97-51115.pdf](http://neighbourhood.statistics.gov.uk/HTMLDocs/images/Model-Based_Income_Estimates%28V2%29_tcm97-51115.pdf)

<sup>7</sup> [http://www.statistics.gov.uk/downloads/theme\\_labour/PC\\_Model\\_estimates\\_User\\_Guide.pdf](http://www.statistics.gov.uk/downloads/theme_labour/PC_Model_estimates_User_Guide.pdf)

has commissioned the University of Southampton and Professor Brunsdon to produce small area models for estimating multidimensional poverty for Mexican local government areas, which combine classic small area estimation techniques with GWR. A UK service poverty index could benefit from these recent methodological advances once a national service deprivation measure has been developed.

## Option 2: ‘Service deprivation’ measure

Given the current financial constraints on public spending, producing a child service deprivation/poverty measure from a question module in a suitable social survey would seem to be the most achievable option. A question module on services could be included in the Family Resources Survey, which is used to produce child poverty and deprivation estimates. However, if a large sample is required (and monies are available) then a service question module could be included in the Integrated Household Survey (IHS)<sup>8</sup>, which interviews 450,000 individual respondents.

For 30 years, UK academic poverty surveys have asked questions about service accessibility, service adequacy and the public’s perceptions of services. Examples of the ‘public service’ and ‘child service’ question in the 1999 *Poverty and Social Exclusion Survey* (Gordon et al, 2000; Pantazis et al, 2006) are shown below. Additional questions were also included about ‘private services’ and services for older people.

*Q: I am going to read out a number of services which are usually provided or subsidised by local councils or other public bodies. Please could you tell me whether you think that these services are essential and should be available or whether they may be desirable but are not essential?*

		(1) Essential	(2) Desirable	(3) Don’t know
[Doctor]	Doctor	99	1	*
[Hosptl]	Hospital with an Accident and Emergency Department	95	5	*
[Dentst]	Dentist	93	7	*
[PostOf]	Post Office	93	6	*
[Opticn]	Optician	86	14	*
[Libris]	Libraries	71	29	*
[SprtFc]	Public sports facilities (e.g. swimming pools)	68	31	1
[VilgHl]	Public/Community/Village Hall	59	40	1
[EveCls]	Evening classes	51	47	2
[MusGal]	Museums and galleries	28	70	2

**ASK ONLY IF THERE ARE CHILDREN IN THE HOUSEHOLD**

<sup>8</sup> <http://www.statistics.gov.uk/statbase/Product.asp?vlnk=15381>

		(1) Essential	(2) Desirable	(3) Don't know
[PlayFc]	Facilities for children to play safely nearby	88	11	1
[Nursery]	Nurseries, playgroups, mother and toddler groups	86	11	4
[SchTrns]	Public transport to school	84	14	2
[ScMeal]	School meals	72	26	2
[YthClb]	Youth clubs	61	36	3
[AfrCl]	After School clubs	44	52	4

A follow up question was then asked about service use – the children's services questions are shown below as an example;

[CardW2] *Please could you tell me which of the following services you use or do not use. For the services you use please tell me whether you think they are adequate or inadequate. For the services you do not use please give the reason you do not use them by choosing an answer from the categories on this card.*

**ASK ONLY IF THERE ARE CHILDREN IN THE HOUSEHOLD**

[CardX2] *Do your children use...?*

**(SHOWCARD W)**

		(1) Use - adequate	(2) Use - inadequate	(3) Don't use - don't want/not relevant	(4) Don't use – unavailable or unsuitable	(5) Don't use – can't afford	(6) Don' t know
[UseScMI]	School meals	47	4	42	4	1	2
[UsePlay]	Facilities to play safely nearby	43	16	18	21	0	2
[UseNsry]	Nurseries, playgroups, mother and toddler groups	31	*	59	4	3	3
[UseSClB]	After School clubs	21	3	58	15	1	2
[UseScBs]	Public transport to school	17	4	71	5	1	2
[UseYClb]	Youth clubs	15	3	67	13	*	2

The results from the 1999 survey have been discussed in Fisher and Bramley (2006) and from the 1990 survey in Bramley (1997). These questions seem to reliably capture the level of public support for different services as well as the adequacy and accessibility of services. In general, poor children and adults are excluded from using public services due to their unavailability or unsuitability rather than due to unaffordability.

## Conclusion

A national service poverty/deprivation measure could be produced from a question module included in the Family Resource Survey and/or the Integrated Household Survey. It might be possible to test some or all of these questions in the 2011 Poverty and Social Exclusion (PSE) Survey at no charge to the Cabinet Office (as this new survey has been paid for by the ESRC). The 2011 PSE survey will follow-up a sample of respondents to the 2010/11 Family Resources Survey and will include considerable additional information about child and adult poverty and social exclusion.



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