

THE UNIVERSITY *of York*

CENTRE FOR HEALTH ECONOMICS  
YORK HEALTH ECONOMICS CONSORTIUM  
NHS CENTRE FOR REVIEWS & DISSEMINATION

**No Need to Weight Community Health  
Programmes for Resource Allocation?**

*Mary Brennan and Roy Carr-Hill*

***DISCUSSION PAPER 146***



**No Need to Weight Community Health Programmes for  
Resource Allocation?**

**by**

**Mary Brennan and Roy Carr-Hill**

## **THE AUTHORS**

Dr Mary Brennan is an Honorary Senior Research Fellow at the Institute of Public and Environmental Health, University of Birmingham and is Chair of South Birmingham CHC.

Dr Roy Carr-Hill is a Senior Research Fellow at the Centre for Health Economics, University of York.

## **ACKNOWLEDGEMENTS**

The authors extend thanks to the South Birmingham Community Health Council who sponsored the research that was the basis of this paper. Thanks go also to Dale Lord for recomputing the table in the Appendix, to Stuart Peacock and Peter Smith for permission to reproduce Table 6 and use their spreadsheet; and to Vanda King and Vanessa Waby for preparing the manuscript.

## **FURTHER COPIES**

Further copies of this document are available (at price £6.00 to cover the cost of publication, post and packing) from:

The Publications Office  
Centre for Health Economics  
University of York  
York YO1 5DD

Please make cheques payable to the University of York. Details of other papers can be obtained from the same address, or telephone York (01904) 433648 or 433666.

## **ABSTRACT**

The NHS Executive has recently implemented modifications to the weighted capitation formula for distributing Hospital and Community Health Service (HCHS) funds in England (NHS Executive, 1994a). Although this was based on some technical work commissioned by the Executive from a team of statisticians and health economists at the University of York (Carr-Hill et al, 1994), the Department of Health decided to apply the needs weights they proposed to only 76% of expenditure. As shown in a previous Discussion Paper (No. 134: Peacock and Smith, 1995), this considerably dilutes the redistributive impact of the formula.

In this paper, the authors show how many of the programmes covered by the 24% of expenditure which are given zero weight relate to overall policy objectives such as the reduction in incidence of key conditions, early diagnosis and referral and early discharge. Achieving these targets requires a range of community programmes. When examined in detail, the majority of these community-based programmes are dealing with conditions which are related to environmental degradation, socio-economic deprivation and long standing morbidity. Moreover, a review of the epidemiology of those conditions demonstrates that they are associated with the needs weights which have been used to distribute the other 76% of the HCHS expenditure.

The authors show the effect of distributing the resources for community programmes on target allocations according to different methods. If the "full" York formula or the square root of the Standardised Mortality Ratio (the basis of the previous formulae) is used, this means that the ten most fortunate authorities are gaining - and the ten least fortunate losing - between 3% and 5% through the DoH formula that has been implemented. However, if monies were to be distributed according to the evidence, then nine authorities are losing between 7% and 11% and ten authorities are gaining over 6% through the implementation of the DoH formula. Of those losing at this level all are in inner-city areas; six in London and the others in Birmingham and Manchester. Of the 20 districts losing 5% or more all are districts containing a higher proportion of inner-city areas.



## **INTRODUCTION**

The NHS Executive has recently implemented a modification to the weighted capitation formula for distributing Hospital and Community Health Services (HCHS) funds in England (NHS Executive 1994a). Although this was based on some technical work commissioned by the Executive from a team of statisticians and health economists at the University of York (Carr-Hill et al 1994), the Department of Health decided to apply the needs weights they proposed to only 76% of expenditure. As shown by Peacock and Smith (1995), this considerably dilutes the redistribution impact of the formula.

## **A LITTLE BACKGROUND**

Since 1976, the HCHS budget has been distributed to Health Authorities by means of various formulae (Mays and Bevan 1987). The first - current from 1976 to 1990 - was based on the report of the Resource Allocation Working Party (RAWP) and allocated funds on the basis of population, adjusted for variations in age structure, health needs as measured by condition-specific standardised mortality ratios (SMRS). The second - current from 1990 to 1995 - was based on an empirical analysis of hospital utilisation data (Royston et al 1992) and used the square root of all causes SMR for those aged under 75. The methods were severely criticised by Sheldon and Carr-Hill (1992). Throughout this period, allocations were made from the centre to the Regional Health Authorities who then distributed to districts according to a sub-regional formula which was not always the same as the national formula.

In 1995, the national formula was again changed, although the basic structure of the formula (an age weighting, a need weighting and a cost adjustment) remained intact. There would, in any case have been substantial changes for several District Health Authorities in the amount they actually receive because the allocations are now made directly to them rather than via the Regional Health Authorities who, in some cases, adopted specific policies favouring for example inner cities. The concern here, however, is with the new targets that have been set. The health needs component of this new formula is based on a new empirical analysis by a team from the University of York, the details of which are reported elsewhere (Carr-Hill et al 1994). This work was based on utilisation of NHS inpatient facilities, which

comprise about 45% of all Hospital and Community Health Services (HCHS) expenditures and two 'need' weightings were proposed corresponding to utilisation of acute in-patient facilities (the 'acute' weight) and to utilisation of psychiatric in patient facilities (the 'psychiatric' weight).

In implementing the work so as to provide a formula for all HCHS expenditures, the Department has chosen to disaggregate total HCHS activity into three sectors: an acute sector, which includes acute inpatients and outpatients, geriatrics, ambulance services and maternity, and represents 64% of HCHS expenditure (to which the 'acute' weight is applied) : a psychiatric sector (including psychiatric inpatients and outpatients and community services) which represents 12% of HCHS expenditure (to which the 'psychiatric' weight is applied); and an 'other' sector, representing 24% of HCHS expenditure (which has been given no weight). This latter sector includes mental handicap, general community services, other hospital and administrative services. The purpose of this report is to examine the arguments for and against this zero weighting to these activities.

### **DOES NEED FOR COMMUNITY PROGRAMMES VARY?**

The present government has several objectives to which they have awarded a high priority. These include the 'Health of the Nation' initiative, policies which promote and sustain early and successful discharge, reduced perinatal mortality, and a commitment to 'care in the community'. These policy objectives are predicated on the assumption that the NHS is not only concerned with the care of acutely ill patients but should be just as involved with initiatives which seek either to prevent illness, diagnose illness at an early stage, or alternatively care for those with long standing illness. In other words, the NHS is a health service and not just an illness service.

Generally these commendable policies have only been criticised in so far as there has been a failure in some cases and in some areas to implement them fully. Whilst resources are always finite, it is important that the distribution of resources follows policies: however, there has been a failure to recognise the implications of these policies in respect of the levels of funding for the community care sector.



This paper will argue that not only should these policy developments about community care be funded adequately, but their existence should also be reflected in any funding formula. This means that if a higher level of spend is indicated for certain programmes, this should be acknowledged in the 'needs' element of the formula.

### *Health of the Nation Targets*

Although health education policies and health promotion programmes have some place in the secondary care sector, most of the expenditure directed towards attaining the objectives of reducing high illness rates and excess mortality will be located in primary care and community programmes. A significant proportion of these monies will be included in the budgets of the community programmes that are at present zero weighted.

Most of the diseases which can be prevented, and are highlighted in 'Health of the Nation', are exactly those diseases which are related to environmental degradation, sociological deprivation, ethnicity and long standing morbidity.

A list of preventable conditions, identified in 'Health of the Nation' as major priorities for action, is shown in Table 1. The evidence that these conditions are associated with commonly accepted indicators of deprivation is shown in the second column (for details see the references to Table 1), and the corresponding indicators in the 'acute' and 'psychiatric' models developed by the York team are shown in the third column. Note that indicators for AIDS are not associated with most indicators for deprivation but the indicators for conception among young people are.

Preventive measures operates through health education and health promotion programmes which are both given a zero weight, although the need for the expenditure varies substantially as can be seen from reference to Table 1. There is a paradox : whilst the resources required to treat these conditions are presumed to vary according to 'deprivation', the resources to prevent the conditions occurring are presumed to be independent of such variations. This is an expensive and misguided policy, which implies that the preventative programmes involved are not effective, when all the evidence shows that they do have a recognisable effect and are useful tools for reducing the costs of health care (Sheldon et al 1995).

**Table 1 Relevant 'Health of the Nation' Targets and their Relationship to any of the Need Indices Identified in the 'Acute' and 'Psychiatric' Funding Models.**

<b>Target condition</b>	<b>Higher incidence and Prevalence associated with</b>	<b>Similar indicators in either of the funding models</b>
Coronary Heart Disease and Stroke	Unemployment, <sup>a</sup> unskilled workers, <sup>b</sup> low income, ethnic minorities, especially North Asian communities, <sup>c</sup> specific occupations, <sup>d</sup> smoking, <sup>e</sup> poor diet, <sup>f</sup> pollution <sup>g</sup>	Standardised limiting long standing illness ratio; SMR (under 75); unemployed; born in New Commonwealth; permanently sick.
Cancers	Smoking <sup>h</sup> early reproduction <sup>i</sup> manual occupations <sup>j</sup> infection-helicobacter <sup>k</sup> (relevant cancers - lung, cervix, digestive)	Morbidity indicators, Unemployed, SMR (under 75), New Commonwealth, lone parents.
Accidents	Urban populations, low socio-economic position <sup>l</sup> low income, <sup>m</sup> single parent <sup>n</sup>	Unemployment, lone parent families, SMR (under 75), morbidity.
Mental Illness	Urban populations, <sup>o</sup> ethnicity <sup>p</sup> unemployment <sup>q</sup> atypical family structure (conditions promoting suicide)	Unemployment, lone parent, morbidity, aged living alone, New Commonwealth
HIV and Aids	Urban populations, <sup>r</sup> low socio-economic position, homelessness, atypical family structure <sup>s,t,u</sup>	Lone parents, morbidity

**Alphabetical footnotes are in the reference section before the text references.**

### *Early Diagnosis and Referral*

The need for early diagnosis and referral are also highlighted in the work of the 'Health of the Nation'. For example, targeted screening is indicated for heart disease which consequently increases the need for open access to laboratory services by GPs. The corresponding screening and other early diagnostic programmes are shown in Table 2.

### *Early Discharge*

The policy of the government in most cases has been to discharge patients back into the community as soon as possible, whether the patient is suffering from mental illness, the replacement of a joint, or a chronic disability. Such a policy must be welcomed but at the same time it must be clearly recognised that its effective implementation will affect primary care, community health and nursing services to GPs under open access, and professional advice and support services. The implications for community mental handicap services are also significant. These are all programmes which are now zero weighted.

In areas, where the incidence and prevalence of disease and disability is higher, the need for these community services will, therefore, be greater. The secondary care services should not be entitled to expenditure which is based on an estimate of increased need, while the effect on the community and preventive services is ignored. Such a policy is short sighted as it encourages care to be given in a more expensive setting.

## **THE IMPLICATIONS OF THE DECISION TO ZERO WEIGHT CERTAIN PROGRAMMES**

The various programmes, which have not been allocated to the categories 'acute' or 'psychiatric' and which make up the remainder of the Hospital and Community Health Services spend, in total account for 24.% of HCHS expenditure. The material in the preceding section suggests that the government's decision to zero weight these programmes is contestable.

**Table 2 Early Diagnostic Tests and Health of the Nation Targets:- illustrative examples**

Target Objective	Test	Corresponding Zero-Weighted Expenditure Programmes
Coronary Heart Disease and Stroke	Cholesterol, Blood Pressure, ECG	GP Open Access, Primary Care, Community Health
Cancer	Cervical Smear	Primary Care, Community Health
Mental Illness	Assessment Programmes	Community Health and nursing, GP support services
Sexual Health	Contraception	Community Health

The programmes which relate to conditions the distribution of which are known to have a close direct association with indicators of deprivation, and those which have an indirect association, are identified in Table 3 together with a telegraphic summary of the evidence. Those factors have been defined as direct which have been shown in a wide variety of research to be both reliable and consistent indicators of the need for those corresponding programmes. We have defined as indirect those factors which reflect the social conditions which entail a higher spend i.e. where greater expenditure is required to obtain the same effect as in other districts. This may be related to the culture, e.g. a poorer uptake of services by the population other things being equal, or a higher level of provision may be required in ancillary services e.g. other hospital services are related to the level of need for some community programmes.

The material in the table demonstrates that all of the zero weighted expenditure can be shown to have a direct, or indirect relationship to need.

## **METHODS FOR ASSESSING HOW EXPENDITURE ON COMMUNITY PROGRAMMES CAN REFLECT NEED**

### *The Choice of Indicators in the York Formula*

The issue which must be addressed in any discussion about the use of a formula to structure resource allocation is whether the indicators used within it are the best of those available. This is because any chosen indicators, for example, the Standardised Mortality Ratio (SMR), should subsume within themselves additional factors which may also affect the pattern of SMRs. The test of a good indicator is that this is the case i.e. it is inclusive.

Any chosen indicator should also be reliable. That is, it should have a close and predictable correlation with health status. A good indicator should also be consistent on a year-by-year and on a district-by-district basis i.e. temporally and geographically. Although, of course, it is possible to change the target allocation every year, any indicator which changed the target allocation markedly from year to year would clearly be unsatisfactory.

**Table 3 The relationship of services within the zero-weighted expenditure band to increased need**

<b>Programme</b>	<b>Direct/Indirect</b>	<b>Comments on association with need</b>
Chiropody	Direct	<p>a) Related to elderly living alone</p> <p>b) A high incidence of diabetes</p> <p>c) A high incidence of peripheral artery disease.</p> <p>All of which are found in deprived groups.<sup>a</sup></p>
Mental Handicap IP and OP	Direct	Higher incidence of mental handicap caused by obstetric complications, poor maternal diet, poor antenatal attendance in deprived groups <sup>b</sup>
Family Planning	Direct	Greater need in certain deprived groups. More expenditure for the same take-up of service <sup>c</sup>
Immunisation	Indirect	More expenditure for the same take-up of service <sup>d</sup>
Child Surveillance	Direct	A higher incidence of conditions requiring long term surveillance <sup>e</sup>
Screening	Direct	A higher incidence of most diseases identified by screening, e.g. breast, cervical cancer, heart disease, TB <sup>f</sup>
Professional Advice	Direct	A higher incidence of conditions requiring counselling in socially deprived groups <sup>g</sup>

Continued ...

**Table 3 (Continued)**

General Community	Direct	<ul style="list-style-type: none"> <li>a) A higher incidence of disease in deprived groups</li> <li>b) More difficult social conditions requiring more involvement, e.g. elderly living alone</li> </ul>
Community Mental Handicap		See above.
Health Promotion	Direct and Indirect	<ul style="list-style-type: none"> <li>a) A greater incidence of preventable diseases in deprived groups.</li> <li>b) More expenditure required for the same take-up of service<sup>h</sup></li> </ul>
Community Dental	Direct and Indirect	<ul style="list-style-type: none"> <li>a) A higher incidence of dental disease found in deprived groups</li> <li>b) Private care not used for dental care as frequently<sup>i</sup></li> </ul>
Services to GPs	Direct	A higher incidence of disease requiring open access is found in deprived groups <sup>j</sup>
Other Hospital	Indirect	Services closely related to those in the acute sector
Administrative	Indirect	More services frequently require more administration

**(N.B. Footnotes are in reference section before the textual references)**

The use of the York model was based on an identification of relevant factors, using epidemiological and sociological research to determine which were closely related to health status. A rigorous statistical exercise was then pursued to discover which of these could be regarded as reflecting a "major dimension". Moreover, the indicators which were chosen have for a considerable period of time shown a close correlation with health status. Therefore, the York indicators met the criteria of being reliable, inclusive and consistent. The team who developed the York model recommended that those programmes which did not fall neatly into either the 'acute' or 'psychiatric' areas should be split according to the identified level of spend between the two areas i.e. 64% and 12% (Carr-Hill et al 1994) or, for example be given the 'acute' weight (Peacock and Smith 1995).

### **INDICATORS USED IN THE ACUTE AND PSYCHIATRIC NEEDS MATRICES AND THEIR RELATIONSHIP WITH NEED MET IN THE NON-WEIGHTED EXPENDITURE PROGRAMMES**

All of the indicators used in either the acute or psychiatric models can be shown to have a close correlation with ill health. The issue is whether these indicators are also related to the conditions which are the target of the programmes included in the non-weighted sector. If the correlation does hold for these conditions and programmes, the contention that these programmes should be zero weighted must fall. We have only examined those measures which do not describe health status.

#### ***Proportion of Economically Active who are Unemployed***

There is a significant level of ill health associated with unemployment (Smith 1987). An early study had shown (Brenner 1971) that not only did suicide deaths rise in the year of a rise in national unemployment, but there was a pronounced increase in cardiovascular deaths, following a lag of about three years (Brenner 1979). In 1971 and 1981, studies by the OPCS have demonstrated that a rise in standardised mortality was found and there was an increase in deaths from ischaemic heart disease, lung cancer and suicides. (Moser, Fox and Jones 1984; Moser, Goldblatt, Fox and Jones, 1987). The British Regional Heart Study confirmed the finding that ischaemic heart disease was significantly higher in the not-ill unemployed



(Cook et al, 1982) There is no doubt that there is an increase in mortality associated with unemployment.

An interesting study by Kasl and Cobb (1968) has shown an increase in blood pressure, serum uric acid and serum cholesterol, following the announcement of redundancy, which indicated a direct biochemical and physiological mechanism. Unemployment in Britain has been shown to lead to a greater need for GP services (Yuen and Balarajan 1989), the call for night visits is higher (Carlisle, Johnstone and Pearson, 1993) and there is a greater need for screening for e.g. hypertension. The health effect is also found in women as well as men (Lee flank et al 1992). It is, therefore, not surprising that there is a greater demand for drugs prescribed by a general practitioner and a higher referral rate even after four years (Yuen and Balarajan 1989).

The 1984 General Household Survey confirmed that 28% of unemployed men reported long standing illness (OPCS, 1986). Therefore, there is no doubt that there is an increase in morbidity associated with unemployment. Furthermore, a higher proportion of the unemployed develop a lifestyle which requires a higher input of health education and health promotion (Lee et al 1991; Hammerstrom 1994) because the actual experience of unemployment generates adverse health related behaviour in some people (Bartley 1994).

Fifty years ago, Woolf and Waterhouse (1945) demonstrated that infant mortality was related to unemployment and several later studies have confirmed this finding, especially in young children (Brennan and Lancashire 1978). The effects recorded include a long term measured increase in the incidence of congenital malformations (Baird 1980) and high morbidity, as well as psychological disorders in children (Gilles, Elwood and Hawtin 1985). In a recent study, it has also been shown that children in areas with low socio-economic status and high unemployment benefit more than other children from routine dental screening and follow-up (Zarod and Lennon 1992). A study in 1991, showed that children subjected to economic stress in the family were still suffering from anxiety several years later (Webb and Friedmann 1991).

All of these findings indicate that in areas with high unemployment, there will need to be a

higher number of GPs, health visitors, community dentists and other primary and community health care personnel, than other areas with the same number and age structure in the population. Furthermore, other types of social support have been shown to reduce the effect of unemployment on health (Turner et al 1991).

### ***Proportion Born in New Commonwealth***

The health problems suffered by ethnic minorities, cultural minorities and migrants are not confined solely to mental illness. These communities in Britain also experience high rates of physical illness (Smaje 1995; Donovan 1984). The overall perinatal mortality rate is higher (WMRHA 1983), which is related to a higher proportion of low birthweight groups (Condie and Terry 1983). Some Asian mothers have retarded foetal growth (Terry et al 1983) and indeed the higher than average perinatal mortality rates in Indian groups is almost entirely accounted for by intra-uterine death before delivery. The majority of these deaths are probably related to poor diet and low income.

There is a higher rate of congenital malformations in Indians and a high rate of multiple and chromosomal abnormalities in the Pakistani population (Terry et al, 1983). These patterns reflect the need for a greater investment of community midwifery, specialising in preventive work. These staff are not always amalgamated into obstetric funding programmes but may be incorporated into community health staffing. There will also be a need for community nursing programmes including health visiting, and an additional workload for GPs, who will require additional screening services and open access.

Dietary deficiencies including Vitamin D deficiencies are found amongst children in the Asian community, particularly the Bangladeshi community (Black, 1985). Lead poisoning has also been found in certain communities (Black 1985). Usually this is found as a result of poor housing stock but can also be related to the use of the eye cosmetic surma. Problems are also found in the Afro-Caribbean community, where there is an increase in chest infections, asthma and accidental burns in children, compared with the host community (Donovan 1984). Most of these illnesses are also associated with poor housing, or poverty.

Amongst the Asian adult population as a whole, it has been found in a study done by South West Thames Regional Health Authority, that the community suffers from a higher incidence of the following (Balarajan et al, 1984):-

"infective and parasitic disease, endocrine disorders [notably diabetes] ischaemic heart disease [not related to smoking], cerebro-vascular disorders, and cirrhosis of the liver".

Very few cases of tuberculosis (TB) are found on entry but shortly afterwards, very high rates of TB are then found, being for example 10 times higher for Africans, 27 times higher for Indians. Some inherited diseases also cause problems. These include sickle cell anaemia in Afro-Caribbeans (Donovan 1984) and thalassaemia, usually in Pakistanis (Black 1985). A higher incidence of diabetes is found in Afro-Caribbeans, as well as Asians. It is notable that research has found that employment protected race and cultural minorities from poorer health (Rushing, Ritter and Burton 1992).

Ethnic minority communities require a wide variety of specialist services and many of these will be located in the community. These include genetic counselling for diseases such as sickle cell anaemia, more support during the ante-natal period, screening services for people to identify diabetes, and also screening for infection, e.g. TB and for those, especially children, returning from visits to tropical countries. Such programmes seek to identify specific disorders, e.g. hookworm (Walsall HA, 1989). Child Health Services need to develop specialist services for children with infections, dietary deficiencies, tuberculosis, asthma and other infections. Any health promotion programmes must be designed to accommodate linguistic and cultural differences (Mcallister and Farquhar 1992).

General practitioners need to refer a higher number of patients, age-for-age, than GPs with no patients from ethnic minority communities (Ebrahim 1995). This has implications for GP Open Access. There is consequently a need for higher expenditure on many services in the zero weighted section, such as primary care, GP Open Access, screening services (Mcallister and Farquhar 1992), professional advice, health promotion, and community health, e.g. link workers for geriatrics, speech therapy, cancer, audiology, etc (Walsall HA 1989).

*Proportion of Dependants in Single Carer Households and Proportion of Dependants with No Carer*

In a study by the General Household Survey in 1985 (OPCS, 1987), it was found that one household in seven was a carer and one household in five contained a carer. About a quarter of all carers were spending 20 hours or more per week on the task. Just over half of carers [53%] were giving personal care e.g. washing, and just under half [46%] were giving medicines.

Therefore, it is reasonable to assume that nationally between one and two million people are providing a substantial amount of care. Are these people providing care which otherwise would have to be provided by the NHS or institutions, or Social Service Departments? The answer is probably in the affirmative and the issue is complicated by the fact that carers are themselves frequently suffering from a long term illness. About a half of those over 45 years, in the GHS study, were reported as having a long standing illness, including a third who were experiencing an illness which restricted their activities. It is hardly surprising, when the information showed that a substantial proportion of carers in the same household have not had a break, some for as long as ten or more years. Of those looking after someone for more than 20 hours per week, just under a quarter fell into this category.

Two thirds of those interviewed were looking after the elderly with a physical disability, just over a fifth were looking after people with physical and mental handicap, and only 5% with a mental disability only.

The GHS survey found that when the carer was in the same household, the most frequent visitor was the district community nurse. This finding is confirmed by other work. (Esposito, 1994 : Mahoney and Shippee-Rice 1994; Welwood, Dennis and Warlow 1994; Hangar and Mulley 1993). Another study suggests that, where the elder who is being looked after by a carer receives visiting services from a community nurse, they are less likely to be re-admitted to hospital. Clearly, this is related to the general level of morbidity in the population and indirectly the variation in need (Bull 1994) Of even more significance, where the dependant lived apart from the carer, there was a greater use of support services.

These findings indicate that carers require help from the community health services, especially when they are the only carer. When the dependant is left alone she/he requires much more support from both health and social services. If the incidence of disease is greater, as in deprived districts, the burden on the community health and nursing services will be greater as well as the burden on the carers.

### *Proportion of Persons in Lone Parent Families*

Births to single parents are more prone to maternal and neonatal problems and experience a higher perinatal mortality rate (WMRHA 1983). For example, births to single parents are more prone to low birthweight, whether this is caused by pre-term delivery, or intra-uterine growth retardation (Kaltreider and Schulyer 1980; Newton et al 1979) It is the children of the single unsupported mother who are at risk, rather than those who are illegitimate as such.\* They experience an increase in handicap and also suffer from a higher morbidity in early childhood (Editorial of Lancet, 1982).

However, children from families who experience marriage break up are also living with a single parent. In England today, about one third of marriages break up and most of these families contain children. Many of these families then experience poverty, particularly in the larger families (Child Poverty Action Group, Reports from various years; Child Support Agency, Reports from various years).

Single parents are estimated to make up 89% of the parents who are classified as unoccupied (Judge and Benzeval 1993). Children in such families have a high measured level of morbidity and mortality. Such children also experience relative poverty, which probably accounts for much of this picture. They experience an age specific death rate which is 42% worse than social class V. As the authors of this study argue, studies relying solely on social class which ignore the familial position of these children present a misleading picture. There is no doubt that these children also suffer from many preventable infections and other

---

\* Whilst about half of all pregnancies, at the present time, are conceived outside of marriage, only a minority of these are to single unsupported women.

conditions. The poverty and poor housing in which they live expose them to additional health risks (Lancet 1984; Brennan 1978). Although parents in such families may be aware of the risks, they have been found to possess significantly fewer items of safety equipment because they are unable to afford them (Kendrick, 1994).

Mothers in lone parent families frequently require a more sophisticated contraceptive service than other families. Although not all births to single women are unwanted, in at least one study it has been found that half the births to such women are unwanted\*\* and were more likely to be so if the mother had already given birth (Brennan and Hebel 1975).

Many of the programmes given zero weighting are involved with the care of these children. In many ways, the work of these programmes in preventing disease amongst these children is just as important as the work of the acute sector in curing their diseases. The objective in both is a reduction of their high mortality. The workload these programmes experience with these families is greater because of their many problems and the high levels of morbidity and mortality. The following programmes are involved :-

- Community midwifery [if funded through community programmes];
- Health visiting;
- Paediatric community nursing;
- School health services;
- GP open access;
- Child development and surveillance;
- Child screening programmes;
- Professional advice and support;
- Community dentistry;
- Health promotion;
- Family planning

---

\*\* Note that in a fairly recent study, it was found that about one sixth of all obstetric patients classified the birth as not wanted i.e. they defined the birth as unwanted and upsetting (Walsall IMG, 1992).

### *Proportion of Pensionable Age Living Alone*

A substantial proportion of the elderly living alone have an accompanying disability. In a study in the borough of Walsall, about one third of the elderly who had a disability were living alone (Walsall HA 1989). The main causes of disability were rheumatism and arthritis, disorders of perception, and cardiovascular disorders, including strokes. The General Household Survey has found that, apart from very young children, the elderly consult their GP more than any other age group. In the survey in Walsall, it was found that the disabled living alone had a very high contact level with their GP and a low contact level with social services. Contact with community health services was higher than social services, but not as high as the GP.

One of the major disabilities found in the elderly are perceptual disorders. This has also major implications for the community care services.

### **THE ASSOCIATION OF ZERO WEIGHTED PROGRAMMES WITH THE YORK INDICATORS**

Table 4 indicates which services, now allocated a zero weighting, relate to conditions which have been shown in the review above to vary reliably and consistently according to the inclusive indicators used in the York acute model. Many of these relationships have been demonstrated for at least twenty years, while some, such as the unemployment indicator, have been known to be associated with an increase in disease since before World War II .

Table 5 indicates which services, allocated a zero weighting, relate to conditions which have been demonstrated in the review above to vary reliably and consistently according to the inclusive indicators used in the York psychiatric needs model.

**Table 4 Zero-weighted services which have a strong association with the York Indicators used in the acute model**

Indicators	Association with Community Programme	Comments
% Unemployed	Family Planning, Screening, Professional Advice and Support, General Community Services to GPs, other Community Health Services	A higher incidence of disease, e.g. heart disease; hypertension; child infections.
Proportion of pensionable age living alone	Chiropody, Professional Advice, General Community Services, Health Promotion, GPs requiring open access	The prevalence and incidence of disease is higher in the aged living alone.
Proportion of single carer households and proportion of dependants with no carer	Professional Advice and Support, General Community Services	Higher level of support required.



**Table 5 Zero-weighted services which have a strong association with the York Indicators used in the psychiatric model not covered in Table 4.**

Indicator	Association with Community Programme (identified by research and epidemiology)	Comments
% from New Commonwealth	Family Planning, Immunisation and Surveillance, Screening, Professional Advice and Support, General Community Patient Care, Health Promotion, Services to GPs	High incidence of disease, also care more expensive, i.e. interpreters, health promotion, higher requirement for screening.
% in lone parent families	Mental Handicap (obstetric complications) Immunisation and Surveillance, Professional Advice, Community Mental Handicap, Community Patient Care, Health Promotion, Community Dental, Family Planning	Children in these families have a higher incidence of disease; parent support is required.
% dependants	Chiropody, Mental Handicap Community, Professional Advice and Support	

### *The Determination of the Appropriate "Needs" Measure.*

In order to explore how these programmes could be weighted we have explored a variety of means which would ensure that the forms of deprivation with which these services are associated are reflected in the method of calculating the split in allocation. It should be emphasised that:

- these calculations pertain to the impact of the needs weight on the target allocations for the 'old' District Health Authorities; the impact on the 'new' Unified Health Authorities will depend on how they have been combined.
- the amounts actually distributed were and will be different, because of the varying formulae used by Regional Health Authorities to make sub-regional allocations.

The first option uses the approach recommended as the full 'York' model by Peacock and Smith (1995) in which the York 'acute' and 'psychiatric' models are applied in the proportion 88% to 12% (see Peacock and Smith, 1995, p.13). The specific effect on the weights are shown in column 2 and 3 of the Appendix and the extreme gainers and losers from this policy are shown in Table 6. However, there is no assurance that the split should be as proposed.

In the second approach, the previous allocation mechanism - the square root SMR under 75 - is used as the indicator of need for that part of the budget with a direct, or indirect relationship to need on the basis that if no other information is available, the appropriate default is the status quo ante. This would amount to 20.38% of the non-weighted budget. The specific effect on the weights for each authority are shown in column 4 and 5 of the Appendix and the extreme gainers and losers from this policy are shown in Table 7. However, the reservations which the DoH have expressed about the use of the square root SMR under 75 should apply to it when used in this option also.

The third approach allocates the spend according to the association of the programme with a main indicator from either the acute and/or the psychiatric matrix. These associations are examined more closely in Table 8. It can be seen that the need for many programmes can be shown to be related to inclusive factors found in both the 'acute' and 'psychiatric' models. Only the mental handicap programmes, whether community or in-patient, show a set of relationships which are associated with 'psychiatric' needs only. No programmes are associated only with the inclusive indicators associated with 'acute' needs only.

**Table 6: Gains from chosen Department of Health formula relative to "full" York needs formula**

<b>Top ten</b>	<b>Gain %</b>	<b>Bottom 10</b>	<b>Gain %</b>
Mid Surrey	5.26	North West Durham	-3.55
Wycombe	4.97	St Helens & Knowlsey	-3.66
South West Surrey	4.82	Salford	-3.70
W Surrey & N E Hants	4.47	Barnsley	-3.71
North West Surrey	4.46	Durham	-3.74
East Surrey	4.34	City and Hackney	-3.93
West Berkshire	4.13	Sunderland	-4.02
Basingstoke	4.03	Liverpool	-4.20
East Hertfordshire	3.91	North Manchester	-5.01
Tunbridge Wells	3.90	Central Manchester	-5.12

Source: Reproduced from Peacock and Smith (1995), Table 8.

**Table 7 Gains from chosen Department of Health formula relative to using the square root of SMR for the bulk of the community spend.**

<b>10 Highest SMR Gains</b>	<b>Gain %</b>	<b>10 Lowest SMR Gains</b>	<b>Gain %</b>
South West Surrey	3.08	South West Durham	-1.96
North West Surrey	2.51	Oldham	-1.97
Wycombe	2.49	Camberwell	-1.99
Huntingdon	2.48	South Tees	-2.03
Mid Surrey	2.33	Hartlepool	-2.08
Cambridge	2.32	Sunderland	-2.20
Eastbourne	2.29	Liverpool	-2.30
West Surrey & North East	2.29	Salford	-2.56
East Hertfordshire	2.26	North Manchester	-3.01
East Dorset	2.26	Central Manchester	-3.12

**Table 8 The Indicators mainly associated with a specific Community Programme.**

(as ascertained by epidemiological survey)

<b>Psychiatric Model</b>	<b>Both Acute and Psychiatric Model</b>	<b>Uncertain</b>
Mental Handicap	Chiropody	Administrative
Community Mental Handicap	Family Planning; Immunisation and Surveillance; Professional Advices and support; Screening; General Community; Health Promotion; Community Dental; Services to GPs; Other Community Health; Other Hospital	
Total Expenditure Per Head:	£22.15      £65.03	£15.26

N.B. All Hospital and Community = £421.59 per head

**Table 9 Community Programmes Allocated to Expenditure Category as indicated by the position of the Inclusive Variable.**

	<b>Total % expenditure linked to appropriate need formula</b>
Acute	63.78%
Psychiatric	17.06% (11.71% + 5.25%)
Acute and Psychiatric	15.64% (use average of both need weights)
Uncertain	3.62%

In the third option examined, the expenditure on the 'non-weighted' programmes has, therefore, been split according to the relationships identified by this review of research. In this approach, where the programme is associated with indicators in both the 'acute' and 'psychiatric' models, the average weighting has been used to calculate the proposed allocation. How this has been calculated is shown in table 9. The specific effect on the weights are shown in column 6 and 7 of the Appendix and the extreme gainers and losers from this policy are shown in Table 10.

The changes discussed are related to the effect on the needs element of the formula of the approach used. However, as this is a multiplier (see page 1 above), the pattern of any effect on the total allocation can be calculated. Depending on the method chosen, different authorities are losers and gainers. This is shown most graphically by comparing the 'top ten' and 'bottom 10' gainers in Tables 6, 7 and 10. Once again, it should be emphasised that these calculations pertain to the 'old' Districts rather than the 'new' Unified Health Authorities. The effect on all districts in England is shown in Appendix 1.

**Table 10: Gains from chosen Department of Health formula relative to an evidence-based allocation of the community spend**

<b>10 Highest Need Gains</b>	<b>Gain %</b>	<b>10 Lowest Need Gains</b>	<b>Gain %</b>
West Surrey and North East Hants	7.27	Lewisham & N Southwark	-6.87
Wycombe	7.11	Newham	-7.03
Basingstoke	7.03	West Birmingham	-7.04
Huntingdon	7.01	Tower Hamlets	-7.78
South West Surrey	6.82	West Lambeth	-7.78
Mid Essex	6.20	Camberwell	-8.28
East Hertfordshire	6.13	Bloomsbury & Islington	-8.84
Winchester	6.11	City and Hackney	-8.90
Tunbridge Wells	6.08	North Manchester	-9.78
West Berkshire	6.01	Central Manchester	-10.89

## CONCLUSIONS

It is not justifiable to assert that the programmes which are now given zero weighting show no relationship to need. These programmes which are concerned with some of the major priorities of the government such as prevention, early diagnosis and referral, early discharge and community care, are in every case found to be closely associated with accepted measures of need.

The use of zero-weighting has had a significant effect on the target allocations to districts typified by a high level of need in other parts of the budget. If the "full" York formula or the square root of the Standardised Mortality Ratio (the basis of the previous formulae) is used, this means that the ten most fortunate authorities are gaining - and the ten least fortunate losing - between 3% and 5% through the DoH formula that has been implemented. However, if monies were to be distributed according to the evidence, then nine authorities are losing between 7% and 11% and ten authorities are gaining over 6% through the implementation of the DoH formula. Of those losing at this level all are in inner-city areas; six in London and the others in Birmingham and Manchester. Of the 20 districts losing 5% or more all are districts containing a higher proportion of inner-city areas.



## APPENDIX

This Appendix lists our estimates of the resource consequences of different models of health care needs. It amplifies that presented in Peacock and Smith (1995), by showing the impact of reallocating the 24% of resources for community health services - which are currently zero-weighted - in the three ways described in the main text. The units of analysis are the 186 District Health Authorities as at April 1992. The Tables show the impact of the various indices as a percentage of the national average per capita. Thus the national per capita average is 100 and a figure of (say) 113.7 implies that the District would get 13.7% more than the national average if the associated needs index were used.

The definition of the columns is as follows

- (a) This column gives the per capita allocations if resources were allocated according to the Department of Health Methods. These entailed a weighted average of the York acute model (64%), the York psychiatric model (12%) and no needs adjustment (24%)
- (b) This column gives the per capita allocations if the resources were allocated according to the York acute index. The SMR used is that described for column (d). The remaining items were derived from the 1991 Census of Population, as detailed in Carr-Hill *et al* (1994)
- (c) This column gives the percentage gain to the District implied by the York acute model compared to the Department of Health choice of method. It is calculated as a percentage increase from column (b) to column (a).
- (d) This column gives the per capita allocation if the bulk of the community resources (see text) were allocated according to the square root of Standardised Mortality Ratio (SMR) for those aged under 75. The SMR used is that for the three years 1990-1992, as supplied by OPCS (see Peacock and Smith, 1995).

- (e) This column gives the percentage gain to the District implied by using the Department of Health choice of method compared to using the SMR weighting for the bulk of the community spend. It is calculated as a percentage increase from column (d) to column (a).
  
- (f) This column gives the per capita allocations if the community spend were allocated to the York acute and psychaiatric indexes according to the existing evidence about the correlates of the conditions which are the object of the different programmes.
  
- (g) This column gives the percentage gain to the District implied by using the Department of Health choice of method as compared to 'evidence-based' weighting. It is calculated as a percentage increase from column (f) to column (a)

		DoH	York	Gain	Ctty/SMR	Gain SMR	Ctty/Need	Gain Need
A01	Hartlepool	113.1480	117.3000	4.5455	115.5463	-2.07565	116.6737	-3.02181
A02	North Tees	108.9600	111.7895	1.3504	111.0007	-1.83844	111.2950	-2.09802
A03	South Tees	114.2880	118.8000	5.8824	116.6548	-2.02890	119.2180	-4.13526
A04	East Cumbria	96.2280	95.0368	-6.4598	96.6122	-0.39771	93.7124	2.68434
A05	South Cumbria	96.5640	95.4789	-4.9014	96.6995	-0.14017	94.2253	2.48205
A06	West Cumbria	102.5200	103.3158	-5.9055	104.5321	-1.92490	101.7401	0.76654
A07	Darlington	104.1040	105.4000	-0.6598	105.3238	-1.15815	105.0210	-0.87314
A08	Durham	113.6840	118.0053	8.2617	115.4318	-1.51415	117.1125	-2.92752
A09	North West Durham	112.2200	116.0789	4.9538	114.3134	-1.83124	114.8126	-2.25809
A10	South West Durham	112.4320	116.3579	4.4505	114.6819	-1.96190	115.3127	-2.49817
A11	Northumberland	101.1320	101.4895	-0.9859	101.6554	-0.51492	100.4521	0.67688
A12	Gateshead	113.3000	117.5000	5.2867	115.5631	-1.95832	117.4157	-3.50525
A13	Newcastle Upon Tyne	115.4560	120.3368	7.5396	117.7149	-1.91893	122.4916	-5.74377
A14	North Tyneside	108.6560	111.3895	3.3298	110.1813	-1.38431	111.2756	-2.35420
A15	South Tyneside	113.4920	117.7526	7.0478	115.4164	-1.66737	118.1796	-3.96649
A16	Sunderland	116.1720	121.2789	6.9479	118.7816	-2.19699	121.1062	-4.07424
B12	Hull	107.1040	109.3474	3.3529	108.2459	-1.05490	108.6714	-1.44232
B13	East Yorkshire	90.9920	88.1474	-6.2262	89.8730	1.24514	86.5903	5.08334
B14	Grimsby	101.8960	102.4947	-2.8486	103.0310	-1.10157	101.1800	0.70760
B15	Scunthorpe	99.1800	98.9211	-5.3387	100.1357	-0.95437	97.4465	1.77890
B22	Northallerton	90.7760	87.8632	-7.9967	89.9639	0.90270	86.3260	5.15484
B23	York	93.9360	92.0211	-4.7401	93.3128	0.66781	90.9792	3.24999
B24	Scarborough	95.0440	93.4789	-2.0137	94.1707	0.92732	92.2976	2.97557
B25	Harrogate	91.9160	89.3632	-7.1069	91.2190	0.76408	88.6873	3.64060
B32	Bradford	112.0400	115.8421	4.0810	114.2047	-1.89549	117.9186	-4.98528
B33	Airedale	96.8400	95.8421	-2.5004	96.5170	0.33465	95.8955	0.98490
B42	Calderdale	105.2320	106.8842	-0.0148	106.5836	-1.26812	107.5404	-2.14658
B52	Huddersfield	103.4080	104.4842	1.5396	103.9487	-0.52014	105.5934	-2.06968
B53	Dewsbury	105.4040	107.1105	0.9524	106.5858	-1.10874	108.0188	-2.42066
B61	Leeds	105.3840	107.0842	2.7680	106.1764	-0.74627	108.0994	-2.51195
B72	Wakefield	103.3920	104.4632	-2.1881	104.7584	-1.30434	104.1566	-0.73406
B73	Pontefract	111.0520	114.5421	4.7961	112.8954	-1.63281	113.0037	-1.72709
C01	North Derbyshire	99.4760	99.3105	-1.5753	99.7054	-0.23010	97.3883	2.14373
C02	South Derbyshire	99.6000	99.4737	-2.3811	99.9997	-0.39972	99.0488	0.55646
C03	Leicestershire	96.2080	95.0105	-1.2365	95.4537	0.79020	95.4409	0.80370
C04	North Lincolnshire	98.0360	97.4158	-1.6995	97.8936	0.14548	96.2366	1.86975
C05	South Lincolnshire	94.6320	92.9368	-5.1665	94.2972	0.35500	91.5053	3.41696
C06	Bassetlaw	101.8840	102.4789	-0.8908	102.5953	-0.69326	100.9721	0.90313
C07	Central Notts	102.8080	103.6947	2.2631	103.1092	-0.29214	101.9704	0.82137
C08	Nottingham	102.6120	103.4368	2.8199	102.7058	-0.09136	103.8227	-1.16609
C09	Barnsley	112.2760	116.1526	7.0531	113.9506	-1.46961	114.4403	-1.89121
C10	Doncaster	109.2280	112.1421	6.8020	110.1953	-0.87783	111.2398	-1.80849
C11	Rotherham	108.6720	111.4105	6.0043	109.6678	-0.90805	110.3323	-1.50480
C12	Sheffield	108.5880	111.3000	7.0192	109.3219	-0.67130	111.9893	-3.03712
D01	Cambridge	89.0880	85.6421	-4.4173	87.0718	2.31554	84.7828	5.07794
D02	Peterborough	98.6360	98.2053	-0.4003	98.3652	0.27526	98.0287	0.61956
D03	West Suffolk	90.1560	87.0474	-7.9838	89.1648	1.11160	85.5301	5.40849
D04	East Suffolk	90.4400	87.4211	-3.1882	88.5603	2.12247	86.3625	4.72141
D06	Norwich	91.5680	88.9053	-1.5446	89.6810	2.10415	87.7834	4.31134
D07	Great Yarmouth	96.7320	95.7000	-0.7261	96.0483	0.71185	94.5733	2.28262
D08	W Norfolk & Wisbech	93.8920	91.9632	-2.2708	92.7697	1.20978	90.4608	3.79299
D09	Huntingdon	87.0960	83.0211	-6.7179	84.9897	2.47824	81.3892	7.01169
E01	North Bedfordshire	91.6040	88.9526	-7.2444	90.8415	0.83941	88.5903	3.40183
E02	South Bedfordshire	97.0640	96.1368	-4.3415	97.1906	-0.13025	96.0543	1.05115
E03	North Hertfordshire	91.6880	89.0632	-4.5411	90.3975	1.42754	88.5812	3.50729
E04	East Hertfordshire	87.4760	83.5211	-7.0956	85.5387	2.26485	82.4204	6.13387
E05	North West Hertfordshire	88.8480	85.3263	-6.4404	87.1478	1.95097	85.0181	4.50485
E06	South West Hertfordshire	90.8560	87.9684	-6.3169	89.6827	1.30826	88.0175	3.22489
E07	Barnet	94.1360	92.2842	-0.8763	92.7536	1.49042	93.2854	0.91180
E08	Harrow	92.6800	90.3684	0.2979	90.7041	2.17838	91.0631	1.77558
E09	Hillingdon	94.4520	92.7000	-3.9378	93.7761	0.72076	92.9634	1.60124
E10	Hounslow & Spelthorne	97.3160	96.4684	-1.6632	96.9275	0.40083	97.4918	-0.18028
E11	Ealing	105.2760	106.9421	3.8273	105.7986	-0.49392	109.1574	-3.55576
E14	Riverside	108.5000	111.1842	5.6884	109.4156	-0.83678	114.7975	-5.48578
E17	Parkside	109.7480	112.8263	9.4339	110.2213	-0.42945	116.6501	-5.91691

		DoH	York	Gain	Ctty/SMR	Gain SMR	Ctty/Need	Gain Need
F01	Basildon & Thurrock	98.0000	97.3684	-2.9228	98.0990	-0.10095	96.3451	1.71763
F02	Mid Essex	88.2440	84.5316	-6.6980	86.4507	2.07438	83.0957	6.19565
F03	North East Essex	94.5000	92.7632	-2.0452	93.4760	1.09547	92.1474	2.55311
F04	West Essex	91.0480	88.2211	-5.9477	89.8776	1.30226	87.1335	4.49249
F05	Southend	94.5200	92.7895	-2.4296	93.5837	1.00053	91.8836	2.86924
F06	Barking, Havering & Brent	97.3120	96.4632	-2.1672	97.0520	0.26789	96.2628	1.08990
F07	Hampstead	109.4360	112.4158	9.0357	109.9089	-0.43029	116.3700	-5.95861
F10	City and Hackney	123.1960	130.5211	16.0187	125.4618	-1.80593	135.2274	-8.89716
F11	Newham	117.1600	122.5789	11.6384	118.9497	-1.50459	126.0211	-7.03141
F12	Tower Hamlets	119.6160	125.8105	12.0307	121.8864	-1.86270	129.7043	-7.77793
F13	Enfield	98.7000	98.2895	2.3849	97.8673	0.85084	99.5649	-0.86873
F14	Haringey	112.4000	116.3158	14.8231	112.4902	-0.08017	119.9459	-6.29107
F15	Redbridge	98.5000	98.0263	0.9540	97.8976	0.61529	99.0897	-0.59509
F16	Waltham Forest	107.4280	109.7737	6.9919	107.8502	-0.39147	112.0889	-4.15823
F22	Bloomsbury & Islington	120.4720	126.9368	14.5639	122.4014	-1.57629	132.1486	-8.83600
G01	Brighton	100.5800	100.7632	3.4529	100.0296	0.55019	101.5059	-0.91214
G02	Eastbourne	91.0400	88.2105	-1.5508	88.9992	2.29306	87.7883	3.70400
G03	Hastings	98.0720	97.4632	3.0266	96.9798	1.12624	97.7759	0.30278
G04	South East Kent	96.0000	94.7368	-0.2770	95.0287	1.02206	93.9726	2.15746
G05	Canterbury & Thanet	97.9440	97.2947	0.4074	97.3369	0.62374	96.9005	1.07687
G06	Dartford & Gravesham	94.6400	92.9474	-6.3974	94.5527	0.09228	92.3153	2.51824
G07	Maidstone	89.3800	86.0263	-7.4986	88.0629	1.49558	84.7773	5.42921
G08	Medway	96.8960	95.9158	-5.3151	97.2096	-0.32259	94.7909	2.22081
G09	Tunbridge Wells	87.5120	83.5684	-8.2674	85.8184	1.97350	82.4950	6.08158
G10	Bexley	94.0560	92.1789	-3.4775	93.1938	0.92514	91.7770	2.48316
G11	Greenwich	108.7560	111.5211	7.1288	109.4783	-0.65980	113.6189	-4.28000
G12	Bromley	91.6120	88.9632	-2.5595	89.9065	1.89698	88.8510	3.10744
G13	West Lambeth	116.9600	122.3158	11.3987	118.7280	-1.48913	126.8274	-7.78021
G14	Camberwell	119.4120	125.5421	11.0010	121.8304	-1.98509	130.1973	-8.28378
G15	Lewisham & N Southwark	114.8640	119.5579	9.5856	116.5214	-1.42242	123.3405	-6.87248
H01	North West Surrey	87.0680	82.9842	-6.7593	84.9332	2.51346	82.6739	5.31492
H02	West Surrey & North East	85.8520	81.3842	-9.4725	83.9327	2.28672	80.0332	7.27043
H03	South West Surrey	85.5560	80.9947	-6.6881	82.9975	3.08265	80.0915	6.82282
H04	Mid Surrey	85.4400	80.8421	-10.0755	83.4975	2.32643	80.7057	5.86615
H05	East Surrey	87.1680	83.1158	-9.1631	85.5456	1.89650	82.6369	5.48309
H06	Chichester	90.3040	87.2421	-3.2793	88.3940	2.16081	86.6911	4.16755
H07	Mid Downs	88.1240	84.3737	-8.5876	86.6641	1.68452	83.5795	5.43732
H08	Worthing	92.9800	90.7632	-1.3444	91.4120	1.71537	90.4028	2.85079
H09	Croydon	97.6360	96.8895	-0.1139	97.0182	0.63677	98.0325	-0.40445
H10	Kingston and Esher	89.7560	86.5211	-6.9666	88.4113	1.52098	86.4105	3.87163
H11	Richmond, Twickenham & Ro	96.3200	95.1579	-0.7738	95.4873	0.87207	96.3443	-0.02519
H12	Wandsworth	110.3040	113.5579	4.5653	111.9060	-1.43159	116.8252	-5.58200
H13	Merton and Sutton	95.7800	94.4474	-0.8947	94.8381	0.99321	95.2258	0.58199
J11	East Dorset	92.4240	90.0316	0.4817	90.3829	2.25826	89.1291	3.69674
J12	West Dorset	91.6720	89.0421	-4.0495	90.2906	1.52990	88.0598	4.10198
J21	Portsmouth	96.0000	94.7368	-2.3332	95.4324	0.59480	94.1557	1.95881
J22	South West Hampshire	94.6200	92.9211	-3.0052	93.8173	0.85563	92.3959	2.40712
J23	Winchester	87.7600	83.8947	-8.2114	86.1282	1.89467	82.7035	6.11399
J24	Basingstoke	86.7080	82.5105	-9.6270	85.0706	1.92478	81.0128	7.02998
J31	Salisbury	89.4600	86.1316	-6.0724	87.8747	1.80399	85.0040	5.24211
J32	Swindon	93.4080	91.3263	-5.5571	92.8100	0.64430	90.2518	3.49715
J33	Bath	89.6800	86.4211	-5.7568	88.0908	1.80410	85.3986	5.01338
J41	Isle of Wight	96.5600	95.4737	-0.1321	95.7081	0.89009	94.6442	2.02419
K11	East Berkshire	91.7680	89.1684	-6.9223	90.9798	0.86635	88.9910	3.12051
K12	West Berkshire	87.1840	83.1368	-9.0407	85.5502	1.90981	82.2429	6.00799
K21	Aylesbury	88.7200	85.1579	-9.0193	87.5253	1.36503	84.1426	5.44002
K22	Wycombe	85.1560	80.4684	-9.7888	83.0910	2.48528	79.5071	7.10486
K23	Milton Keynes	97.0760	96.1526	-4.0393	97.1571	-0.08345	95.3468	1.81360
K31	Kettering	95.6520	94.2789	-5.5321	95.6594	-0.00778	93.6180	2.17269
K32	Northampton	93.3400	91.2368	-8.0274	93.2426	0.10451	90.5992	3.02523
K41	Oxfordshire	89.0280	85.5632	-5.9746	87.3026	1.97639	84.4754	5.38925

		DoH	York	Gain	Ctty/SMR	Gain SMR	Ctty/Need	Gain Need
L11	Bristol and Weston	98.8640	98.5053	0.6182	98.4451	0.42554	98.5009	0.36863
L12	Frenchay	92.5960	90.2579	-3.9810	91.4488	1.25446	89.4244	3.54674
L13	Southmead	93.0040	90.7947	-3.9209	91.9528	1.14316	90.0863	3.23875
L21	Cornwall	96.4360	95.3105	1.1789	95.3124	1.17886	93.8991	2.70170
L31	Exeter	93.1360	90.9684	-1.9737	91.7392	1.52262	90.1766	3.28174
L32	North Devon	92.3360	89.9158	-1.7314	90.6949	1.80950	88.4586	4.38329
L33	Plymouth	98.8720	98.5158	0.3216	98.5326	0.34446	97.6630	1.23791
L34	Torbay	95.2920	93.8053	1.8515	93.7349	1.66118	93.0554	2.40349
L41	Cheltenham	90.2520	87.1737	-5.7582	88.8146	1.67840	86.4613	4.38423
L42	Gloucester	92.7120	90.4105	-4.4286	91.6909	1.11361	89.3595	3.75175
L51	Somerset	91.1960	88.4158	-2.4108	89.3751	2.05734	87.1960	4.58742
M01	Bromsgrove & Redditch	92.9160	90.6789	-4.2461	91.9183	1.08539	89.4158	3.91452
M02	Hereford	91.2840	88.5316	-4.9070	89.9758	1.45394	87.1341	4.76266
M03	Kidderminster	94.4960	92.7579	-5.2524	94.1428	0.37515	91.2846	3.51796
M04	Worcester	91.0840	88.2684	-5.9974	89.9370	1.27528	87.0250	4.66417
M05	Shropshire	95.8680	94.5632	-2.6126	95.3359	0.55815	93.3330	2.71610
M06	Mid Staffordshire	94.3720	92.5947	-7.3126	94.4361	-0.06783	90.7226	4.02254
M07	North Staffordshire	107.0560	109.2842	1.1891	108.6434	-1.46114	108.7551	-1.56228
M08	South East Staffordshire	95.6200	94.2368	-5.9513	95.7270	-0.11175	92.7583	3.08514
M11	South Warwickshire	91.1120	88.3053	-6.9491	90.1536	1.06310	87.7544	3.82619
M13	East Birmingham	113.2680	117.4579	7.4638	115.0167	-1.52038	119.4855	-5.20360
M14	North Birmingham	99.9760	99.9684	-0.5289	100.0707	-0.09463	100.3159	-0.33880
M16	West Birmingham	117.1080	122.5105	9.6782	119.2849	-1.82493	125.9744	-7.03824
M17	Coventry	106.8480	109.0105	2.5499	108.0449	-1.10779	110.5824	-3.37705
M18	Dudley	98.3400	97.8158	-2.0863	98.3506	-0.01080	96.9883	1.39363
M19	Sandwell	109.4240	112.4000	3.5945	111.0574	-1.47080	113.5988	-3.67500
M20	Solihull	92.9040	90.6632	-3.8567	91.8132	1.18811	89.9402	3.29526
M21	Walsall	106.4280	108.4579	1.1734	107.8344	-1.30422	108.9801	-2.34182
M22	Wolverhampton	109.6200	112.6579	5.4849	110.8956	-1.15028	114.3099	-4.10277
M24	North East Warwickshire	98.0400	97.4211	-2.3837	98.0335	0.00662	96.5501	1.54318
M25	South Birmingham	109.3680	112.3263	4.6844	110.7397	-1.23863	114.3372	-4.34610
N11	Chester	98.5280	98.0632	-2.7151	98.7241	-0.19867	97.0726	1.49931
N12	Crewe	97.0040	96.0579	-4.7989	97.2454	-0.24824	94.4653	2.68746
N13	Halton	107.5840	109.9789	2.6881	109.0031	-1.30190	108.5670	-0.90544
N14	Macclesfield	91.9080	89.3526	-6.0435	90.9923	1.00632	88.4266	3.93710
N15	Warrington	101.9600	102.5789	-0.8899	102.6712	-0.69272	101.9840	-0.02349
N21	Liverpool	119.4720	125.6211	9.5214	122.2867	-2.30173	127.0258	-5.94667
N31	St Helens & Knowsley	113.1960	117.3632	6.4036	115.2139	-1.75145	116.4069	-2.75833
N41	Southport & Formby	96.3840	95.2421	-1.9134	95.8394	0.56823	94.4017	2.09981
N42	South Sefton	108.3560	110.9947	3.9277	109.6887	-1.21497	110.4712	-1.91469
N51	Wirral	106.1040	108.0316	1.3429	107.4119	-1.21762	107.5766	-1.36893
P01	Lancaster	103.0920	104.0684	0.0658	103.8831	-0.76150	104.0845	-0.95354
P02	Blackpool, Wyre & Fylde	103.6960	104.8632	1.0242	104.4529	-0.72467	104.3590	-0.63531
P03	Preston	111.2160	114.7579	3.3855	113.3289	-1.86440	116.7001	-4.69932
P04	Blackburn, Hyndburn & Rib	110.6480	114.0105	5.3702	112.1987	-1.38208	115.7678	-4.42245
P05	Burnley, Pendle & Rossend	112.2440	116.1105	7.2119	113.8044	-1.37108	117.7918	-4.70985
P06	West Lancashire	101.1800	101.5526	1.3499	101.2375	-0.05683	100.3684	0.80864
P07	Chorley & South Ribble	96.9760	96.0211	-3.3021	96.8867	0.09218	94.6514	2.45594
P08	Bolton	110.8120	114.2263	5.0840	112.4712	-1.47525	115.6192	-4.15779
P09	Bury	103.7560	104.9421	-0.0551	104.7401	-0.93960	105.2157	-1.38731
P10	North Manchester	129.2640	138.5053	14.1841	133.2747	-3.00937	143.2794	-9.78185
P11	Central Manchester	131.9800	142.0789	15.7938	136.2277	-3.11807	148.1115	-10.89144
P12	South Manchester	117.9680	123.6421	11.0890	120.0691	-1.74990	126.5350	-6.77047
P13	Oldham	112.0680	115.8789	3.7412	114.3189	-1.96896	117.7324	-4.81128
P14	Rochdale	112.8080	116.8526	5.1779	114.9333	-1.84918	118.5938	-4.87867
P15	Salford	116.8040	122.1105	5.4495	119.8662	-2.55472	123.3917	-5.33885
P16	Stockport	98.1800	97.6053	-3.4567	98.4258	-0.24971	97.2673	0.93838
P17	Tameside & Glossop	108.5120	111.2000	1.4599	110.3877	-1.69917	111.8929	-3.02152
P18	Trafford	100.8320	101.0947	0.3920	100.9600	-0.12682	101.4785	-0.63712
P19	Wigan	110.6600	114.0263	4.2288	112.5186	-1.65184	112.8631	-1.95200

## REFERENCES

### Footnotes for Table 1

- a* Brenner M H [1979] Mortality and the National Economy Lancet 2 568-573 *and* [1979] Unemployment, Economic growth and Mortality, Lancet i, p 672, 24th March
- b* Rose G, Marmott MG [1981] Social class and coronary heart disease British Heart Journ 45,13-19
- c* Donovan J [1984] Ethnicity and Health- a research review, Social Sci and Med 19, p 663, also Platt S [ 1984] Soc Sci and Med 19, p 111
- d* The Annual Report of the Director of Public Health for 1988 [1989] Chap 5 part 1 Walsall Health Authority
- e* Doll R [1983] Prospects for Prevention BMJ 286, 445
- f* Williams AJ, [1991] Low high density lipoprotein cholesterol and other coronary heart disease risk factors, Journ Amer Board Fam Pract, 285-297
- g* Rosenman KD [1984] Cardiovascular disease and workplace exposure , Archives of Environmental Hlth, May-June p 1218, *and* Mazumdar S, Sussman N, [1983] Relationships of air pollution to health, results from the Pittsburgh study Archives of Envir Hlth, January-February, p 17
- h* Doll R [1983] Prospects for Prevention BMJ 286, 445
- i* Chamberlain J Miller DL, [1982 ] Gynaecological Cancers in Epidemiology and Diseases, Edit DL Miller and RTD Farmer, Blackwell Scientific Publications
- j* Great Britain Office of Census and Surveys [ 1978] Occupational Mortality Decennial Supplement Series DS no1 HMSO
- k* Kuipers EJ, Uytterlinde AM, Pena AS, Roosendaal R, Pals G, Nelis GF, Festen HP, Meuwissen SG, [ 1995] Long term sequelae of helicobacter pylori gastritis, Lancet 345[8964] :1525-28 Jun 17th *and* Burstein M, Mongue E, Leon-Barua R, Lozano R, Berendson R, Gilman RH, Legua H, Rodriguez C, [ 1991] Low peptic ulcer prevalence and high gastric cancer prevalence in a developing country with a high prevalence of infection with helicobacter pylori, Journ of Clin. Gastroenterol 13 [2] :154-56 April
- l* Kendrick D [ 1993] Prevention of pedestrian accidents, Archives of Disease on Childhood 68[ 5] :669-72 May *and* Sparkes G, Craven MA, Worth C [1994] Understanding differences between high and low childhood accident rate areas, Journ of Public Hlth Med 16[4] :439-46, December
- m* Smith KR, Waitzman NJ, [1994] Double jeopardy: interaction effects of marital and poverty status, Demography 31[3] :487-507 August
- n* Kendrick D [ 1994] Childrens safety in the home, Public Hlth 108[1] 21-25 January *and* Roberts I [ 1994] Sole parenthood and the risk of child pedestrian injury Journ of Paediatrics and Child Health 30[6] :530-32 December
- o* Lewis G Booth M [1994] Are cities bad for your health? Psychological Medicine 24[4] :913-15 November
- p* Donovan J [1984] Ethnicity and Health- a research review, Social Sci and Med 19, 663
- q* Dean G, Walsh D, Downing H, Sheeley E [1981] Brit Journ of Psych 139 506
- r* Hart DJ, Dawson J, Fitzpatrick RM, Boulton M, Mc Lean J Brookes M, Parry JV [ 1993] Risk behaviour, anti-HIV and anti-hepatitis B core prevalence in clinic and non-clinic samples of gay men in England 1991-1992, AIDS 7[6]:863-69 Jun
- s* Matson SC, Pomeranz AJ, Kamps KA [1993] Early detection of sexually transmitted disease in pregnant adolescents of low socioeconomic status, Clinical Pediatrics, 32[10]:609 -12
- t* Hobfall SE, Jackson AP, Lavin J, Brotton PJ, Shepherd JB [1994] Reducing inner-city womens AIDS risk activities, Health Psychology 13[5] 397-403
- u* St Lawrence JS, Brasfield TL, [1995] HIV risk behaviour amongst homeless adults , AIDS

**Footnotes for Table 3**

- a* Kempen G I Suumeijer TP[ 1991] Factors influencing professional care utilisation amongst the elderly , Soc Sci and Med, 32[1] 77-81 *and* Illiffe S , Tai SS, Haines A, Gallivan S, Goldenburg E, Booroff A, Morgan P [1992] Are elderly people living alone an at risk group? BMJ, 305[6860] 1001-4 Oct 24th
- b* Kaltreider DF, Schulyer K, [1980] Epidemiology of Pre-term delivery, Clin Obst and Gynae 23,1 17 *and* Newton R, Weberter P, Muskey N, Phillips A[ 1979] BMJ, Psycho-social stress in pregnancy and its relation to 'premature labour.2, 411 18th August
- c* Brennan M and Opit LJ [1973] The unwanted birth and the Family Planning Service, Journ Biosoc Sci 6,407
- d* Report of the Director of Public Health for 1988 and 1992 [1989 and 1993] Wallsall Health Authority and many other similar reports from other DHAs
- e* as refs d also Judge K, Benzeval M,[ 1993] Health Inequalities, new concerns about the children of single mothers, BMJ, 306[6879] 677-80 March 13th *and* Brennan M [ 1978] Association of Childhood poverty with housing status and unemployment Journ of Epidemiol and Commun Hlth 32,28
- f* Mc Coy CB, Smith SA, Metsch LR, Anwyl RS, Correa R, Bankston L, Zavertnik JJ [ 1994] Breast cancer screening in the medically underserved, Cancer Practice 2[4] :267-7 4 July *and* Sutton S, Bickler G, Sancho-Aldridge J, Saidi G, [ 1994] Prospective study of predictors of attendance for breast screening in inner London, Journ of Epidemiol and Comm Hlth 48[1] :65-73 *and* McEwan SR, Davies HT, Allan E, Mclean D, Forbes CD, [ 1993] Measurement and management of cardiac risk factors Is screening worthwhile?, Scottish Medical Journal 38[6] :173-77
- g* Blackburn C [1993] Gender class and smoking cessation work, Health Visitor, 66[3]:83-85
- h* Mc Callister G Farquhar M [1992] Health Beliefs a cultural division, Journ of Advanced Nursing 17[12] ;1447-54 *and* Lee AJ, Crombie IK, Smith WC, Tunstall- Pedoe HD [1991] Cigarette smoking among the unemployed Soc Sci and Med 33[11] :1309-12 *and* Cupples ME Mc Knight A [ 1994] Randomised control trial of health promotion in general practice, BMJ 309[6960] :993-96 Oct 15th
- i* Zarod BK, Lennon MA [1992] The effect of school dental screening on dental attendance, Comm Dental Hlth 9[4] :361-68
- j* Pringle M, Morton Jones A, [ 1994] Using unemployment trends to predict prescribing trends in England, Brit Journ of Gen Pract 44[379] ;53-56 *and* Ebrahim S [1995] Changing patterns of consultation in General Practice, Fourth National Morbidity Study, 1991-1992 Brit Journ of Gen Pract, June 45, 395, p283 *and* Carlisle RD, Johnstone SP, Pearson JC, [1993] Relation between night visiting rates and deprivation measures in one general practice, BMJ, 306[6889] :1383-85 May 22nd

## Textual References

- Baird D [1980] Environment and Reproduction Brit Journ of Obst and Gynae, 87, 12
- Balarajan R, Bulsu L, Adelstein AM, Shukla V,[1984] Patterns of Mortality amongst migrants to east and West from the Sub-Indian Continent-BMJ 289,1185
- Bartley M [1994] Unemployment and ill health, understanding the relationship, Journ of Epidemiology and Community Health, 48[4] 333-37, August
- Black J [1985] Asian Families - conditions that may be found in children BMJ 16th March
- Brennan M and Hebel R [1975] Socio-economic factors associated with unwanted births to married women, Journ Biosoc Sci 7,463-472
- Brennan M and Lancashire R [1978] Association of Childhood Mortality with housing status and unemployment, Journ of Epidem and Comm Hlth, 32,1, 28-33
- Brennan M [1978] Association of Childhood poverty with housing status and unemployment, Journ of Epidemiol and Commun Hlth 32,28
- Brenner MH [1971] Economic changes and Heart Disease mortality, Amer Journ Pbl Hlth 61,606, and [1979] Unemployment, economic growth and mortality, Lancet 24th March, p 672
- Bull MJ. [1994] Use of formal community services by elders and their family caregivers two weeks following discharge, Journ of Advanced Nursing 19[ 3] 503-8 March
- Carlisle RD, Johnstone SP, Pearson JC [1993] Relation between night visit rates and deprivation measures in one general practice, BMJ, May 22nd, 306,6889, p1383-85
- Carr-Hill R et al [1994] A formula for distributing NHS revenues based on small area use of hospital beds. Centre for Health Economics, University of York.
- Child Poverty Action Group, reports from various years. Child Support Agency, reports from various years.
- Condie RG, Terry PB[ 1983] Ethnic differences in Birthweight. Post graduate Journ.59,655
- Cook DG, Cummin RO, Bentley MJ, Shaper AG [1982] The health of unemployed, middle aged men in Great Britain, Lancet i Jun 5th 1290-4
- Dellasega C [1991] Caregiving stress, Journ of Community Nursing 8[4]197-205
- Donovan J [1984] Ethnicity and Health- a research review, Social Sci and Med 19, 663
- Ebrahim S [1995] Changing patterns of consultation in General Practice, Fourth National Morbidity Study, 1991-1992 Brit Journ of Gen Pract, June 45, 395, p283
- Esposito L [1994] Home Health care management ; Home Health Care Nurse 12[3]38-43
- Gilles P, Elwood JM, Hawtin P [1985] Anxieties in Children about unemployment and war. BMJ,



291, 383-84

Hammerstrom A [1994] Health Consequences of Youth Unemployment; Public Health, 108[6] 403-12

Hanger HC, Mulley GP [1993] Stroke 24[4] 536-38 April

Judge K, Benzeval M, [1993] Health Inequalities, new concerns about the children of single mothers, BMJ 306[6879] :677-80

Kaltreider DF, Schulyer K, [1980] Epidemiology of Pre-term delivery, Clin Obst and Gynae 23,1 17

Kasl and Cobb [1968] JAMA, 206, 1500-1507

Kendrick D [1994] Childrens safety in the home, Public Hlth 108[1] 21-25 January

Lancet Editorial [1982] Enquiries into perinatal and later childhood deaths, Feb 27th, p 487

Lancet Editorial [1984] Inequalities in Health The Black Report p 200.

Lee AJ, Crombie IK, Smith WC, Tunstall-Pedoe HD [1991] Cigarette smoking and employment status, Social Sci and Med, 33[11] 1309-12

Lee flank RL, Klein-Hesselink DJ, Spruit IP, [1992] Health effects of Unemployment, Men and Women Social Sci and Med, 34, 4, Feb 351-63

Mahoney DF, Shippee-Rice R. [1994] Training family care givers of older adults, Journ of Comm Hlth Nursing 11[2] 71-78.

Mcallister G, Farquhar M [1992] Health Beliefs a cultural division, Journ of Advanced Nursing 17[12] 1447-54 Dec

Mays N and Bevan G [1987] Resource Allocation in the Health Service, London: Bedford Square Press.

Moser V, Fox A and Jones DR [1984] Unemployment and Mortality an OPCS longitudinal study, Lancet ii 1324-9

Moser, Goldbaltt, Fox and Jones [1987] BMJ 294 86-90

Newton R, Weberter P, Muskey N, Phillips A [1979], Psycho-social stress in pregnancy and its relation to premature labour BMJ, 2, 411 18th August

NHS Executive [1994a] HCHS revenue capitation allocation : weighted capitation formula, Leeds: NHS Executive.

OPCS [1987] General Household Survey for 1985 London HMSO.

OPCS [1986] General Household Survey for 1984 London HMSO.

- Peacock S and Smith P [1995] The Resource Allocation Consequences of the New NHS Needs Formula, Discussion paper 134. University of York
- Royston GHD, Hurst JW, Lister EG and Stewart PA [1992] Modelling the use of health services by populations of small areas to inform the allocation of central resources to larger regions. Socio-Economic Planning Sciences 26[3] 169-180.
- Rushing B, Ritter C and Burton RP [1992], Race differences of multiple roles of health Journ of Hlth and Soc Behav 33[2]126-39
- Sheldon T et al [1995] Review of the Research on the Effectiveness of Health Service Interventions to reduce variations in health, CRD Report 3, NHS Centre for Reviews and Dissemination, University of York.
- Sheldon T and Carr-Hill RA [1992] Resource allocation by regression in the NHS: a statistical critique of the RAWP review, Journal of the Royal Statistical Society (Series A), 155[3] 403-420.
- Smaje C [1995] Health, Race and Ethnicity London Kings Fund
- Smith R [1987] Unemployment and Health - a disaster and a challenge, Oxford OUP
- Terry PB, Condie RG, Matthew PM, Bissenlich JF [1983] Ethnic Differences in the distribution of congenital malformations, Post Grad Med Journ 59,657
- Turner JB, Kessler RC, House JS, [1991] Factors facilitating adjustment to unemployment; American Journ of Comm Psychol ,19[4] 521-42
- Walsall Health Authority [1989] Annual Report of the Director of Public Health 1988.
- Walsall Systems for Purchasers [1992] Health Needs Care Assessment: A case study - Preventive services for maternity patients for Development of Information Systems for Purchasers IMG Implementation project for the DOH
- Webb A, Friedmann ML [1991] Six years after an economic crisis, Journ of Community Health Nursing, 8[4] 233-43
- Welwood I, Dennis MS, Warlow CP [1994] Perceptions and knowledge of stroke amongst surviving patients and their carers , Age and Ageing 23[4] 293-98 July
- West Midlands Regional Health Authority [1983] Report of the Regional Perinatal Working Party
- West Midlands Regional Health Authority [1983] Perinatal Working Party Report WMRHA
- Woolf and Waterhouse J [1945] Studies on Infant Mortality, Journ of Hygiene 44,67-98
- Yuen P and Balarajan R [1989] BMJ 298, 1212-4
- Zarod BK, Lennon MA [1992] The effect of school dental screening, Community Dental Health, 9[4] 361-68 Dec.