

concern about the added effects of ozone depletion, the recommendations in the consensus statement seem a reasonable position to take. They should be promoted in a way that suggests that people can still enjoy outdoor activities while reducing their sunlight exposure. The recommendations will do little harm at the least and should have the potential to reduce the incidence of what is now becoming a public health problem in many countries throughout the world.

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Race, ethnicity, culture, and science

Researchers should understand and justify their use of ethnic groupings

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Race and ethnicity are commonly used variables in medical research. Each year about 2500 papers are indexed under the headings "ethnic groups" or "racial stocks" on Medline¹; many more control for ethnic group or cultural differences during analysis. Patterns of disease, response to treatment, and the use of services are increasingly being explained in ethnic or racial terms, and from next April providers in the NHS must collect "ethnic data."

However, substantial problems exist with this burgeoning literature. The categories of race or ethnic group are rarely defined, the use of terms is inconsistent, and people are often allocated to racial or ethnic groups, arbitrarily.² Some researchers use the original Blumenbach classification³ and class "Asians" as "Caucasian," though modern definitions often class "Asians" as "black."⁴ Some use "Afro-Caribbean" for people of African or Caribbean descent; others use it for people who are black and of Caribbean ancestry. The King's Fund no longer uses the term "ethnic" because of its heathen connotations and classes all disadvantaged groups as "black populations," believing that the experience of racism is paramount.⁴ Meanwhile, the Commission for Racial Equality uses the term "ethnic minorities," believing that cultural and religious differences are important (Commission for Racial Equality, personal communication).

Race is often used interchangeably with ethnicity or culture, though race is thought to be biologically determined and ethnicity and culture are ideas derived from social theory. This results in research findings that are difficult to compare and a host of inappropriate hypotheses and discussions.² A common mistake is to produce biological explanations when the variable used—for example, ethnicity or culture—is socially or politically determined. Biological and genetic factors do not underlie ethnicity or culture, and in this week's journal Senior and Bhopal call for the abandonment of ethnicity as a synonym for race (p 327).⁵

But even if the terms were used consistently, the studies would still be undermined by the uncertainty over the standing of race, ethnicity, and culture as scientific variables.^{6,7} Race is characterised by a handful of

phenotypical features⁸ but modern genetic techniques have undermined the scientific validity of this category. Geneticists have shown that the differences between classically described racial groups (10% of genetic variation) are only slightly greater than those which exist between nations (6% of variation), and both of these are small compared to the genetic differences within a local population (84% of genetic variation).⁹

Culture is a social construct which is characterised by the behaviour and attitudes of a social group. Determined by upbringing and choice, culture is constantly changing and is notoriously difficult to measure.⁸

Of all the variables, "ethnic group" is probably the most difficult to use. Such groups are characterised by a sense of belonging or group identity¹⁰ (so the common practice of researchers assigning people to ethnic groups may lead to error); they are determined by social pressures and psychological needs; and they are dynamic. Hence in one American study where people had to assign themselves to an ethnic group in two consecutive years, one third of the population chose a different ethnic group on the second occasion.¹¹

Faced with the complexity of categorisation of ethnic groups, some researchers have used terms such as ethnicity and ethnic origin, which combine colour with the place of birth of subjects or their parents—mixing biological and social theory to produce variables of doubtful validity.

Many of the terms used, such as "Asians," are so heterogeneous that their place in formulating hypotheses is questionable.¹² Most systems of classification would class all the warring factions in Bosnia as one ethnic group together with groups as culturally diverse as the Swedish and the Iranians (white/ Caucasian) and ignore the diversity of cultural and religious life in Africa (black African). In addition, these variables are strongly confounded by social class, deprivation, and educational achievement; Polednak found that although age specific mortality in "blacks" was higher than that in "whites" in Suffolk, adjustment for achieved educational level reversed this.¹³

Given all of these criticisms, some people have argued

against the use of race or ethnic groups as variables except in research into the impact of racism and disadvantage due to cultural differences on the use and provision of health care.² It was specifically to address inequalities that "ethnic" data were included as part of the contract minimum datasets, which provider units in the NHS will have to generate for each patient. The proposed categories are based on those used by the Office of Population Censuses and Surveys—a political and pragmatic classification designed for a census rather than to demarcate sociocultural differences.¹⁴ The chief medical officer is clear that these broad categories may not be sensitive enough to identify important local variations.¹⁵ The availability of such data will, however, lead to a host of papers looking at "ethnicity" and, for example, hospital admissions, length of stay, and use of services. These papers will be limited by the doubtful validity of the variables, their mutability, and their substantial confounding by socioeconomic and educational status—information not recorded in the contract minimum dataset. To discover why different groups have different experiences of health and what can be done to redress the balance we need to disentangle the influences of racism, education, unemployment, and social deprivation.

A thorough investigation of the validity of current classifications is urgently needed; in the meantime, science could be greatly improved by adopting the methodological rigour expected elsewhere in medical research. This would include a discussion of the relevance of collecting data on ethnic group; a description and explanation of the categories, how they are to be used, and the logic underlying them; and the measurement of possible confounders. Any hypothesis should be consistent with the conceptual framework used—whether biological, sociological, or interactional.

In 1991 Bhopal and colleagues called for a wide debate to establish internationally acceptable principles guiding classification and description of ethnic groups.¹² In this

issue Senior and Bhopal give nine recommendations on how to make ethnicity a sounder epidemiological variable. If these guidelines were to be followed then new research in this field might start to be comparable and could improve our understanding of differences in health between ethnic groups.

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Public health and the 1991 census

Non-random underenumeration complicates interpretation

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National censuses provide authoritative data on populations and housing. These results inform public understanding and the governance of society, particularly in respect of strategic planning and the allocation of resources. Assessment of health needs, the purchase and provision of services, equality of access, and evaluation of health outcomes—concerns of providers and purchasers—are also contingent on such information.

The 1991 census broke new ground in two respects, both with major dividends for public health research. It asked respondents whether they had a limiting long term illness or handicap and it asked them to identify their ethnic group.

This last census covered 97.8% of Britain's population—a lower proportion than in previous censuses.¹² Comparisons with population estimates based on the 1981 census show that the latest census "missed" some 1.2 million people, half of them young adults but also sizeable numbers of young children and very elderly people. The post-census validation survey located only

about a fifth of this shortfall. Census undercoverage in 1991 was not random: it was higher in inner London and other metropolitan areas and among men in their 20s (9% overall and almost 20% in inner London).¹² Particular types of households—those in converted or shared accommodation and those in inner London—were also undercounted.¹ These patterns of non-response resemble those of previous censuses and of national social surveys such as the general household survey.³ Several factors, however, probably contributed to the higher undercount in this census compared with others, such as the increases in one person households and transient populations, census procedures relating to communal establishments, and the unpopularity of the poll tax, leading young people (mainly men) to avoid enumeration.²⁻⁵ Dorling and Simpson illustrate the importance of allowing for undercoverage in particular applications of census data.⁴

To correct for the estimated undercoverage, the Office of Population Censuses and Surveys has developed adjustment factors for inflating the census counts in age-