Commentary: Socioeconomic inequalities and child growth

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The article by John Pemberton ‘Malnutrition in England’, which appeared in the University College Hospital Magazine in 1934,1 looked at the effects of poor nutrition on child health at a time when this was considered a major problem in Britain. The paper raised a key association that nowadays no one would refute, that of deprivation with poor nutrition and impaired child growth. Dr Pemberton based his observation on an analysis of the cost of providing the minimum diet, as recommended by the British Medical Association, for a typical family consisting of a husband and wife and three children, versus the statutory unemployment benefit for such a family. The comparison permitted Pemberton to conclude that they could buy at the least 48%, and at the most, 74% of the requisite amount of food to keep themselves healthy and able to work. The same results were seen for any size of family. A comparable investigation, arriving at similar conclusions, had been carried out 2 years earlier by Dr Crowden and colleagues from the London School of Hygiene and Tropical Medicine.2 Based on the two reports, in conjunction with the rates of unemployment benefits in place at the time, the author concluded that the majority of the unemployed and their families must be suffering from what he called ‘chronic under-nourishment’.

To illustrate the effect this situation has on the health status of the affected families, Pemberton used a then recent investigation of the health and nutritional status of preschool children in Newcastle. The study compared a sample of children from unemployed, low-paid working-class families with a control sample chosen from well-to-do professional families. The comparison yielded striking differences between the two groups in terms of attained linear growth, weight status, and indicators of anaemia and respiratory infections. The investigators concluded that the low standard of health in the sample of poor children was preventable, and due mainly to overcrowding and under-nourishment.

There are interesting parallels between the paradox referred to by Dr Pemberton—a world where large quantities of food are burnt annually at the same time that hundreds of people are under-fed—and the situation in many parts of the world today. English children have come a long way since those early days and, today, the vast majority enjoys high levels of health and nutritional status. Indeed, concern is being raised about the opposite problem, i.e. overweight and obesity.3 A recent investigation reported that between 1989 and 1998, among 3–4 year old English children, there was a 60% increase in the prevalence of overweight and a 70% increase in the prevalence of obesity.4 However, this is not the case for millions of children worldwide. Child malnutrition remains a major public health problem in developing countries.5 In some countries rates of stunting—a process of failure to reach linear growth potential—are rising, while in many others they remain disturbingly high.6

The health and social consequences of the current high prevalences of child malnutrition are severe. It is now recognized that about 60% of childhood deaths occurring every year are attributable to malnutrition,7 and a recent global analysis demonstrates that childhood malnutrition is the leading cause of the global burden of disease.8,9 Children suffering from impaired growth tend to have more severe diarrhoeal episodes and are more susceptible to several infectious diseases such as malaria, pneumonia, or meningitis. Similarly, there is strong evidence that poor growth is associated with impaired cognitive development and a number of studies have demonstrated a relationship of growth status with school performance and intellectual achievement.10–12 Child stunting leads to significant reduction in adult size;12 one of the main consequences of small adult size resulting from stunting during childhood is reduced work capacity,13 which in turn has an impact on economic productivity. The implications of the long-lasting consequences of impaired child growth are enormous for the human and socioeconomic development of the affected populations.

The observation made by Pemberton of the direct link between social deprivation and poor nutritional status and ill health is today well-founded on empirical evidence. On a population basis, high levels of stunting are associated with poor socioeconomic conditions and increased risk of frequent and early exposure to adverse conditions such as illness and/or inappropriate feeding practices.14 Similarly, a decrease in the national stunting rate is usually indicative of improvements in overall socioeconomic conditions of a country.15 To illustrate this point, Figure 1 presents the height-for-age z-score distribution, by quartiles of per capita family income, for a national sample of Brazilian children compared with the National Center for Health Statistics (NCHS)/WHO international growth reference distribution. As Figure 1 shows, the entire Brazilian distribution shifted to the right in moving from the lowest to the highest income quartile distribution until it overlaps with that of the NCHS/WHO reference in the highest quartile of per capita income. Similarly, based on national-level data for four countries (Bolivia, Nepal, Pakistan, and Peru), Figure 2 shows the association between height-for-age and maternal education. What is striking is the similarity in the pattern of the association and dose–response relationship; the rate of stunting declines as levels of education increase across the four countries. This intrinsic link between poverty indicators and anthropometric deficits has not only made child-growth assessment an excellent means for evaluating the health and nutritional status of...
Figure 1  Height-for-age by quartiles of per capita income in a national sample of Brazilian preschool age children (Source: Ref. 16)

Figure 2  Variation of height-for-age according to maternal educational level for four national samples of preschool age children (Source: Ref. 14)
children but also provided a measurement of the health inequalities faced by entire populations.17

Pemberton ends his paper by questioning the capacity of the medical profession to deal with the situation given the number of reports documenting increasing numbers of malnourished and infected children. In his view, the solution lies out of reach of the ‘Art of Medicine’ as the problem is rooted in the inability of families to meet their basic needs such as food, housing, and health care. However, the medical community can play an important role by raising public awareness of the problem, and by doing so, mobilize political commitment to make the legislative changes that will ensure that citizens receive welfare services that will allow them to cover their basic needs. Despite 70 years difference, there is some resemblance between the situation faced by Dr Pemberton and his colleagues in the 1930s and that faced by the scientific and health community today. Last year, nearly 11 million children died before they reached the age of 5 years. More than half of these children did so of diseases that could have been easily prevented or treated.8 Given these numbers and the fact that so many lives could be saved with the implementation of relatively simple measures, it is surprising that child health does not receive more attention. This year, and with similarities to the ‘Committee Against Malnutrition’ described in Pemberton’s paper, a working group formed by researchers in the area of child health will be established in Bellagio, Italy, assisted by The Lancet, to refocus the world’s attention on child health and make it an international health priority once again.18 The working group is expected to lay out what must be done to avoid millions of preventable deaths and improve child health in a meaningful way. The question will then be whether there is adequate political commitment at national and international levels to do what is necessary.

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References
2 Crowden GP et al. The minimum cost of physiologically adequate diets for working class families. Lancet 1932;I:899.