Cultural incorporation of the ORT message

SIR,—The decade of the eighties saw enormous interest in promoting oral rehydration therapy (ORT) as a simple, easily accessible, effective, and low-cost treatment for diarrhoea. International donor agencies such as UNICEF and WHO, and many governmental and non-governmental organisations, have been leaders in promoting this therapy.

In Bangladesh, a house-to-house programme to give instructions about how to make ORT at home with salt and sugar was done over 10 years between 1980 and 1990.[1] Conducted by BRAC, a local non-governmental organisation, the programme reached over 14 million rural mothers. The government programme included production of oral rehydration salt (ORS) sachets, their distribution through static centres and outreach workers, and instruction of government health workers on their use. Many pharmaceutical companies marketed their own brands of ORS. Messages on ORS and ORT were developed for radio and television, although access to such media was limited because only 20% of households have radios and only a few have televisions.

An objective of the BRAC programme was to make ORT a part of the culture—ie, that mothers would transmit the information to their children, as they pass on ideas of folk medicines or cultural values. Transmission of ideas, however, takes time, and thus the cultural incorporation of ideas has been little investigated. Nor did we have the time or a ready-made method to conduct the necessary studies. Recently, however, an educational study of 2100 children aged 11–12 years provided useful information on the inter-generational transmission of this health message. The study (called the assessment of basic competencies, or ABC)[2] aimed to examine the level of basic education of Bangladeshi children. The definition of basic education included skills in reading, writing, simple arithmetic, and knowledge of selected so-called essential life skills. The survey organisers regarded knowledge of treatment for diarrhoea as an essential life skill. Bangladeshi children were asked: "what is the first treatment for diarrhoea?". Nearly three-quarters knew of ORS/ORT as the treatment for diarrhoea:

Schooling	*% reporting knowledge of ORS/ORT*
None (n = 356)	56
3 years (n = 268)	67
5 years (n = 407)	79
Total (n = 2100)	72

Many of these children were not born when their mothers were taught about ORT. Although some non-formal education programmes include ORT and other public health measures, ORT is not in the curriculum of the country's formal schooling system. Why knowledge of ORT improved with time in education may have more to do with heightened comprehension than any increased exposure to the idea of ORT through the schooling system. Even among children who never attended school, knowledge was substantial; they probably learned about ORT from their mothers, older siblings, other family members, neighbours, and/or from the radio. In most aspects of basic education, boys did better than girls, although knowledge of ORS/ORT was one of the few areas in which girls did better[3]—perhaps because of their early involvement in the care of younger siblings. These results have been confirmed by another study done in February, 1993, of 2520 children of the same age group.[4] What should be explored is how the message about ORT has been transferred from one generation to the next, and what elements of the BRAC programme and other efforts have been effective in making knowledge of this treatment a part of local culture. Other public health programmes could learn from this experience. What is not clear from the survey is how effectively ORT is used.

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Is PCR a viable option for population screening?

SIR,—Theoretically, the polymerase chain reaction (PCR) is the most sensitive test for the detection of infectious pathogens, and, in practice, its sensitivity exceeds that of animal transmission studies, which may represent the lower limit of clinical relevance.[1] For many infectious agents, hepatitis C virus (HCV) in particular, the specificity and extreme sensitivity of PCR makes it superior to standard serological tests in the determination of carrier state, and false-negative serological results have led to the suggestion that PCR should replace antibody testing for screening.[2] However, PCR is expensive and time consuming, and is generally regarded as unsuitable for the mass screening of clinical samples.[3]

By arranging the samples to be tested in a two-dimensional array, either physically or conceptually, pooling the samples in both columns and rows (figure), and doing PCR on the pooled samples and those individual samples found to be positive by "grid referencing", it is possible to increase the efficiency of screening. Assuming one positive, and both negative reagent and sample controls, are run concurrently, and grid-reference-positive samples are not retested, the screening load of grid-referenced PCR (the number of samples to be assayed) increases at $2n + 3$, where n is the dimension of the array, while the screening rate (the number of samples about which information is obtained) increases at n^2 (figure, a). Thus, to screen a 20x20 array (400 samples) by grid-referenced PCR, a minimum of 43 individual PCR reactions would need to be run.

Assuming a single positive in the samples tested, the screening multiple (the ratio between the screening rate and the screening load) also increases exponentially (at a rate $n^2/2n + 3$) and in a 20×20 array is 400/43 or 9·3, meaning information is obtained on 9·3 samples for every one tested. However, the wider application of this approach is limited by the introduction of "test false positives" created by the grid-reference system (figure, b). The number of false positives (^FP) generated by grid referencing and requiring subsequent PCR is a function of the number of true positives (P), and of the distribution of those positives, but will maximally increase according to the equation $^FP = P^2 - P$, meaning that the overall screening load increases at a rate $2n + 3 + (P^2 - P)$, and the screening multiple by $n^2/2n + 3 + (P^2 - P)$. The efficiency of