Dyer *et al.*[8] emphasized the arbitrary aspect of cut-off points, there being a continuous strong, graded relationship, independent of other major risk factors, between systolic and diastolic blood pressure greater than 120 mm Hg systolic and 80 mm Hg diastolic and morbidity and mortality from cardiovascular disease. They also cited the MRFIT study of 350,000 people between 30 and 57 years of age, which concluded that 57 percent were at high normal or hypertensive, and only 18 percent optimal.

The letter of Sharma raises very interesting phylogenetic issues. We suggested that a prime feature of savannah existence in the interior of continents was paucity of sodium supply. There would therefore have been a selection pressure favouring sodium appetite and avid ingestion when occasionally the opportunity presented through licks and salt springs. Adequate sodium was essential to the reproductive process.

It is feasible that there may have been considerable biological variation in the rate at which any sodium in excess of that retained to repair any extant body deficit would have been excreted by hominoids. But given that any ingestion would have been episodic only, rather than there being sustained high intake, such biological variation would have been without significance in terms of natural selection, even if accompanied by transient rise in blood pressure —whether the salt source was encountered by hominid or pongid[9].

The implications of biological variation in rate of excretion of any sodium ingested over and above that needed immediately would have become relevant only late in hominid evolution. Continuous liberal access and large intake of salt came with the advent of the agricultural era with commercial organization of salt sources and its use in food preservation and pickling — over the last few thousand years.

For the individual human, there are important medical sequelae according to whether or not there is the capacity to excrete chronic excess dietary salt load without involving an equilibrium state with rise of blood pressure. This focuses a further question: To what significant degree, if at all, do such medical sequelae occurring in phylogenetically recent times, influence reproductive success and represent a natural selection pressure favouring relatively "salt-resistant" individuals in the population?

The large increase in mean life expectancy is recent. With hunter–gatherer societies, evidence indicates that menarche was later than in present western society, first birth was in late teens and the birth interval was 4–5 years. Thus, reproduction could have occurred in the late thirties and early forties[10]. Possibly, according to society organization, premature death or incapacity of parent in early midlife might have been influential on prospects of adolescents, including reproductive success. But, in general, any disorder that occurs largely in the postreproductive years would exert little selection pressure. Possibly this is the case with human high blood pressure, albeit with a reservation that with some racial groups the nature of socio-economic conditions, or a history of recent transition from hunter-gatherer to urban existence, has resulted in the triad of obesity, insulin-resistant diabetes and early-onset hypertension[1,11].

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Defending attacks on statistics

To the editor — While I share Swift's irritation with critics who unthinkingly disparage statistically significant results generated from small samples (see *Nature Med.* **1**, 1134; 1995), I think there are a number of broader considerations which may, perhaps unconsciously, inform their judgement and justify some of their reservations.

Two important arguments support people's intuitive suspicion of significant results obtained from small samples. These relate to the power of the study, which as Swift points out, is the main attribute affected by sample size. The first argument leads bluntly to the conclusion that a significant result from a small sample is less likely to represent a true positive than one based on a large sample. Taking a Bayesian view, if the (unknown) probability of the alternative hypothesis being true is denoted t, the critical significance level is denoted α and the power, which is the probability of achieving that level if the alternative hypothesis is true, is denoted P, then it is clear that the probability of a significant result being a true positive is $Pt/(Pt + \alpha(1 - t))$. Obviously, the smaller the sample size, and hence the lower the power, then the lower the probability will be.

The other main way that power can and should impact on the interpretation of significant results is indirectly through the effects of publication bias. When small samples are studied, by and large the only results which get written up, submitted and published are those that are statistically significant. While the statistical assessment of any one study may well be valid, this selection process is certain to yield a misleading picture of the field as a whole, and one may easily see why people might then feel hesitant about accepting such results for publication.

The topic is complex and worthy of wide debate. To dismiss out of hand significant results from small samples is wrong, but it is also wrong to dismiss all "down-grading" of them as "non-scientific" when there are some legitimate causes for concern.

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Swift replies — I thank Dr. Curtis for his support of the general principle