

Scientists link closer kinship with reproductive success

February 7 2008

In a paper published today deCODE scientists establish a substantial and consistent positive correlation between the kinship of couples and the number of children and grandchildren they have. The study, which analyzes more than 200 years of deCODE's comprehensive genalogical data on the population of Iceland, shows that couples related at the level of third cousins have the greatest number of offspring.

For example, for women born between 1800 and 1824, those with a mate related at the level of a third cousin had an average of 4.04 children and 9.17 grandchildren, while those related to their mates as eighth cousins or more distantly had 3.34 children and 7.31 grandchildren. For women born in the period 1925-1949 with mates related at the degree of third cousins, the average number of children and grandchildren were 3.27 and 6.64, compared to 2.45 and 4.86 for those with mates who were eighth cousins or more distantly related.

The findings hold for every 25-year interval studied, beginning with those born in the year 1800 up to the present day. Because of the strength and consistency of the association, even between couples with very subtle differences in kinship, the authors conclude that the effect very likely has a biological basis, one which has yet to be elucidated. The paper, 'An association between the kinship and fertility of human couples,' is published online in *Science* magazine.

This study provides the most comprehensive answer yet to the longstanding question of how kinship affects fertility in humans.

Previous studies in other parts of the world have suggested that the two phenomena are positively correlated, though confounding variables, such as the impact of socioeconomic status on the size of families or age at marriage, have made the results difficult to interpret.

The analysis of such a long-term series of data from Iceland effectively eliminates these variables by encompassing an entire population which has historically been highly homogeneous both culturally and economically. Moreover, the results are strikingly consistent from eras in which Iceland was a predominantly poor and rural country, to the present-day era of a highly urbanized society with one of the highest standards of living in the world.

The authors note that the findings are somewhat counterintuitive from an evolutionary perspective because closely-related parents have a higher probability of having offspring homozygous for deleterious recessive mutations, although closer parental kinship can also decrease the likelihood of immunological incompatibility between mother and offspring, for example in rhesus factor blood type.

Perhaps most importantly, today's findings also suggest that the recent and dramatic demographic shift experienced in Iceland – from a rural society to a highly urbanized one – may serve to slow population growth, as individuals are exposed to a much broader range of distantly related potential mates. If so, this could be of relevance to slowing population growth in the many other – and much more populous – societies around the world undergoing transition from closely-knit rural societies to more urbanized ones. Indeed, the UN estimates that in the 2007-2008 period the majority of the world's population will, for the first time in human history, live in town and cities.

Source: deCODE genetics

Citation: Scientists link closer kinship with reproductive success (2008, February 7) retrieved 24 April 2024 from

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