Kissing cousins, arranged marriages and genetic diversity

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Credit: Jeff Belmonte / Wikipedia

In the first study of its kind, a research team led by Massey University professor Murray Cox et al., in a publication in the advanced online edition of *Molecular Biology and Evolution*, has examined the effects of arranged marriages on genetic diversity.

From hemophilia and color blindness amongst British and Russian monarchies, people have long known the potential damaging genetic consequences of inbreeding. But until recently, no one could measure or understand the impact of marriage rules on genetic diversity.

Amongst the traditional culture of the Indonesian Rindi, with an isolated population of just a few thousand on the island of Sumba, marriage rules dictate that a man ideally marries his first cousin on his mother's side, with an aim to consolidate wealth and power by bringing the bride into his family's sphere of social influence.

Armed with new DNA sequencing and a computer simulation tool called SMARTPOP, the team wanted to understand two key questions: 1) What are the expected genetic consequences of following the marriage rules? 2) From their genetic detective work, how closely do the Rindi actually follow the rules?

According to the team's simulations, the Rindi marriage rules should lead to a reduction in genetic diversity.

But in a surprising result, their data shows that the Rindi don't always strictly follow the rules, showing a relaxed compliance (long-term averages indicate two out of three adhere to the rules, based on their analyses) that produced a genetic diversity similar to random mating. The authors conclude that, in the end, the Rindi marriage rules are treated with enough flexibility to form social connections without having a harmful effect on biological diversity.

"People like to say they follow the rules, but actually we're all really good at looking the other way if people don't. Our work suggests that sometimes that's a good thing," Cox said.

With SMARTPOP, the research team has developed a useful open-

source tool for the research community to examine how other marriage rules throughout the world may affect human diversity.

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