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Preconception sex selection for non-medical reasons: a representative survey from Germany

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BACKGROUND: Preconception sex selection for non-medical reasons raises serious moral, legal and social issues. The main concern is based on the assumption that a freely available service for sex selection will distort the natural sex ratio and lead to a severe gender imbalance. However, for a severe gender imbalance to happen, at least two conditions have to be met. First, there must be a significant preference for children of a particular sex, and second, there must be a considerable demand for preconception sex selection. To ascertain whether or not these two conditions are met, we have conducted a survey in Germany. METHODS: As a representative sample of the German population, 1094 men and women aged 18–45 years were asked about their gender preferences and whether or not they could imagine selecting the sex of their children through flow cytometric separation of X- and Y-bearing sperm followed by intrauterine insemination. RESULTS: 58% of respondents stated that they do not care about the sex of their offspring. 30% wish to have a family with an equal number of boys and girls. 4% would like to have more boys than girls, 3% more girls than boys, 1% only boys and 1% only girls. For first-borns, however, there is still a preference for boys over girls. While 75.6% claimed to have no gender preference, 14.2% would like their first child to be a boy and 10.1% would like their first child to be a girl. Whereas 6% could imagine taking advantage of preconception sex selection, 92% found this to be out of the question. Even in the hypothetical case that a medication for sex selection were ever to become available, 90% stated that they would not want to use it. CONCLUSION: Given that a majority does not seem to care about the sex of their offspring and only a minority seem to be willing to select the sex of their children, a freely available service for preconception sex selection for non-medical reasons is rather unlikely to cause a severe gender imbalance in Germany.

Key words: sex selection/sperm sorting/gender preferences/sex ratio distortion

Introduction

MicroSort, a potentially safe and effective technology for the flow cytometric separation of X- and Y-bearing sperm, may soon increase the interest in preconception sex selection for non-medical reasons (Fugger *et al*., 1998; Stern *et al*., 2002). Since such a practice poses serious moral, legal and social problems, it has become one of the most controversial issues in bioethics today (American Society of Reproductive Medicine, 2001; Robertson, 2001; Human Fertilisation and Embryology Authority, 2002). One concern is that preconception sex selection for non-medical reasons may constitute an inappropriate use of limited medical ressources (Hill *et al*., 2002). A second concern is that it may perpetuate sexist attitudes and reinforce discrimination against women by paying undue attention to gender itself (Dai, 2001). A third concern is that children born as a result of sex selection may be expected to act in certain gender-specific ways and risk being resented by their parents if they fail to do so (Davis, 2001). A fourth concern is that sex selection may accelerate the disturbing trend towards selection of offspring characteristics and the creation of 'designer babies' (Fukuyama, 2002).

Still, the main concern is that a freely available service for preconception sex selection may distort the natural sex ratio and lead to a gender imbalance in our society, as has occurred in countries such as India, China and Korea (Benagiano and Bianchi, 1999; Allahbadia, 2002; Mudur, 2002; Plafker, 2002). Even uncompromising advocates of procreative liberty concede that sex ratio imbalances would 'justify limits on reproductive choice' (Robertson, 2001). However, whether or not a sex ratio imbalance poses a real threat to Western societies is, of course, an empirical question that cannot be answered by intuition, but only by evidence. For a gender imbalance to happen, there must be (i) a strong preference for children of a particular sex, and (ii) a considerable demand for

Table I. Questionnaire

Suppose you did not have any children but would very much want to.
1. If given a choice, would you like your first born child to be
   a boy
   a girl
   do not care
2. If you would like to have more than one child, would you prefer to have
   only boys
   only girls
   more boys than girls
   more girls than boys
   an equal number of boys and girls
   do not care
3. It may soon be possible for parents to choose the sex of their children. Couples interested in such a service would have to visit a Fertility Center, provide a sperm sample, undergo an average of three to five cycles of intrauterine insemination, and to pay a fee of €2000 per attempt. Would you take advantage of this technology?
   yes
   no
4. Suppose the procedure would require just a single cycle of intrauterine insemination, could be performed in any doctor's office, and would be covered by your health insurance. Would you then consider taking advantage of it?
   yes
   no
5. Suppose there was a medication enabling parents to choose the sex of their children. Couples simply had to ingest a blue pill to ensure the birth of a boy or a pink pill to ensure the birth of a girl. Would you take advantage of such a medication?
   yes
   no

preconception sex selection. To ascertain whether or not these two preconditions are met, the Center for Dermatology and Andrology and the Clinic for Psychosomatic Medicine and Psychotherapy at the University of Giessen have conducted a representative survey on preconception sex selection for non-medical reasons in Germany.

Methods and results

Using omniTel®, a randomized, computer-assisted telephone interview tool provided by FORSA (the German Institute for Social Research and Statistical Analysis), 1094 people aged 18–45 years responded to five questions (Table I). This was a response rate of 70.7%; all respondents were German-speaking and those of non-German origin were <10%. A more precise ethnic origin was not known.

(i) Participants were asked if, given a choice, they would want their first-born child to be male or female. 14.2% of respondents would like their first child to be a boy, 10.1% would like the first child to be a girl, and a majority of 75.7% stated that they do not care about the sex of their first-born child (Figure 1).

(ii) Provided they would like to have more than just one child, participants were asked, if, given a choice, they would want only boys, only girls, more boys than girls, more girls than boys, as many girls as boys or whether the sex of their children would not matter to them at all. 1% prefer only boys, 1% only girls, 4% more boys than girls, 3% more girls than boys, 30% would like to have as many girls as boys and 58% find it to be of no importance what sex their children will be (Figure 2).

(iii) Participants were then asked if they could imagine selecting the sex of their children by using MicroSort. In order to make an informed decision, they were told what this technology entails. Participants were informed that they would have to visit a Center for Reproductive Medicine, to provide a sperm sample for separation via flow cytometry, to undergo an average of three up to five cycles of intrauterine insemination, and to pay a fee of approximately €2000 per attempt. Whereas 6% of respondents could imagine taking advantage of MicroSort, 92% found it to be out of the question (Figure 3).

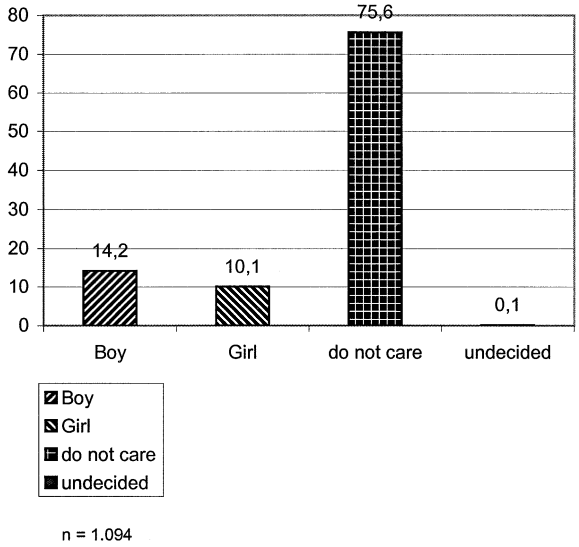

Figure 1. Gender preferences for first-born child.

(iv) To establish whether the 92% who declined using MicroSort are in fact not interested in selecting the sex of their children or simply found the procedure to be too demanding, we asked them if they could imagine making use of this technology if it required only one cycle of intauterine insemination and if it were covered by their health insurance.

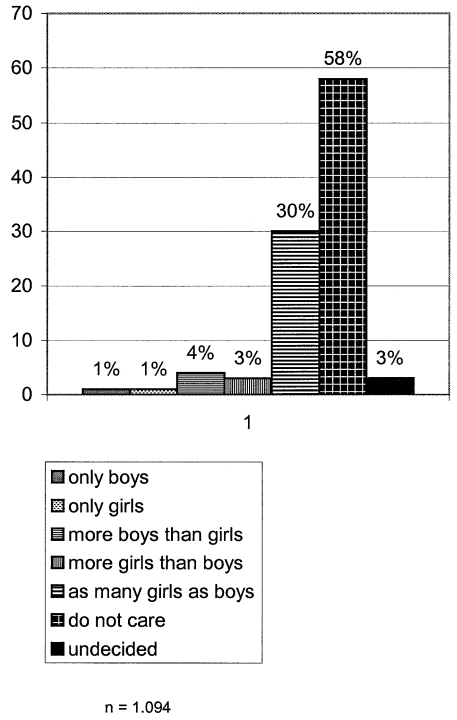

Figure 2. Gender preferences for all children born.

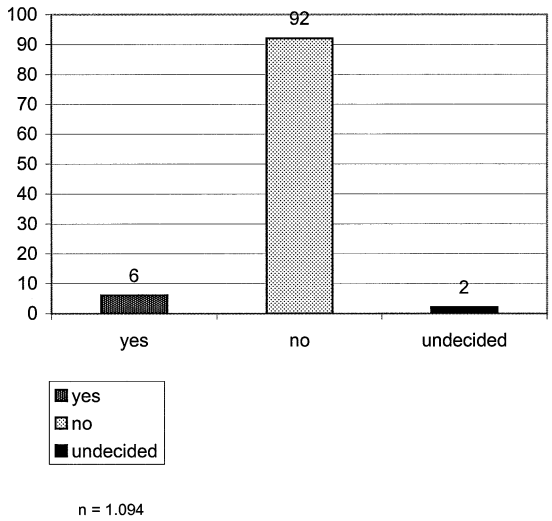

Figure 3. Interest in preconception sex selection when couples have to undergo three to five cycles of intrauterine insemination and have to pay for the treatment themselves.

Given these less demanding circumstances, 5% were prepared to consider utilizing MicroSort, while 94% still rejected the idea of using it (Figure 4).

(v) Finally, we asked the participants to imagine that there was a medication to select the sex of their children. Rather than visiting a Center for Reproductive Medicine, they would simply have to ingest a 'pink pill' to ensure the birth of a girl or a 'blue pill' to ensure the birth of a boy. While 8% would be willing to use such a medication, 90% of respondents would not want to do so (see Figure 5).

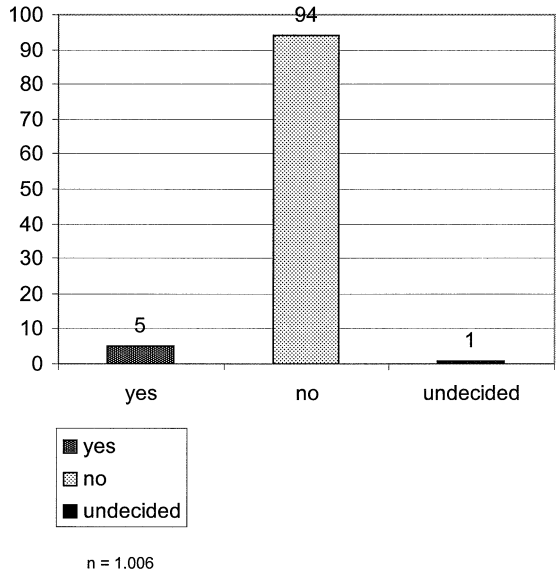

Figure 4. Interest in preconception sex selection if couples had to undergo just a single cycle of intrauterine insemination and treatment was covered by health insurance.

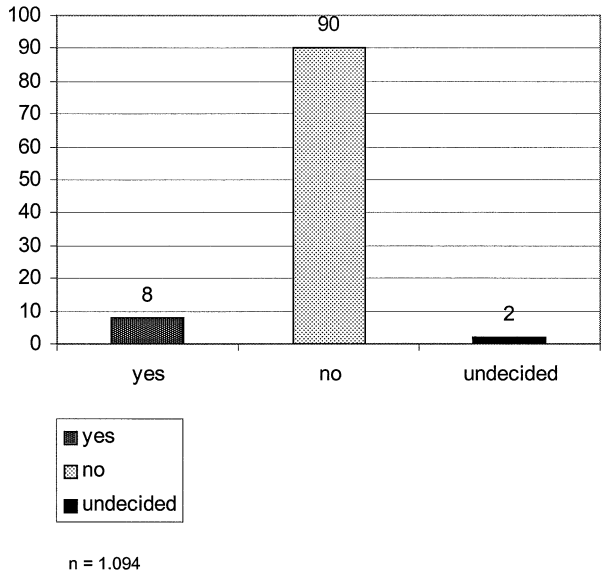

Figure 5. Interest in preconception sex selection if there was a medication to select the sex of their children.

Discussion

According to our survey, there is no evidence of a strong preference for children of a particular sex and only a modest interest in preconception sex selection for non-medical reasons. If this holds true, a freely available service for preconception sex selection is likely to have only a negligible societal impact.

The results of our survey are consistent with previous findings which support a similar conclusion. For example, in a British survey, conducted at the Center for Family Research of the University of Cambridge, 2359 pregnant women were asked 'Do you mind what sex your baby is?' Response options were 'prefer a boy'; 'quite like a boy'; 'quite like a girl'; 'prefer a girl'; and 'no preference'. '58% of responders said they had

no preference for a child of a particular sex; 6% said they would prefer a boy and 6% a girl; 12% would quite like a boy and 19% a girl' (Statham *et al*., 1993).

Perhaps even more instructive than surveys are data published by so-called 'Gender Clinics'. Worldwide, there are about 65 centres that offer some method of sperm sorting followed by intrauterine insemination. According to The London Gender Clinic, within its first 18 months it had been consulted by only 809 couples (Liu and Rose, 1995). Of the 809 couples, 468 were of Indian origin, 259 European, 29 Chinese and the remaining 55 of other ethnic origins. The majority of European couples were seeking sex selection to 'balance their family', i.e. they already had two or three children of the same sex and wanted to have at least one child of the opposite sex: 'Our study shows that well over 95% of couples came for this sole purpose. They are predominantly men and women in their mid-30s nearing the end of their reproductive life and having on average 2–3 children of the same sex' (Liu and Rose, 1996). Similarly, the Gender Clinic of New York City reports that all of the 120 American couples seeking sex selection were doing so for family balancing purposes: 'They selected girls when they had boys at home and boys when there were only girls' (Khatamee *et al*., 1989). Likewise, Gametrics Limited in Alzada, Montana, which detailed the collective experience of 65 Gender Clinics says: 'The overwhelming majority had two or more children of the same sex and desired a child of the opposite sex (Beermink *et al*., 1993). And finally, a report of the Genetics & IVF Institute in Fairfax, Virginia, which is currently conducting a clinical trial on the safety and efficacy of MicroSort, states: 'The majority of couples (90.5%) in our study were seeking gender preselection for family balancing purposes, were in their mid-thirties, had two or three children of the same sex, and desired only one more child' (Fugger *et al*., 1998).

In summary, the available evidence suggests that a readily available service for preconception sex selection for non-medical reasons will have only a negligible societal impact and is unlikely to cause a severe gender imbalance.

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