Knowledge and attitudes towards preimplantation genetic diagnosis in Germany

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BACKGROUND: Preimplantation genetic diagnosis (PGD) is a technique which is often related to emotional debates because of its ethical and social implications. Worldwide there are different forms of legislation; Germany constitutes an interesting case because of the historical background concerning eugenics and dealing with handicapped persons at the time of national socialism. PGD is currently not legal but there are still polarized positions and legalization remains an issue. Studies about the attitudes of the general population towards PGD are rare.

METHODS: Data were collected in a representative survey carried out in November 2003. Subjects were 2110 persons in Germany aged 18–50 years. RESULTS AND CONCLUSIONS: Respondents had little knowledge about PGD. There were incorrect assumptions about the diagnostic possibilities and a lack of basic genetic knowledge. A tendency towards a general acceptance of PGD for medical indications was found. Non-medical indications such as sex selection were generally not accepted. It could be observed that respondents who already had a notion about PGD overestimated the diagnostic possibilities and would eventually use PGD in the future more than respondents who had never heard about PGD before.

Key words: assumed indications of PGD/knowledge about PGD/lay attitudes/preimplantation genetic diagnosis

Introduction

It is an aim of science to discover laws and patterns in (human) life, and the attempts to sequence the human genome follow this tradition. Important goals have been achieved in this field. Many genes have been identified and held responsible for many diseases. The best-known example of this research is the worldwide ‘human genome project’ (http://www.doegenomes.org). Technical developments in human genetics made a predictive genetic diagnosis possible in the early stages of human development and therefore enabled the study of diseases that might occur later in life. This type of diagnosis can be found in prenatal diagnostic procedures and has a broad acceptance by the public. Modern techniques, especially IVF, which has been established in reproductive medicine since 1978, first made it possible for science to access the human embryo. These parallel developments actually made preimplantation genetic diagnosis (PGD) possible. PGD is a technique used to diagnose specific genetic disorders of an embryo. Here, couples with an above-average risk for a genetic disease undergo IVF and the resulting embryos are tested. Only those embryos which do not show the genetic disposition for the disease are implanted in the uterus.

A valid PGD was reported for the first time in 1989 and this technique was first implemented in England to assess the sex of an embryo because of a X-chromosome-related disease (Handyside et al., 1989). The idea behind PGD is two decades older (Edwards, 1965).

To date, >1000 children have been born after PGD, and the application possibilities range from monogenic determined, X-chromosomal recessive, to the predisposition to malign diseases (Strowitzki, 2003). Nevertheless, PGD is most frequently used in aneuploidy screening (PGD-AS) to improve the pregnancy rate within IVF (Delhanty et al., 1993; Munné et al., 1999; ESHRE PGD Consortium Steering Committee, 2002; Katz et al., 2002). Here, PGD is not used as a diagnostic instrument, but as a tool for quality assurance of IVF.

PGD is also used and offered for ‘social sexing’, i.e. selecting the sex of an embryo without any medical indication (Malpani, 2002; Pennings, 2002). It is possible that further developments will lead to new medical and non-medical indications for PGD in the future (Harper et al., 2001; International Working Group on Preimplantation Genetics, 2001; Strowitzki, 2003). The combination of PGD with HLA-typing can be taken as an example of these novel medical developments. In this very recent therapeutic application, PGD is used ‘not only to allow couples to have an unaffected child, but also to select a potential donor progeny for stem cell transplantation’ (Verlinsky et al., 2004, p. 2079). However, creating a child as a donor is linked to many ethical, social and psychological problems which are currently being discussed (Knox, 2003).
In some countries, such as the USA, India, Spain and the UK, PGD is already being practised regularly. In Germany and Austria, by contrast, PGD is not explicitly regulated. Ethical concerns and problems related to PGD are still being taken into account and discussed in every country, whether they already practise PGD or not.

In Germany there has already been a pro-PGD vote from the commission for public and ethical issues in the German Association for Human Genetics. They stated that PGD should be available for all women, but under special restrictions (Nippert, 2000). The German National Ethic Council followed this vote in its statement from January 23, 2003 (German National Ethics Council, 2003). Other commissions and organizations such as the Catholic and Protestant church in Germany or the Enquete Kommission ‘Ethics and Law in Medicine’ voted against PGD (Enquete Kommission, 2002; Strowitzki, 2003). Germany represents a special case for regulations regarding PGD which does not seem surprising, when the recent history of this country and especially the treatment of disabled persons and eugenics under the Nazi regime is considered. The discussion about legalization of PGD in Germany focuses on possible long-term consequences of this technique and is being held in a very emotional and polarized way. Different arguments show the lack of consensus between different groups and their conflicting cost-benefit analyses (Enquete Kommission, 2002; German National Ethics Council, 2003).

Several studies (Viville and Pergament, 1998; Henneman et al., 2001; Shirai, 2001; Lavery, 2002; Pardo, 2002) showed that, in those countries in which PGD is allowed and practised, the technique is evaluated from different perspectives. In Japan, for instance, different surveys showed that attitudes towards PGD are changing: in 1996 and 1997, respondents of the survey had more favourable attitudes than the respondents in 2000 (Shirai, 2001). In contrast to this, the information about PGD had increased when comparing the years 1997 and 2000: 58% had heard about PGD in 2000 compared to 36% in 1997 (Shirai, 2001). Persons interested in PGD, such as couples or experts, include positive and negative aspects in their evaluation. PGD is without doubt a labour-intensive and expensive technique, which requires expertise in embryology, molecular genetics and reproductive endocrinology (Lavery, 2002). Spanish and English patients who had already undergone PGD named the avoidance of a therapeutic termination of pregnancy as the main benefit of PGD (Lavery, 2002). On the other hand, patients perceived the low success rate of IVF as the main disadvantage of this procedure. With a take-home baby rate of 15–20% at best, it does not seem surprising that these couples perceive it as an important factor, considering that most of them are fertile (Lavery, 2002). A study with parents of children affected by cystic fibrosis in the Netherlands showed that only 18% of all parents planning to have more children would consider using methods such as PGD, adoption, or artificial insemination (Henneman et al., 2001). Further, although a great number of affected persons (parents of children with cystic fibrosis and adult patients with this disease) would consider prenatal diagnosis, abortion is less accepted within this population, with gender—more women than men would terminate the pregnancy—and religious conviction affecting the willingness to terminate a pregnancy of an affected child (Henneman et al., 2001).

The fact that these debates are only held in circles of experts seems inadequate considering that the broad population will be confronted with the consequences of legalizing (or not) PGD. The study of the impact of certain information on the general population seems very important, due to the fact that ‘upset and upheaval are likely to accompany the societal change that growth in genetic knowledge is bringing about. Psychologists and sociologists who study the impact of change and adaptation to new information will have a role in helping those making rules for this changing society to understand how threatening such new information can be, especially when it relates to such basic human concerns as reproduction and physical and mental illness’ (Patenaude et al., 2002, p. 277).

Studies about the attitudes of the general population towards PGD are rare even on an international level. Previous studies about genetic testing and prenatal genetic diagnosis in the general population have revealed that the attitudes towards this subject can be seen as rather ambiguous and complex. Still, a consensus can be seen in the fact that non-medical reasons do not legitimate the practice of this testing (Hietala et al., 1995; Michie et al., 1995; Singer et al., 1999). This is also shown in the discussion about sex selection (Ethics Committee of the American Society of Reproductive Medicine, 1999, 2001; Pennings, 2002). Dahl et al. (2003) interviewed a representative sample of the German population and found that only a minority in Germany would care for selecting the sex of their children. Further, they could not observe a clear preference for children of a particular sex. Finally, and based on these results, they concluded that it is not probable that sex selection through PGD or other procedures (such as MicroSort) will change or distort the natural sex ratio in Germany (Dahl et al., 2003).

In this study we assessed the attitude of the German general population towards PGD with a survey conducted on a representative sample.

The aim of this paper is to assess the influence of knowledge, information and sociodemographic aspects on attitudes towards PGD.

Materials and methods

The results of this study emerge from the research project ‘Knowledge and attitudes towards controversial medical and ethical issues in reproductive medicine and preimplantation genetic diagnosis (PGD)’ supported by the German Federal Ministry of Education and Research (BMBF, registration number: 01GP0205/0255). Some preliminary results of this study were presented at the ESHRE annual meeting, 2004 (Borkenhagen et al., 2004).

Data were collected in a representative survey, which was assigned by the University of Leipzig and carried out in November 2003 by the market research institute USUMA, Berlin. The sample was weighted regarding sex and age to fit the characteristics of the German population. Data from the statistical Ministry provided information about the population structure of Germany regarding
the distribution of men and women aged 18–50 years. This information was compared to the proportions of sub-groups in the sample. For every person, USUMA provided a weighting factor which resulted from the division of the ideal values of a group (real distribution in the German population) and the actual proportion of this group in the sample.

The elected individuals were personally approached by the interviewer who collected the sociodemographic information face-to-face, but the self-report attitude questionnaire was filled out by the respondents themselves still in the presence of the interviewer.

The subjects of this study were 2110 persons in Germany, aged 18–50 years. The average age was 35.8 years. More information about the sample is summarized in Table I.

The questionnaire used to assess people’s knowledge and attitudes towards PGD contained questions about information sources and knowledge-level regarding the subject of PGD. (Some of the items were developed in cooperation with the research group around Prof. Richter and Prof. Zoll from the Marburg University, Germany.) Respondents were asked to estimate whether they had heard, read or watched something about PGD and to self-evaluate their knowledge about this subject. Afterwards, every respondent received the same abstract with information about PGD which summarized the medical facts of this technique.

Table I. Sociodemographical characteristics of the sample

<table>
<thead>
<tr>
<th>Table I. Sociodemographical characteristics of the sample</th>
<th>Total</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>35.8</td>
<td>35.4</td>
<td>36.0</td>
</tr>
<tr>
<td>SD</td>
<td>9.1</td>
<td>9.3</td>
<td>8.8</td>
</tr>
<tr>
<td>Age groups (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–30</td>
<td>641 (30.4)</td>
<td>315 (33.9)</td>
<td>326 (27.6)</td>
</tr>
<tr>
<td>31–40</td>
<td>739 (35.0)</td>
<td>297 (32.0)</td>
<td>442 (37.4)</td>
</tr>
<tr>
<td>41–50</td>
<td>730 (34.6)</td>
<td>317 (34.1)</td>
<td>413 (35.0)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married, living together</td>
<td>1138 (53.9)</td>
<td>458 (49.3)</td>
<td>680 (57.6)</td>
</tr>
<tr>
<td>Married, separated</td>
<td>29 (1.4)</td>
<td>13 (1.4)</td>
<td>16 (1.4)</td>
</tr>
<tr>
<td>Single</td>
<td>712 (33.7)</td>
<td>384 (41.3)</td>
<td>328 (27.8)</td>
</tr>
<tr>
<td>Divorced</td>
<td>194 (9.2)</td>
<td>67 (7.2)</td>
<td>127 (10.7)</td>
</tr>
<tr>
<td>Widowed</td>
<td>37 (1.8)</td>
<td>7 (0.8)</td>
<td>30 (2.5)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without degree</td>
<td>19 (0.9)</td>
<td>5 (0.5)</td>
<td>14 (1.2)</td>
</tr>
<tr>
<td>8th class</td>
<td>625 (29.6)</td>
<td>293 (31.5)</td>
<td>332 (28.1)</td>
</tr>
<tr>
<td>10th class</td>
<td>974 (46.2)</td>
<td>385 (41.5)</td>
<td>589 (49.9)</td>
</tr>
<tr>
<td>Intermediate study</td>
<td>90 (4.3)</td>
<td>34 (3.7)</td>
<td>56 (4.7)</td>
</tr>
<tr>
<td>without degree</td>
<td>231 (10.9)</td>
<td>101 (10.9)</td>
<td>130 (11.0)</td>
</tr>
<tr>
<td>12th class without university degree</td>
<td>151 (7.2)</td>
<td>97 (10.4)</td>
<td>54 (4.6)</td>
</tr>
<tr>
<td>University degree</td>
<td>20 (0.9)</td>
<td>14 (1.5)</td>
<td>6 (0.5)</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>1167 (55.3)</td>
<td>734 (79.0)</td>
<td>433 (36.6)</td>
</tr>
<tr>
<td>Part time</td>
<td>247 (11.7)</td>
<td>12 (1.3)</td>
<td>235 (19.9)</td>
</tr>
<tr>
<td>Per hour*</td>
<td>77 (3.7)</td>
<td>0 (0)</td>
<td>77 (6.5)</td>
</tr>
<tr>
<td>Army/maternity leave</td>
<td>47 (2.2)</td>
<td>5 (0.5)</td>
<td>42 (3.6)</td>
</tr>
<tr>
<td>Unemployed/short-term job</td>
<td>166 (7.9)</td>
<td>81 (8.7)</td>
<td>85 (7.2)</td>
</tr>
<tr>
<td>Pensioner</td>
<td>16 (0.8)</td>
<td>7 (0.8)</td>
<td>9 (0.8)</td>
</tr>
<tr>
<td>Not employed/housewife</td>
<td>212 (10.0)</td>
<td>4 (0.4)</td>
<td>208 (17.6)</td>
</tr>
<tr>
<td>In training</td>
<td>47 (2.2)</td>
<td>26 (2.8)</td>
<td>21 (1.8)</td>
</tr>
<tr>
<td>In school (or university)</td>
<td>131 (6.2)</td>
<td>60 (6.5)</td>
<td>71 (6.0)</td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1275 (60.4)</td>
<td>472 (50.8)</td>
<td>803 (68.0)</td>
</tr>
<tr>
<td>No</td>
<td>835 (39.6)</td>
<td>457 (49.2)</td>
<td>378 (32.0)</td>
</tr>
<tr>
<td>Church affiliation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1576 (74.7)</td>
<td>668 (71.9)</td>
<td>908 (77.0)</td>
</tr>
<tr>
<td>No</td>
<td>533 (25.3)</td>
<td>261 (28.1)</td>
<td>272 (23.0)</td>
</tr>
</tbody>
</table>

Values in parentheses are percentages.

*Per hours = persons working only by the hour.

The questionnaire also contained a section of specific and general attitudes towards PGD and its legalization in Germany. First, respondents had to estimate whether the following diseases and conditions can be diagnosed by PGD or not: ‘strong psychological and physical disability’, ‘any kind of disease or handicap’, ‘sex’, ‘physical characteristics, e.g. height, hair colour, eye colour’ or ‘personality aspects, e.g. aggressiveness, introversion’.

Subsequently, different hypothetical conditions and diseases were presented: ‘a disease where the child will die during the first year of age’, ‘a chronically disabling disease which leads to death in early adulthood’, ‘Down syndrome’, ‘cancer with onset in late adulthood’, ‘risk for heavy overweight’, ‘below-average intelligence’ and ‘sex selection’. Respondents had to state for each condition: (i) whether they agreed or disagreed to legalization of PGD in Germany, and (ii) whether they themselves would use PGD in these cases.

For all questions mentioned above, respondents could answer ‘yes’, ‘no’ or ‘do not know’.

Finally, data about emotions and thoughts associated with this topic were collected. Therefore, a list with 10 emotions and thoughts was presented and respondents could choose more than one.

Data were analysed with descriptive as well as inferential statistical procedures. Significance levels of differences between frequencies were assessed through χ²-analysis and analysis of variance (ANOVA) was used to test differences between means. Three-way ANOVA was also used to assess interactions between the variables age, sex and education.

Results

Knowledge about PGD

To the question: ‘Have you heard, read or watched something about PGD before today?’ 59.9% of all respondents denied that they had; 30.2% stated that they had perceived something about this subject and 9.9% were not sure (N = 2110).

There was an influence on the response tendencies of the variables sex, age and education. More women than men had a notion about PGD. Respondents aged 31–40 years knew about PGD more often than respondents in the other age subgroups. Persons with a higher educational degree had heard, read or watched something about this topic more often than others (see Figure 1).

Self-evaluated knowledge

When considering only those respondents who had already perceived something about PGD, 13% of them would...
estimate their knowledge as ‘good’ or ‘very good’ and 40% as ‘low’ or ‘very low’. 47% of these respondents stated that their knowledge was average.

**Information sources of PGD**

An important question was which sources respondents had used to gain information about PGD. Television was named as the most important source with 50%. In second place appeared (weekly) journals. Radio and the internet were the less important sources of information about this subject (see Figure 2).

In the future, respondents would prefer to gain information by talking to experts on the subject (53%), television (43%) and journals (35%).

**Assumed indications for PGD**

All respondents were asked to estimate which diseases can be diagnosed with PGD. The majority of respondents (79%) stated that PGD can be used to assess ‘strong psychological and physical disability’. The indication assumed less (17%) was the diagnosis of ‘personality aspects’. Interestingly, only 43% said that the sex of an embryo can be ascertained through PGD (see Figure 3).

**Legalization of PGD in Germany**

When respondents were asked how PGD should be regulated in Germany, most respondents would be in favour of a restricted legalization, only 3% would legalize it for all characteristics, and 20% would not want PGD legalized by any reason (see Table II).

**Public allowance of PGD in Germany and eventual personal utilization**

The majority of respondents would agree to permit PGD in the case of some conditions, such as a disease where the child dies during the first year of age (76%) or in the case of Down syndrome (70%). Social sexing was the least accepted indication for the legalisation of PGD in Germany (8%) (see Table III).

The most significant differences were seen in the hypothetical cases of cancer in late adulthood, below-average intelligence, risk for heavy overweight and social sexing, in relation to the variables sex, age or education (see Table III). An interesting tendency was observed: more men than women, more younger respondents than older respondents and more persons with a low educational status than persons with a high educational status would legalize PGD in these hypothetical cases.

When asked about their own eventual utilization of PGD in the same hypothetical cases, the majority of respondents would use PGD to diagnose a disease where the child dies during the first year (63%) or to diagnose Down syndrome (59%). Social sexing was not conceived as an important indication of PGD (6%) (see Table IV).

The most significant differences in the eventual personal utilization of PGD (related to the variables sex, age or education) were seen in the cases of a disease where the child dies during the first year, cancer in late adulthood, Down syndrome and below-average intelligence (see Table IV).

**Table II. How should PGD be regulated in Germany?**

<table>
<thead>
<tr>
<th>Indication</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>... remain prohibited, not be practised at all</td>
<td>20.2</td>
</tr>
<tr>
<td>... be practised ... only when there is a well-founded indication</td>
<td>50.3</td>
</tr>
<tr>
<td>... be practised ... also for a general screening of all genetic diseases</td>
<td>26.1</td>
</tr>
<tr>
<td>... be practised ... also for non medical reasons, in order to select</td>
<td>3.4</td>
</tr>
<tr>
<td>special characteristics such as sex or intelligence</td>
<td></td>
</tr>
</tbody>
</table>

*aWeighted after sex and age.*
Finally, respondents showed differences when considering whether the diagnosis of certain diseases and characteristics should be legal in Germany, or whether they themselves would use it in the same cases (see Figure 4).

Two- or three-way interactions between the variables sex, age and education could not be observed for any question. This applies to ‘public allowance of PGD in Germany’ and ‘eventual personal utilization’.

### Emotions and thoughts associated with PGD

The emotions and thoughts that are mostly associated with PGD are ‘ambivalence’ ‘insecurity’, ‘hope’ and ‘fear’ (see Table V).

### Relations between knowledge and attitudes

The following segment focuses on differences between two groups: those respondents who already knew PGD ($n = 636$):
'group informed', and those who did not (n = 1255): 'group uninformed'. Respondents who could not say whether they had heard about PGD or not were not included in the groups.

When considering the assumed indications of PGD there were significant differences between the informed and uninformed groups (Table VI). Nevertheless, there were differences between these groups with respect to which conditions they themselves would use PGD (Table VII).

### Discussion

Our results indicate that PGD is not well known by the German population as a modern technique in reproductive medicine. Further, social, ethical and psychological implications of this technique are not a discussion topic for the general population. This lack of information about PGD may be seen not only in respondents who had never heard anything about PGD, but also in the knowledge self-evaluation made by those respondents who already had a notion of PGD. When comparing the sources of information from which people currently gather information about PGD with those that they would use in the future to inform themselves, there are noticeable differences. People are rather passive when gathering information and receive it from television, magazines and the daily press, which they cannot influence. In contrast, people would like a more active part when gathering information about PGD in the future. Nevertheless, television remains a popular resource of knowledge, which should be taken into account in research because it underlines the importance of media coverage in the generation of attitudes towards new techniques. It can be assumed that the level of information about PGD in the general population is related to governmental regulation of this technique. Studies in Japan have demonstrated that the legal status of PGD had an influence on people’s knowledge and information of PGD (Shirai, 2001). A local example in Germany was the sensitive and strained debates held in 2002 about the legalization of stem cell research, which captured everybody’s attention. These findings underline the importance of media coverage on the attitudes towards new developments.

The knowledge deficiency about PGD can also be seen in the assumed range of applications: on the one hand, there is an overestimation of the potential of PGD, with 50% of all respondents stating that PGD can diagnose ‘any kind of disease or handicap’. On the other hand, real indications, such as sex selection, are less noticed (only by 43% of all respondents). This indicates a lack of knowledge in basic genetics and their relationship to PGD.

In spite of the lack of information and knowledge as stated above, attitudes towards PGD and its legalization...
in Germany can be assessed. The tendency to agree to restrictive legalisation for PGD in Germany can be observed in the majority of respondents (50%).

Interestingly, there are noticeable differences between the eventual personal utilization of PGD and the attitude towards legalisation of PGD. When considering the indication of cancer in late adulthood, for example, 40% of the respondents would agree on legalization of PGD, but only 32% would eventually use this technique in this case themselves. Considering the fact that the average risk for cancer in late adulthood is relatively high, our findings appear problematical and need further serious discussion.

Non-medical indications for PGD, such as below-average intelligence, are less accepted than medical indications, but would still be considered by some respondents as a possibility. In contrast, social sexing was almost never chosen as an indication for PGD by the respondents. This is consistent with the findings of previous studies related to this topic in Germany (Dahl et al., 2003). The conclusion can be drawn that there is no cultural or social preference of female or male offspring in Germany.

The fact of whether a person had a notion about PGD or not influences both the assumed indications of PGD and the personal eventual utilization of this technique for certain conditions. Interestingly, persons who stated that they had a notion of PGD showed the tendency of overestimating its potential in all examined conditions. Furthermore, this group of informed persons would use PGD more in the case of a ‘disease where the child dies during the first year’, in the case of a ‘chronically disabling disease which leads to death in early adulthood’ and to test an ‘below-average intelligence’. The emotions associated with PGD by the respondents illustrate the ambivalence and insecurity related to this topic.

These results should be analysed with caution, because there may yet be more variables that influence the attitudes of a person towards PGD. Understanding these processes will require exploration of these different patterns in attitudes towards PGD including social, cultural and psychological aspects.

Critical aspects of this study can be seen in the fact that the interviewed persons had barely a notion about PGD and that this is a topic that cannot be found in the everyday life of most respondents. Another critical aspect was that respondents had to imagine several hypothetical situations and respond to them. This is a cognitive effort and results in a high demand on the respondents.

New techniques in reproductive medicine and their development involve on the one hand hope and the promise of healthy offspring for affected couples, on the other hand long-term risks and ethical issues for society. Balancing the individual right to a reproductive autonomy and choice as well as ethical standards will constitute a challenge for society in the future. ‘Genomic medicine holds formidable promises for the future of medicine; it is bound to revolutionize health care. But there are many ethical concerns and limitations to be addressed’ (Zilberstein, 2004, p. 8).

Our study showed that there is very little knowledge about PGD among the general population. Still, in many cases hope or a certain apprehension replace the knowledge about PGD and influence the attitudes towards it. In summary, respondents are ambivalent and insecure regarding PGD and its possible consequences. This can be observed in the ambivalent responses to different issues of this technique.

Our findings underline the importance of providing adequate information and by this means educate the general public about the new techniques in modern reproductive medicine. This is an important call for action for the government and would follow the recommendation made by the German Enquete Kommission in 2002. Several studies sponsored by the Ministry of Education and Research constitute the first step in this direction. Regulating PGD will be an important task for the government, not only considering the interest and positions of different concerned groups, but also the position of the general population. This demands that the general population is not only informed adequately but also has a voice in this matter.

The social implications of modern medical developments must be tackled in order to maintain our responsibilities towards future generations.

References


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