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ADVISORY COMMITTEE ON TOXIC SUBSTANCES

Genetic testing for employment: susceptibility and exposure to hazardous substances

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Cleared by John Thompson on 23 February 2004

Issue

1. The subject of genetic testing for employment was raised at the ACTS open meeting in October 2003.

Timing

2. Routine.

Recommendation

3. That the Committee notes the information on genetic testing in relation to workplace health and safety that is provided in this paper and the attached Annexes. Members are asked to notify the Secretary should they wish to bring this topic above the line for discussion at a subsequent meeting (see action point at paragraph 12).

Background

4. At the ACTS open meeting on 17 October 2003 a delegate representing GeneWatch UK asked the Committee for their view on genetic testing in the workplace. The Chair summarised the ACTS/HSE view as being that "it was not at present likely to be a fruitful or safe tool" (ACTS/42/2003, paragraph 6.4). The GeneWatch representative gave Secretariat a copy of their report *Genetic Testing in the Workplace* (see Annex 1). Some members expressed a desire to discuss the matter in more detail at a future meeting. The purpose of this paper is to provide the necessary background to allow

members to decide how they wish to proceed.

5. GeneWatch UK is a not-for-profit public interest group, which was formed in January 1998. The following extract, taken from the GeneWatch website (www.genewatch.org), explains their aims and principles:

“Genetics and the new genetic technologies, including genetic modification, cloning and genetic testing could revolutionise food, agriculture, industrial production and medicine. Our aims are to ensure that genetic technologies are developed and used in the public interest and in a way which promotes human health, protects the environment and respects human rights and the interests of animals. Ensuring public involvement in the decisions that are made about if or how genetic technologies are used is an important goal. GeneWatch aims to increase public understanding of genetic technologies and to carry out or support research about their impacts.”

6. The Occupational Health Advisory Committee (OHAC) is the lead HSC/E Advisory Committee on the topic of genetic screening. In 1995 OHAC established a Working Group to review the health and safety implications of genetic screening at work. The Group was reconvened in January 2002 since when it has met twice, most recently in October 2003. A number of Commission papers have considered the matter (HSC/95/25, HSC/97/37, MISC/49/99 and [HSC/00/236](#)).
7. The Government set up the Human Genetics Commission (HGC) in 1999. In responding to an HGC report in 2000 the Government agreed that
 - it would not be acceptable for employers to use the information arising from genetic tests to predict future poor health of potential or existing employees or to exclude people from employment or advancement;
 - specific genetic tests might provide valuable information if appropriately used to detect a condition that may put the employee or others at risk in the workplace. However, the removal of the worker from the work should be the action of last resort;
 - HSC should continue to monitor developments and implications for the health and safety aspects of employment;
 - more specifically, HSC would ensure that developments in genetic science are considered as it facilitates the implementation of the 10 year occupational health strategy for GB.
8. The Government response (above) recognised the role of OHAC and they undertook to ensure that HSC/E are in a position to provide timely advice in the future to stakeholders, for example on how and in what circumstances genetic testing might be applied at work as a risk control measure; and how genetic testing data might be interpreted in a workplace setting.
9. The current HSC and OHAC policy is clearly set out in the document *Inside information, Balancing interests in the use of personal genetic data* published by the Government's HGC in May 2002. This states:

The current policy of the Health & Safety Commission (HSC) and its Occupational Health Advisory Committee is to emphasise the duties under the Health and Safety at Work Act. These require an employer to ensure that the risks are properly controlled and to provide a safe working environment. They have told us that they consider it unacceptable to exclude or remove a person from the workplace because he or she might develop a genetic condition.

10. The two annexes to this paper provide further information:

- Annex 1 – Extract (Executive summary) from the GeneWatch UK report *Genetic Testing in the Workplace* (June 2003);
- Annex 2 – Extract (Chapter 8, Personal genetic information in employment) from the report *Inside information, Balancing interests in the use of personal genetic data* (Human Genetics Commission, May 2000).

Consultation

11. The Secretariat of OHAC's Genetic Screening Working Group has been consulted.

Action

12. Members are asked to note and consider the information provided in this paper and notify the Secretary should they wish the matter to be formally discussed at a future meeting. One option might be to consider inviting a representative from the OHAC Working Group on Genetic Screening to speak at a future ACTS meeting.

Contact

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Extract from: ***Genetic Testing in the Workplace***, A Report by GeneWatch UK, June 2003¹

Executive Summary

Current laws in the UK allow employers to refuse someone a job on the basis of their genetic test results. Genetic tests for susceptibility to occupational disease are being developed and a few have already been used in workplaces in the USA. However, none of these tests can accurately or reliably predict whether an individual is at risk. It is neither scientifically nor ethically valid to use these tests for employment purposes, but there is a real danger that they could be used inappropriately to discriminate unfairly against employees.

Evidence supporting the use of genetic tests in the workplace

The evidence of a link between genes and occupational illness is weak. Since the effect of any gene is small, its impact can only be demonstrated via statistical analysis of large numbers of people. The statistics frequently lead to false associations being made and the results of comparable studies are often contradictory. Moreover, this type of research fails to take into consideration the complexity of the impact of workplace exposures on health. Most researchers agree that using the results of genetic studies for employment purposes would be premature. The results from population studies simply cannot be transferred to the individual.

Despite its limitations, there is still a considerable amount of interest in research into genetic testing in the workplace, in both the public and private sectors. Chemical manufacturers have expressed an interest in identifying individual genetic susceptibilities to chemical exposures, and the nuclear industry is funding work in this field. Conflicts of interest can arise when companies studying genetic tests are also responsible for exposing their workers to chemicals that are known to cause cancer. These employers and others might see genetic selection of employees as a cheaper and easier alternative to reducing all workplace exposures. However, improving workplace conditions is a more effective way of reducing occupational illness than genetic testing.

Implications for employers

Employers might wish to use genetic tests because they believe that the tests could identify people who are most at risk from hazardous exposures or sudden illness. They might seek to reduce their liability for illnesses caused at work by using genetic tests to exclude the most susceptible individuals from employment. However, not only would the tests prove ineffective, but by shifting the emphasis away from factors in the environment, they could actually lead to deteriorating workplace standards. Workers might be at even greater risk of ill health as a result.

In a survey carried out by the Institute of Directors, 50% of employers who replied were in favour of using genetic tests to identify workers at risk from occupational hazards and 34% were interested in testing their employees for susceptibility to heart disease.

¹ Full report can be viewed at <http://www.genewatch.org/HumanGen/Publications/reports.htm>

Employers are likely to be under increasing pressure to use genetic tests as the biotechnology and pharmaceutical industries seek a return from their investment in research and gene patents. Pressure to use genetic tests could also come from insurance companies. Employers might mistakenly believe they could use genetic tests to identify individuals who are likely to have long periods of time off work or retire early due to ill health. Excluding these individuals could then be seen as a means of reducing premiums. However, since the predictive value of the tests is so poor, misinterpretation is likely to be common.

Current UK legislation relating to workplace safety places a duty of care on employers to protect the health and safety of all their employees. The principles of prevention enshrined in the law are based on protective measures to combat or reduce risks at source. There is no mention of employee selection. Employers' use of genetic tests to exclude existing workers would therefore contravene the spirit of their legal role and responsibilities. However, legislation does not prevent job applicants from being refused employment on the basis of genetic test results.

Implications for employees

Employees might wish to take a genetic test as they might believe it could help them to avoid any hazardous chemicals that were particularly likely to cause them harm. However, no genetic test is yet able to predict accurately whether an individual is safe from exposure. Nor are workers often in the position where they can freely choose not to take a high-risk job.

There is only a remote chance that genetic tests will provide genuine benefits to employees in the future, but there is a real possibility that such tests could lead to genetic discrimination today. People could be excluded from work on the basis of positive test results even when their condition does not affect their health or their job performance. Since most tests are unreliable, some people may be excluded even though they do not carry a faulty gene. Since gene variations are not distributed evenly in different populations, there is also a danger that decisions based on genetic test results may be influenced by racism – as has happened in the past. Employers' use of genetic tests is likely to cause more harm than good.

There is no law in the UK to protect employees against this kind of discrimination. In this regard, the UK lags behind many countries in Europe and many of the US States. The use of genetic information by employers should be banned immediately and the UK Government should draft new legislation to ensure that the complex issues raised by the use of genetic tests are adequately addressed.

GeneWatch UK's position

GeneWatch UK concludes that:

No employer should demand that an individual takes a genetic test or reveals a genetic test result as a condition of employment. Nor should employers be allowed to use genetic information to determine an employee's terms, conditions, privileges or employment benefits.

New legislation needs to be introduced to prevent all forms of genetic discrimination and to prohibit employers (and insurers) from using or accessing individual genetic test results. To this end, it is vital that the UK Government ratifies and signs the European Convention on Human Rights and Biomedicine without further delay.

GeneWatch also recommends that greater emphasis is placed on reducing workplace exposures rather than identifying and removing the 'most susceptible workers'. GeneWatch believes this is the most effective means to reduce the number of cases of occupational illness and to ensure genuine benefits for *all* employees.

Extract from: *Inside Information, Balancing interests in the use of personal genetic data*, A report by the Human Genetics Commission, May 2002²:

Chapter 8: Personal genetic information in employment

8.1 The use of personal genetic information by employers has been considered in some depth by committees such as the Human Genetics Advisory Commission (HGAC). Their 1999 report – “The implications of genetic testing for employment” – provided a thorough analysis of the issues and made a number of recommendations³. Our discussion document did little more than summarise the HGAC report and the Government response of July 2000. The main element of the Government response was a request for HGC to promote discussion of the issues and to keep the Department for Education and Employment (now the Department for Work and Pensions) informed of our findings in order that they could conduct a wider review after five years.

8.2 In this chapter we wish to reflect the comments made to us, together with information from our survey of public attitudes. We also believe that there are certain implications that flow from the broad definition of personal genetic information that we have adopted, from the general ethical principles and from consideration of the use of genetic information in insurance. By broadening the definition, we also believe that some current practices in preemployment medical examinations may need to be reconsidered.

8.3 As a first stage, we wish to be clear about the potential uses of personal genetic information in employment. There are two broad classes of information that we are interested in here:

- personal genetic information (such as family history or previous genetic test results) that is predictive of inherited disease, and;
- personal genetic information about particular genetic variations that might indicate that a person is susceptible to a particular occupational disease or workplace chemical.

8.4 The first class of information will generally only be available from the person’s medical record or may be divulged by the employee or be visible to an observer. It will generally not be actively sought by the employer themselves. The second class may also be obtained from a medical record (e.g. pharmacogenetic test results) or in some cases by tests or screening programmes instigated by the employer. It is this latter aspect that appears to raise the most concern.

8.5 Personal genetic information may be used by an employer to make decisions about a person’s susceptibility to hazards in the workplace, whether they may pose a safety risk to others or about whether they may have long periods of illness or be unable to work on medical grounds. There may also increasingly be decisions about access to employee benefits such as occupational pensions, private health insurance and other forms of insurance. Such decisions may be made before employment or at any time after a person has been employed.

² Full report available at: <http://www.hgc.gov.uk/insideinformation/index.htm>

³ Available at: <http://www.doh.gov.uk/hgac>

8.6 We have also considered another scenario that was raised with us by the Health and Safety Executive. Individuals may increasingly take advantage of knowledge of their genetic characteristics to demand that their employer takes action to prevent exposure to certain workplace hazards. In this sense, a person may be conducting a personal risk assessment. It is even possible that commercial companies may offer such testing directly to the public and provide them with advice on what substances they should avoid exposure to. This also raises interesting questions in relation to an employer's duty of care, which we comment on below.

8.7 The particular type and use of personal genetic information is important in determining to what extent existing laws and codes apply in order to prevent inappropriate use of such information. We therefore offer the following summary of responses to our consultation and the results of our enquiries into the position in other countries. We hope that this will contribute to a wide-ranging debate on this important topic.

The present situation

8.8 There still does not seem to be any evidence that genetic test information is being used in employment, either during recruitment or as part of occupational health programmes. The Ministry of Defence has confirmed that they no longer screen aircrew recruits for sickle cell disease carrier status, although selective testing may be carried out where there is a clinical indication. In this sense, we note that personal genetic information in its widest sense will be considered by employers and their medical advisers in individual cases. This includes family history information as it may be disclosed by pre-employment medical reports from a GP.

8.9 The comment was also made to us that police and scenes-of-crime officers are requested to supply DNA samples for the Police Elimination Database so that they can be ruled out as a possible contaminant at a crime scene. To date over 56,000 samples have been provided. There have been proposals to make this a condition of entry to the police force. We understand that the Police Regulations 1995 have not yet been amended to make it a statutory requirement and any samples provided by police cadets are on a voluntary basis. We feel however, that this form of 'genetic testing' for elimination purposes is markedly different from the predictive genetic testing that we refer to in this chapter. We will consider DNA testing for identification purposes in more detail in Chapter 9. Therefore, **overall we conclude at present there is no evidence in this country of any systematic use of predictive personal genetic information in employment.**

Attitudes to personal genetic information and employment

8.10 There was a spectrum of views in the responses to *Whose hands on your genes?* from employers and employees and agencies or bodies directly responsible for, or affected by, issues related to occupational health and employment discrimination. From these and from the data from the People's Panel survey it is clear that the use of personal genetic information in employment was felt to be inappropriate unless there were clear occupational health benefits. However, even here there are potential concerns about the conflict between screening out susceptible employees and preventing exposure in the workplace.

8.11 In our discussion document, and in our survey of public attitudes, we identified three broad scenarios. These were where employers might in the future wish to engage in genetic testing of employees to identify:

- a) which employees may be at risk of putting other people at risk in the workplace;
- b) which employees have an increased susceptibility to occupational disease; and
- c) which employees are likely, because of genetic factors, to experience long, and possibly expensive, periods of absence from work.

8.12 The survey results were similar irrespective of whether they were asked to consider the situation for an existing or a potential employee. In both cases, most felt that it was inappropriate to use genetic test results to see who might be absent from work – (c) above. Opinion was more evenly divided for those who might pose a risk to others in the workplace – (a) above. Most felt that it was appropriate for employers to use genetic test results to see if existing or potential employees were sensitive to substances at work – (b) above.

8.13 We also heard from a Consultative Panel member involved in assessing future medical incapacity in airline pilots. He or she felt that even in that context it would be difficult to defend the use of predictive genetic testing. Another commented that protection against unfair discrimination at work would encourage disclosure of safety-related genetic information.

8.14 The Institute of Directors provided us with the results of a survey of members that showed very little support for workplace testing. They noted their members' concerns over civil liberties implications and ethical issues involved and resistance to the idea in general. However, the survey did show some support for predictive testing which might affect sickness absence or early retirement. This would depend on whether the employee consented. There was more support (about half of those responding to the survey) for genetic testing to see if employees were at risk from occupational exposure to chemicals or other substances. A small minority (16%) agreed that such testing should be compulsory if it is in the employee's best interest.

Using personal genetic information to make decisions about employment

8.15 In considering the use of personal genetic information in preemployment medical examinations, a distinction can be drawn between:

- personal genetic information (such as family history or previous genetic test results) that is predictive of inherited disease, and;
- personal genetic information that might indicate that a person is susceptible to a particular occupational disease or workplace chemical.

In either case the information may be considered in assessing a (prospective) employee's ability to carry out the job safely or without compromising their health. There are clear parallels with the situation for insurance. Earlier we endorsed the position that an insurer should not demand that a genetic test be taken as a condition of insurance. **We generally believe that – in accordance with the principle of respect for persons – employers must not demand that an individual take a genetic test as a condition of employment.**

8.16 The current policy of the Health & Safety Commission (HSC) and its Occupational Health Advisory Committee is to emphasise the duties under the Health and Safety at Work Act. These require an employer to ensure that the risks are properly controlled and to provide a safe working environment. They have told us that they consider it unacceptable to exclude or remove a person from workplace because he or she might develop a genetic condition. This was echoed by others, such as the Trades Union Congress (TUC) and the Faculty and Society of Occupational Medicine who are similarly opposed to genetic testing or susceptibility screening because it reverses the employer's legal health and safety duties.

8.17 A number of responses could identify criteria for the justifiable genetic screening of prospective or existing employees. For example, genetic screening should only be introduced when there is clear evidence of connection between working environment and disorder, there is a rapid onset without other symptoms, where it is a serious risk to the health either of employee or of third parties (public or work colleagues), and where the risks cannot be significantly reduced by reasonable measures taken by the employer. This might be viewed as an extension of current practice, which considered whether current or predicted health problem might be relevant to involvement in safety critical work.

8.18 However, this would require the development of specific and sensitive genetic tests. Genetic testing is unlikely to provide any information that cannot be gathered by means of existing medical and screening procedures. **We conclude that given the current uncertainties about interpreting genetic information, at present it may be more appropriate to monitor the health of a person by other, more direct, means.** For example, it is possible to detect that a person is red/green colour blind (or deuteranopic) by a genetic test, but it is easier and more accurate to carry out a functional visual perception test. However, we should note that such information would still be considered to be personal genetic information in the sense that we have defined it. In some occupational settings it might be appropriate on safety grounds to consider whether a person is red/green colour blind.

Future use of personal genetic information in employment

8.19 Several responses argued that genetic testing or screening should not be introduced without careful consideration, possibly involving an independent agency to decide what tests are relevant. There are again clear parallels with the use of genetic test results in insurance, where GAIC has played an important part in examining the evidence-base and justification. There are potential benefits if such reviews can effectively reflect the interests of employers, employees and relevant professional groups. We do not consider that a body like GAIC should be established at this stage to decide whether particular genetic test are relevant for employment purposes. However, we do wish to give more thought to the broader ethical and social implications of this issue with a view to advising Government in the future. **We would therefore encourage a voluntary undertaking by employers or other groups to inform HGC of any proposals to use genetic testing for health and safety or recruitment purposes.**

8.20 Furthermore, we heard that the HSC Occupational Health Advisory Committee has considered requests for advice about testing individuals to identify those who are resistant to development of specific occupational diseases. An employer had argued that he had a

duty of care not to employ someone who had a particular genotype that made them more susceptible to lead. The civil case *Paris v Stepney Borough Council* was cited as legal support⁴.

8.21 Whilst we would not support the possibility of discrimination in favour of those who were not susceptible to a workplace hazard, this example raises some interesting issues that we feel must be addressed in any future review of the use of genetic testing in employment. Is there a duty of care to employ those who are less susceptible to hazards in the workplace? Or is it the reverse? It could be argued that it would be good employment practice to inform employees if there is genetic variation related to a workplace hazard and offer the relevant genetic testing. We believe that more examples of genetic variation related to workplace hazards are likely to come to light with the development of pharmacogenetics and, more generally, with increasing knowledge of genetic variation in the population. We should note that in the People's Panel Survey a clear majority thought it was appropriate for employers to know about genetic information related to substances at the workplace for both existing and potential employees. We have also considered a possible situation where individual employees have knowledge that they are susceptible to a particular workplace substance and expect their employer to take appropriate steps to protect them. This might mean that employers are expected to exceed their normal legal duties under health and safety legislation, perhaps fearful of future litigation in the event of ill-health.

8.22 There is also a danger of employment discrimination against ethnic minority groups who are more likely to carry a polymorphism that might make individuals particularly susceptible to a workplace hazard – or the reverse. There has been past evidence of this in the United States where potential pilots were excluded if they carried sickle cell trait – a policy that affected a large number of African-American recruits. A similar example was identified in the HGAC report where the Ministry of Defence was testing pilots for sickle cell trait – a policy that has now been discontinued.

8.23 Fortunately, we believe that the present level of understanding of the genetics of susceptibility to hazardous substances in the workplace or wider environment allows us time to consider these in depth before society is faced with the widespread introduction of genetic testing in employment. The proposed review of the use of personal genetic information in employment in 2005 is timely, but these issues should be addressed before then. **HGC therefore intends to maintain a dialogue with statutory bodies such as the Health and Safety Commission**, the Disability Rights Commission, with employer organisations, trades unions and with professional bodies such as the Society and Faculty of Occupational Health Medicine. **We recommend that a joint Committee be formed to monitor developments in genetic testing and employment, and that this committee should include representatives from HGC, the Health and Safety Commission, the Disability Rights Commission and other interested parties.**

⁴ *Paris v Stepney Borough Council* [1951] AC 367. The plaintiff was employed by the defendants at their premises as a garage mechanic. His right eye was injured in an accident while working on a Council-owned vehicle. He claimed damages for negligence in that the Council failed to provide goggles and insist on their use. The plaintiff had previously lost the use of his left eye during an air raid. The defendant knew that the plaintiff had only one useful eye. The House of Lords eventually ruled in favour of the plaintiff in that the supply of goggles is obviously necessary when a one-eyed man was put to the kind of work to which the appellant was put.

Pre-existing personal genetic information

8.24 We consider above the use of personal genetic information in the context of occupational health and safety. For the time being, a more likely scenario is the use of predictive genetic information – genetic test results or family history – to identify “unhealthy” individuals as part of pre-employment medical reports or examinations. For example, the BMA commented about concerns surrounding general – “catch-all” – health questions within preemployment medical reports. These request other information that may be relevant to future health or regarding recent referral to a specialist. This would seem to include, for example, referring to genetic test results, even if only for late – onset conditions. We do not necessarily wish to suggest that genetic information is different to other predictive health information, such as a history of heart disease or mental health problems. However, as we have established earlier, there are aspects of genetic information that are different in certain contexts.

8.25 The Data Protection Act is relevant to such requests. The Information Commissioner has issued for consultation a draft code of practice on the use of personal data within employer/employee relationships, under section 53 of the DP Act. It contains a section dealing with the use of genetic testing in employment which is based on the conclusions and recommendations of the Human Genetics Advisory Commission’s Report on the Implications of Genetic Testing for Employment of July 1999. It seeks to lay down minimum standards based on duties under the DP Act or the Data Protection principles. The final Code of Practice is being issued in parts and the sections relating to medical and genetic information are due to be published in mid-2002.

8.26 We welcome the possibility of a Code of Practice and believe that it will provide a sound basis for any future consideration of the use of genetic test results by employers. It is our conclusion that pre-employment medical report forms should not include general questions about possible future ill-health, in order to meet the requirements of the 3rd Data Protection principle. **We would suggest that the Information Commissioner clarify that the relevant parts of this Code cover both the results of previous genetic tests and other personal genetic information (such as a family history of a genetic condition).**

8.27 The draft Code of Practice also contains important advice and standards in relation to employee information that is relevant to participation in employee benefit schemes such as pension and group health or disability insurance. Several responses stressed to us that genetic information should not be used to unfairly restrict access to these schemes. The TUC referred to a case where an employer was attempting to predict employees who were at an increased risk of early retirement due to ill-health in order to exclude them from the early retirement provisions of the occupational pension scheme. We have noted earlier that there is a blurring between the uses of personal genetic information in insurance and in employment-related benefit schemes. **We also anticipate that the price that an employer must pay for liability insurance may be affected by the use that is made, or is not made, of relevant personal genetic information. We believe that any future discussions on the use of genetic information in private insurance should also consider the wider implications for employment benefit schemes that are based wholly or partly on financial products that are based on the recognised principles of private insurance underwriting.**

8.28 The HGAC report welcomed the proposal to require prior notification under the DP Act before genetic data was processed (stored or used) for employment purposes. The Information Commissioner has since recommended that neither the processing of genetic data in employment nor any other processing is designated as processing which is assessable under the DP Act. This is not a reflection on the extent to which the Commissioner considers that the processing of genetic data might pose specific risks for individuals. Rather it is recognition that the assessable processing provisions, as currently set out in the law, would provide the Information Commissioner with little information about the use of genetic data in employment. It might also give false reassurances to individuals about the processing of their genetic data and would be disproportionately burdensome to operate.

Policy principles for the use of personal genetic information in employment

8.29 The Government response to the HGAC report on Genetic Testing and Employment took the form of a letter from Ministers to HGC in July 2000. It invited HGC to work with other bodies and Government Departments to address two of the main recommendations of the report. These included the HGAC's proposed policy principles that should be observed if and when genetic testing in employment becomes a real possibility. We requested views on this in *Whose hands on your genes?* We have also tended to adopt a wider definition of genetic information than that used by HGAC, which may affect the precise wording of the principles. We have also set out our own set of general ethical principles which we believe should be considered in setting out policy principles for the use of personal genetic information in employment.

8.30 A number of responses pointed out some possible inconsistencies between the 1st and 3rd HGAC policy principles. The first principle upholds the "right not to know", which we have covered under our principles of genetic privacy. However, the 3rd HGAC principle states that in certain cases, an employer should be able to refuse to employ a person who declines the offer of a genetic test. The point was made that consent to a genetic test may not be given freely if employment, or an offer of employment, depended on it. We believe that there must be compelling medical or safety grounds before an employer could offer a genetic test, and in some cases therefore refuse to employ someone who declined to take such a test.

8.31 We also feel that it is important to ensure that employees are aware where there is specific hazard in the workplace and a known genetic variation that makes them especially susceptible to harm.

8.32 In conclusion, we have some misgivings about the HGAC's policy principles. We believe that whilst they form a useful basis for current thinking – for example to inform the Information Commissioner's Code of Practice – there should be a wider consideration of the issues relating to the use of personal genetic information by employers. Given that this is largely theoretical at this stage, we would prefer to consider any future uses of personal genetic information in employment on a case-by-case basis, as we have indicated earlier in our report.