

**ADVANCED GCE
CRITICAL THINKING**

Unit 3: Resolution of Dilemmas

RESOURCE BOOKLET

TUESDAY 10 JUNE 2008

F493/RB

Afternoon

Time: 1 hour 15 minutes



INSTRUCTIONS TO CANDIDATES

- Use Documents 1, 2, 3 and 4 to answer the questions.

This Resource Booklet consists of **7** printed pages and **1** blank page.

Document 1

Chemical testing on animals

The views of the British Union for the Abolition of Vivisection (BUAV)

(**Note:** the BUAV is an organisation which campaigns to end animal experimentation.)

Chemical toxicity (the testing of poisons) on animals basically involves subjecting animals to different levels of potentially toxic substances to assess how and in which way they are affected.

This approach to chemical testing, which uses animals and is mainly observational and descriptive, is extremely crude. Animal tests tell us little about why a substance is toxic, as the results tend to demonstrate effects rather than causes of toxicity. The test results are difficult to extrapolate from sterile laboratory conditions to real life exposure of humans or even wildlife. Scientists simply cannot rely on animal test results accurately reflecting chemical effects on humans.

The underlying problems are the inevitable and significant differences between species in biochemistry, pharmacology, physiology and even anatomy. Here are just two of many examples:

Skin irritation:

Rabbits and guinea pigs are usually used for skin irritation testing but lack the varied range of human responses, partly due to a difference in the distribution of fine blood vessels. Their skin reacts to a limited degree and does not distinguish between very mild and moderate irritants.

Carcinogenicity (testing to see if chemicals might cause cancer):

Rodents are used in large numbers in cancer tests which attempt to replicate life-long exposure. However, whilst humans live an average of 75 years, rodents only live for two or three years.

Document 2**The use of animals in medical research****The Views of the The Research Defence Society (RDS)**

(**Note:** The RDS is an organisation which aims to promote an understanding of animal research in medicine.)

Those who would seek to abolish animal research often claim that the use of animals in medical research is unnecessary because information can be obtained by alternative methods, such as test tubes and computers.

What is often not realised is that scientists have strong ethical, economic and legal obligations to use animals in research only when absolutely necessary. A lot of effort goes into trying to reduce the number of animals used, and trying to develop new methods to replace animals. As a result, the number of laboratory animals used annually in the UK has almost halved in the last 20 years.

Non-animal methods – such as computer-modelling and studies of patients and populations – are very widely used. In fact, only about ten pence in every pound spent on medical research goes on animal studies. The word ‘alternatives’, often used to describe these non-animal methods, can lead to confusion because these methods are generally used alongside animal studies, not instead of them. All these techniques have their place, and it is rarely possible to substitute one for the other.

It is unethical and illegal to expose patients to new medicines without being confident that they are likely to benefit and not be seriously harmed. Treatments must, therefore, be tested on animals to establish their probable effectiveness and safety. They are then tested on human volunteers. The process is not perfect but testing on whole animals is by far the best way to protect people. Animal tests ensure that obviously toxic substances are not given to human beings and that doctors in charge of human volunteers are made aware of serious side effects.

Document 3

Home Office Statistics of Scientific Research on Living Animals in 2005

(i) Total procedures (experiments) on animals:

The number of procedures started in 2005 was just under 2.9 million, a rise of about 41,300 (1.4%) on 2004. The overall level of procedures is determined by a number of factors, including the economic climate and global trends in scientific endeavour.

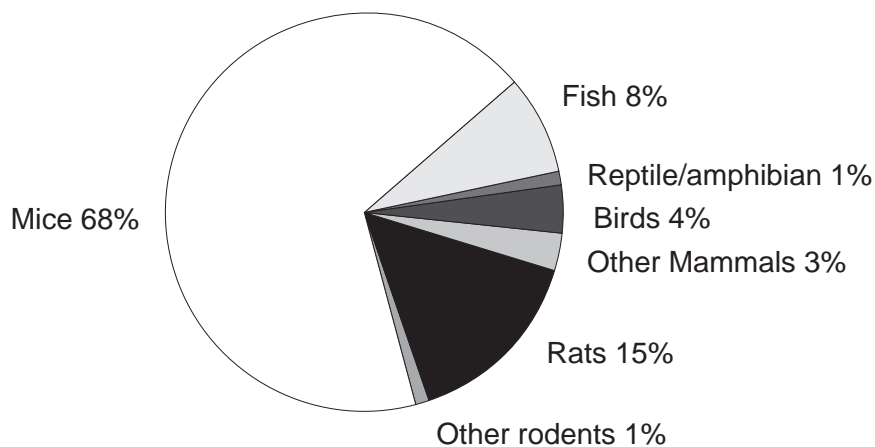
(ii) Categories of procedure

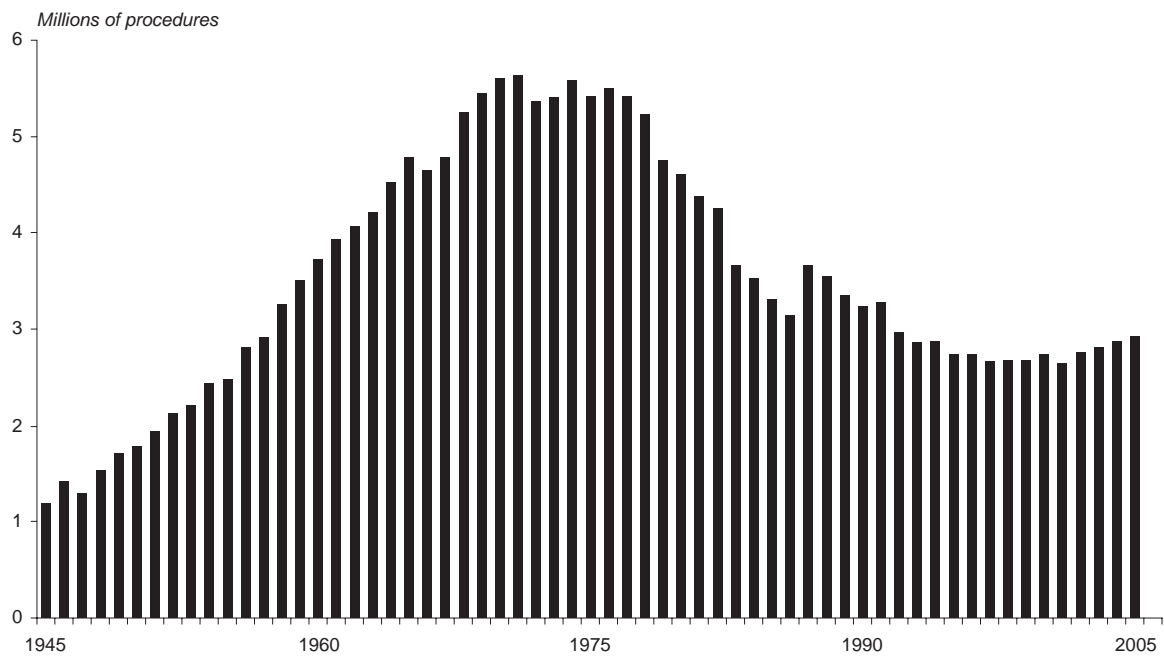
Procedures	% of Total Procedures
Breeding	35.0
Fundamental biological research	32.0
Applied studies into human medicine or dentistry	22.0
Protection of man, animals or the environment	3.4
Others (including education, training, forensic enquiries and direct diagnosis)	7.6

(iii) Procedures for **toxicology** purposes accounted for about 14% of all procedures.

(iv) Around 40% of all procedures used some form of **anaesthesia** to alleviate the severity of the Interventions.

(v) Procedures by species of animals:



(vi) Procedures 1946-2005

Source: Home Office, www.homeoffice.gov.uk.

Document 4

An extract from a research project involving animal testing

“A significant number of babies are born with brain damage resulting from problems with oxygen supply and/or the presence of infections at the time of childbirth. We hypothesise that treating the mother with statins during the last stages of pregnancy may help to reduce the degree of brain damage in the new born.

Statins are a class of drugs routinely used to lower cholesterol concentrations in the blood. They also have many other beneficial effects on both the blood vessels and the nerves.

Statins are not licensed for use in pregnant women. Before we can test our hypothesis we therefore need to determine if treating pregnant animals in late pregnancy has any adverse effect on either the mother or the babies. We have chosen to use rats as these are the lowest vertebrate that we can administer the statins to orally in the most controlled but least stressful manner. We will give the mother rats statins in the last few days of pregnancy so that we can determine where in her and her babies' bodies the statins go. Following birth some of the rat pups will be killed and their brains prepared for examination. The remaining pups will be observed daily for the first 3 to 4 weeks of their life to determine if their exposure to statins during the last few weeks of pregnancy has had any obvious adverse effects on their development. The mothers' health will also continue to be monitored through this period. At approximately 3 weeks after the birth the experiment will be concluded and both the mother and the remaining pups will be killed.

Brain damage occurring around the time of childbirth has a large emotional and economic cost for society. Treating mothers in late pregnancy with statins may be a cost effective method to reduce the extent of brain damage occurring in children around the time of birth. This study is the first step in determining if this is a feasible treatment.”

Source: Home Office, www.homeoffice.gov.uk.

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