

SHORT REPORT

Estimating the incidence of occupational asthma and rhinitis from laboratory animal allergens in the UK, 1999–2000

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We report a survey of the number of persons handling laboratory animals in the UK in 1999–2000. This estimate has allowed us to calculate annual incidence rates of allergic asthma and rhinitis attributable to laboratory animals, insects, and birds using numerators derived from cases reported to a national surveillance scheme (SWORD). The number of exposed employees has almost halved since the early 1980s. From these data, the estimated annual incidence rate of occupational asthma among persons working with small mammals is 1.56/1000 employees. Although reported cases are rare, estimated incidence rates of asthma attributable to birds (23.9/1000/year) and insects (2.35/1000/year) are high.

Laboratory animal allergens are an important cause of occupational asthma in the UK. A national surveillance scheme (SWORD, The Surveillance of Work & Occupational Related Diseases) has recorded new cases of occupational asthma and rhinitis in the United Kingdom, annually since 1989. The scheme relies on voluntary reporting of incident cases, with details of agent and job, by respiratory and occupational physicians. A core set of physicians reports on a monthly basis; others are randomly sampled for one month of each year. The numbers of new cases of occupational lung disease are estimated each year, taking into account the sampling fractions; and occupation specific rates are calculated using denominators derived from the Labour Force Survey. The population of laboratory assistants and technicians

was estimated as 127 478 in 1989,¹ and the estimated annual incidence of occupational asthma in this category was 0.235/1000/year from 1989 to 1991.² However, only a proportion of this population works with laboratory animals. Over the past 20 years there has been a steady reduction in the number of animal experiments in the UK,³ and in consequence the number of employees currently in contact with laboratory animals is likely to be much lower than the previous estimate of 32 000 in 1981.⁴ We aimed to determine the number of individuals having current contact with laboratory animals and to use this as the denominator to estimate the incidence of occupational asthma among this group of employees.

METHODS

Every institution in the United Kingdom that undertakes animal experimentation is required to nominate an individual (the holder of certificate of designation) who oversees all aspects of the procedures.⁵ They, numbering 296 in 1999, are each registered with the Home Office. We devised a single page questionnaire in which respondents were asked to enumerate the employees at their institution by job category and species handled. Three broad job categories were considered: animal technicians, researchers/scientists, and others (maintenance, security, etc). Species were grouped into small (rats, mice, guinea pigs, hamsters, ferrets, and rabbits) and large (cats, dogs, sheep, cows, primates, horses, goats, and pigs) animals. Groups for insects and other animals were also included. The Home Office delivered the questionnaire with a circular during October 1999 and anonymous responses were returned to the authors in a reply envelope. Two follow up mailings were conducted in early 2000. The estimated range of the total population, our denominator, is based on the information obtained and the likely characteristics of the non-responding populations. The lower estimates reflect the actual responses for small animals and assume that none of the non-responders used them at their sites. The higher estimates assume that the distribution among non-responders is the same as the responders. Quarterly SWORD reports over 12 months following the survey identified the number of new cases of occupational asthma and rhinitis reported among laboratory staff which were attributed to laboratory animals, insects, or birds. We calculated numerators (with 95% confidence intervals based on a Poisson distribution) using the sampling fraction for four consecutive quarters. Incidence rates were calculated using the higher estimates of the denominator population. The data were analysed using STATA (Stata Corporation, Texas).

RESULTS

Most of the surveyed sites were commercial organisations (38%) or places of higher education (34%). A total of 207

Main messages

- The number of persons in contact with small laboratory animals in the UK has halved since the last estimate in 1981.
- The data suggest that the incidence of occupational asthma attributable to small animal species may be higher than recent estimates.
- The rates of asthma attributable to birds and insects during 1999/2000, although based on small numbers, were high.

Policy implications

- Occupational health physicians involved in the care of those working with small animal species should remain especially vigilant against the development of occupational asthma.

Table 1 Estimated numbers of persons working with laboratory animals in the UK, 1999, by job category and species; rates of occupational asthma and rhinitis among persons working with small mammals, insects, birds

Species	No. animal technicians		No. researchers		No. others		Total no.*		Estimated cases of asthma	Estimated cases of rhinitis	Rate of asthma/1000/y (95% CI)	Rate of rhinitis/1000/y (95% CI)
	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher				
Mice	1224	1812	5053	7478	806	1193	7083	10483				
Rats	1000	1480	4534	6710	796	1178	6330	9368				
Guinea pigs	578	855	2915	4314	498	737	3991	5906				
Hamsters, rabbits, ferrets	707	1046	2720	4027	710	1051	4137	6124				
Any small animals	2018	2886	8669	12397	1385	1981	12073	17262	27	43	1.56 (1.03 to 2.28)	2.49 (1.80 to 3.35)
Sheep, cows, pigs, goats, horses	504	746	661	978	277	410	1442	2134				
Cats, dogs	220	326	304	450	101	149	625	925				
Primates	188	278	160	237	60	89	408	604				
Any large animals	859	1228	1060	1516	413	591	2332	3335				
Fish	74	107	260	377	107	155	441	639				
Poultry	82	117	142	203	147	210	371	530				
Insects	58	84	184	267	52	75	294	426	1	9	2.35 (0.06 to 13.1)	21.1 (9.65 to 40.1)
Birds (not poultry)	31	44	65	93	50	72	146	209	5	3	23.9 (7.75 to 56.0)	14.4 (2.96 to 42.0)

* Column totals for each job group are not the sum for each species due to cross handling of different species.

questionnaires (70% of those eligible) were returned; information regarding the breakdown of species for small and large animals was available for 200 responses. Table 1 shows the lower and higher estimated numbers of employees grouped by species and job category. Between 12 000 and 17 300 employees were working with small mammals, in most cases scientists working with mice or rats. Much smaller numbers work with larger animals, birds, insects, or fish.

Using the higher estimates of the denominators, and among those working with small animals, we calculated a current, annual incidence rate of 1.56 cases/1000 persons for occupational asthma and a figure of 2.54/1000 persons for occupational rhinitis. The rates for those working with birds or fish were higher, but based on a small number of cases.

DISCUSSION

This is the first attempt in 20 years to determine the size of the population occupationally exposed to laboratory animals. Over this period major changes have taken place in the number and type of animal experiments conducted in the UK. Our results suggest that the number of exposed employees has halved since 1981. Unlike the earlier estimate, we have been able also to estimate the numbers working with individual species. The higher of our estimates of those working with small animals is in close agreement with the number of current personal licence holders (animal technicians and researchers, n = 13 700) recorded by the Home Office in 1999. In 2000 there were 1900 animal technicians who were members of the Institute of Animal Technology,⁶ a figure also close to our lower estimate. In future, these more readily available statistics may serve as a useful indicator for these populations. Our estimated rates of occupational asthma and rhinitis are high; but nonetheless are likely to underestimate the true figures because the numerator depends on cases reported by chest and occupational physicians to SWORD. Rates among newer employees, who are probably at particularly high risk, may also be higher.

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