

Invited Editorial

Some Economic Benefits of REACH

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Forty years ago, Rachel Carson (1962) wrote in *Silent Spring*: 'If we are going to live so intimately with these chemicals—eating and drinking them, taking them into the very marrow of our bones—we had better know something about their nature and their power.' She could surely not have imagined that her observation: 'The full scope of the dangerous interaction of chemicals is as yet little known ...' would still be so accurate in the third millennium.

In 2003 the European Commission published a draft regulation known as REACH (Registration, Evaluation, Administration of Chemicals). This will amend or replace most of the existing European Union (EU) legislation on supply of chemicals, introducing a common approach for existing substances and for substances new to the market, and shifting much of the responsibility for evaluation of hazard from the member states to industry (Musu, 2005). The traditional core area of interest of the occupational hygienist concerned with chemicals is their use in the workplace, and most legislation on this is not affected. Nevertheless, REACH is likely to have a big effect on the hygienist's work, and a recent workshop organized jointly by BOHS and the Belgian Society for Occupational Hygiene considered this. The EU Council and Parliament may agree to the new legislation in 2006, and it may then come into force in 2007.

Various studies have tried to estimate the negative and positive effects of the draft regulation. The European Commission Extended Impact Assessment estimated the costs to be between €2.8 and €5.2 billion (European Commission, 2003). The health benefits were estimated to be worth between €27 and €54 billion over a 30 year period (RPA, 2003). By these estimates, therefore, the benefits

dwarf the costs. However, more than 99% of the calculated benefits were owing to avoided cancer deaths. The modest health benefits estimated for non-cancer diseases seem to be flawed, as the estimated costs are a small fraction of actual costs borne by insurers for these occupational diseases. Figures available for Germany on occupational skin diseases and on occupational asthma show a total expenditure of approximately €240 million in 2001. In contrast, the figures employed in the RPA study for Germany, for the same year and for the same two disease categories, estimated costs to be only about one-hundredth of this figure, about €2.5 million.

We can estimate the true costs from the occupational diseases documentation compiled by the industrial employers' liability insurance associations in Germany, the Gewerbliche Berufsgenossenschaften (BGs). This documentation forms an acceptable basis for an appropriate assessment of the costs of chemical-related occupational diseases, which occur, above all, when lack of knowledge of substance properties prevents adequate protection or when the knowledge exists but the information passed on by manufacturers or users is inadequate.

In the following, the basis of the occupational diseases documentation will be explained. Using this, the potential effects of REACH are estimated for occupational skin diseases and occupational asthma, utilizing the same approach as employed in the RPA study (RPA, 2003). Details of the cost estimates are given in supplementary information in the on-line edition of this issue (Rühl and Wriedt, 2006).

THE LIABILITY INSURANCE ASSOCIATIONS (THE BGs) AND OCCUPATIONAL DISEASE

In Germany there are 35 industrial BGs, which in 2003 took care of the accident protection of

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~42 million insured workers in 3 million companies. The term 'industrial' is important, since other insurance bodies are responsible for those working in the public sector. Employees of the local authorities, of public works departments, of universities, etc. are not insured by the industrial BGs; nor are many those who are employed in any of the many job creation programmes.

The system operates on a mixed model, that is both on the basis of lists of diseases and/or causative hazards, and by consideration of individual cases. Officially-recognized occupational diseases are listed in the Occupational Disease Regulation (Berufskrankheiten-Verordnung, BKV). If a claim is made for an occupational disease, the relevant BG has to determine the history of exposure and which disease is medically diagnosed. Then it has to establish whether there is a clear connection between the two. Only when a link is proven is the disease acknowledged. This is often very difficult, particularly when the exposure took place a long time in the past, when documentation is likely to be grossly inadequate.

Nine of the occupational diseases (e.g. isocyanate-asthma and skin diseases) are only acknowledged when the worker gives up the occupation owing to the disease. For skin diseases it is additionally required that the disease must be serious and recurrent.

Because of the need to prove a link with past exposure, and because the link must be to a substance specified in the BKV, without taking account of possible effects of mixed exposure, overall it has to be said that the German occupational diseases law acknowledges too few rather than too many cases as occupationally caused.

THE COST OF OCCUPATIONAL DISEASE

Costs from BGs are an underestimate

In the supplementary material in the on-line edition of this issue (Rühl and Wriedt, 2006), the BG figures are used to estimate the compensation costs of various occupational diseases in Germany. There are several reasons for believing that this underestimates the true cost.

- (i) As already mentioned, the BG figures do not include any data from employees in public service, including local authority employees, university staff, public hospital and clinic staff, railway and airport staff, the police service, etc.
- (ii) Nor do they include cases that the patient does not wish to pursue as occupational—perhaps to keep it secret from the employer—or for which the occupational link is not generally recognized.

- (iii) The allergies can only be recognized as such once the sensitizing properties of the substance are known. Since there are no validated detection methods for respiratory system sensitization properties in an animal model (Schnuch *et al.*, 2002), respiratory sensitization is not recognized until the diseases occur in practice and until the linkages are perceived. Only the test on the user shows whether a substance is sensitizing to the respiratory system!
- (iv) For a skin allergy case, not all substances that the person is exposed to are tested, but only those for which the sensitizing properties are already known, and most substances have not been tested for sensitizing properties. Moreover testing is difficult because of limited scope for fixing epicutane stickers.
- (v) Usually a worker does not rush to the doctor's with every single symptom, especially in economically difficult times, or when he or she knows from experience or from colleagues that such symptoms are normal—not a disease but an everyday aspect of the job or profession. If the condition worsens he or she goes to the doctor and gets something for it. There are numerous cases in which for years, sometimes for decades, cortisone cream has been prescribed for allergic symptoms. When an occupational disease is then really claimed it cannot be acknowledged on precisely these grounds—there are no periods of sickness absence so the disease is not serious or recurring.
- (vi) In the case of skin diseases, the Occupational Disease Regulation requires that the disease be serious or recurring, i.e. there have to be multiple days off sick. But, of course, normally there have already been days off work sick before a connection between the job and the disease/condition has been made. The Central Association of the German Construction Industry has stated that the costs for days lost are far more than the costs to the BG of the pension/compensation as well as of medical and occupational rehabilitation.

When testing is done, quite often occupational chemicals can be traced as being the causative agents: Dickel *et al.* (2001) found that when 49 out of 210 metal workers with occupational skin diseases were tested with substances from their workplaces, 38 of them reacted positive. For other groups of workers, the following results were obtained (tested/positives): health workers—72/58; metal production workers—23/19; painters—11/7; wood workers—15/14. Bock *et al.* (2003) report that, of 206 construction workers with occupational skin allergy, in 21 cases an allergic skin dermatitis has been detected only through testing with materials brought along by the patients.

Calculation of costs of 'chemical-related illnesses' in Europe

Despite these difficulties, it is nevertheless possible to use the Occupational Diseases Documentation of the BGs to estimate the costs that the accident insurers in Europe have to bear as a result of the use of substances for which the information was or still is insufficient. Roughly a fifth of the working population of the 15-state EU is employed in Germany. If one takes the costs, which arise because of chemical-related diseases in Germany, and wishes to apply these to the EU as a whole, then the costs in Germany have to be multiplied by five.

Epoxy resins and isocyanates. The supplementary material in the on-line edition (Rühl and Wriedt, 2006) estimates costs via the BGs in 2003 at €3.7 million for epoxy resins. If this is one-fifth of the European cost, as argued above, the cost of compensation to the industrial economy of Europe would be €18.5 million. A similar argument for isocyanates leads to an estimate of €21.5 million, or €40 million for these two diseases together. This figure might conservatively be increased by 10% to allow for the public sector, and perhaps doubled to allow for days lost in the private and public sectors, leading to a total of €90 million for 2003 for these two classes substance alone.

Other substances. To avoid doing the calculations for every substance we shall here just make an overall estimate on the lines above of the magnitude of the costs for skin diseases and asthma (excluding isocyanate cases). The costs to the industrial BGs for these diseases in 2003 were approximately €250 million (figure 7 of the supplementary material), and with 10% added for the workers in public service in Germany that would make approximately €275 million. If that figure is then multiplied by 5 for the 15 state EU, the total is €1.38 billion. For days lost, one would have to reckon about the same sum again, totalling about €2.75 billion.

Our estimate of costs for wages and loss of productivity is rather conservative. A recent publication showed considerably higher figures for these costs for occupational skin diseases in Germany in 2002 in the health sector and in the metal industry (Batzdorfer and Schwanitz, 2004).

Not all of these cases would be prevented by REACH, but according to the approach in the RPA study, between 7 and 61% of all cases of occupational skin diseases and between 4 and 55% of all cases of occupational asthma could be avoided by the implementation of REACH (RPA, 2003). Applying this to the estimate of €2.75 billion for skin disease and non-isocyanate asthma, we arrive at possible savings of between €156 and €1615 million every year. Employing the same 3% discount rate as in the RPA study, over a 30 year period between €910 million

and €9.5 billion could be saved for the two occupational disease categories only.

In relation to these costs, the costs of acquiring the necessary data on substances as well as the other further costs to industry of implementing REACH do not seem so horrendous. This is particularly the case when one keeps in mind that the estimates are based on costs that accrue solely from acknowledged occupational diseases.

Here it should again be emphasized that not all diseases such as those mentioned above are a result of deficits in the data on the characteristics of substances and that some are a result of other factors. Yet if the better basis of data projected under REACH contributes to only half of the cases, which it is estimated will be avoided as a whole under REACH, then the savings would in a few years exceed the necessary costs of acquiring that data.

CONCLUDING REMARKS

This editorial is intended as a contribution to placing the discussion on a more sober footing, utilizing the data from occupational health and safety. We have concentrated on the financial benefits, which we believe have been very seriously underestimated. We also believe that the costs have been overestimated, but even accepting that the costs are as has been stated, the benefits are greater. REACH will bring other benefits (Lahl, 2004), but we believe that the benefits are economic as well.

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