# Sinonasal cancer and furniture workers: update and methodological points

*Christoph Erwin Minder, John Paul Vader*

*Department for Social and Preventive Medicine, University of Berne, Switzerland*

## 1. Introduction and material

Various aspects of the National Research Council Project 'Occupation and mortality' have been presented previously, dealing mainly with the quality control of data [1], with methodology [2] and with the application of the methods to broad socio-economic groups [3]. The next logical step is to look at specific occupational groups and at single causes of death. Dealing with mortality statistics, obviously no data is available on exposure and we therefore cannot easily draw conclusions about etiology. It is, however, feasible to confirm findings from other studies and to use mortality statistics as an instrument for general surveillance of occupational mortality. The present paper illustrates these aspects, using the concrete example of sinonasal cancer mortality among Swiss furniture workers, and gives an update of our earlier publication on sinonasal cancer among Swiss furniture workers [4].

The databases used are mortality statistics for Switzerland for the years 1979–1985 and the national census of 1980.

## 2. Results

Study and comparison populations were constructed in the following way:

- Only Swiss males aged 15 or over were considered.
- The numerator in the study population is the number of sinonasal cancer deaths among Swiss male furniture workers, taken from the mortality statistics;
- the denominator is the number of all Swiss male furniture workers, aged 15 or over in the 1980 census.
- The numerator of the comparison population comprises all sinonasal cancer deaths among Swiss males;
- the denominator consists of all Swiss males aged 15 or over with a clear occupation recorded in the census.

Table 1 presents these figures for the period 1979 to 1985. For 1979 to 1982 they are given in [4].

*Tab. 1. Sinonasal cancer rates*

| | Number at risk | Sinonasal cancer deaths | Rate per 100 000 man-years |
|---|---|---|---|
| Furniture workers | 41 667 | 16 | 5.49 (= A) |
| All workers | 1 813 798 | 115 | 0.906 (= B) |

A notion of relative risk of sinonasal cancer death for furniture workers can be obtained by setting A over B in table 1 which in this case is 6.0. To adjust for possible differences in age distribution between furniture workers and the comparison population, the standardized mortality ratio (SMR) was used. This is the most commonly used measure of occupational mortality risk. For the years 1979–1985 the SMR for sinonasal cancer mortality among furniture workers is 620 (95% confidence interval: 360–1020, $p < 0.00001$).

We verified the histological type of 8 out of 9 cases in our initial study population (1979–1982), thanks to the generous assistance of regional cancer registers, doctors and hospitals. Over half of the furniture worker cases turned out to be adenocarcinomas. The cancer registers have recently pooled their data and, based on 147 cases, they estimate that 16% of all sinonasal cancers in Switzerland are adenocarcinomas. Our estimate of the odds ratio for adenocarcinoma of the sinonasal cavities for furniture workers, including a further case that has recently been brought to our attention, is 75 times that of the comparison population. This figure is similar to the figure of 80 reported by Acheson et al. [5]. Table 2 shows the number of sinonasal cancer deaths of furniture workers by year.

*Tab. 2. Distribution of case deaths per year in Swiss furniture workers*

| Year | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|---|
| Number of cases | 3 | 2 | 2 | 2 | 0*) | 3 | 4 |

*) One 45-year old foreigner, not included in our study

An indispensable part of such a study is data quality control and checking the comparability of the two populations. The quality of the item 'occupation' on the death certificate and in the census was checked by comparing a random sample of 3058 linked records of death certificates and census records. For 'furniture workers' the concordance is above 70% in both directions. The reliability of 'cause of death' on the death certificate was checked by comparing a set of 12'478 linked hospital records and death certificates. With 85% concordance, the group 'other malignant tumors of respiratory tract' is among the most reliable causes of death on the death certificate. The two major components of this group are mesothelioma and sinonasal

cancer. A further reliability check is afforded by the autopsy/operation rate. The cause of death was confirmed by either operation or autopsy in 61% of the cases in our comparison population and 100% in our original study population.

## 3. Discussion

To put these results in a public health perspective it must be said that sinonasal cancers are very rare, even among furniture workers. It must also be pointed out, however, that to our knowledge, only 4 of our at least 16 cases have so far been officially recognized as occupational diseases. The SMR is a simple instrument to follow up, over the coming years, what we hope will be a self-limited cohort effect among furniture workers. For the time being, however, there is no trend towards a fall in the number of cases as can be gleaned from table 2.

This study illustrates that through careful checking and cross-checking of mortality data, it is possible to avoid several important pitfalls that normally beset mortality studies. In spite of some remaining possible sources of bias, we feel our results accurately reflect a true and important mortality risk for this cause of death among this occupational group. The fact that proportional mortality ratios and figures from other studies, published elsewhere (Cf. discussion in [4]), give similar results provides a degree of internal and external validation for our method.

It is indispensable that the whole range of age-groups be included within the pale of such studies. If only those under 65 had been included, our initial SMR would have been 0 [4]; there were no cases among furniture workers under 65. This is because the mean latency period for this occupational cancer is 40–45 years. For this reason, one cannot over-emphasize the necessity of retaining the item "occupation" for retired persons, both on the death certificate and in census records.

We would also like to emphasize the use that has been made of several existing databases in this study: census, mortality statistics, hospital records (VESKA), cancer registers. This is an encouraging example of how epidemiological research can be carried out in Switzerland, even in an atmosphere of rather strict personal data protection regulations and decentralized databases.

Obviously, such detailed occupational surveillance is not possible for all causes of death and for all occupations. However, we feel that use of similar methods is also valid for other combinations. At the very least, cause of death must be reliable and there must be a strong concordance between 'occupation' on the death certificate and 'occupation' on the census records.

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**Summary**

Using data drawn and adapted from the 1980 national census and the mortality statistics for the years 1979–1985, we update our previously published standardized mortality ratio for sinonasal cancer mortality and odds ratio for sinonasal adenocarcinoma death among Swiss furniture workers. The former is 620 (95% confidence interval 360–1020, $p < 0.00001$), the latter is 75.

**Résumé**

**Cancers nasosinusaux chez les menuisiers-ébénistes: mise à jour et discussion de la méthodologie**

Utilisant des données tirées et adaptées du recensement fédéral de 1980 et des statistiques de mortalité des années 1979–1985, nous mettons à jour nos résultats récemment publiés. Le rapport standardisé de mortalité pour tous les cancers nasosinusaux chez les menuisiers-ébénistes suisses est 620, le «odds ratio» pour l'adénocarcinome est 75.

**Zusammenfassung**

**Krebse der Nasennebenhöhlen bei Schreinern: Ergänzungen und methodologische Diskussion**

Mit Daten aus der Volkszählung 1980 und der Sterblichkeitsstatistiken der Jahren 1979–1985 bringen wir unsere vor kurzem veröffentlichten Resultate auf den neuesten Stand. Die standardisierte Mortalitätsrate (SMR) für diese Krebse bei Schweizer Schreiner ist 620, die «odds ratio» für Adenokarzinom ist 75.

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