the debate on whether women with minor cytological abnormalities (squamosa atypia or koilocytosis) should be immediately assessed by colposcopy or should be followed up by repeat cytology. Although colposcopy is certainly more sensitive than cytology, its prompt and extensive use in assessing women with abnormal smears has been questioned because it may have negative psychological effects.2,3

Within a prospective study (European Community SOCC 93-102330) that compared the diagnostic accuracy of six months’ cyto-

go logical surveillance to immediate colposcopic assessment in women with minor histological abnormalities, we have measured the level of psychological discomfort (anxiety) in two comparable, age-matched subgroups of 50 women assessed according to the two policies. Psychiatric symptoms were quantitatively and qualitatively assessed by the Spielberger state-trait anxiety inventory (STAI),4 and by the Z-test.5 The latter focused on the analysis of “anatomical” contents which are strongly associated with anxiety.6 Psychiatric tests were administered immediately before colposcopy or repeat smear.

As shown in the table, a minor statistically significant (mean (SD) score: colposcopy = 44.6 (10.9); repeat smear = 40.7 (8.7); p<0.05; 95% confidence interval = 3.8; 3df; 5, = p < 0.11) increase in anxiety was observed in the group of women undergoing colposcopy according to the STAI test. No difference, however, was observed in the response to Z-test between the two groups, which showed comparable frequencies of anatomical contents.

Review of the article by Knox: Leukemia clusters in childhood

SIR—In 1994 an article was published by Professor Knox presenting the results of a geographical analysis of childhood leukemia clusters in childhood.1 The objective of this analysis was to validate a previously demonstrated spatial clustering of childhood leukemias by investigating the relative proximity of map features to cluster locations compared with control locations.

Based on 9406 childhood leukemias and non-Hodgkin lymphomas, including 264 cases (or more) of leukemia and 50 or less partially matched and unmatched controls, clusters showed a relative proximity to several map features, the strongest being for railways. After more detailed analysis of the association with railways, Knox concludes that the use of fossil fuels, especially petroleum, is associated with the occurrence of childhood leukemia clusters. The investigator has made a methodological error in this study related to the selection of controls. Specifically, because leukemia/lymphoma clusters are more likely to occur in densely populated areas than in areas with a small population density, and more densely populated areas are more likely to have railways and industrial facilities located in them, controls should have been selected in a manner similar to that used to select clusters. However, Knox instead selects controls from postcodes filed alternately 10000 before and after the cluster postcode, as well as randomly. This method of control selection creates an artificial difference between the two samples. Any factor related to population density may be statistically associated with the disease clusters. Knox should have defined “control clusters” in the same manner as case clusters, perhaps from clusters of other childhood diseases (for example, non-cancerous conditions such as cleft palate). This would have balanced the aggregation of case clusters in densely populated areas.

Knox states that population density has been taken into account by using church distance to standardise rail distance. However, this adjustment is unlikely to completely account for population density due to the significant correlation between distance to the closest church and distance to the nearest railway. When two variables are highly correlated, it is not possible to adjust for the effects of one variable on another. In fact, the stratified analysis by degree of population densities (second paragraph, page 372) suggests population density is not accounted for. In this analysis, the difference in mean rail distance between clusters and controls in the higher density areas was only 0.12 km and not statistically significant, compared with the lower density areas where the difference was more extreme (1.12 km) and statistically significant. The author, however, incorrectly interprets this as a further confirmation of the hypothesis.

Knox’s analysis of individual cases and randomly selected controls does not suffer from the limitations noted above. However, this analysis shows associations for a variety of different types of installations which suggest the data are unable to discriminate between potential hazard types. Moreover, data for refineries suggest that risk increases as distance from the refinery increases, an unexpected finding if petroleum use is associated with childhood leukemia. For example, the relative risk (RR) for residence within 0.3 km of a refinery was RR = 1.17, while at 3–5 km the RR increases to 1.26. Risk decreases at 5–10 km to RR = 1.17, but this irregular dose-response pattern is inconsistent with a petroleum related effect. Similar patterns of irregular dose-response are observed for “lessor oil hazards” such as oil storage and oil distribution terminals, and for fossil fuelled power stations.

Finally, the heterogeneous patient group consisting of leukemia cases and non-Hodgkin cases and the lack of statistically significant associations with roadways, which would be expected if fossil fuel use were associated with childhood leukemia clusters, also argue against the validity of Knox’s findings and conclusions.1 Furthermore, Knox makes a distinction between primary and secondary associations, without any scientific justification.

In conclusion, the geographical analysis presented by Knox suffers from serious methodological shortcomings cannot be used to support or refute a relationship between leukemia clusters and environmental exposures from fossil fuel combustion.

G M H SWAEN
University of Limburg,
Maastricht, The Netherlands.


Smoking and health promotion in Nazi Germany

SIR—Hermann Brenner’s letter1 seems to consider that our article “Smoking and health promotion in Nazi Germany”2 should have contained a “detailed and informative individual-level studies” of interventions aimed at reducing smoking. This seems to rather spectacularly miss the central point of our piece, which is that to understand smoking behaviour in populations, some knowledge of the historical and social background is required. By discussing the possible reasons for the continuing high levels of smoking in Germany, backed up by a cohort analysis stretching back to those who initiated their smoking during or before the second world war, and not referring to the possible long term influence of one of the most dramatic (and fortunately, in what it accompanied, historically unique) prohibitionist movements the world has seen, seems bizarre. This is especially the case when the reasons Brenner cites for the remaining high rates of smoking – the lack of restrictive smoking policies in workplaces and on transport, together with a paucity of health education activity among youngsters – are exactly those which the Nazis implemented, with little success.

Understanding behaviour as complex as smoking requires a considerably more sophisticated view of how the world is than one which sees individual-level motivation as

\[ \text{Results of psychiatric assessment of two comparable groups of women with minor}
\]

\[ \text{cytological abnormalities and undergoing immediate colposcopic assessment (group A), or}
\]

\[ \text{cytological surveillance after six months (group B)} \]

<table>
<thead>
<tr>
<th>Psychiatric test</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>State-trait anxiety inventory:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score 20–39</td>
<td>19</td>
<td>28</td>
</tr>
<tr>
<td>Score 40–55</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>Score &gt;55</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Z-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absence of anatomical contents</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>Anatomical contents present</td>
<td>28</td>
<td>29</td>
</tr>
</tbody>
</table>

Our findings agree with those of Gath et al.,2 who suggest that colposcopic assessment in women with minor cytological changes is not associated with major psychiatric morbidity. In particular, the level of anxiety is not significantly greater than that associated with cytological surveillance. Thus, the latter policy should not be preferred to immediate colposcopic assessment on the grounds of minor psychiatric morbidity.

PATRIZIA MAGHERINI
SILVIA CECCHINI
CARLO F CATAGNI
FELICIA DI FRANCISCA
STEFANO CIATTO
GRAZIA GRAZZINI

Centro per lo Studio e la Prevenzione Oncologica,
Florence, Italy.


Review of the article by Knox: leukemia clusters in childhood.

G M Swaen

*J Epidemiol Community Health* 1996 50: 109
doi: 10.1136/jech.50.1.109

Updated information and services can be found at:
[http://jech.bmj.com/content/50/1/109.1.citation](http://jech.bmj.com/content/50/1/109.1.citation)

**Email alerting service**

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

**Notes**

To request permissions go to:
[http://group.bmj.com/group/rights-licensing/permissions](http://group.bmj.com/group/rights-licensing/permissions)

To order reprints go to:
[http://journals.bmj.com/cgi/reprintform](http://journals.bmj.com/cgi/reprintform)

To subscribe to BMJ go to:
[http://group.bmj.com/subscribe/](http://group.bmj.com/subscribe/)