A method to determine if consenters to population surveys are representative of the target study population

Helen F. Boardman, Elaine Thomas, Helen Ogden, David S. Millson and Peter R. Croft

Abstract

Background Searching medical records of study non-responders to investigate selection bias is no longer acceptable. We explore an alternative by comparing consultation rates in survey responders who consented to medical record review, with anonymized consultation rates for the total practice populations.

Methods Anonymized aggregated consultation rates for the year following a population-based survey were calculated for headache and a number of other conditions (chosen to reflect a mixture of chronic and episodic conditions). These rates were compared across two groups of adults: (i) responders to the survey who consented to medical record review and (ii) a ‘population group’ created from records of the general practices participating in the survey to represent all patients aged 18 years and over at the midpoint in the study year. The consultation rates for the conditions were compared across the two groups using direct standardization.

Results Adjusted consultation rates were similar but generally higher in the responders.

Conclusions This alternative method applied here offers one potential approach to determine whether study responders are representative of the total target population. Since anonymized data may be obtained and used for the target population as a whole, this represents an indirect way of assessing the impact of non-response on representativeness. We compared consultation rates for some common conditions among responders to a headache survey who had consented to the use of their practice records for research with anonymized rates derived from the practice populations from which they were sampled.

Methods

Details of the headache survey have been reported elsewhere. Briefly, a random sample of 5000 adults aged 18 years and over was selected from the practice registers of five general practices. They were mailed headache questionnaires, with two reminders to non-responders. Respondents were asked for their consent to review their general practice records.

A ‘population group’ was created on the practice records represented by all patients aged 18 years and over at the midpoint in the study year. Anonymized aggregated consultation rates for the year following the survey were calculated for headache and a number of other conditions (chosen to reflect a mixture of chronic and episodic conditions).

Introduction

Recently introduced data protection legislation has changed research practice in the United Kingdom, although uncertainties about the interpretation of the legislation remain. Methods such as searching general practice records to investigate whether non-responders are different to responders, are no longer acceptable as they use information about identifiable individuals without their consent. Using general practice consultation data differences in health status between responders and non-responder to surveys has been previously demonstrated.

An alternative approach to estimating the effect of non-response is to reformulate the problem as the extent to which respondents are representative of the total target population. Since anonymized data may be obtained and used for the target population as a whole, this represents an indirect way of assessing the impact of non-response on representativeness. We compared consultation rates for some common conditions among responders to a headache survey who had consented to the use of their practice records for research with anonymized rates derived from the practice populations from which they were sampled.
The consultation rates for the conditions among the study consenters were then compared with those from the population group. Direct standardization was used to adjust the consenters group to the age and gender characteristics of the population group. In this way the non-consenter records were not separately identified.

Ethical approval for the study was obtained from North Staffordshire Local Research Ethics Committee.

Results

2662 (56 per cent response) questionnaires were returned and 2192 (82.3 per cent) responders consented to medical record review. The population group consisted of 39 025 patients aged 18 years plus (including the 2192 consenters).

The consenters group was more likely to consult both for headache and all other conditions examined compared with the population group (Table 1). However, after standardization these differences were reduced.

Discussion

The adjusted consultation rates presented here were similar but generally higher in the consenters group compared with the population group. This suggests that consenters have more morbidity than those who do not participate, not only with respect to the topic of the survey (headache) but for other conditions also. However, the differences were not large and suggest that non-response bias is unlikely to be substantial with respect to the extent and pattern of ill health. Previously in this study we have demonstrated that age and gender affected response to the survey. The results of this analysis suggest that once these demographic differences are taken into account, consultation behaviour has little additional effect on participation.

Our analysis is limited to one aspect of generalizability and the extent to which this establishes generalizability in a broader sense depends on whether consultation behaviour is a good marker for health status and behaviour in general. Our study had a response rate of 56 per cent and this method can be used to demonstrate whether such a level of response is compatible with generalizability to the target population.

Evidence suggests that non-morbid characteristics such as lifestyle also influence response to surveys. Studies which have collected information directly from non-responders, such as supplementary telephone contact or information from previous contact, show that women, older people, higher socio-economic groups, those with healthier lifestyles and those with the condition of interest are all more likely to respond to surveys.

Amongst those responding to a survey, information given such as gender, age and the symptom under investigation have been shown to be related to the likelihood of consenting to medical record review. This introduces another potential for participation bias. This phenomenon was seen in our study, where those who consented to medical record review were more likely to be younger, male and report a recent headache compared with those who completed the survey but did not consent to record review. In contrast, after adjusting for age and gender differences between the consenting group and the total practice population from which the study sample was drawn, the consultation rates for headache and a number of other conditions were similar in the two groups.

The method described here offers one potential approach to determine whether respondents to a study are representative of the population from which they were sampled with respect to a particular set of characteristics, namely their morbidity as measured by consultation with a general practitioner, and as such can be used as one measure of the representativeness of the responding sample.

Acknowledgements

We would like to thank the staff and patients of the North Staffordshire GP Research Network for their assistance with the study. We would also like to thank the network team and administrative staff from the Primary Care Sciences Research

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of consultations per 10 000 in the study period</th>
<th>Consenters</th>
<th>Consenters, age and gender adjusted</th>
<th>Population group (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>328</td>
<td>319</td>
<td>316 (299, 334)</td>
<td></td>
</tr>
<tr>
<td>Essential hypertension</td>
<td>1305</td>
<td>1186</td>
<td>1052 (1022, 1083)</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>497</td>
<td>492</td>
<td>462 (441, 483)</td>
<td></td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>246</td>
<td>232</td>
<td>207 (193, 222)</td>
<td></td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>151</td>
<td>149</td>
<td>106 (96, 116)</td>
<td></td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>265</td>
<td>234</td>
<td>253 (238, 269)</td>
<td></td>
</tr>
<tr>
<td>Anxiety and depression</td>
<td>990</td>
<td>978</td>
<td>935 (906, 964)</td>
<td></td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>520</td>
<td>491</td>
<td>495 (474, 517)</td>
<td></td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>351</td>
<td>352</td>
<td>347 (330, 366)</td>
<td></td>
</tr>
</tbody>
</table>
Centre and administrative staff from the Department of Medicines Management, Keele University for their help and support with the study. Survey costs were funded by the Proprietary Association of Great Britain.

References