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ENDGAMES

STATISTICAL QUESTION

Questionnaire surveys

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Researchers developed a questionnaire to ascertain doctors' perceptions about their own and their colleagues' use of alcohol while on call. A 20% random sample of all doctors, stratified by specialty, in one county of the United States was selected. A total of 206 questionnaires were mailed and 135 (65%) responses were received. Those who responded to the survey differed from those who did not. Non-responders were more likely to be women (25% *v* 16%), to have graduated from medical school more recently (18 years *v* 20 years), to be doctors of internal medicine (31% *v* 17%), but they were less likely to be surgeons or paediatricians (24% *v* 36%).[1]

Although 98% of respondents thought that patients would care if doctors drank alcohol while on call, they disagreed about whether they should do so. Of the 135 respondents, 32 (24%) had drunk alcohol while on call and 35 (26%) reported that alcohol use while on call was a private matter.

Which one of the following biases best describes the reported difference in characteristics between responders and non-responders?

a) Response bias

b) Non-response bias

c) Selection bias

d) Attrition bias

Answers

Non-response bias (answer *b*) best describes the reported difference in characteristics between responders and non-responders.

Non-response is often a problem in questionnaire surveys. Non-response bias occurs when non-responders are different from responders in their sociodemography, behaviour, or attitudes. Any such differences may be difficult to quantify because limited information, if any, is typically available for those who do not respond. The researchers reported a difference between responders and non-responders in their sex distribution, time since qualification, and specialty, so non-response bias therefore existed (answer *b*). Because of the existence of such bias, it may not be possible to generalise the survey results to the wider population of doctors in the county or the entire country.

Non-response bias should not be confused with response bias. Response bias results from bias in how questions are answered (answer *a*). It is possible that response bias did occur—doctors may not have been truthful when answering questions about alcohol drinking while on call but may have answered in a socially desirable way to avoid extreme opinions.

In a questionnaire survey, selection bias occurs if those people invited to take part are not representative of the population of all possible participants (answer *c*). In the above survey, doctors were invited to take part after random sampling within a county, with stratification of the population by specialty. Therefore, selection bias did not occur. However, because of non-response bias the resulting sample was not representative of the population of doctors in the county.

Attrition bias occurs in longitudinal studies when people are lost to follow-up in a non-random manner (answer *d*), especially if those lost to follow-up differ in some systematic way from those not lost to follow-up. It is a particular problem if the characteristics of those people lost to follow-up or the reasons for attrition are associated with the outcome measure(s). This questionnaire survey was a cross sectional study with doctors surveyed at one point in time, so attrition bias did not occur.

Competing interests: None declared.

1 Ahmad T, Wallace J, Peterman J, Desbiens NA. Doctors' perceptions of drinking alcohol while on call: questionnaire survey. *BMJ* 2002;325:579-80.

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