
**RESPONSE RATES FOR MAILOUT SURVEY-DRIVEN STUDIES
IN PATIENTS WITH HEAD AND NECK CANCER**

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Abstract: *Background.* Mailout survey studies are becoming more prevalent in the head and neck literature. The objective of this paper is to summarize response rates in patients with head and neck cancer, and to provide recommendations surrounding methodology used to design and implement mailout survey questionnaires.

Methods. The results of this paper are from a study assessing the measurement properties of the Disabilities of the Arm, Shoulder and Hand Questionnaire (DASH) in head and neck cancer patients. A modified Dillman tailored design approach was used.

Results. The methods used yielded a response rate of 80% with this patient population.

Conclusion. This is a considerably higher response rate than other reports in the oncology literature. © 2010 Wiley Periodicals, Inc. *Head Neck* **32**: 1585–1591, 2010

Keywords: mailout study; response rate; survey; questionnaire; nonresponse bias; cancer; head and neck cancer

Mailout survey studies are becoming more prevalent in the head and neck literature. This methodology is useful in that it is relatively inexpensive and yields quick results. Survey-driven studies have been frequently employed in studies involving patient populations, and medical professionals including medical students, residents, and practicing physicians.^{1–4}

The major drawback to mailout surveys is the potential for poor response rates. Poor response rates can lead to failure to meet an estimated sample size, thus resulting in lower statistical power. Nonresponse also has the potential to bias the results of the study because those who are dissatisfied with their outcome or

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disinterested may not respond, thereby underestimating negative results.⁵

The Dillman tailored design approach provides a standardized approach for conducting mail surveys to maximize response rates.^{6,7} Dillman and others have described a high response rate to mailout questionnaires.^{3,4,6,7} Understanding response rates and level of participation in a target population is important in study design and implementation, particularly in determining whether the required sample size can be achieved with a mailout survey. To the best of our knowledge, there have not been studies in the literature specifically addressing response rates with mailout surveys in the patient population with head and neck cancer. The goal of this paper is to provide one example of response rates in patients with head and neck cancer, as well as recommendations surrounding the methodology used to design and implement mailout survey questionnaires. The results of this paper are from a study assessing the measurement properties of the Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH) in patients with head and neck cancer.

MATERIALS AND METHODS

A cross-sectional mailout (postal) study was undertaken to evaluate the measurement properties (ie, reliability, validity, and sensibility) of the DASH questionnaire in patients who underwent neck dissection for head and neck cancer. The sample population included patients with head and neck cancers of the upper aerodigestive tract (oral cavity, oropharynx, nasopharynx, or larynx), skin, thyroid, or salivary glands, who had a neck dissection at the Princess Margaret Hospital, University Health Network, University of Toronto. Patients were older than 19 years of age and had undergone either a radical neck dissection, a modified radical neck dissection, or a selective neck dissection. All patients included were disease-free at the time of inclusion in the study.

For reliability testing, the sample size required was 47 analyzable cases. For validity testing, a sample size was estimated at 30 patients with analyzable data in each neck dissection group (selective neck dissection, modified radical neck dissection, and radical neck dissection) for a total of 90 subjects. Given the lack of data on response rates in this population, the

sample size of patients eligible for inclusion was arbitrarily increased by about 50% to allow for the inability to contact patients or nonresponse to the survey. A list of patients eligible to be sent packages was determined from a chart review. Due to the limited survival, all living radical neck dissection patients treated after the year 2000 meeting the eligibility criteria (63 patients) were mailed questionnaire packages. Given the large number of available patients in both the modified radical neck dissection and selective neck dissection groups, 45 patients treated between the years 2000 and 2005 meeting the eligibility criteria (based on chart review) were randomly chosen. Thus, a total of 153 eligible patients were sent questionnaire packages. Institutional ethics board approval was obtained for the study.

Procedures Used to Maximize Response. Eligible patients were sent a questionnaire package containing an introductory cover letter, 2 consent forms, instruction sheet, the DASH questionnaire, the Neck Dissection Impairment Index, and a study-specific questionnaire surveying patients' opinions on how well the DASH questionnaire measures shoulder disability (sensibility questionnaire). Also included was a return envelope addressed with prepaid postage. The initial mailout was performed in the middle of January when patients were expected to be back from any holidays. A modified Dillman approach, as described below, was used to maximize response rates.^{1,2} Two weeks after the initial mailing, a postcard was sent to the patients thanking them for completing and returning the questionnaire package and reminding them to do so if they have not responded yet. Two weeks after the postcard mailing, a second complete package was sent to the patients who failed to mail back a package after the first mailing. For assessment of the test-retest reliability, a package containing the DASH questionnaire, Neck Dissection Impairment Index, and a change in status form was mailed out approximately 2 weeks after completion of the patient's first package. To maintain patient confidentiality, each package was assigned a study identification number at the top of each survey booklet.

All forms were printed on 8.5" × 11" white paper using black colored ink. Both mailout and return envelopes were 9" × 12" and labeled with the University Hospital logo. The return

envelope was preaddressed and had a first-class printed stamp. The cover letter was printed on hospital letterhead and was personalized to include a handwritten title and name of recipient. The cover letter was hand signed by the individual surgeon who had treated that patient. Patient labels with their name and address were used to label the cover letter and the mailout envelope.

Each questionnaire was printed single sided, stapled as a separate booklet, and labeled with the questionnaire name and easy-to-follow instructions. Questionnaire length was kept to a minimum. The DASH questionnaire is a 30-item questionnaire with 2 optional 4-item modules. Respondents circle the appropriate response on a 5-point scale, which takes approximately 10 to 13 minutes to complete. The Neck Dissection Impairment Index is a 10-item questionnaire with responses rated on a 5-point scale. The complete package was previously piloted on 10 consecutive patients with head and neck cancer to ensure that the questionnaire was not too long and that the instructions were easy to understand.

Follow-up postcards were 6.5" × 4.5" in size and were printed on white cardstock paper with black ink. The University Hospital logo was included on the postcard with a return address. The recipient's name and address were printed on stickers that were used to label each postcard. A friendly reminder was printed on the opposite side.

A summary of the different techniques used in this study to maximize response rates is included in Table 1. A tracking form was used to record the mailout dates for the initial mailing, the postcard, and the final mailing. Also maintained on the tracking form were the dates we received the completed packages or any other type of correspondence from patients or their families. Approval was obtained from the hospital research ethics board. A chart review of nonresponders could not be performed because the research ethics board committee felt that failure to return a package was considered to be a refusal to participate in the study. Therefore, nonresponse bias could not be assessed. Differences in response rates by head and neck cancer site was performed using chi-square analysis. A *p* value of <.05 was considered statistically significant. Sites were divided into carcinomas of the upper aerodigestive tract (oral cavity, oropharynx, hypopharynx, nasopharynx, larynx), thyroid, salivary gland, and skin.

Table 1. Summary of techniques used to maximize response rate.

Mailing technique (modified Dillman approach):
First mailing with cover letter, consent forms, questionnaires, and addressed prepaid stamped envelope.
Follow-up postcard at 2 weeks after initial mailing thanking those that responded and urging nonresponders to participate.
Third mailout 2 weeks after follow-up postcard included all items of first mailing sent to nonresponders.
Cover letter:
Printed on University Hospital letterhead.
Limited to 1 page in length.
Handwritten patient name and title as salutation.
Sticker label included with patient's name and address.
Hand-signed signatures by patient's surgeon.
Anonymity and confidentiality assured.
Informed consent as a separate form (3 pages long).
Questionnaire structure and design:
Labeled with study identification number.
Sensitive questions were avoided.
Single-sided printing.
Multiple booklet design with a separate instruction sheet stapled to the beginning of each booklet.
Simple response patterns used (a box for multiple choice responses or a number to circle for Likert-type scale responses).
Envelopes and postcard:
All mailings used a sticker label with patient name and address.
All outgoing mail included University Hospital logo and return address.
Envelopes were 9" × 12" and postcards were 6.5" × 4.5".
First class printed postage used on all envelopes and postcards.

RESULTS

Response Rates for Patients. A total of 153 eligible patients were sent packages, of which 10 were returned to sender and 6 could not be filled out because the patient had died. Therefore, 137 patients were presumed to have received the package and included in the final response rate calculation (Table 2). The overall response rate for living patients was 79.6% (109/137). Table 2 also highlights the response rates for the 3 different types of neck dissections and the reasons for nonresponse. In general, 76% of radical neck dissection patients, 83% of modified radical neck dissection patients, and 80% of selective neck dissection returned a questionnaire package. Figure 1 shows the patient response rates with each mailing using the modified Dillman approach. For the test-retest reliability mailing, 52 packages were sent out a second time and 44

Table 2. Reasons for nonresponse and response rate by neck dissection type.

Description	Radical neck dissection	Selective neck dissection	Modified radical neck dissection	Total
Eligible for mailout	63	84	57	204
Mailed out	63	45	45	153
Deceased	3	0	3	6
Mail returned to sender	10	0	0	10
Did not return	12	9	7	28
Patients able to return	50	45	42	137
Returned	38 (76%)	36 (80%)	35 (83%)	109 (79.6%)

(85%) packages were returned (Table 3). There were no statistically significant differences in response rates based on tumor site ($p = .5$) (Table 4).

Missing Items. Reporting the missing items from respondents is an important adjunct to response rate data. Too often papers will report a response rate without commenting on the quality of the responses received. The quality of

the response can best be measured by describing the number and type of missing items.

One hundred nine packages were returned. For the DASH questionnaire main module, 18 patients had missing items. Only 5 patients had more than 10% missing items, which excluded them from analysis based on the DASH questionnaire instructions for handling missing data. One of these patients inadvertently failed to complete an entire questionnaire. For the neck dissection impairment index, 4 patients had missing items, of which only 1 had more than 10% missing items. This 1 patient did not complete the neck dissection impairment index at all. Of the 44 patients who returned the package as part of the retest reliability, 2 patients had greater than 10% of items missing on the DASH questionnaire.

DISCUSSION

For our study, a mailout survey was chosen because the study was a cross-sectional design and we required data from a large number of patients within a short time period at a relatively low cost. Many of the patients seen at the Princess Margaret Hospital travel long distances across the province, and therefore it was not

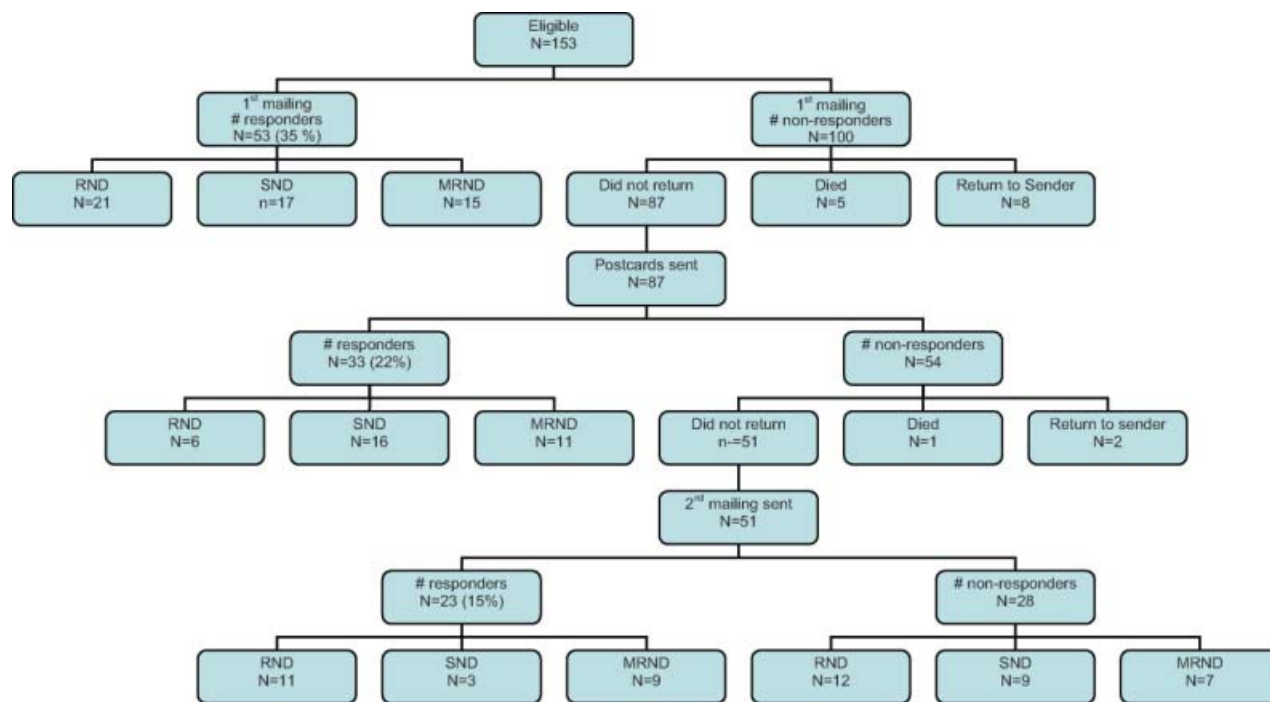


FIGURE 1. Patients' response rates with each mailing. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Table 3. Test–retest response rate by neck dissection type.

Description	Radical neck dissection	Selective neck dissection	Modified radical neck dissection	Total
Retest mailed out	18	17	17	52
Retest returned	15 (83%)	14 (82%)	15 (88%)	44 (85%)

feasible to have them return solely for a study. A potential drawback to choosing a mailout survey design is that the success of the study would be partially dependent on response rates. This raised some concern as there was limited data on response rates with mailout surveys in the head and neck patient population. Many studies using quality of life measures/questionnaires frequently employ methods of collecting data from the patients in person. As well, there were specific concerns of poor response rates in the patient population with head and neck cancer because patients are frequently older and high rates of substance abuse have been reported that may limit response rates. A high response rate was particularly important for the radical neck dissection patients, as the potential sample population was relatively small.

Overall, our patient response rate was high at 80%. This proved to be higher than the response rates reported for survivors of other cancers described in the literature. Published mailout survey results for cancer survivors have been shown to yield response rates as low as 47% in the bladder cancer survivor population, and as high as 64% in the childhood cancer (lymphoma, leukemia, or central nervous system cancer) survivor population.^{8,9} Low response in the bladder cancer survivor study may be explained by the fact that survivors were 5 to 10 years posttreatment and were considered to be cancer-free, thus not requiring regular follow-up visits with their physicians; and perhaps feeling less indebted and less motivated to respond. In the childhood cancer study, both parents and the survivors (if they were >18 years of age) received a monetary incentive to complete the survey and this may have led to the higher response rate.

We searched the literature to confirm some of the most valuable techniques to maximize response rates. After excluding the feasibility of an in-person interview, we chose to perform a mailout survey because over the last few years, studies have suggested that this method

consistently produces better response rates when compared to alternate methods of survey administration (excluding in-person surveys). Phone surveys have also been assessed and a randomized trial showed that postal surveys gave superior response rates over telephone interviews (41% for telephone vs 60% for mail).¹⁰ A population-based study compared a web questionnaire with a similar printed questionnaire and found that although those that responded to the web questionnaire found the process more appealing, the mailed questionnaire had a significantly higher response rate (64% for print vs 50% for web, a difference of 14%).¹¹

Population survey-driven studies have shown that a longer questionnaire is associated with a lower response rate.¹² The final response rates were higher among those receiving a short (1 page), rather than a long (7 pages), questionnaire (75.6% vs 68.2%; $p = .08$). A randomized trial of variations of printing design showed that this could also influence response rates. Single-booklet questionnaires had a better response than the multiple-booklet questionnaires and single-sided questionnaires had a better response than double-sided questionnaires.¹³ In our study, for practical reasons we were unable to combine all the surveys into 1 booklet as each survey came with a specific instruction form. We did, however, keep all printed correspondence single-sided.

In a randomized study of envelope and ink color, the use of green ink was found to increase response rates when compared to black ink.¹⁴ However, envelope color was inconsistent in its effect on response rate. Another meta-analysis showed that printing questionnaires on colored paper did not substantially increase response rates in mailed surveys.¹⁵ We were unable to print using a color font for practical reasons (the office printer and photocopier did not have the color photocopying feature). We did,

Table 4. Response rate by head and neck cancer site.

Cancer subsite	Respondents	Nonrespondents	Response rate, %
Upper aerodigestive tract	64	19	77
Salivary gland	13	4	76
Thyroid	17	4	81
Skin	15	1	94

however, print all surveys on white paper and included a standard hospital brown envelope. Including a pen with a mailed questionnaire has been shown to increase response rates.¹⁶ Furthermore, the additional cost of the pen was compensated by the reduced number of nonrespondents who would have otherwise required another mailout.¹⁷ We did not include a pen, but would do so in the future.

Inclusion of questions of a sensitive nature, questions seeking consent to link medical records, and questions requesting telephone numbers in mailout surveys have not reduced survey response rates.^{18,19} However, 2 systemic reviews by Edwards et al^{20,21} showed that the odds of response were reduced when the questionnaire included questions of a sensitive nature. For the purposes of our study, any such sensitive questions were avoided so as to maximize the response rate. The same reviews by Edwards et al^{20,21} showed that the use of stamped return envelopes, an assurance of confidentiality, providing a second mailout of the questionnaire to nonresponders, and personalized cover letters and questionnaires all increased the likelihood of response. Cover letters that use a more personal approach and stress the importance of the individual's response have been shown to increase the response rate.²² There is conflicting data on the use of handwritten versus printed signatures on cover letters for mailout surveys.^{7,23} Personalized cover letters and handwritten signatures were used in our study.

Currently, the standard for conducting mail surveys is the Dillman tailored design approach, specifically using multiple mailouts or telephone reminders.²⁴ A systematic review looking at 13 studies reporting 15 trials confirmed that using a Dillman tailored approach with multiple reminder letters had the most significant impact on response rate (odds ratio 3.7; $p < .00001$). Dillman also stresses the importance of personalizing the cover letter sent out with a mailout study. He suggests including the date, the recipient's name and address on the letter and on the envelope, an appropriate salutation, a description of what is being requested and why, a statement that confirms that answers are confidential and participation is voluntary, the enclosing of a prepaid postage return envelope, a statement concerning who to contact with questions, and the inclusion of a nontyped signature written in contrasting ink. Implementa-

tion of reminder letters and telephone contact has a significant positive effect on response rates.²⁴ We did receive several phone calls from patients commenting on the study or explaining why they could not respond. We found that the inclusion of a statement concerning whom to contact with questions was helpful. Multiple mailings of the entire package to initial nonresponders have been shown to have a small additional effect on response rates.^{25,26} We limited ourselves to a postcard reminder which was flanked by 2 mailings of the entire package. This was done in compliance with the ethical conduct of research that promotes voluntary participation and prevents perceptions of harassment by those conducting the study.

CONCLUSION

Mailout driven survey-based studies are relatively inexpensive and can yield quick and useful results. Here, we describe an example of maximizing survey response rates among patients with head and neck cancer. A high response rate was achieved for a patient population with head and neck cancer by using a modified Dillman approach, an evidence-based cover letter and questionnaire design, and by providing prepaid stamped envelopes to all of our research participants. Maintaining high response rates is crucial in mailout studies to circumvent nonresponse bias, nongeneralizability of the results, insufficient sample size, large standard errors, and low statistical power. The results of this study and the review of the literature discussed, highlight the importance of methodology in maximizing response rates.

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