

# The Accuracy of Pap Smear Utilization Self-Report: A Methodological Consideration in Cervical Screening Research

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*One method used to determine utilization rates of cervical screening is women's self-report. Few studies have assessed the accuracy of this measure—none has been conducted in Australia—although there are a number of reasons for suspecting its validity. This study examined and quantified the accuracy of self-report of Pap smear use among a randomly selected sample of women from an Australian community. Accuracy of Pap smear utilization self-report within a three-year period was assessed by comparison with pathology records. Results indicate that almost half of the women who have not had Pap smears within three years will be missed by a self-report measure of utilization. Some implications for the measurement and use of self-report data are discussed.*

While little Australian data are available, it is evident that a substantial proportion of Australian women may not be having Pap smears within

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recommended screening intervals (Armstrong, Rouse, and Butler 1986; Mitchell and Medley 1987). The optimal method for determining utilization rates of screening is less than clear. Two methods of data collection have been reported in the literature: (1) obtaining data from the cervical smear records of a central screening registry or from pathology laboratories responsible for smear and analysis (Armstrong, Rouse, and Butler 1986; Mitchell and Medley 1987; Parkin, Collins, and Clayden 1981); and (2) obtaining self-reported information from women in the community regarding their previous Pap smear history, by conducting interviews or administering questionnaires (McCurtis 1979; Editorial Committee of the Cardiff Cervical Cytology study 1980; Hendershot 1981).

Within the last decade only two Australian studies using either screening registry or pathology laboratory data to determine utilization rates have been located (Armstrong, Rouse, and Butler 1986; and Mitchell and Medley 1987). Armstrong and colleagues collected data on cervical screening in Western Australia from the records of pathology laboratories and found the percentage of women screened in one year to peak at 34 percent for women aged 25–29 years, falling with increasing age to approximately 5 percent for women aged over 65 years. Checking laboratory records, however, is labor intensive and time consuming. In states with much larger populations, the task would require checking through the records of many more pathology laboratories—for instance, approximately 80 in New South Wales. As many smaller laboratories do not have computerized records, the costs of such a search would prove prohibitive.

Mitchell and Medley (1987) estimate that the percentage of the female population of Victoria aged 15–70 years screened by the Victorian Cytology (Gynecological) Service during 1986 was 18.3 percent, and note dramatic differences in smear rates for women of different ages. It is difficult to assess the appropriateness of utilization when data are derived from pathology records; for instance, nothing may be known of previous screening history or factors related to sexual history and hysterectomy status. Of the population not present for screening, we learn nothing of who they are, apart perhaps from their age distribution, or why they are not receiving smears. Inaccuracy is introduced where it is not possible to distinguish repeat screenings for one woman from instances of single screenings for several women, or to adjust figures for screening conducted by other organizations. Also, it is difficult to infer screening levels over a longer period (for instance, three years) from data reported on annual utilization.

The second method used to assess screening rates is self-report

data, obtained by the administration of interviews or questionnaires to a sample of the population. We know of only one published Australian study using this approach (Dickinson, Leeder, Sanson-Fisher 1988), although a number of American studies have been reported (McCurtis 1979; Hendershot 1981; Kegeles et al. 1965; National Center for Health Statistics 1975; Warnecke and Graham 1976; Mischynski and Stern 1979; Howe and Bzduch 1987; Kleinman and Kopstein 1981). Dickinson, Leeder, and Sanson-Fisher (1988) assessed utilization among a sample of general practice patients in Newcastle, New South Wales. However, as the authors acknowledge, biases in the study population—for instance, toward high health care utilizers—mean that results cannot be generalized to a community population.

An advantage of the self-report approach to data collection is that it permits exploration of the sociodemographic, knowledge, and attitudinal characteristics describing women who do and do not have smears. Also, women not at risk for cervical cancer, as a result of hysterectomy or never having been sexually active, can be identified and excluded. When no central screening registry exists, such as in New South Wales, this method has the advantage of ease relative to checking the records of many pathology laboratories. The difficulties of this method, however, include the problem of relying on the accuracy of a self-reported measure of a preventive health behavior.

There are several reasons for suspecting the accuracy with which women report cervical screening histories. First, self-report of Pap smears relies on a memory of events going back over a number of years, with less recent events being subject to greater errors of memory (Sudman and Bradburn 1974, 1983). Second, asking women about their cervical screening history presupposes both a knowledge of Pap smears and of whether or not a smear was taken. There have been suggestions that such knowledge may not always be present (Kleinman and Kopstein 1981; Kegeles 1967). Third, there is a degree of social pressure to conform to accepted health practice, and to engage in preventive health behaviors. It seems likely that some women may misinform about previous Pap smears in order to appear to be “doing the right thing”—displaying social desirability response bias (Furnham 1986). A degree of unreliability has been noted with self-report measures of other preventive health behaviors susceptible to social pressure (Webb, Bowman, and Sanson-Fisher 1988; British Thoracic Society 1983).

Studies of self-reported utilization have paid only cursory attention to the accuracy of their data source (McCurtis 1979; Kleinman and Kopstein 1981; Kegeles 1967; Teitelbaum et al. 1988), and we

have found only three that attempt any empirical assessment (Warnecke and Graham 1976; Misczynski and Stern 1979; Walter et al. 1988). Misczynski and Stern (1979) state that 78 percent of self-reported Pap smears were verified in medical records. Warnecke and Graham (1976) conducted a survey to define the characteristics of black U.S. women obtaining Pap smears, and attempted to verify self-reported Pap smear histories. No records could be found for 36 percent of the respondents who reported smears. Where records were found, considerable discrepancy was evident between interview response and record contents: 51 percent of women reported a greater number of Pap smears than were found in their records; 38 percent reported an identical number; and 11 percent reported fewer Pap smears than were verified. However, the authors concede that "some" of those for whom cytology could not be verified had probably been tested. Walter et al. (1988) assessed the level of agreement between patients' self-report of smears and their physicians' records. Women were likely to overreport significantly the number of smears taken in the previous one, two, and five years, and were also likely to have reported their latest smear as more recent than did their physicians. These studies provide an indication that the issue of self-report reliability should be of concern to researchers in this area.

The purpose of this article is to examine and quantify the accuracy of Pap smear utilization self-report among a randomly selected sample of women from an Australian community.

## METHOD

### SUBJECT SAMPLE

Recruitment was by a random household survey conducted within the Newcastle, New South Wales area. A random selection of census districts within the study area and a household sampling framework were supplied by the Australian Bureau of Statistics. Subjects for the present study were women aged between 18 and 70 years, with sufficient understanding of English to enable participation.

### COLLECTION OF SELF-REPORT DATA

Interviewers were 16 female nursing students from the Newcastle College of Advanced Education, who had participated in a number of comprehensive training sessions before commencing the survey.

The following standard description of the Pap smear test was first read to respondents:

“During an internal examination, a doctor collects some cells from the cervix or the neck of the womb, smears them on a glass slide and sends them off to a laboratory to be examined. The cells are checked for any abnormal changes which may indicate cancer of the cervix, or conditions which could become cancer, early enough for treatment to prevent serious consequences.”

The interviewer then asked the following questions to assess cervical screening history:

1. “Have you ever had a Pap smear? And if so, about how many?”
2. “Have you had a Pap smear in the last five years? And if so, how many?”
3. “Have you had a Pap smear in the last three years? And if so, how many?”
4. “Have you had a Pap smear in the last year? And if so, how many?”

Subjects were also asked by the interviewer to read and sign a consent form allowing their Pap smear pathology records to be checked.

#### COLLECTION OF DATA FROM PATHOLOGY RECORDS

Eight pathology laboratories provide all cervical cytology analysis in the Newcastle area. All participated in the study.

Information obtained from pathology records consisted only of the smear date. In the conduct of record searches, subjects giving signed consent were identified by their full name (including any previously used surnames) and date of birth. Address at time of interview was available as an additional check on identity if required.

The National Health and Medical Research Council (1987) currently recommends a minimum screening frequency of every three years. In order to give more clinical significance to our examination of self-report reliability, and to establish some sensible temporal limit to expectations of reliability, the research question was restricted to a simple assessment of whether or not the survey respondents had had a Pap smear within the previous three years.

## RESULTS

### SAMPLE CHARACTERISTICS

The sampling frame identified 318 households, and contact was made with residents in 273 of these. Thirty-nine (14 percent) of households contacted did not have a suitable woman resident. Where more than one suitable woman was resident, only the first contacted in that household was included in the survey. Of the 234 women asked to take part in the survey, 157 (67 percent) consented to be interviewed. The sociodemographic characteristics of this sample are described in Table 1. They are compared to 1981 census data from the study area.

There is a slight underrepresentation of older women and "never married" women in the study sample but, in general, the sample appears to reasonably reflect the census data.

### ACCURACY OF SELF-REPORT

Of the respondents interviewed, 89 percent (140) reported having had at least one Pap smear in their lifetime. Eighty-six percent (120) of these women had resided in the study area for at least five years, and were asked to give consent for their Pap smear pathology records to be checked by the research team. The subject sample is constituted of the 93 percent (111) who gave signed consent for the check of self-report reliability.

Table 2 compares self-report and pathology record data for smear use within the last three years.

Table 1: Sociodemographic Characteristics of Women Interviewed ( $N = 157$ )

	<i>Study Sample</i> (%)	<i>1981 Census</i> (%)
<i>Age</i>		
18-34	46.1	40.5
35-54	37.2	32.8
55+	16.7	26.7
<i>Marital Status</i>		
Now married	62.6	54.5
Never married	14.8	22.7
Other	22.6	22.8
<i>Employment Status</i>		
Employed	38.9	35.4
Not in labor force	61.1	64.6

Table 2: Frequency of Smear Use “Within the Last Three Years” – Row and Column Percentages

		PATHOLOGY RECORDS		
		Smear in 3 Years	No Smear in 3 Years	Totals
SELF-REPORT	Smear in 3 Years	64 (77%)* [93%]†	19 (23%) [45%]	83 (100%)
	No Smear in 3 Years	5 (18%) [7%]	23 (82%) [55%]	28 (100%)
	Totals	69 [100%]	42 [100%]	111

\*Row percentages in parentheses.

† Column percentages in brackets.

According to self-report, 75 percent (83) (s.e. = 4.1 percent) of women had had a Pap smear, while on the basis of pathology records, this figure was only 62 percent (69) (s.e. = 4.6 percent). A difference of over 10 percent is evident in the prevalence figures obtained by the two measures.

We can consider the data in Table 2 by taking pathology records as the gold standard against which to assess self-report. Sensitivity refers to the ability of self-report to identify instances where a smear is found in pathology records, that is, where, in truth, the woman has had a smear. Conversely, specificity is the ability of self-report to identify instances where a smear is not found in pathology records. Sensitivity is 93 percent (s.e. = 3.2 percent): when pathology records indicate that women have had a smear, agreement between records and self-report is high. Specificity is 55 percent (s.e. = 7.8 percent): many women say they have had a smear, when pathology records suggest that they have not.

We can also consider the results of Table 2 in terms of the positive and negative predictive value of self-report. Positive predictive value refers to the percentage of “smear in 3 years” responses that agreed with pathology records: 77 percent (s.e. = 4.6 percent). Negative predictive value refers to the percentage of self-report “no smear in 3 years” responses that agreed with pathology records: 82 percent (s.e. = 7.4 percent). Approximately the same degree of error occurs within both categories of self-report response, that is, around 20 percent for each.

## DISCUSSION

The results of this study indicate that measures of Pap smear utilization based on self-report alone must be cautiously interpreted. The figures for nonutilization obtained using this method of data collection may be underestimates: at least 10 percent more women may be at risk as a result of inadequate screening than self-reported prevalence figures suggest.

It is possible that some records may have been missed in the search. However, even if it is assumed that 10 percent of the records were missed, specificity of self-report is still only 65 percent (s.e. = 7.4 percent). More likely, the source of most discrepancy between the two measures is inaccurate self-report.

The results have implications for the uses to which self-report data may be put. The low specificity value indicates that self-report identifies only 55 percent of all women who have not had a Pap smear within three years. As almost one-half of inadequately screened women remain undetected, intervention campaigns that target only those women who report not having had a smear will miss many of those at risk.

However, the high negative predictive value (82 percent) indicates that those women who report not having had a Pap smear within the last three years truly have not done so. That is, women who identify themselves as not having had a smear are genuinely at risk. Intervention with this group would therefore be cost effective, in the sense that only actual "nonusers" are targeted.

Several factors may have contributed to the discrepancy between self-report and pathology record data identified in this study. A number of "task" variables have been related to response effects in surveys, including the degree of structure in the task, the social desirability of responses, and the saliency of the information required (Sudman and Bradburn 1974, 1983).

The difficulty of the recall task that this study required brought comments from many respondents. Much of the disagreement between self-report and pathology records would have been expected to result from honest errors of memory. It seems likely that the accuracy of self-report would have been influenced both by the period of time since previous Pap smears and by the time span of screening activity the respondents were asked to recall. Sudman and Bradburn (1974) spoke of telescoping error — where an event is remembered as occurring more recently than it actually did. Sometimes referred to as "border bias," it



seems particularly relevant to the problem of obtaining accuracy in the self-report of Pap smear "recency."

Some degree of "social desirability response bias" (Furnhan 1986) might also have been expected. Their belief that they "should" have had a smear might have prompted some women to state, falsely, that this was the case. And finally, a degree of misreporting may have resulted from women thinking they had had a smear, when in fact they had not—a situation that might have been avoided if more information had routinely been given to women by practitioners taking Pap smears.

These findings have implications for the techniques that should be employed when collecting self-report data on Pap smear behavior. A second assessment of accuracy, making greater use of the literature on response effects and question construction, and of methods for aiding recall, such as "bounded recall" procedures (Sudman and Bradburn 1974, 1983), is currently being undertaken by the group. Respondent characteristics such as age may also be related to the accuracy of self-report (Hochstim and Renne 1971). The sample population in this study was slightly younger and less likely to have been never married than the general population. Both of these factors might be expected to result in inflated screening rates, but any possible effect on the accuracy of self-report is unknown. The sample size limitations of this study prohibited any exploration of possible "predictors" of accuracy (such as age, educational level, time since last smear, and health services utilization), but this issue will be addressed by a second study.

## CONCLUSIONS

The issue of accuracy is clearly a crucial methodological concern if self-report is to be used as a means of assessing cervical screening utilization. The results of this study indicate that almost half of the women with inadequate screening histories will be missed by a self-report measure of utilization. Future research could make a valuable contribution to this issue by developing improved measurement instruments, thus producing optimal self-report accuracy.

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