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PRINCIPAL INVESTIGATOR: Philip W. Chu
Rebecca Smith-Bindman, M.D.

CONTRACTING ORGANIZATION: University of California, San Francisco
San Francisco, California 94143-0962

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13. Abstract (Maximum 200 Words) (abstract should contain no proprietary or confidential information) There is uncertainty about whether women older than age 65 should undergo screening mammography. Although screening mammography may benefit some elderly women through the detection of early breast cancers, it may harm other women through false positive diagnoses and the detection of clinically insignificant lesions. This research study involves the design and implementation of a data analysis of HCFA Medicare billing claims linked with National tumor registry data from the Surveillance Epidemiology and End Results (SEER) program. The specific aims of this research will evaluate 1) differences in breast cancer mortality, 2) differences in breast cancer treatment and 3) difference in breast cancer tumor attributes between women who were screened and those who were not. In the second year of this grant the PI will focus on validating that the Medicare claims are accurate for determining screening mammography.			
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INTRODUCTION

Uncertainty persists over whether women older than age 65 should undergo screening mammography. Although screening mammography may benefit some elderly women through the detection of early breast cancers, it potentially can harm other women through false positive diagnoses and the detection and surgical treatment of clinically insignificant lesions. This study involves the design and implementation of a data analysis of HCFA-Medicare billing claims linked with national tumor registry data from the Surveillance Epidemiology and End Results (SEER) program. The specific aims of this research are to evaluate, between screened and un-screened women, differences in 1) breast cancer mortality, 2) breast cancer treatment (mastectomy and lumpectomy) and 3) breast cancer tumor attributes (e.g., size and stage). A critical initial project is to validate the accuracy of Medicare billing claims for the classification of screening mammography, and this analysis must be completed before the primary aims described above can be analyzed.

Using prospectively collected data from the San Francisco, New Mexico, and Seattle Breast Cancer Surveillance Consortium (BCSC) registries (an NCI-sponsored collaboration of mammography registries) linked with data from Medicare and Health Care Financing Administration (HCFA), contained within the SEER-Medicare database, for the same geographical regions from 1992–1996, we will assess whether Medicare physician claims can be used to identify the use of screening mammography. If the Medicare database can be used to adequately identify the use of screening mammography, we will obtain the linked SEER-Medicare database to evaluate the described outcomes of screening mammography among elderly women.

STUDIES and RESULTS

SOW #1: Obtain HCFA /SEER Tumor Registry Data

We have obtained and completed cleaning of the linked HCFA-Medicare/SEER database describing Medicare claims through 1998 and breast cancer cases through 1996.

SOW #2:

A) Develop algorithm for identifying and classifying screening mammography use

The purpose of this analysis is to determine how well the SEER-Medicare data can be used to identify screening mammography utilization. In summary, this analysis evaluates SEER-Medicare characterization of screening mammography utilization, compared with the “gold standard” of the Breast Cancer Surveillance Consortium (BCSC). The BCSC data rely on an assessment of physical symptoms, referring clinician and radiologist estimation of whether the mammogram was obtained for screening or diagnostic purposes, whereas the Medicare data rely on the use of billed procedures and physician visits to determine if mammograms were obtained for screening or diagnostic purposes. We have cleaned and linked the SEER-Medicare dataset with the individual BCSC datasets from three sites (San Francisco, New Mexico, and Seattle). The cohort of women who in whom we compared the SEER-Medicare and BCSC were defined as women 1) ages 66 and older who had a mammogram recorded in the BCSC data, 2) who were eligible for

Medicare coverage and had at least one Medicare bill within the range of years studied, and 3) who did not have HMO coverage for any of the time period (because Medicare does not receive bills for mammograms such women).

To classify screening and diagnostic mammograms, we created separate algorithms for each of the BCSC datasets due to differences in data collection and recording at each site.

We have performed the validation analysis at three levels:

1) *Mammogram level*: we compare each mammogram in the BCSC and SEER-Medicare data to calculate the overall proportion of mammograms that were correctly identified in the SEER-Medicare data. From this analysis we can estimate the proportion of mammograms occurring in clinical practice that are not “seen”, if Medicare data are used to estimate mammography utilization. A mammogram was considered to be correctly identified by the Medicare data if a mammogram claim occurred on exactly the same date as (perfect match), or within seven days of (good match), a BCSC mammogram .

Results: between 85-88% of mammograms recorded in the BCSC were captured in Medicare, yielding and under-capture rate of 12-15%.

2) *Woman level*: Using results from the mammogram-level analysis, we compare the proportion of women classified as having undergone mammography in the SEER-Medicare data, using the BCSC data as a gold standard.

Results: Between 91-92% of women who underwent mammography according to the BCSC are captured in Medicare. Thus, approximately 8-9% of women who underwent mammography were under-captured.

3) *Mammogram history level*: Each woman’s history of mammography in the five years prior to breast cancer diagnosis was categorized into the following groups:

- 1) Not Screened (women with no screening mammogram)
- 2) First screening mammogram (of first within 5 years)
- 3) Screened 1-2 years before cancer detected (=frequently screened)
- 4) Screened 2-3 years before cancer detected
- 5) Screened 3-5 years before cancer detected

Results: The characterization of screening history was moderate to good (Kappa statistic 0.5 –0.7). The disagreement resulted from under-capturing of mammograms in both the Medicare data and the BCSC data, a problem we had not anticipated originally.

We are currently trying to refine the criteria for defining a screening mammogram to determine if some of the under-captured mammograms and under-captured women can be identified using the Medicare data, for example by including “rejected” claims (which we thus far have not included). Additionally, we are determining if we may have erroneously included women who were ineligible for part B coverage and may have no claims on this basis. Also, we are determining if women with Medicaid insurance may have had that insurance primarily billed. If so, these exams would not appear in Medicare. Lastly, we will ensure that women resided in the same geographic region (i.e., if they were truly residents of the area in which we had Medicare claims). If we cannot “explain” any of these reasons for Medicare under-capturing of mammograms, estimates of mammography utilization based on Medicare billing claims will need to be “inflated” by 12-15% to account for actual practice. We currently are also examining possible differences in capture rates by income and race/ethnicity, though we have found no associations so far.

B) Develop a plan to approximate SES using census tract and zip code information

In order to estimate the socio-economic status (SES) of patients in our cohort, we must use the aggregate variables provided by SEER-Medicare. Recent research indicates that median income is the best surrogate (available in the SEER-Medicare data) for having precise patient-level SES information. SEER-Medicare provides two levels of granularity for the aggregate median income level (and other SES indicators): zip code and census tract. While census tracts are smaller than zip codes, and corresponding census tract variables offer the potential to be more specific to an individual, our experience with the data indicated that census tract level variables are often coded as missing or unavailable. We observed that the zip code level variables, while less specific, tend to be missing or unavailable in far few instances. Our approach to estimate a given subject's SES is to use the census tract median income variable, and where that variable is missing or unavailable we use the zip-code median income variable.

C) Develop a survival analysis plan

We are currently working on developing working definitions of the variables that will be included in the survival analysis, including measures of screening mammography utilization, timeliness of breast cancer diagnosis, and breast cancer treatments. Working definitions of all interpretations is underway, and we will soon begin our initial survival analysis.

KEY RESEARCH ACCOMPLISHMENTS

- Completed data cleaning and merging, HCFA-Medicare data and BCSC data.
- Determined Medicare claims can be used (with thus far a 10% error rate) to determine the use of mammographic screening. We have found regular screening rates are much lower than suggested by self-reported surveys of these same aged women.

REPORTABLE OUTCOMES

None

CONCLUSIONS

The second year of the project has been successful and we achieved major goals outlined in the Statement of Work. Analyses of the remainder of the aims are expected to proceed as originally planned. Due to a transfer of name to this grant and ensuing delays, Philip Chu received the monies in January 2002. The third goal for Year 2 of the project (survival analysis) is currently underway.