Final Report

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Second Cancers, Tumor p53, and Archaea Research

Submitted by

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EPIDEMIOLOGY OF CANCER IN NORTHEAST PENNSYLVANIA

As has been previously requested and approved (in May 2000), the research objectives have changed since this grant was originally awarded. As such, the activities conducted under this grant are not reflected in the project title. Research activities that were carried out since the most recent progress report are summarized below.

Cancer Surveillance

The Cancer Institute has continued to conduct cancer surveillance in Northeast Pennsylvania using data from the institute's population-based regional cancer registry and the Pennsylvania Cancer Registry. The results of this surveillance have been used to set priorities for research and outreach activities at the Cancer Institute and selected results have been reported to medical professionals at member hospitals and in the community.

A consistent observation of this surveillance is that colorectal cancer is unusually common in Northeast Pennsylvania; incidence is approximately 25% higher than the rate published for NCI's Surveillance Epidemiology and End Results (SEER) Program. Compared to the distribution of stage at diagnosis in SEER program data, a significantly smaller proportion of incident colorectal cancer cases are diagnosed at local stage in NEPA. In addition, death rates from colorectal cancer in several counties in this region are above the 90th percentile for colorectal cancer mortality in the United States. As a result of these observations, several activities have been developed to increase awareness of colorectal cancer and the value of screening for this cancer in both the lay and medical communities. A preliminary analysis of the most recent surveillance data suggests that the proportion of new colorectal cancer cases diagnosed at local stage is increasing.

A manuscript, entitled "Colorectal cancer incidence and mortality in Northeastern Pennsylvania," has been prepared and will be submitted for publication.

Cancer registry data have also been used to examine the use of adjuvant chemotherapy in colorectal cancer patients. For more than 10 years, clinical guidelines recommending adjuvant chemotherapy for all patients with stage III colorectal cancer have been published, yet many patients do not receive this treatment. Cancer Institute investigators sought to identify barriers to the use of adjuvant chemotherapy in patients with this common stage of colorectal cancer. Of a total of 512 patients with stage III colorectal cancer (mean age 70.2 yrs) were studied, 302 (59%) received chemotherapy in addition to surgery as first-course therapy. In bivariate analyses, patient age, year of diagnosis, and anatomic site within the colon were associated with the use of adjuvant therapy. Compared to patients younger than 70 years of age, the odds ratio (OR) for those 70+ was 0.2 (95% Confidence Interval [CI], 0.13 - 0.29); compared to patients diagnosed in 1998, the OR for the use of adjuvant therapy in 2002 was 0.54 (95% CI, 0.32 - 0.93); and compared to patients with cancer of the rectum/rectosigmoid, the OR for cancers of the colon was 0.6 (95% CI, 0.39 - 0.91). Patient sex, insurance coverage, and place of residence were not statistically associated with the use of this treatment. In a multivariable model including all of these factors, only patient age was associated with the use of adjuvant chemotherapy; compared

to patients less than 70 years of age, the OR for the use of adjuvant therapy among those 70+ was 0.2 (95 % confidence interval, 0.13 - 0.30). An abstract entitled “Barriers to the use of adjuvant chemotherapy in stage III colorectal cancer” summarized this analysis and is included as Appendix A.

Cancer Risk Factor Study

Funding from this grant has provided support for a population-based study of cancer risk factors, screening practices, and related behaviors. This project will continue beyond the termination of the present grant with funding from other sources. This project gathers data from a representative sample of adults residing in a six county area of Northeast Pennsylvania.

Analyses conducted to date of the established risk factors for colorectal cancer have not revealed an explanation for the high incidence of this cancer in this population.

Tobacco use

Cancer Institute investigators have used the data from this study to conduct annual analyses of the prevalence of tobacco use in NEPA. These reports covering 2002, 2003, 2004 and partial data from 2005 have been provided to tobacco control authorities in four Northeast Pennsylvania counties. The results document that the prevalence of current cigarette smoking is significantly higher in NEPA than in either Pennsylvania, as a whole or the United States. In 2004, 28.9% (95% CI, 26.5% – 31.3%) of adults living in NEPA reported smoking cigarettes regularly: a figure that was significantly higher than the corresponding figure for Pennsylvania (25.4%, $p < 0.05$) or the United States (22.2%, $p < 0.001$). A paper describing these observations has been presented at a recent meeting of the American Public Health Association. An abstract summarizing these results is included as Appendix B. Analyses of the use of other tobacco products (smokeless tobacco, cigars and pipes) have also been completed, and the results have reported to tobacco control authorities in these counties.

An analysis of factors associated with cigarette smoking in NEPA has been completed. Current smokers (defined as those who had smoked at least 100 cigarettes in their lifetime and continue to smoke, $n=337$) were compared to subjects who smoked fewer than 100 cigarettes in their lifetimes ($n=670$). Logistic regression was used to study the relationship between smoking status and the following variables: age, sex, race, educational attainment, marital and employment status, place of residence (urban v. rural), and usual source of health care. The odds of smoking decreased with increasing age (adjusted odds ratio [OR] for one-year increment of age = 0.96, 95% Confidence Interval [CI] 0.95-0.97). The following were also associated with current smoking: male sex (OR 1.5, 95% CI 1.1-2.0), non-white race (OR 0.3, 95% CI 0.15-0.76), college education (OR 0.37, 95% CI 0.25-0.54), not having a private physician as usual source of healthcare (OR 1.9, 95% CI 1.2-3.1), and being divorced/separated (OR 3.2, 95% CI 2.1-5.0). Employment status and place of residence were not associated with current smoking. A paper describing these findings was presented at the 2005 annual meeting of the Society for Epidemiologic Research; the abstract for this presentation is included as Appendix C.

Colorectal cancer screening

Using data from this project, Cancer Institute investigators have documented the prevalence of and change over time in colorectal screening in this community. The prevalence of colorectal

cancer screening by sigmoidoscopy or colonoscopy increased from 32% in 2001-2002 to xx% in 2004. This later figure is comparable to the average figure for colorectal cancer screening in the US in 2001. In addition, investigators at the Cancer Institute have completed an analysis of factors associated with colorectal cancer screening in this high-risk population. A manuscript, “Predictors of colorectal cancer screening in a high-risk population” is in preparation and will be submitted for publication in a peer-reviewed journal. An abstract summarizing this analysis is included as Appendix D.

An analysis examining screening for colorectal cancer by colonoscopy or sigmoidoscopy in relation to spiritual practices has also been conducted. Subjects were classified by religion (Catholic, Protestant, Jewish, or other/none), and The Duke University Religion Index was used to measure spiritual beliefs and practices. Logistic regression analysis was used to study the relationship between endoscopy screening and religion and spirituality, while controlling for age. Intrinsic spirituality was not associated with having been screened in the previous five years. However compared to Catholics, Jews were more likely to have been screened (adjusted odds ratio [OR] 4.7, 95% Confidence Interval [CI] 1.5, 14.7); men and women who engaged in private spiritual activities (prayer/meditation/bible study) at least once a day (compared to those who rarely did so), and men who participated in organized worship at least once a week (compared to those who worshiped once a year or less) were less likely to have been screened (OR 0.59, 95% CI 0.38, 0.91) and (OR 0.51, 95% CI 0.25, 1.0), respectively. A poster describing these observations was presented at the 2005 annual meeting of the Society for Epidemiologic Research. An abstract summarizing the results of this analysis is included as Appendix E.

Breast cancer screening

Our collaborators at the University of Scranton School of Nursing have continued their analysis of breast cancer screening practices in older women using these data. This sub-project is not supported by funds from this grant, however it makes use of data generated under this grant. The investigators are conducting the analysis on their own time. A manuscript describing their results is expected.

Colorectal Cancer Cohort Study

Patients with new diagnoses of incident invasive colorectal cancer are recruited into this study. To date, 162 patients have been enrolled and completed baseline interviews (80% of those approached by study personnel). The available data is being analyzed to explore possible etiologic questions regarding colorectal cancer. This experience and preliminary data will be used to support an application to the National Cancer Institute to conduct a case:control study of colorectal cancer in Northeast Pennsylvania.

Prospective Consent Pilot Project

Investigators at the Cancer Institute have developed a procedure to facilitate recruitment of cancer patients into approved research protocols. This pilot project tests whether the staff of the regional cancer registry can be used to identify newly diagnosed patients, physicians will grant permission, and patients can be contacted and authorization for release of protected health information to qualified researchers. Experience to date has been mixed. Approximately 25% of

incident cases are not ascertained until six months following diagnosis and physician permission is withheld (or patients are ineligible) for as many as 30% of the remaining cases. After reviewing pilot procedures and cancer registry data, it was determined that patients receiving neo-adjuvant radiation/chemotherapy prior to rectal cancer surgery account for most of the late ascertainment. The procedures have been revised and additional experience will be gathered to determine the case ascertainment fraction using the revised protocol. In addition, a system that will transmit diagnostic pathology reports electronically to the cancer registry in real time is being explored. This project will continue with support from other sources.

DNA Archive

Investigators at the Cancer Institute have created an archive of genomic DNA from colorectal cancer patients and healthy adults. A protocol to harvest buccal cells using a mouth rinse procedure was developed with Dr. Peter Eden, at Marywood University, has been used successfully to identify polymorphisms in glutathione S-transferase genes (*GSTT1* and *GSTM1*) in a small sample of adult volunteers. Seventy-two samples have been collected using this procedure. To allow collaboration with investigators at another institution, Penn State Hershey Medical Center, an alternative procedure for collecting buccal cells was pilot tested. This protocol requires using a wooden tongue blade to collect buccal cells. To date, 147 samples have been collected from willing adults. This project will continue under other support.

Risk Factors for Cancer in Healthy Adults

Investigators at the Cancer Institute have developed and pilot tested a protocol to gather data on dietary and genetic risk factors for colorectal cancer from a representative sample of healthy adult residents living in Northeast Pennsylvania (potential control subjects). Data have been collected by face-to-face interview in the subject's home and buccal cells will be harvested using the Penn State protocol (described above). This pilot project documents the Cancer Institute's ability to recruit a high proportion of eligible subjects and to collect high quality DNA from healthy controls. To date, 101 subjects have been enrolled and 100 buccal cell samples have been collected. This experience and preliminary data (in combination with similar data from our study of colorectal cancer cases) will be used to support a competitive grant application to conduct a population-based case:control study of colorectal cancer. Specifically, this study will test the hypothesis that dietary consumption of well-cooked meats increases the risk of colorectal cancer and that UDP-glucuronosyltransferase (UGT) genotype modulates this association. In addition, it will be possible to investigate whether UGT genotype modifies the relation between cigarette smoking and colorectal cancer risk. This pilot project will continue with funding from other sources, and an application for grant funding will be prepared.

GRANT APPLICATIONS SUBMITTED

Since the most recent previous report, the following grant applications have been submitted:

Physician Characteristics and Colorectal Cancer Stage

This R03 application (in response to PAR-04-020 “Small Grants for Behavioral Research in Cancer Control”) was revised and re-submitted to the National Cancer Institute. A grant was awarded, and the project was started in September 2005. This project will increase the knowledge base regarding screening practices of community-based physicians and how these practices affect stage at diagnosis and ultimately colorectal cancer outcome. The abstract from this application is included as Appendix F.

Predictors of Colorectal Cancer Screening in the Elderly

A revised R03 application was re-submitted to the National Cancer Institute in response to PAR-04-020 “Small Grants for Behavioral Research in Cancer Control.” In this proposed project, data from the Cancer Institute’s Cancer Risk Factor Study will be used to further understand the determinants of colorectal cancer screening in the elderly. This application was not funded; a revised application is under consideration. The abstract from this application is included as Appendix G.

Breast and Prostate Cancer Data Quality and Patterns of Care Study

An application was submitted to the Center for Disease Control in response to RFA-DP-05-071 “Breast and Prostate Cancer Data Quality and Patterns of Care Study.” The goal of this project was to increase the knowledge of the current state of cancer treatment in the US and to identify populations who do not regularly benefit from the best treatments available. This application was not funded and revision and resubmission is not possible under this mechanism. The abstract from this application is included as Appendix H.

Breast Cancer Screening in NEPA 2001-2005

An application for funding was submitted to the Northeastern Pennsylvania affiliate of the Susan G. Komen Breast Cancer Foundation. The proposed research will collect and analyze data regarding breast cancer screening among women in Northeast Pennsylvania and compare the results to data collected in previous years and in other populations. The results will be used to assess the effectiveness of breast cancer screening promotion programs and to identify groups of woman in particular need of assistance. This application is currently under review. The abstract from the application is included as Appendix I.

OTHER ACTIVITIES SUPPORTED BY THIS GRANT

Scientific Advisory Board

The Northeast Regional Cancer Institute maintains an independent scientific advisory group composed of respected epidemiologists and other cancer researchers. This group meets annually with Dr. Lesko and other senior staff to review the research program, its activities in the prior year, and plans for the coming year. This group last met on October 7th of 2004. The current members of the Advisory Board are listed in Appendix J.

Lay and Professional Education Programs

Members of the research staff have presented research findings at education programs designed for audiences made up of the lay public and medical professionals; separate programs have been developed for lay and professional audiences.

Programs presented to professional groups since the previous progress report include:

- **Cancer in Northeast Pennsylvania** (presented as part of a professional education program titled “Cancer Screening and Detection 2004: The Role of the Primary Care Provider”, November 2004);
- **Colorectal Cancer in Northeast Pennsylvania** (a continuing medical education program presented to the medical staff of a member hospital, November 2004);
- **Tobacco use in Northeast Pennsylvania 2003** (presented to area tobacco control administrators for 10 Pennsylvania counties, December 2004);
- **Colorectal Cancer: Incidence, Mortality and Current Screening Recommendations** (presented at Tumor Board (Oncology education conference for house staff) at a member hospital, February 2005);
- **Colorectal Cancer in Northeast Pennsylvania: Epidemiology and Screening** (presented on multiple dates as a professional education program for ancillary health care professionals, March 2005);
- **The Cancer Risk Factor Study: One Example of a Population-based Study in NEPA** (presented at Health Sciences Research in NEPA 2005, a regional health research conference, April 2005);
- **A population-based study of predictors of colorectal cancer screening in a high-risk population** (presented at Health Sciences Research in NEPA 2005, a regional health research conference, April 2005);
- **The prevalence of cigarette smoking in Northeast Pennsylvania 2002** (presented at Health Sciences Research in NEPA 2005, a regional health research conference, April 2005);
- **Colorectal Cancer Screening: Options and Barriers to Use** (presented to a combined meeting of health promotion researchers and community coalition members, June 2005);

Programs presented to the lay public include:

- **Cancer Research in Northeast Pennsylvania: Epidemiology and Cancer Risk Factors** (presented as a poster/table top display at a public forum on cancer research, October 2004);
- **Colorectal Cancer in Northeast Pennsylvania** (presented as part of a public television broadcast to increase public awareness of colorectal cancer, March 2005); and
- **Uses of Cancer Registry Data in Northeast Pennsylvania** (presented to graduate students in health promotion, April 2005)

STUDIES AND PROJECTS CONDUCTED BY OTHER PERSONNEL AT THE UNIVERSITY OF SCRANTON

Final reports for the following projects, supported by a subcontract with the University of Scranton, have been included in a previous progress report.

ErbB2 project

As previously reported, work on ErbB2 gene research through a contract with the University of Scranton's Institute of Molecular Biology and Medicine (IMBM) was terminated when the principal investigator on the project left his position at the university.

Haloferax volcanii project

Investigators at the IMBM have completed their examination of the proteome of this organism. The final report for this activity has been previously submitted.

Ethics studies

Drs. W. Rowe and C. Pinches in the departments of Philosophy and Theology have overseen the establishment of the Center for Ethics Studies at the University. The final report for this activity has been submitted with a previous progress report.

Appendix A

Barriers to the use of adjuvant chemotherapy in stage III colorectal cancer

Background: Colorectal cancer is the second leading cause of cancer death in the US. Despite clinical guidelines recommending adjuvant chemotherapy for all patients with stage III colorectal cancer, many patients do not receive this treatment.

Objectives: The authors sought to identify barriers to the use of adjuvant chemotherapy in patients with this common stage of colorectal cancer.

Methods: Cross-sectional analysis of colorectal cancer case data from a population-based cancer registry in Northeast Pennsylvania. All cases with stage III adenocarcinoma of the colon or rectum diagnosed in 1998 through 2002 were included. The chi-squared test was used to evaluate relationships between age, sex, health insurance coverage, place of residence (urban v. rural), year of diagnosis, and anatomic site within the bowel and adjuvant chemotherapy use. Multiple logistic regression was used to control for confounding in multivariable models.

Results: A total of 512 patients with stage III colorectal cancer (mean age 70.2 yrs) were studied. Of these, 302 (59%) received chemotherapy in addition to surgery as first-course therapy. In bivariate analyses, patient age, year of diagnosis, and anatomic site within the colon were associated with the use of adjuvant therapy. Compared to patients younger than 70 years of age, the odds ratio (OR) for those 70+ was 0.2 (95% Confidence Interval [CI], 0.13 - 0.29); compared to patients diagnosed in 1998, the OR for the use of adjuvant therapy in 2002 was 0.54 (95% CI, 0.32 - 0.93); and compared to patients with cancer of the rectum/rectosigmoid, the OR for cancers of the colon was 0.6 (95% CI, 0.39 - 0.91). Patient sex, insurance coverage, and place of residence were not associated with the use of this treatment. In a multivariable model including all of these factors, only patient age was associated with the use of adjuvant chemotherapy; compared to patients less than 70 years of age, the OR for the use of adjuvant therapy among those 70+ was 0.2 (95 % confidence interval, 0.13 - 0.30).

Conclusions: Despite clinical guidelines supporting the routine use of adjuvant chemotherapy for all patients with stage III colorectal cancer, only about 60% receive this treatment. Advancing age is the only significant barrier to the use of adjuvant chemotherapy in these data. Further research is needed to determine the extent to which other factors (patient preference, co-morbidity, and physician recommendation) influence the use of adjuvant chemotherapy in stage III colorectal cancer.

Appendix B

Prevalence of cigarette smoking in Northeast Pennsylvania in 2002.

Tobacco is the most common preventable cause of death and disability in the US. Incidence rates for several tobacco-related cancers in Northeast Pennsylvania (NEPA) are significantly higher than the corresponding US rates. We used data from an on-going population-based study of cancer risk factors to estimate the prevalence of current cigarette smoking among adult residents of six NEPA counties. A total of 1,096 participants, identified by random digit dialing, were interviewed by telephone. Prevalence estimates were adjusted for sex and education, and 95% Confidence Intervals (CI) were calculated. The prevalence of current cigarette smoking among all adults was 27.5% (95%CI, 24.9%-30.1%). This proportion was significantly higher than 2001 Behavioral Risk Factor Surveillance Study figures for PA and the US (24.5%, 22.7% respectively). Among men and women in NEPA, the prevalence of current smoking was 28.9% (95%CI, 24.3%-33.5%) and 26.1% (95%CI, 22.9%-29.3%), respectively. The prevalence of smoking among women was significantly higher than the US figure (20.6%). When examined by age, the prevalence of current smoking in NEPA was greatest among 30-44 year olds (40.7%, 95%CI, 35.3%-46.1%). This proportion was significantly greater than both the PA (22.8%) and the US figures (20.6%). The high prevalence of smoking in NEPA underscores the need for more effective tobacco control efforts for adults in this six county region. Women and younger adults (30-44 years old) are two subgroups who may particularly benefit from targeted interventions.

Appendix C

Factors associated with cigarette smoking in Northeast Pennsylvania

Tobacco use, particularly cigarette smoking, remains the number one cause of preventable disease and death in the U.S. In the six-county area of Northeast Pennsylvania, the prevalence of current cigarette smoking in 2003 (28.7%) was significantly higher than in Pennsylvania as a whole and the U.S. We sought to identify factors associated with current smoking in this high-risk population. We conducted a cross-sectional analysis of current cigarette smoking in a population-based study of adults aged 18 and older. Self-reported history of tobacco use was obtained by telephone interview using random digit dialing. Current smokers (defined as those who had smoked at least 100 cigarettes in their lifetime and continue to smoke, n=337) were compared to subjects who smoked fewer than 100 cigarettes in their lifetimes (n=670). We used logistic regression to study the relationship between smoking status and the following variables: age, sex, race, educational attainment, marital and employment status, place of residence (urban v. rural), and usual source of health care. The odds of smoking decreased with increasing age (adjusted odds ratio [OR] for one-year increment of age = 0.96, 95% Confidence Interval [CI] 0.95-0.97). The following were also associated with current smoking: male sex (OR 1.5, 95% CI 1.1-2.0), non-white race (OR 0.3, 95% CI 0.15-0.76), college education (OR 0.37, 95% CI 0.25-0.54), not having a private physician as usual source of healthcare (OR 1.9, 95% CI 1.2-3.1), and being divorced/separated (OR 3.2, 95% CI 2.1-5.0). Employment status and place of residence were not associated with current smoking. The data suggest that not having a private physician and being divorced/separated, male, and less-well educated increase one's risk for cigarette smoking in this community, while non-whites are at a significantly lower risk than the majority white population. These characteristics may assist tobacco control specialists deliver more targeted interventions.

Appendix D

Predictors of colorectal cancer screening in a high-risk population.

Colorectal cancer (CRC) is the second leading cause of cancer death in the U.S. Despite evidence that CRC screening can reduce mortality, screening rates remain low. In the 6-county area of Northeast Pennsylvania, incidence and mortality are significantly higher than state and national rates. We sought to identify factors associated with screening in this high-risk population. We conducted a case-control analysis of CRC screening in a population-based study of 819 adults 50+ years of age with no personal history of CRC. Self-reported history of CRC screening was obtained by telephone interview using random digit dialing. Cases were defined as those having had an endoscopy (sigmoidoscopy or colonoscopy) within 5 years (N=261). Controls were subjects who reported endoscopy more than 5 years previously or never. We used logistic regression to study the relationship between endoscopy and the following variables: age, sex, marital status, education, place of residence, occupation, body mass index, exercise, smoking, alcohol use, personal history of cancer, family history of cancer, other cancer screenings, and other health screenings. The following were associated with recent endoscopy screening: male sex (adjusted Odds Ratio 1.7, 95% Confidence Interval 1.2-2.4), personal history of cancer (OR 1.8, 95%CI 1.2-2.7), family history of cancer (OR1.7, 95%CI 1.2-2.4), other cancer screenings (OR 2.2, 95%CI 1.4-3.3), and other screenings (OR 2.5, 95%CI 1.2-5.3). The data suggest that being male, having a personal and family history of cancer, and being current with cancer and other health screenings predict screening for colorectal cancer with endoscopy in a population-based study.

Appendix E

Do spiritual practices influence colorectal cancer screening?

Colorectal cancer (CRC) is the second leading cause of cancer death in the US. Despite evidence that CRC screening reduces mortality, US screening rates remain low. The prevalence of CRC screening in Northeast Pennsylvania is lower than in Pennsylvania as a whole or the US. It is not clear why screening rates are low in this region. One hypothesis that has not been extensively studied is whether CRC screening is associated with religion or spiritual practices. We conducted a cross-sectional analysis of CRC screening in a population-based study of 782 adults 50+ years of age with no personal history of CRC. Self-reported history of CRC screening was obtained by telephone interview using random digit dialing. Subjects who reported having had screening sigmoidoscopy or colonoscopy (endoscopy) within 5 years (n = 256) were compared to subjects who reported having never been screened or only more than 5 years previously. Subjects were classified by religion (Catholic, Protestant, Jewish, or other/none), and The Duke University Religion Index was used to measure spiritual beliefs and practices. Logistic regression analysis was used to study the relationship between endoscopy screening and religion and spirituality, while controlling for age. Intrinsic spirituality was not associated with having been screened in the previous five years. Compared to Catholics, Jews were more likely to have been screened (adjusted odds ratio [OR] 4.7, 95% Confidence Interval [CI] 1.5, 14.7); men and women who engaged in private spiritual activities (prayer/meditation/bible study) at least once a day (compared to those who rarely did so), and men who participated in organized worship at least once a week (compared to those who worshiped once a year or less) were less likely to have been screened (OR 0.59, 95% CI 0.38, 0.91) and (OR 0.51, 95% CI 0.25, 1.0), respectively. These data suggest that spiritual practices may help identify subjects who could benefit from efforts designed to increase colorectal cancer screening.

Appendix F

Physician Characteristics and Colorectal Cancer Stage

Colorectal cancer is the fourth most common cancer and the second leading cause of cancer death in the United States. Survival is strongly determined by stage at the time of diagnosis but only approximately 40% of all new cases are diagnosed at local stage. Effective screening methods are available which can lead to early detection and reduced mortality from this disease, but these remain underutilized. We believe the factors that influence colorectal cancer screening rates in a population determine the stage at diagnosis of colorectal cancer in that population. We propose to conduct a population based case:control study to identify factors associated with stage at diagnosis of colorectal cancer in a high-risk, underserved population. In particular, we will study the relationship between physician characteristics, type of practice, specialty training, knowledge of screening guidelines, attitudes regarding screening, actual screening practices, approaches to patient education and communication, and perceived barriers to screening in relation to stage at colorectal cancer diagnosis. The study will compare approximately 680 patients with incident local stage invasive colorectal cancer (cases) and 1590 patients with more advanced stage disease (controls) identified from a population-based cancer registry. Logistic regression will be used to assess the relationship between case:control status and physician characteristics and behaviors while controlling for confounding. This research will increase the knowledge base regarding screening practices of community-based physicians and how these practices affect stage at diagnosis and ultimately colorectal cancer outcome. A better understanding of the utilization of currently available screening procedures and attitudes toward screening will help illuminate the reasons for low colorectal screening rates observed in the United States.

From an R03 grant application submitted to the National Cancer Institute.

Appendix G

Predictors of Colorectal Cancer Screening in the Elderly

Colorectal cancer is the fourth most common cancer and the second leading cause of cancer death in the United States. Survival with colorectal cancer is strongly dependent on stage at diagnosis. If diagnosed in the early stages through screening, and promptly treated, the prognosis for long-term survival is very good. Despite high probability of survival when diagnosed at local stage of disease, only 38% of colorectal cancer is diagnosed at this early stage. Furthermore, colorectal cancer is one of the few cancers for which screening can reduce incidence. Screening for colorectal cancer is associated with early stage at diagnosis. Despite clear evidence of effectiveness, screening rates remain below the 50% goal set by Healthy People 2010. Factors that have been associated with colorectal cancer screening include age, sex, marital status, educational attainment, place of residence, and personal and family history of cancer. A preliminary analysis of data from Northeast Pennsylvania suggests that screening rates are lower among rural-dwelling than urban elderly. We propose to conduct a cross-sectional analysis of existing data to identify factors associated with (or barriers to) colorectal cancer screening. Specifically, we will test for associations between colorectal cancer screening and age, sex, marital status, educational attainment, place of residence, personal and family history of cancer, screening for other cancers, and screening for other chronic diseases among a large population-based sample of adults 50 years of age and older, including a sub-group of nearly 1,000 elderly (those 65 years of age and older) living in high-risk, underserved communities. In particular, we will test whether screening rates are lower among rural elderly than their urban counterparts. Identifying and understanding determinants of colorectal cancer screening can help reduce disparities in screening among high-risk populations.

From an R03 grant application submitted to the National Cancer Institute.

Appendix H

Breast and Prostate Cancer Data Quality and Patterns of Care Study

Breast and prostate cancers are the most commonly diagnosed and the second leading cause of cancer death in American women and men, respectively. Recent improvements in age-adjusted mortality rates are likely due to improvements in treatment and early detection of these cancers. Despite the publication of treatment standards for breast cancer and evidence supporting the effectiveness of a range of treatment approaches for prostate cancer, it remains unclear how many patients in the US receive the benefit of these modern treatments. We propose to conduct a population-based study of the prevalence and determinants of first course treatment of female breast and prostate cancers. Random samples of breast and prostate cancer cases (500 of each) will be selected from the records of the Pennsylvania Cancer Registry, and new abstracts will be created for these cases from primary medical records. These data will be merged with data from other participating state cancer registries. The new abstracts will be compared to the original abstracts in the cancer registry files to assess the completeness and accuracy of the registry records and to create composite (most complete) records for further analysis. The assembled data will be used to estimate the prevalence of common treatments for prostate cancer and the proportion of women with Stage I-III breast cancer who have received treatment that is consistent with published treatment standards. We will use logistic regression models to identify tumor, patient, provider and health system characteristics that are associated with receipt of these treatments. The assembled data will also be used to evaluate the accuracy and completeness of the stage and treatment data recorded by state cancer registries. If sufficiently accurate, data from population-based cancer registries can be used to document the prevalence of various cancer treatments, to identify subpopulations at risk of under-treatment, to monitor changes in treatment over time, and as a resource for future patterns of care studies.

Public Health Relevance: This project will contribute to our knowledge of the current state of cancer treatment in the US and will identify populations or sub-populations who do not regularly benefit from the best treatments available. This information is essential to developing strategies to address disparities in cancer treatment in the US.

From a grant application submitted to the Centers for Disease Control and Prevention

Appendix I

Breast Cancer Screening in Northeast Pennsylvania 2001-2005

Breast cancer is the most commonly diagnosed cancer and second leading cause of cancer death among women living in Northeast Pennsylvania. By detecting breast cancer early, when it can be most easily cured, screening can help reduce the number of deaths from this common cancer. Professionals at the Northeast Regional Cancer Institute will conduct a survey of current breast cancer screening practices among women living in Northeast Pennsylvania and will use this information to estimate the proportions of women 40 and older who have a mammogram within the prior year. We will compare these results with information from prior years to search for trends in screening over time and will examine the effects of age, race, ethnicity, education, marital status, and place of residence (urban v. rural) on the likelihood that a women has been recently screened. Among women who have never been screened for breast cancer, we will describe their reasons for not having been screened (for example, cost, fear, waiting time). The results of this survey can be used to assess the effectiveness of community-wide programs designed to promote breast cancer screening in Northeast Pennsylvania and to identify groups of women in particular need of additional assistance.

From a request for Funding submitted to the Susan G. Komen Breast Cancer Foundation.

Appendix J

NORTHEAST REGIONAL CANCER INSTITUTE SCIENTIFIC ADVISORY BOARD

Lawrence Bergner, MD, MPH, has 40 years experience in epidemiology and public health research, teaching, and administration. He has developed programs at institutions such as the National Cancer Institute, Fred Hutchinson Cancer Research Center in Seattle, University of Washington, Columbia University, and the New York City Department of Health.

Kathy Helzlsouer, MD, MHS, is a Professor of Epidemiology at the John Hopkins School of Public Health. She is the director of a large population-based specimen bank located at the John Hopkins Training Center for Public Health Research, Hagerstown, MD. Her current research interests include studies of the etiology of cancer, defining susceptible populations, and clinical trials of cancer chemo-preventive agents.

Lewis Kuller, MD, DrPH, is University Professor of Public Health at the University of Pittsburgh. Dr. Kuller's research interests include: Cardiovascular Disease, Diabetes, Cancer, Nutrition and Chronic Disease and the Epidemiological Basis of Preventive Medicine Programs. He is the author of several texts on the subject of chronic diseases.

Ruth McCorkle, RN, PhD, is a leader in cancer nursing and education, as well as cancer control research, especially on the psychosocial ramifications of cancer. She is a member of the faculty of the Yale School of Nursing where she heads the doctoral program and is the founding director of the Center for Excellence in Chronic Illness Care.

Timothy Rebbeck, PhD, is an Associate Professor of Epidemiology in the Department of Biostatistics and Epidemiology and Senior Scholar in the Center for Clinical Epidemiology and Biostatistics at the University of Pennsylvania School of Medicine. Dr. Rebbeck's primary research interest is in the area of molecular and genetic epidemiology of common cancers.

Paul D. Stolley, MD, is a practicing physician, part-time staff member of Public Citizen, and emeritus professor of Preventive Medicine at the University of Maryland. He has formerly served as Professor and Chair of the Department of Preventive Medicine at the University of Maryland and as senior consultant to the United States Food and Drug Administration.

Membership as of October 2004