FINAL ABSTRACT PROGRAM
PLENARY, CONCURRENT & POSTER SESSIONS

NAACCR 2016 Annual Conference

NAACCR
St. Louis 2016

June 11 - 16, 2016
St. Louis, Missouri
Hyatt Regency
St. Louis at The Arch

NAACCR
2016 CONFERENCE
Final Abstract Program

NAACCR would like to thank the poster, plenary, and concurrent session oral presenters for their contributions to the conference.

Electronic versions of the posters and oral presentations will be made available online at NAACCR.org after the conference.

NAACCR 2016
Table of Contents

Poster Viewing in Grand Ballroom EFGH:

Monday, June 13   5:30 pm to 7:00 pm
Tuesday, June 14   7:00 am to 5:45 pm
Wednesday, June 15   7:00 am to 12:00 pm
Thursday, June 16   7:00 am to 3:30 pm

Poster Listings

All delegates are encouraged to take the opportunity to visit the posters to become familiar with some of the latest advances and research in the field.

P-01 Colorectal Cancer Predictors and Colorectal Cancer Screening among Adults Aged 50-64 Years, 2007-2011, Georgia
I. Solomon

P-02 Fine Needle Aspiration Cytology of Body Organ Masses with Histopathological Correlation: A 5 Years and 5 Months Study in Tikrit City - Iraq
N. Gheni

P-03 County-Level Racial/Ethnic Disparities of Lung Adenocarcinoma and Squamous Cell Carcinoma in the United States, 2004-2012
K. Houston

P-04 Designing an All-Purpose Base Map for Presenting North American Cancer Data
F. Boscoe

P-05 The Relationship Between Breast Cancer Incidence, Mammography and Income in New York State
F. Boscoe

P-06 Length of Central Cancer Registry Operations: Effect on Multiple Primary Cancers and Survival Estimates
B. Qiao

P-07 Multiple Primary Cancers in the United States, 2007-2011
B. Qiao

P-08 Incidence and Survival Results From the Cancer in Young People in Canada (CYP-C) Surveillance System
D. Mitra

P-09 Race-Specific Trends in Testicular Cancer and Obesity in the United States
O. Ayodele

P-10 The Burden of Cancer and Benign Brain Tumors among Massachusetts Residents Reported With Hepatitis B and Hepatitis C From 2002-2012
R. Knowlton

P-11 Description of Brain and Central Nervous System Tumors on the National Cancer Data Base, 2004-2011
T. Dolecek

P-12 A Comparison of Cause-Specific Survival With Relative Survival for the Most Common Cancers in Taiwan
T. Tseng

P-13 Impact of Cancer Incidence Reporting Delay on Relative Survival Analysis
X. Dong

P-14 Trends in Incidence of Tobacco-Related Cancers in New Jersey by Sex and Race, 1979-2013
K. Pawlish

P-15 Development and Implementation of a Novel Web-Based Application Integrating Cancer Registry Data into Survivorship Care Plans
R. Vanderpool

P-16 Data Reports: They Can Always Get What They Want
S. Gershman

P-17 Cancer in Ontario: A Review of Current and Historical Cancer Statistics, 1981-2016
T. Navaneelan

P-18 Utilization of Cancer Registry Data to Increase Outpatient Palliative Care Referrals in a Hospital Setting
M. LeBeau

P-19 Risk of Developing Colorectal Cancer after Surviving a Female-Specific Cancer in Puerto Rico
M. Alvarado Ortiz

P-20 Understanding Theories of Cancer in Population Cancer Surveillance
B. Riddle

P-21 Using NAACCR Survival Tables to Look at Deaths
B. Riddle

P-22 Establish if the Use of Biomarker Testing has Increased and the Impact on Treatment Over Time
D. Rousseau

P-23 Incidence and Mortality Trends of Colorectal Cancer in Puerto Rico: 1987–2012
A. López-Rodríguez

P-24 Rising Thyroid Cancer in Puerto Rico, 1987-2012: Access, Excess, or What?
C. Torres-Cintrón

P-25 Emergency Presentation and Short-Term Survival among Colorectal Cancer Patients Enrolled in the Government Health Plan of Puerto Rico
K. Ortiz-Ortiz

P-26 Cancer Treatment Delay Statistics for Six Major Types of Cancer in the State of Missouri
C. Schmaltz

P-27 Descriptive Epidemiology of Breast Cancers among Take Charge! Screenings, Oklahoma, 2004-2013
A. Sheikh

PL-01:

STRATEGIES FOR ACCELERATING TRANSLATION OF RESEARCH FINDINGS INTO CANCER PREVENTION THAT WORKS
GA Colditz[1]
[1]Siteman Cancer Center, St Louis, MO, United States

Refining strategies to implement and sustain cancer prevention interventions that are established as effective to reduce cancer incidence offers the best and fastest return on our past investment in cancer research.

There are effective cancer prevention strategies, including:

- Colorectal cancer screening
- HPV and HepB vaccines
- SERMs
- Aspirin
- Smoking cessation

Across prevention targets, there are many persistent disparities among and within countries across race/ethnic and income groups. The health care system's general approach to cancer screening can be improved. In the United States, only about 43% of adults are current on all cancer screenings needed. For colorectal cancer alone, it is estimated that over 24 million adults need to be screened in the next 3 years to reach the target: 80% population coverage by 2018.

A key opportunity is to determine how to increase uptake of known prevention strategies across all populations and design new interventions for implementation and dissemination.

Some implementation science questions include:

1. How to speed the uptake in community settings so prevention reaches populations that will benefit the most?
2. Does implementation of known effective prevention and screening strategies as a cohesive integrated set of services increase their uptake, and what would the impact be?
3. What components or organizational features of the provider setting support integrated cancer prevention service delivery?
4. How do we communicate complex prevention concepts to different groups?

Answering these questions through rigorous implementation science offers opportunities for widespread impact. It should also reduce or eliminate cancer disparities. Cancer registries play a growing role in the evaluation of implementation programs as we document benefits across the population. Adding patient-reported outcomes to registry data systems remains an emerging area of great promise.

NOTES:

Plenaries

TUESDAY, JUNE 14 - PLENARY SESSION 1
⌨ 10:00 AM - 12:00 PM

PL-02

LUNG CANCER SCREENING GUIDELINES AND THE IMPACT ON CANCER SURVEILLANCE

M LeFevre[1]
[1]University of Missouri, Columbia, MO, United States

Lung cancer is the leading cause of cancer-related death in the United States, with approximately 160,000 deaths per year. In spite of some advances in treatment, it continues to have a poor prognosis: nearly 90% of individuals diagnosed with lung cancer will eventually die of it. The 5-year survival for all stages is approximately 16%. Although widely promoted for years, chest x-ray screening of asymptomatic individuals has no impact on survival from lung cancer. Screening for lung cancer with CT scan has been evaluated in a large multicenter randomized controlled trial and has been shown to reduce lung cancer mortality by 20% after an average of 6.5 years. There are, however, significant risks of screening, particularly a very high false positive rate and the risk of unnecessary biopsies that can result in serious complications, rarely death.

Overdiagnosis, that is, the diagnosis and treatment of cancers that would never have become apparent in the individual's lifetime in the absence of screening, occurs, though the precise rate is unknown. The U.S. Preventive Services Task Force has examined the evidence of both benefits and harms of lung cancer screening and recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.

PL-03

RECORDING PEDIATRIC CANCER STAGE IN POPULATION-BASED CANCER REGISTRIES: THE TORONTO CONSENSUS GUIDELINES

L Frazier[1]
[1]Dana-Farber Cancer Institute, Boston, MA, United States

At a population level, cancer stage at diagnosis can be used to evaluate the effectiveness of prevention and early diagnosis campaigns, as well as to help understand any increases or decreases in overall survival, but stage is not collected by many population-based cancer registries (PBCRs). The principal method of staging adult cancers is the "tumor, node, metastasis" (TNM) classification. Pediatric cancer stage does not use the TNM classification nor is there one universally accepted staging system. Rather, different national groups around the world have developed their own idiosyncratic staging systems that include malignancy-specific parameters. Thus, the collection of pediatric stage data represents a significant challenge for PBCRs and the comparability of the data globally is fraught with challenges, given the many heterogeneous staging systems. We assembled the key experts and stakeholders (oncologists, cancer registrars, epidemiologists) and utilized a modified-Delphi approach to establish principles guiding pediatric cancer stage collection. Using these principles, recommendations were made on which staging systems should be adopted by PBCRs for the major childhood cancers, including adaptations for low-income countries. The Toronto Consensus Guidelines have been endorsed by the UICC and the TNM committee. Implementation of these guidelines in pediatric PBCRs will facilitate international comparative studies of pediatric cancer outcomes.

NOTES:

PL-04

THE CAMP LEJEUNE CANCER INCIDENCE STUDY: THE NEED FOR NATIONWIDE CANCER DATA
F Bove[1]
[1]Agency for Toxic Substances and Disease Registry, Atlanta, GA, United States

During the early 1980s, high concentrations of volatile organic compounds such as trichloroethylene (TCE) and tetrachloroethylene (PCE) were discovered in drinking water serving some areas at Marine Corps Base Camp Lejeune in North Carolina. The Environmental Protection Agency classified TCE as "carcinogenic in humans by all routes of exposure" and PCE as "likely to be carcinogenic in humans by all routes of exposure." Based on extensive modeling, the Agency for Toxic Substances and Disease Registry (ATSDR) determined two drinking water systems on base were contaminated from the early 1950s through February 1985. Mortality studies at Camp Lejeune found associations with several cancers including cancers of the kidney, rectum, lung, prostate, multiple myeloma, and leukemia when Camp Lejeune cohorts were compared to unexposed cohorts from Camp Pendleton. Following up on results of the mortality studies, ATSDR initiated a retrospective cohort study of cancer incidence. The study includes Marines stationed at Camp Lejeune or Camp Pendleton any time during April 1975 – December 1985 and civilians employed at either base anytime during October 1972 – December 1985. Information on cancers will be obtained from data linkage with federal and state cancer registries. ATSDR will submit requests for data linkage to all 50 state cancer registries; registries covering D.C., Puerto Rico, and other territories; the Veterans Affairs Central Cancer Registry; and the Department of Defense Cancer Registry Program. Cancer data will be requested from the earliest date the registry has complete data or January 1, 1973, whichever is later, through December 31, 2016. ATSDR will supply personal identifier data for cohorts and will request that each registry provide individual cancer data linked to personal identifier information. The presentation will explain details of the study and discuss how data on the cohorts are being used in NAACCR's effort to establish a virtual pooled registry.

NOTES:

Plenaries

TUESDAY, JUNE 14 - PLENARY SESSION 2
1:15 PM - 3:30 PM

PL-05

CANCER AND MORTALITY SURVEILLANCE FOR AMERICAN INDIAN AND ALASKA NATIVE POPULATIONS
M Jim[1]
[1]Centers for Disease Control and Prevention, Albuquerque, NM, United States

In 2010, an estimated 5.2 million people reporting American Indian/ Alaska Native (AI/AN) ancestry alone or in combination with 1 or more races lived in the United States, representing approximately 1.7% of the population. These communities have diverse languages, cultures, and histories. The Indian Health Service (IHS) provides primary health care to approximately 2.2 million enrolled members of 566 federally recognized tribes. Misclassification of AI/AN as non-AI/AN in cancer incidence and vital statistics data has resulted in the underestimation of the disease burden in these populations. Linkages of data from central cancer registries who are part of the Centers for Disease Control and Prevention's National Program of Cancer Registries (NPCR) and the National Cancer Institute's Surveillance and End Results Program (SEER) with IHS patient registration data provided evidence that, when reporting national rates, the regional variations were masking the real burden of disease among AI/AN. Similarly, a linkage of U.S. National Death Index records with IHS patient registration data showed that the disparity in death rates between AI/AN and non-Hispanic white populations in the United States remain large for most causes of death. Tribal linkages to further address race misclassification as well as methods that have been used to create tribal reports will also be discussed.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

PL-06

IF YOU DON'T ASK, YOU DON'T COUNT: INCLUDING SEXUAL ORIENTATION AND GENDER IDENTITY FOR CANCER RESEARCH AND SURVEILLANCE
J McElroy[1]
[1]University of Missouri, Columbia, MO, United States

While cancer affects many adults throughout mid- and later life, sexual and gender minority (SGM) people, (also known as lesbian, gay, bisexual and transgender [LGBT]) have unique needs with respect to cancer screening, treatment, and survivorship. SGMs have higher prevalence of cancer risk factors, including tobacco use, alcohol intake, obesity (LB women) and nulliparity; experience unique discrimination in health care settings; and have different social support networks and needs than non-SGM individuals (also known as cisgender heterosexuals). Cancer prevalence, screening/diagnosis, treatment, and survivorship experiences of SGM adults have received little attention in quantitative research including surveillance reports. This is largely driven by lack of these demographics being collected at the population level. With Meaningful Use Stage 3 requirements to include sexual orientation and gender identity (SOGI) data fields in the electronic medical record, much attention has been given to creating standardized questions and answer options. This, in turn, will allow cancer registries to collect these data. The goals of this presentation are to identify barriers, value, and important elements in data collection of SOGI that would support cancer surveillance and research focusing on the SGM population.

PL-07

TRAINING FOR DIVERSITY IN PUBLIC HEALTH PRACTICE
R Brownson[1]
[1]Washington University in St. Louis, St. Louis, MO, United States

A diverse work force is a more productive and effective workforce. Numerous national reports have documented the need for a more diverse public health workforce. This presentation will describe the rationale for a more diverse workforce, gaps in the current workforce, implications for cancer prevention and control, and effective training approaches for enhancing public health capacity and diversity.

Plenaries

PL-08

NATURAL LANGUAGE PROCESSING TO SUPPORT CANCER REGISTRIES AND CANCER SURVEILLANCE

P Fearn[1]
[1]Fred Hutchinson Cancer Research Center, Seattle, WA, United States

Informatics researchers have estimated that that the majority of desired clinical data elements to characterize cancer patients currently come from text documents such as pathology and radiology reports or other clinical notes from electronic medical records systems. Abstraction and consolidation of data elements from clinical notes is still largely a manual process for cancer registration and clinical research. Natural language processing (NLP) and machine learning tools and methods have matured and may be able to facilitate or automate some of the information extraction and processing work for registries and cancer surveillance such as case finding, abstraction, case consolidation, and quality assurance. This presentation will provide a brief and introductory overview of NLP, a review of the literature of NLP applied to cancer registries, and a vision and framework for applying informatic, NLP, and machine learning technologies to help registries and advance cancer surveillance.

PL-9

A NEW DATA RESOURCE FOR SOCIAL NEEDS

M Kreuter[1]
[1]Washington University, St Louis, MO, United States

The association between social and economic determinants of health and cancer is well documented. Addressing social and economic factors has become increasingly central to government and private efforts to improve population health and eliminate health disparities. To date, timely, searchable and localized data on social needs have been sparse and/or not publicly accessible. But that is changing. This presentation will introduce attendees to *211 Counts*, an online data dashboard of daily basic needs at the zip code level for communities across the United States. Opportunities for integration with cancer and other population health surveillance data will be discussed.

PL-10

REDUCING GEOGRAPHIC DISPARITIES: CAN LOCAL BREAST CANCER DATA IDENTIFY WHERE TO TARGET SCREENING?

M Schootman[1], E Nelson[1], S Yun[2]
[1]Saint Louis University, St. Louis, MO, United States; [2]Missouri Department of Health and Senior Services, Jefferson City, MO, United States

Reducing disparities is a key Healthy People 2020 goal. To identify where and how to increase screening based on early- and late-stage breast cancer rates in order to reduce geographic disparities, we used 2008-2011 data about women aged 40-64 from the Missouri Cancer Registry. These women are the target population of the Missouri Breast and Cervical Cancer Early Detection Program (BCCEDP). We used the 2010 American Community Survey data to identify differences in social determinants among zip codes with high early-stage breast cancer rates, high late-stage breast cancer rates, and the remaining zip codes in Missouri. We obtained the location of mammography facilities from the FDA to calculate the average distance between a zip code and the location of the nearest facility for the three types of areas. We used similar methods for BCCEDP provider locations. We used the Getis-Ord Gi^* test for spatial autocorrelation to identify statistically significant clusters of zip codes with high and low rates. We found that 9,739 Missouri women (32.5% early stage) aged 40-64 years of age were diagnosed with first primary breast cancer across 783 Missouri zip codes (12.3% were Black women). The rate of late-stage breast cancer ranged from 0.0 to 2040.8 per 100,000 population (39 zip codes had significant higher rates [$p<0.05$] than the rest of Missouri). The high school graduation rate ($p=0.031$) and the percentage of urban areas ($p=0.053$) were highest in zip codes with high late-stage breast cancer, but none of the other social determinants differed across the three types of areas. The average distance to mammography facilities was highest in zip codes with high late-stage breast cancer rates ($p<0.001$), but the average distance to BCCEDP providers did not differ across the three types of areas ($p=0.594$). We conclude that mobile mammography facilities should be deployed in 39 specific zip codes to increase breast cancer screening and reduce late-stage breast cancer disparities in Missouri.

Plenaries

THURSDAY, JUNE 16 - PLENARY SESSION 4
9:45 - 11:30 AM

PL-11

INTEGRATING POPULATION SCIENCES INTO CANCER CENTER RESEARCH
E SIMOES[1]
[1]University of Missouri, Columbia, MO, United States

The 67 Comprehensive Cancer Centers are dedicated to research in the development of more effective approaches to prevent, diagnose and treat cancer. The National Cancer Institute funded the Centers' scientific work between $720,000 and $13.6 million in FY11. Centers have historically designed and implemented a variety of research approaches and methodologies from cell to population, including most recently genomics, proteomics, and precision medicine. Because Centers are an integral part of the health care systems, not an isolated research unit, they have to adapt and embrace new approaches and methodologies being introduced by two complementary drivers of a renewed and expanded concept of population health.

Over the past 10 years, robust research in the social determinants of health combined with a renewed and expanded interest in improving population health have created pressure for Centers researchers to further incorporate new methodologies capturing these concepts. The growing and robust evidence of social-economic factors' impact on health has changed the paradigm of an epidemiological research framework that is over a century old. Epidemiologist and population health scientists can no longer just control for these factors' effect because the factors are often the effect. In addition, recent fiscal and legal changes of the U.S. health care system have led health systems to move away from measuring and monitoring the patient and focusing more on the population giving rise to patients. Payers and patients want more value, including increased quality of care offered and satisfaction with care received, while demanding lower costs. These transformational changes arose together with a focus on information technology and informatics, leading to new methodologies and metrics that have contributed to change the existing paradigms of population sciences.

PL-12

TRANSLATING RESEARCH INTO CLINICAL PRACTICE IN HEPATOCELLULAR CANCER
K Staveley-O'Carroll[1]
[1]University of Missouri-Columbia, Columbia, MO, United States

Hepatocellular carcinoma (HCC) is the second leading cause of cancer-related mortality and continues to increase in its incidence. The current standard of care for patients with HCC only provides limited therapeutic benefit. Development of innovative strategies is urgently needed. Experience with immunotherapy in HCC is quite early, but has rapidly progressed in the past 10 years. Multifaceted immune-based approaches have shown efficacy in achieving disease regression, representing the most promising new treatment approach in a number of malignancies, and we hope to extend these benefits to patients with HCC. To this end, we established a clinically relevant animal model by intraperitoneal injection of carbon tetrachloride and intrasplenic inoculation of potential oncogenic hepatocytes. As a result, tumors arise and grow in the setting of hepatic fibrosis. The established model mimics human HCC and reflects its typical features. Using this mode, we elucidated the complex dialog occurring between host immunity and tumors during tumor initiation and progression. We have leveraged these mechanistic findings to design clinically feasible antitumor therapeutic strategies. Four different strategies are in development by our team:

1. Clinically feasible chemoimmunotherapy against HCC: Combination of sunitinib and anti-PD-1 antibodies for the treatment of HCC
2. Integration of liposome-loaded C6 ceramide and immunotherapy in the treatment of HCC
3. Radiofrequency ablation in combination with sunitinib for the treatment of HCC
4. Laser immunotherapy for the treatment of HCC

Plenaries

PL-13

FUTURE OF CANCER SURVEILLANCE—CDC PERSPECTIVE
C Richards[1]
[1]Centers for Disease Control and Prevention, Atlanta GA, United States

Public health surveillance is the foundation of effective public health action. Public health surveillance, including cancer surveillance, is evolving to utilize emerging tools in health information technology, data analytics, and patient- or consumer-generated data. While new technologies offer incredible opportunities to leverage data for surveillance, important policy challenges must be considered and addressed. As progress is made, timelier and more robust, locally relevant public health surveillance can drive public health action, particularly in prevention.

PL-14

PALLIATIVE CARE AND END-OF-LIFE DECISION MAKING: THE IMPACT OF POPULATION-BASED CANCER DATA
C Anderson[1]
[1]NorthCare Hospice and Palliative Care, North Kansas City, MO, United States

Hospice and palliative care services are widely available in the United States and of utmost importance for cancer patients and families at the end of their illness journey, but are utilized too seldom and too late to optimally benefit many of those who qualify. One of the barriers to best utilization of hospice and palliative care services is a lack of understanding in clinical practices, cancer centers, and the lay public about how often and when cancer patients might need these services. Population-based cancer data, when shared and communicated with these stakeholders, enhance understanding and acceptance of why and how cancer patients and families can benefit from end-of-life care services such as hospice and palliative care. In fact, these services should be regarded as a critical aspect of cancer control, given that their appropriate application will reduce the burdens of physical, emotional, spiritual, and financial burdens of advanced cancer cases. In this session, we will discuss together how population-based cancer data can guide stakeholders toward earlier and better organized transitions to optimal end-of-life care.

NOTES:

001

TRIPLE NEGATIVE BREAST CANCER AND FACTORS ASSOCIATED WITH ITS TREATMENT IN THE US, 2011–2012

M Wu[1], T Thompson[1], B Ryerson[1], C Eheman[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States

Background: Triple receptor-negative breast cancer (TNBC) is characterized by the lack of expression of all the three protein biomarkers: estrogen receptor, progesterone receptor and human epidermal growth factors receptor 2. Large population-based studies on TNBC epidemiology and treatment in the United States were generally limited due to a lack of routinely data collection on these biomarkers until recent years.

Purpose: This study examined and documented general treatment status and factors associated with receipt of different treatments among TNBC patients in the United States.

Methods: We used the NPCR and SEER combined data. All women in the United States with a primary *in situ* or invasive breast cancer diagnosed in 2011 and 2012 were included. TNBC age-specific and standardized incidence rates and incidence rate ratios by demographic characteristics, geographic distribution, and stage at diagnosis were examined. Regression analysis on factors associated with different treatments was also performed.

Results: Ninety-five percent of women with early stage TNBC had surgery. Among those who received mastectomy, 31% chose to undergo contralateral prophylactic mastectomy. Among the women receiving breast conserving surgery (BCS), 64% received or were recommended to receive radiation therapy. Chemotherapy was received by or recommended for 77% of stage I-IV TNBC women. Among stage 0-III patients, sentinel lymph node biopsy was less likely performed than lymph node dissection for those aged ≥70, Non-Hispanic African-American or Hispanic women, those living in the South versus Northeast Region, and women living in areas of lower SES; however, SES had no impact on surgery type and there was no association of insurance status and radiation therapy among patients receiving BCS.

Conclusions: Treatment differences existed for some groups. More effective treatment options and treatment equality are warranted to improve overall care of TNBC.

002

TRIPLE-NEGATIVE BREAST CANCER IN GEORGIA: BURDEN, DISPARITIES, AND CONNECTIONS TO GEORGIA'S BREAST CANCER GENOMICS PROGRAM

A Berzen[1], R Bayakly[1]
[1]Georgia Department of Public Health, Atlanta, GA, United States

Background: Triple-negative breast cancer (TNBC) is typically aggressive and unresponsive to traditional cancer treatment. It disproportionately affects young and Black women and is more likely to be associated with a BRCA mutation. Georgia's Breast and Cervical Cancer Program (BCCP) routinely screens clients for increased risk of genetic mutation.

Purpose: Current guidelines recommend women diagnosed with TNBC should receive genetic testing/counseling. We looked into the burden of TNBC, as well as racial disparities, in Georgia to assess the data's use to inform Georgia's genomics efforts.

Methods: Using data from the Georgia Comprehensive Cancer Registry (GCCR) for 2010-2012, we calculated percentages and rates of TNBC, as well as stage at diagnosis and a case fatality rate based on vital status for TNBC cases vs. all malignant breast cancers, by race and age group.

Results: The percentage of invasive breast cancers, versus *in situ*, was the same for Georgia Black and white women; however Black women had almost double the frequency of TNBC as white women. Black women under 40 years of age had a 50% higher breast cancer incidence rate than white women of the same age, and had a 2.5 times higher TNBC rate. Black women aged 40-64 had a similar breast cancer incidence rate as white women, but their rate of TNBC was more than double. Georgia TNBC cases were about twice as likely as non-TNBC cases to be reported as deceased, and Black TNBC cases had higher fatality rates than white cases (twice as high in women under 40).

Implications: Awareness of hormone receptor status (and furthermore, possible presence of genetic mutation) for women diagnosed with breast cancer will help guide the proper course of treatment. In addition, family members of women diagnosed with TNBC in Georgia may take advantage of the screening for risk of genetic mutation through Georgia's genomics program in advance of a cancer diagnosis, and receive counseling where appropriate.

003

BREAST CANCER INCIDENCE IN MARIN COUNTY: A HOTSPOT GROWS COLD?

CA Clarke-Dur[1], SL Glaser[1,2], M McKinley[1]
[1]Cancer Prevention Institute of California, Fremont, CA, United States; [2]Stanford Cancer Institute, Stanford, CA, United States

Background: In 1994, the Greater Bay Area Cancer Registry reported that rates of invasive breast cancer in non-Hispanic white women in the San Francisco Bay Area were among the highest worldwide. We then documented ongoing rate increases and then decreases, particularly in Marin County, in response to concerns from regional community groups and the Marin Health Department. Over 20 years, we have monitored and studied regional breast cancer rates carefully, making several observations important to incidence and risks of breast cancer in the United States.

Purpose: To review the history of our response to this regional cancer cluster concern, and to share our most recent findings regarding long-term breast cancer trends.

Methods: We used incidence (1988-2012) and mortality (1988-2013) data on breast cancer from the California Cancer Registry, as well as SEER*Stat and Joinpoint software, to calculate rates and trends.

Results: Invasive breast cancer rates in Marin County have declined: the 2012 incidence rate (130 per 100,000 women) was 31% lower than the peak rate in 2001 and was the lowest reported since 1988. Joinpoint models showed a significant rate decline from 1998 to 2012 of -1.8% per year (95% CI: -2.9, -0.8). The 2013 mortality rate (16 deaths per 100,000 women) represented a 65% decline and the lowest reported since 1988. In 2007-2012, rates and trends in Marin County have been comparable to those in surrounding areas, with no statistical evidence of a remaining geographic excess. Patterns of occurrence by age at diagnosis, invasive/*in situ* status, and tumor hormone receptor status point to an important role in the documented changes of menopausal hormone therapy use as opposed to mammography use.

Conclusions: The breast cancer "hotspot" of the late 1990's in Marin County seems to have gone cold as rates have returned to average. Hormone therapy utilization patterns are the most likely explanation for the changing trends of the 1990s and 2000s.

004

UTILIZATION OF ONCOTYPE DX TEST FOR NODE-NEGATIVE, HORMONE RECEPTOR POSITIVE, HER2 NEGATIVE BREAST CANCERS IN THE COMMUNITY SETTING

X Wu[1], X Li[1], V Petkov[2], M Hsieh[1], M Loch[1], P Andrews[1], V Chen[1]
[1]Louisiana State University Health Sciences Center, New Orleans, LA, United States; [2]National Cancer Institute, Bethesda, MD, United States

Background: In 2008, the National Comprehensive Cancer Network's treatment guidelines added a recommendation for Oncotype Dx testing to guide chemotherapy decisions for women with node-negative, hormone receptor positive, Her2 negative breast cancer. This test helps identify women who are unlikely to benefit from chemotherapy to avoid toxicity of the treatment. Utilization of this test in the community setting is unclear because of unavailability of such data. Our purpose was to examine utilization of this test by socioeconomic status (SES).

Methods: Oncotype Dx test data were from a data linkage of National Cancer Institute's Surveillance, Epidemiology, and End Results registries with Genomic Health Inc., which is the only lab performing this test in the United States. We analyzed 3,749 eligible women diagnosed with a node-negative, hormone receptor positive, Her2 negative breast cancer in Louisiana in 2010-2012 by SES (i.e., race, insurance, census tract poverty) as well as age, tumor size, and tumor grade using chi-square and multivariable logistic regressions.

Results: Overall, 38.8% of the women had this test ordered in Louisiana. Out of those who received a test result, 57.0% had a low recurrence score, 35.8% had an intermediate score, and 7.2% had a high score. The distributions of recurrence risk did not significantly differ by SES. Significant predictors of lower use of Oncotype Dx test included black race (OR, 1.30; 95% CI: 1.08 to 1.57), Medicaid insurance (OR, 2.55; 95% CI: 2.00-3.27), high poverty ($\geq$20%) (OR, 1.38; 95% CI: 1.04-1.81) and older age ($\geq$70 years) with adjustment for the study variables.

Conclusions: Utilization of the Oncotype Dx test varies significantly by SES. Women in high SES group are more likely to have this test done than their counterparts.

005

HISPANIC CHILDHOOD LEUKEMIA INCIDENCE IN CALIFORNIA: HIGH AND RISING

B Giddings[1], T Whitehead[3,4], C Metayer[3,4], M Miller[2,3]
[1]California Cancer Reporting and Epidemiologic Surveillance Program, University of California Davis Health System, Institute for Population Health Improvement, Sacramento, CA, United States; [2]Western States Pediatric Environmental Health Specialty Unit, University of California, San Francisco, San Francisco, CA, United States; [3]Center for Integrative Research on Childhood Leukemia and the Environment, University of California, Berkeley, Berkeley, CA, United States; [4]University of California, Berkeley, School of Public Health, Berkeley, CA, United States

Background: Childhood leukemia incidence differs by subtype, sex, age, race/ethnicity, and geography. High rates of childhood leukemia incidence have been reported in Latin America and among Hispanic children in the United States SEER regions. California's large Hispanic population affords an important opportunity to thoroughly examine the leukemia burden among Hispanic children.

Methods: Cases of leukemia diagnosed among Hispanic and non-Hispanic white (NHW) children aged 0 to 14 years were identified using the California Cancer Registry (n=8,540). Age-adjusted incidence rates (AAIR), standardized rate ratios (SRR), and secular trends in incidence were examined by subtype, race/ethnicity, sex, and age. Trends were analyzed using joinpoint analysis to estimate the annual percent change (APC) and 95% confidence intervals (CI).

Results: The AAIR of acute lymphoblastic leukemia (ALL) was significantly higher among Hispanic versus NHW children (SRR=1.2, P-value < 0.01) and significantly increased among Hispanics (APC=1.0%; 95% CI 0.5 – 1.4). The AAIR of acute myeloid leukemia (AML) was significantly higher among Hispanic versus NHW children (SRR=1.2, P-value 0.04) and significantly increased among Hispanics (APC=1.3%; 95% CI 0.6 – 2.0). When trends were stratified by race/ethnicity and sex, ALL and AML incidence significantly increased among Hispanic females.

Conclusions: Leukemia incidence was significantly higher among Hispanic versus NHW children in California. Incidence rates significantly increased among Hispanic children, predominantly among females. There is some evidence to suggest that differences in childhood leukemia incidence between Hispanic and NHW children reflect differences in genetic susceptibility as well as differences in patterns of carcinogenic exposure between the two populations. However, more research on the underlying causes of the disproportionate burden of childhood leukemia among Hispanics is warranted.

006

ON SECOND THOUGHT, YES, WE DO HAVE A PREVALENCE ESTIMATE FOR NON-MALIGNANT BRAIN TUMORS!

C Kruchko[1], QT Ostrom[1,2], A Zhang[3], JS Barnholtz-Sloan[1,2]
[1]Central Brain Tumor Registry of the United States (CBTRUS), Hinsdale, IL, United States; [2]Case Comprehensive Cancer Center, Case Western Reserve University School of Medicine, Cleveland, OH, United States; [3]Department of Epidemiology and Biostatistics, Case Western Reserve University School of Medicine, Cleveland, OH, United States

Prevalence attempts to calculate the total number of persons with a diagnosis at a point in time, and reflects the relationship between incidence, survival, and demographics. Accurate estimation of population survival times requires >15 years of follow up. Pilocytic astrocytomas (PA) are classified as a non-malignant brain tumor (BT) as of 2007. Prior to this, PA were classified as malignant. Cancer registration in the United States continues to classify these as malignant. This provides the ability to estimate prevalence, in contrast to other non-malignant BT where data is available starting in 2004. This study estimates the 2010 prevalence of PA.

Limited duration prevalence was estimated from CBTRUS and Surveillance, Epidemiology, and End Results (SEER) program data. Prevalence was estimated from 1995-2010 CBTRUS incidence data and 1995-2010 SEER survival data, and extrapolated to model data from 1975-2010 using the SEER 1975-2010 incidence and survival data. Estimates were generated overall, and by age groups. Prevalence rates (PR) were calculated using the 2010 census population.

From 1975-2010, 30 year relative survival in PA for was 84.1%. It was estimated that there were 11,464 prevalent cases of PA in 2010 with an overall PR of 3.7/100,000 population. Of all PAs, 56.5% were in persons <20 at prevalence, with a PR of 7.8/100,000 (31.6% of prevalent BT). Young adults (20-39) represented 33.8% (4.7/100,000), and older adults (>39) represented 9.4% of prevalent cases (PR 0.8/100,000).

PA is classified as a non-malignant tumor, but has historically been categorized as a malignant tumor. As a result, appropriate data is available to generate prevalence estimates. Due to uncertain behavior and long survival time, PA represents a larger proportion of prevalent BT than incident cases (7.8% vs 4.3%). The relative impact of PA is higher among children than any other age group. Prevalence estimates provide critical information towards public health and healthcare planning.

1 Concurrent

007

TRENDS IN THE LIFETIME RISK OF DEVELOPING CANCER IN ONTARIO, CANADA

H Jiang[1,2], P De[1], X Wang[1,2]
[1]Cancer Care Ontario, Toronto, ON, Canada; [2]University of Toronto, Toronto, ON, Canada

Background: The lifetime risk of developing cancer refers to the chance a person has of being diagnosed with cancer over their lifetime. Interventions such as cancer screening can have an impact on lifetime risk. Usually, estimates of risk are obtained by applying the cancer incidence and all-cause mortality rates at different age groups for a specific year. However, given that age-specific cancer rates and all-cause mortality rates change over time, such estimates may not be truly reflective of risk, especially when such risk can change over time. We aim to improve on the typical analytic approach using breast cancer as the example as well as test if the lifetime risk has changed after the introduction of organized breast cancer screening in Ontario in the early 1990s.

Methods: Lifetime risk will be estimated using the "current probability" method. We will use actual data for cohorts born from 1940 to 1960 that are followed up to age 80, supplementing with age-period-cohort projection models where inadequate follow-up data exist. Breast cancer data will be obtained from the Ontario Cancer Registry, which has captured all new cancers in Ontario since 1964, and all-cause mortality from the provincial registrar general.

Results: The lifetime risk of breast cancer for women born in the 1940s will be compared with those born in subsequent decades. The trend in risk will be examined with regard to the introduction of a breast screening program. Results using different projection models and assumptions will be considered.

Conclusion: This analysis will improve our understanding of the lifetime risk of breast cancer in light of increasing life expectancy, changes in lifestyle, and improved interventions and treatments, which may have resulted in higher propensity for multiple primary cancers in Ontario. The results would be of particular interest to healthcare providers and planners.

008

COMPLETENESS OF REQUIRED SITE-SPECIFIC FACTORS FOR BRAIN AND CNS TUMORS IN THE SURVEILLANCE, EPIDEMIOLOGY AND END RESULTS (SEER) 18 DATABASE (2004-2012, VARYING)

JS Barmholtz-Sloan[1,2], QT Ostrom[1,2], H Gittleman[1,2], C Kruchko[1], L Penberthy[3], V Petkov[3],
[1]Central Brain Tumor Registry of the United States (CBTRUS), Hinsdale, IL, United States; [2]Case Comprehensive Cancer Center, Case Western Reserve University School of Medicine, Cleveland, OH, United States; [3]Surveillance Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute, Bethesda, MD, United States

Background: Cancer registries are an important source of population-level information on brain and CNS tumor incidence and survival. The Surveillance, Epidemiology, and End Results (SEER) registries currently collect data on specific factors related to brain and CNS tumors as defined by the American Joint Commission on Cancer, including World Health Organization (WHO) grade, MGMT methylation and 1p/19q loss of heterozygosity (LOH). We assess their "completeness," defined as having valid values, overall, and by year, histology and registry.

Methods: Data were obtained through a SEER custom data request on four required factors related to brain and CNS tumors for the years 2004-2012 (7/8 factors collected only from 2010-2012). SEER*Stat was used to generate frequencies of "completeness" for each factor overall, by year, histology and registry.

Results: The four factors varied in completeness by histology and registry, and completeness of all factors increased over time. WHO grade is the factor that had been collected the longest and showed significant increases in completeness. Completeness of MGMT, and 1p/19q LOH was highest in all types of gliomas. Completeness was much higher for gliomas that met 2010-2012 NCCN guideline criteria for testing. Oligodendroglioma tumors had 1p/19q LOH reported in 43-49% of the cases. Availability of MGMT was highest in glioblastomas (12%) though this biomarker was not included in NCCN guidelines until 2013.

Conclusions: Availability of SSFs in SEER data should be assessed and interpreted in the context of standard of care and clinical practice and guidelines at the time of cancer diagnosis. With increasing focus on "precision medicine" in cancer research and treatment, it is critical that we understand the impact of these brain and CNS specific factors at the population level. Overall, several of the factors examined had high completeness, and all factors increased in completeness over time demonstrating their relevance to clinical practice.

TUESDAY, JUNE 14 - CONCURRENT SESSION 1
📅 4:00 - 5:30 PM

009

USING NAACCR XML WITH RELATIONAL DATABASES
I Hands[1]
[1]Kentucky Cancer Registry, Lexington, KY, United States

Background: The NAACCR Board approved a new XML-based data exchange standard (http://naaccrxml.org) in September of 2015 to eventually replace the current NAACCR Volume II fixed-width format. This new standard addresses many limitations of the current standard, including extensibility and compatibility with newer healthcare data exchange efforts. It also includes a new patient-centered data model in the data exchange files, something unfamiliar to many cancer registries that rely on a tumor record-based data model. This new XML standard is still very new to the cancer registry community and needs to overcome some perceived obstacles to adoption such as compatibility with relational database systems, used by most cancer registries in North America.

Purpose: This presentation demonstrates software and processes developed at the Kentucky Cancer Registry to load NAACCR XML files into a relational database and perform common data analytics using SQL queries. It also explores why XML is sometimes perceived as incompatible with relational database systems and common considerations when modeling NAACCR XML data in a relational database system.

Methods: The Kentucky Cancer Registry utilized the software toolkit and documentation already released into the public domain by the NAACCR XML Task Force along with new, custom software and processes that allow NAACCR XML files to be loaded directly into a relational database. A simple relational data model was created that takes advantage of many of the benefits of moving to XML, while retaining the ability to use relational database systems for long term storage and analysis.

Results and Conclusions: The KCR was able to demonstrate the practical use of NAACCR XML data in a relational database environment. Leveraging relational database models also allows sophisticated data analytics utilizing the common database language, SQL. Compatibility and ease of use in a relational database environment is a major milestone for the continued adoption of the NAACCR XML standard among cancer registries.

010

NAACCR XML IN ACTION: FROM THE SEER ABSTRACTING TOOL TO SEER*DMS
F Depry[1]
[1]Information Management Services, Inc., Calverton, MD, United States

Significant progress has been made in defining an XML layout that would serve as an alternate NAACCR Data Exchange standard. The benefits of using XML have been well documented by the XML Task Force, but the implementation has not been tested—until now. This presentation will demonstrate how the NAACCR XML format can be used to move data from the SEER Abstracting Tool to the SEER Data Management System.

The SEER Abstracting Tool (SEER*Abs) is a highly customizable Java-based abstracting software. SEER*Abs can be configured to write data files in any format. This presentation will describe changes made to the core application to support NAACCR XML and a comparison of customizing an abstracting tool that uses XML vs the flat file format.

The SEER Data Management System (SEER*DMS) is used by 13 registries. One of the many features it offers is the ability to import data in different formats. The presentation will provide a brief overview of the SEER*DMS import module and highlight the changes required to accept NAACCR XML data.

This presentation will include a summary of the technical challenges encountered when implementing XML, and a discussion of the pros and cons of XML in abstracting and data management systems.

NOTES:

---

1 Concurrent

011

HOW BRIDGING THE GAP BETWEEN VB6 AND .NET PROVIDES EFFICIENCY FOR AUTOMATED TUMOR LINKAGE PROCEDURES IN REGISTRY PLUS CENTRAL REGISTRY DATABASE SOFTWARE

M Esterly[2], J Rogers[1], J Seiffert[2], S Baral[2]
[1]Centers for Disease Control and Prevention/National Program of Cancer Registries, Atlanta, GA, United States; [2]Centers for Disease Control and Prevention/National Program of Cancer Registries Contractor, Atlanta, GA, United States

Background: Automated tumor linkage is a challenge for central cancer registry staff and their software providers. NPCR's current Registry Plus (RP) software, programmed in VB6, included limited automated logic for linking multiple reports for the same tumor. Manual decisions were necessary for the majority of reports linking to an existing patient.

Purpose: To present the automated logic incorporated into the RP software and demonstrate increases in efficiency in assigning tumor linkage and Sequence Number Central. To present the tool used by subject-matter experts to encode the logic.

Approach: Registry Plus is being entirely re-programmed in .NET with a release date of 2016. To improve efficiency and automation in the meantime, the RP team created a stand-alone tumor linkage program, written in .NET. Based on SEER's "Multiple Primary and Histology Coding Rules," the team developed logic for high-volume primary sites, significantly reducing the manual linkage burden for users. Sequence Number Central codes are automatically calculated for the incoming and existing tumors, within the appropriate range of values, based on their chronological order of diagnosis dates and Sequence Number Hospital values.

Using a custom testing program, we will demonstrate the program logic for common and rare situations.

Results: The functionality of the stand-alone program is being incorporated into the standard workflow of the .NET revision. Once the .NET version is released, new abstracts that are able to link to a patient and tumor, consolidate successfully, and pass edits will be disposed directly to the central registry database without requiring manual intervention.

Conclusions: Linking multiple reports for the same tumor according to standard rules and assignment of Sequence Number Central can be successfully automated. RP's logic and implementation in .NET streamlines the process for users at a critical time when automation and efficiency are vital to registry operations.

012

FLORIDA PHYSICIAN CLAIMS PROCESSING: FROM COLLECTION TO IMPLEMENTATION

G Levin[1], W Scharber[2], M Herna[1], P Stearns[3], S Peace[1], M Hernandez[1], J Bonner[1]
[1]Florida Cancer Data System, Miami, FL, United States; [2]Registry Widgets, Elk River, MN, United States; [3]Advanced Consulting Enterprises, Miami, FL, United States

As part of the NPCR requirements to collect non-hospital cancer reports the Florida Cancer Data System (FCDS) began the physician reporting initiative through medical claims for practices in oncology, hematology, and urology in 2011. This presentation will step through the methodology implemented in Florida to integrate claims data into daily operations from a technical perspective.

The FCDS claims team developed a methodology whereby claims records for a patient are merged together, and patient linkage and consolidation against existing registry patient are performed. A description of the coding systems, translation tables, mapping rules, and patient-tumor matching logic will be reviewed. A detailed look at the most important component of processing, setting status categories to identify the use of the claim record and its linkage result will be presented. Finally, the benefits and limitations, as well as lessons learned, will be shared.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Concurrent 1

013

UNLOCKING THE POWER OF PHYSICIAN MEDICAL CLAIMS

M Hernandez[1], G Levin[1], W Scharber[2], S Peace[1], M Herna[1], J Bonner[1], P Stearns[3]

[1]Florida Cancer Data System, University of Miami, Miami, FL, United States; [2]Registry Widgets, Elk River, MN, United States; [3]Advanced Consulting Enterprises, Miami, FL, United States

Background: As part of the NPCR requirements to collect non-hospital cancer reports the Florida Cancer Data System (FCDS) began the physician reporting initiative through medical claims for practices in oncology, hematology, and urology in 2011. Since then, the FCDS has collected over 12 million claims records in the effort to capture unreported cases and to enhance existing patient treatment data. Through the use of specific claims data elements the registry is able to capture patient demographic, diagnostic, and treatment information, which are used to generate a standard NAACCR abstract.

Methods: A vital component of the FCDS claims processing system is to identify and categorize the claims records so that the appropriate action can be taken. Two status categories were established; one to categorize the availability of cancer treatment on a claims record; and another to categorize the action needed after patient linkage and consolidation against the FCDS existing tumor records had been performed. The treatment crosswalk based on ICD9, HCPCS and CPT coding was used to determine whether a claims record included a cancer-related treatment. Patient demographics were used for patient linkage and the NAACCR multiple primary rules were utilized for tumor matching.

Results: Through this methodology, the FCDS can enumerate linkages to patient-tumors, types and counts of new cases, types of treatments, and enhancement records. Furthermore, these status categories help to differentiate between cases that can be incorporated into the registry database in an automated fashion from those that most likely need more visual review.

Implications: Quality control of physician medical claims requires the development of new business practices and methodologies for accurate tumor linkage and data capture. These novel procedures serve to maximize automation and reduce the need for visual review by taking into consideration all the caveats of claims data.

NOTES:

014

ASSESSMENT OF LINKAGE OF SEER BREAST CANCER CASES TO ONCOTYPE DX TESTS

V Petkov[1], N Schussler[2], W Howe[2], M Yu[1]
[1]National Cancer Institute, Rockville, MD, United States; [2]Information Management System, Calverton, MD, United States

Background: Oncotype Dx and other multigene signature assays for breast cancer (BC) have been required for collection by SEER registries since 2010. Oncotype Dx predicts the risk of distant recurrence and the benefit of chemotherapy in lymph node negative, hormone receptor positive, HER2 negative invasive BC. The test was introduced in 2004 and recommended by guidelines since 2008. Due to concern of incomplete data, the SEER Program linked 2004-2012 BC cases to Oncotype Dx tests completed by Genomic Health, the only lab performing this test.

Purpose of the Study:
1. To assess how many tests were missed by registries.
2. To compare manually collected to linkage obtained Oncotype Dx for cases with registry reported tests. (3) To evaluate differences in cases with registry reported vs. provided only through linkage Oncotype Dx.

Methods: The study sample consisted of invasive BC cases diagnosed 2010-2012 in 17 SEER registries that participated in the linkage. Logistic regression was used to compare cases with registry reported vs linkage only provided Oncotype Dx.

Results: More than 40% of linkage provided Oncotype Dx was not captured in registry data. The registry reported and linkage provided Oncotype Dx RS had good agreement (kappa 94%). In 2.7% of the cases the discrepancy between registry and linkage RS placed the case in different risk group. Of note, 8.3% of cases with registry reported Oncotype Dx were not linked to GHI test due to missing data on linkage variables. Cases with registry reported test did not differ substantially from cases with linkage only test in demographic and tumor characteristics. Cases with linkage only Oncotype Dx were more likely to have other missing data concerning tumor characteristics and particularly treatment.

Conclusion: A substantial number of cases that had Oncotype Dx were not captured in the data reported by the registries. Annual linkage would be a better mechanism for collecting this important prognostic and predictive factor.

015

IMPROVING PATIENT DEMOGRAPHICS IN EPATH REPORTS AND TIMELY CAPTURE OF CLINICALLY DIAGNOSED CANCER CASES BY LINKAGE WITH HOSPITALS ADMISSION, DISCHARGE, AND TRANSFER (ADT) DATA

M Lynch[1], I Landry[1], B Mumphrey[1], M Hsieh[1], X Wu[1], V Chen[1]
[1]Louisiana Tumor Registry, New Orleans, LA, United States

Background: Electronic pathology (E-Path) coverage has significantly increased to over 92% of cancer cases in Louisiana, but these reports were often missing demographics (i.e., race, SSN, address), and did not identify clinically diagnosed cases. We explored the feasibility of linking hospitals' ADT data to improve demographics in E-path reports, and for timely identification of clinically diagnosed pediatric and young adult cancer (PYAC) cases for the early case capturing (ECC) project. The purpose of this presentation is to share our experience in implementing the ADT module and its effectiveness for PYAC case reporting.

Methods: The Louisiana Tumor Registry (LTR) recruited four hospitals, which had installed AIM's E-Path software and had a high proportion of E-Path reports with missing demographics. The E-path interface tapped into the hospital's ADT module, extracted demographics, and incorporated it into the reports that were automatically transferred to the LTR central office. To improve the timely capture of clinically diagnosed cases for PYAC patients, the ADT module electronically scanned for relevant ICD-9 codes and forwarded potential PYAC cases to the LTR for further investigation.

Results: Preliminary results from three of the four facilities showed a significant reduction in missing demographic information in E-path reports: missing race decreased from 88% to 15%; missing address decreased from 100% to 2%, and missing social security number decreased from 47% to 36%. Additionally, PYAC clinically diagnosed brain/CNS tumors were identified within 30 days of diagnosis using the ADT feed.

Conclusions: Supplementing E-Path reports with data from ADT significantly improves patient's demographics. Using the ADT feed to identify clinical cases has potential relevance in rapidly capturing PYAC cases because many are initially diagnosed solely through images/scans, making them difficult to identify in a timely fashion using traditional case-finding methods.

016

PROBABILISTIC AND DETERMINISTIC DATA LINKAGE BETWEEN KENTUCKY CANCER REGISTRY DATA AND HEALTH CLAIMS DATA

B Huang[1], E Tai[2], Q Chen[1], R Blythe[2], J Nee[1], D Butterworth[2], K Ward[3], J Lipscomb[3], J Talbert[1], N Subramanian[4], R Dufour[4], P Landfield[5], R Maiti[5], T Tucker[1]

[1]University of Kentucky, Lexington, KY, United States; [2]Centers for Disease Control and Prevention, Atlanta, GA, United States; [3]Emory University, Atlanta, GA, United States; [4]Comprehensive Health Insights, Louisville, KY, United States; [5]Kentucky Cabinet for Health and Family Services, Frankfort, KY, United States

Background: Cancer registry data have limited or incomplete treatment information. It is common to link external data, such as health claims data, to augment treatment data in cancer registries. Both probabilistic and deterministic data linkages have been used in several published studies. However, the characteristics of these approaches have rarely been directly compared, especially for both Medicaid and private insurance claims data.

Aims: Utilizing the Centers for Disease Control and Prevention's Registry Plus™ Link Plus software, we will examine the probabilistic data linkage process and how cutoff values will introduce biases in identifying true matches. Deterministic data linkage will be also examined. Sensitivity and specificity will be calculated for various scenarios and approaches.

Methods: Kentucky Cancer Registry data for major cancer sites will be linked with Medicaid, state employee insurance, and private insurance claims files. Utilizing Link Plus, many-to-many and one-to-many matches will be produced and manual review will be conducted to identify matches. A final set of true matches will be identified and then used to calculate related statistics for both the probabilistic approach and the deterministic approach.

Results: Preliminary results showed little difference in true matches between many-to-many matching and one-to-many matching. Deterministic matching also provided good results for the Medicaid data linkage. Final results will be presented at the conference.

Discussion: Acquiring permissions to conduct the manual review process following matching and the matching process itself is time consuming. The results of this study can be used to develop and publicize the most efficient approaches to reduce manual review.

017

IMPACT OF ALTERNATIVE DATA SOURCES ON PROJECTED VS. ACTUAL CASE COUNTS

R WILSON[1]

[1]Centers for Disease Control and Prevention, Atlanta, GA, United States

Background: Each year, using previously reported cancer incidence data and a detailed modeling formula, the American Cancer Society (ACS) estimates the number of new cancer cases expected to be diagnosed in the upcoming year. This analysis evaluates the difference between actual case counts and the ACS projections and whether reporting from sources other than hospitals affect the comparison.

Methods: Incidence counts for diagnosis years 2008-2012 from the United States Cancer Statistics were compared with ACS projected new cases for each year. The percent difference was determined for major sites between projections and reported cases at the 24-month period for the diagnosis year and at 36-, 48-, 60-, and 72-month periods, where applicable. Case reporting by Type of Reporting Source was evaluated for 1998-2012.

Results: Trends in over- and under-estimation are seen by cancer site. Over-estimation was higher in cancer sites more frequently diagnosed in outpatient settings. Multiple myeloma and leukemias were more frequently over-estimated in diagnosis year 2008 shifting to slightly under-estimated counts beginning in diagnosis year 2010. Reporting from sources other than hospitals increased over time, with the largest increase occurring in urinary tract sites.

Conclusion: Reporting by sources other than hospitals reduced differences between projected and reported cases and is likely to be a result of improved electronic data reporting from pathology and physician sources.

018

CONSTRUCTION OF A NORTH AMERICAN CANCER SURVIVAL INDEX TO MEASURE PROGRESS OF CANCER CONTROL EFFORTS.

C Johnson[1], H Weir[2], A Mariotto[3], R Wilson[2], E Nishri[4]
[1]Cancer Data Registry of Idaho, Boise, ID, United States; [2]Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA, United States; [3]Surveillance Research Program, National Cancer Institute, Bethesda, MD, United States; [4]Prevention and Cancer Control, Cancer Care Ontario, Toronto, ON, Canada

Background: Comparing cancer survival between jurisdictions and over time can help measure the success of cancer control efforts. Interpreting all sites survival is challenging because the age, sex and primary site distribution of the cancer patient population differs between jurisdictions, or changes over time within a jurisdiction.

Purpose: We describe construction of a North American cancer survival index (CSI), first used in the inaugural CINA Survival publication.

Methods: Data from 41 registries were used to construct two sets of statistics for all sites combined for cancer patients diagnosed 2006 through 2011. The first, labeled "All Sites," shows the age-standardized relative survival rates (RSR) for all sites combined. The RSR reflects the primary site distribution in each jurisdiction. As such, the Idaho estimate is not directly comparable to the Kentucky estimate because of the different mix of highly fatal, smoking-related cancers. The second, labeled "CSI" is the weighted sum of the site-specific RSRs, with the weights derived from the proportionate distribution of all incident cases by age, sex, and primary site for diagnosis years 2006-2008.

Results: The "All Sites" RSRs varied from 58.8 to 70.8, while the "CSI" RSRs varied from 60.5 to 65.6. For U.S. whites, the "All Sites" RSRs varied from 58.9 to 71.3, while the "CSI" RSRs varied from 61.2 to 66.0. For U.S. Blacks in the 9 states for which the index could be calculated, the "All Sites" RSRs varied from 53.6 to 58.9, while the "CSI" RSRs varied from 54.0 to 56.4.

Conclusions: "CSI" RSRs are directly comparable because they are standardized by age, sex, and primary site (but not race). The CSI can be used to compare the effectiveness of cancer control efforts between states or by Healthy People 2020 to measure progress in meeting the objective to increase by 10% the proportion of cancer survivors who are living 5 years or longer after diagnosis.

019

MODELLING ALL-CAUSE MORTALITY TO PRODUCE LIFE TABLES BY SOCIOECONOMIC STATUS FOR CANADIAN PROVINCES

D Spika[1], D Nishri[2], MP Coleman[1], C Allemani[1]
[1]London School of Hygiene and Tropical Medicine, London, England; [2]Cancer Care Ontario, Toronto, ON, Canada

Background: When estimating population-based cancer survival by socioeconomic status (SES), it is important to control for variations in background mortality by SES. Statistics Canada produces life tables at a national and jurisdictional level, but not by SES.

Purpose: To construct provincial life tables for Canada by SES.

Methods: SES was categorized by neighborhood income quintile, assigned by postal code. Death probabilities from abridged life tables (5-year age groups) and population counts by age group, sex, calendar period, SES, and province were obtained through the Canadian Partnership Against Cancer. Those data were used within a multivariable flexible modelling approach[1] to construct complete life tables (by single year of age). Age and SES were included as covariables in the model.

Results: Age-specific mortality varied widely by SES across Canada. In all provinces, life expectancy at birth was highest in the most affluent neighborhoods and lowest in the most deprived. During 1999-2011, affluent males and females in British Columbia had the highest life expectancy (81.2 and 85.0 years, respectively), and deprived males and females in Manitoba had the lowest (70.5 and 77.6 years, respectively). The deprivation gap in life expectancy was widest in Manitoba (males: 8.7 years, females: 5.4 years), and smallest for males in Newfoundland and Labrador (3.3 years) and for females in New Brunswick (1.7 years). We will explore the impact on survival estimates of using SES-specific life tables instead of overall provincial ones.

Conclusions: Age-specific mortality varies widely by SES in Canada. This reinforces the importance of adjusting for variations in background mortality by SES when estimating net survival by SES.

Reference:
1. Rachet, B, et al. Multivariable flexible modelling for estimating complete, smoothed life tables for sub-national populations [in press]. *BMC Public Health*, 2015.

TUESDAY, JUNE 14 - CONCURRENT SESSION 1
⏰ **4:00 - 5:30 PM**

020

IMPROVING THE ACCURACY OF SURVIVAL ESTIMATES: USE OF THE SSA EPIDEMIOLOGY FILE TO IDENTIFY INVALID SOCIAL SECURITY NUMBERS
P Pinheiro[2], R Martinsen[1], C Morris[1]
[1]CalCARES, Institute for Population Health Improvement, Sacramento, CA, United States; [2]University of Nevada Las Vegas, School of Community Health Sciences, Las Vegas, NV, United States

Introduction: The validity of cancer survival statistics for racial-ethnic groups with large proportions of foreign-born can be affected by lack of valid social security numbers. This can be particularly challenging for registries that rely on the presumed alive method (PAM) as opposed to SEER's reported alive method (RAM) for survival calculations.

Methods: We analyzed California data for cancers diagnosed 2003-2008 and used the SSA_Epi file to identify cases with an Invalid SSN and Lost to Follow-Up (ISLFU) without a valid date of alive contact within 5 years of diagnosis. We computed 5-year survival rates for the four most common cancers including (1) all cases and (2) excluding cases identified as ISLFU using both RAM and PAM in the calculations.

Results: Over 480,000 cases were analyzed. The proportion of ISLFU varied from 0.4% among whites to 4.2% among Mexican Hispanics, and from 0.37% for lung cancer to 1.2% for prostate cancer. Differences in survival estimates with and without inclusion of ISLFU were very small if RAM was used; less than 0.5 percentage points for most groups. The difference for male lung cancer in South and Central Americans was 3.9 percentage points, compared with 1.3 percentage points using RAM in the calculations. However, when ISLFU cases were excluded, the differences between the two methods were greatly reduced for all cancers.

Discussion: Our study based on California data shows that the existing overestimation of survival rates for Hispanics and Asians due to invalid SSNs using RAM is negligible, thus reassuring us of the validity of the currently produced estimates. In addition, our study suggests that if ISLFU cases are excluded from the analysis survival estimates for Hispanics and Asians in non-SEER registries are similar to those obtained with SEER's RAM. The SSA_Epi file is a valuable resource for cancer registries to produce accurate survival estimates for all racial-ethnic groups.

NOTES:

2 Concurrent

021

THE SEER VIRTUAL TISSUE REPOSITORY PILOT: LEVERAGING POPULATION-BASED BIOSPECIMENS

R Moravec[1], S Altekruse[1], V Petkov[1], J Boten[1], L Penberthy[1]
[1]National Cancer Institute, Rockville MD, United States

Background: The National Cancer Institute's Surveillance Research Program (NCI-SRP) supports 18 Tumor Registries across 14 states representing 30% of the U.S. population. These Surveillance, Epidemiology and End Results (SEER) Registries report approximately 450,000 incident cancer diagnoses each year. Most community-based pathology labs store formalin-fixed, paraffin-embedded tumors for at least 10 years. This provides a potential opportunity for registries to assemble robust collections of biospecimens to support population-based cancer research.

Purpose: The NCI-SRP is conducting a SEER pilot study that explores best practices to serve as a Virtual Tissue Repository (VTR) for tissue retrieval in collaboration with seven SEER registries.

Methods and Study Design: The SEER VTR Pilot will explore the potential to annotate tissues from 224 patients with pancreatic ductal adenocarcinoma who survived at least 5 years, and 418 localized node-negative female breast cancer patients who died of this cause within 2 years. Cases will be matched to controls with more typical patterns of survival based on important tumor and demographic attributes identified in logistic regression models.

Process Improvement: The SEER VTR Pilot will define best practices for population-based biospecimen acquisition so that this effort can be expanded in scale. Custom annotated information will be collected including tumor histology, comorbidities, detailed chemotherapy, time-to-recurrence, and outcomes. Pathology lab surveys will collect information on the location of tissues, retrieval costs, and requirements for release of de-identified data to investigators. The pilot will also explore best practices for acquisition of histology slides, digital images and pathology review.

Implications: Our goal is to use pilot findings to scale-up a future SEER VTR that can support a broad range of current cancer research questions.

022

QUALITY OF THE KRAS DATA IN POPULATION-BASED REGISTRIES FOR STAGE IV COLORECTAL CANCER CASES

M Charlton[1,2], J Schlichting[1,2], B Matt[1,2], I Landry[3,4], M Lynch[3,4], V Chen[3,4]
[1]University of Iowa College of Public Health, Iowa City, IA, United States; [2]State Health Registry of Iowa, Iowa City, IA, United States; [3]Louisiana Tumor Registry, New Orleans, LA, United States; [4]Louisiana State University Health Sciences Center, New Orleans, LA, United States

Background: The National Comprehensive Cancer Network 2009 treatment guidelines recommended KRAS testing for Stage IV colorectal cancer (CRC) patients upon diagnosis, with epidermal growth factor receptor inhibitors given only to those with wild-type KRAS. KRAS testing was added as a SEER variable in diagnosis year 2010, but yielded a lower than expected rate (23%); Iowa (IA) and Louisiana (LA) rates were particularly low (15-19%). We assessed accuracy of this variable and factors associated with testing.

Methods: IA and LA cases diagnosed in 2011-13 with Stage IV CRC were included. Registry personnel reviewed pathology reports to determine accuracy of initial KRAS value. Cases were allocated to the facility providing the majority of care; facilities were categorized by status including teaching and NCI designation.

Results: KRAS testing was initially coded in 31% of 541 Iowa cases and 18% of 1,042 LA cases. It rose to 44% on re-review of IA cases, where mean number of days from diagnosis to testing was 145. Of 67 additional IA cases found to have KRAS testing on re-review, 34 had a test date after abstraction date, and 33 were started on traditional chemotherapy agents (5FU) for first-line treatment before testing. For LA, testing rose to 27% on re-review of records, and KRAS results were available in EPath reports for 67% of tested cases by 2013. In both states, age <50 was associated with higher testing odds (IA=1.38; LA= 2.89). However, treatment at teaching facilities [2.15(1.33,3.48)] was positively associated with KRAS testing in IA, whereas treatment at teaching facilities [0.32(0.19,0.52)] and Medicaid coverage [0.35(0.19-0.69)] were negatively associated with testing in LA.

Conclusion: KRAS testing was missed primarily when performed well after diagnosis and/or abstraction date. Addition of a test date would help to understand treatment patterns and determine consistent coding criteria. EPath appears to be a promising source of capturing KRAS values.

023

DATA FEDERATION-A CANCER REGISTRY AND A BIOBANK

D Dale[1], H Begley[1], J Brierley[1], T Michaelson[1], G Zufelt[1]
[1]Princess Margaret Cancer Centre, Toronto, ON, Canada

Princess Margaret Cancer Centre, part of University Health Network (UHN) in Toronto has a hospital cancer registry. The registry has a tool to capture disease and staging information.

The Biobanking and Data Federation Technologies (BDFT) team are a software development team within the UHN that focuses on the development and implementation of Biobanking Management Systems and federating data from diverse and discreet clinical databases. One of those implementations was for the UHN Biospecimens Program, a comprehensive institutional biobank supporting medical research throughout UHN. Access to these biospecimens for research purposes is monitored by the UHN Tissue Committees with the mandate to ensure that the specimens are used effectively and do not deplete the bank.

Over the last few years, staff in the registry has been working with the BDFT team in order to make registry data available for other uses within UHN. In 2015, a requirement was articulated by the tissue committee to monitor what is stored in the biobank along with knowing the cancer site for the specimens.

The two departments have collaborated to develop biobank statements containing an inventory of the biospecimens currently stored in the biobank. The data sources federated the biospecimen management system and the cancer staging tool. Initially, the statements were designed to provide the biospecimen inventory and cancer site only. After pilot testing, it was obvious that morphology along with the site would be beneficial. The complete ICD-O-3-M codes were reviewed and grouped to provide meaningful information for each cancer site.

By December 2015, the process went live with the statements sent monthly to the site group leaders. Work is now underway to enhance the statements with stage group. This process has been an opportunity for the Cancer Registry to showcase all the data available and how it can assist researchers to effectively use biospecimens in one of the largest biobanks in Canada.

024

NATIONAL PROGRAM OF CANCER REGISTRIES – ADVANCING E-CANCER REPORTING AND REGISTRY OPERATIONS PROJECT (NPCR-AERRO): ELECTRONIC PATHOLOGY (EPATH) AND BIOMARKER SYNOPTIC REPORTING ACTIVITIES

S Jones[1], J Karp[2], R Moldwin[2], A Nichols[3], R McCabe[3], B Weatherby[4], J Rogers[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]College of American Pathologists, Chicago, IL, United States; [3]PathGroup Laboratories, Nashville, TN, United States; [4]DB Consulting, Atlanta, GA, United States

Background: CDC's National Program of Cancer Registries-Advancing E-cancer Reporting and Registry Operations (NPCR-AERRO) has successfully implemented electronic pathology (ePath) reporting from more than 20 national/large regional laboratories to over 44 central cancer registries (CCRs) using the NAACCR Volume V standard and the Public Health Information Network Messaging System. Major challenges existed in reporting of cancer pathology and biomarker data because no consistent standards are used across labs.

Purpose: The purpose of this project is to enhance the completeness, timeliness, and quality of cancer data through the automated capture of standardized cancer pathology and biomarker data using the College of American Pathologists (CAP) electronic Cancer Checklist (eCC) templates.

Methods: Through collaborations with labs, NPCR-AERRO continues to implement electronic transmission of narrative pathology reports to CCRs. CDC has collaborated with the CAP and PathGroup Lab to implement electronic reporting of cancer pathology and biomarker data captured using the eCC templates. The NAACCR Volume V standard was used to transmit the CAP eCC data to CCR systems.

Results: Several standards have been implemented through different pilot projects and lessons learned were captured that will be used to identify possible solutions for reporting these types of data. Templates that describe standard cancer pathology and biomarker information that labs need to capture and report to CCRs have been developed based on work with CAP, Cancer Care Ontario and other experts. The eMaRC Plus software has been expanded to receive and process synoptic reports.

Conclusion: We will present an update on the NPCR-AERRO activities that expanded implementation of ePath reporting from national/large regional labs to CCRs, review PathGroup activities to implement use of CAP eCC to report cancer pathology and biomarker data to CCRs, and discuss strategies to increase use of CAP eCCs by pathologists.

025

THE FUTURE OF CANCER REGISTRATION IN THE ERA OF ELECTRONIC HEALTH RECORDS

JD Rogers[1], W Blumenthal[1], S Jones[1], J Seiffert[2], and S Van Heest[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]Northrop Grumman, Atlanta, GA, United States

Background: A 2011 *U.S. News & World Report* article on the electronic health record (EHR) declared, "Medicine is entering a new era of information technology." According to the Office of the National Coordinator (ONC) Health IT Dashboard, as of 2014, 83% of office-based physicians and 76% of hospitals have adopted EHR systems. Since 2008, the adoption of any EHR system has nearly doubled for both. If trends continue, nearly all health care providers may adopt an EHR in the next 5 years. Implications for cancer surveillance given the current infrastructure are profound.

Purpose: CDC and NAACCR have had a history of working to ensure that cancer reporting is a function in EHRs. This presentation focuses on the future challenges and opportunities related to direct reporting of cancer data from EHR systems to hospital and central cancer registries.

Approach: Based on experience gained through cancer reporting in Stage 2 of Meaningful Use (MU) and through literature review, this presentation will outline anticipated future challenges and opportunities of direct reporting from EHR systems.

Results: EHR vendors are diverse. The cancer registry community can tap into direct feeds from EHR systems by working directly with vendors, providers, and national standard setting organizations to achieve and collect timely, complete, interoperable, and high quality cancer data. Data sets created for epidemiological and clinical analyses could be expanded.

Conclusions: In the era of EHR systems, charting a course for the future of cancer registries will require careful consideration of the current challenges and opportunities so that efforts can be prioritized to fully implement what innovation will bring.

026

ELECTRONIC PHYSICIAN REPORTING TO STATE CANCER REGISTRIES...PRESENT AND FUTURE

W Blumenthal[1], S Jones[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States

Background: In August 2012, the Centers for Medicare and Medicaid Services (CMS) published its final rule for Stage 2 of Meaningful Use (MU) of Electronic Health Records (EHRs). This final rule included an optional objective for ambulatory providers to report cancer cases to central cancer registries. Physicians were able to begin reporting to cancer registries on January 1, 2014. The MU Stage 3 rules were released in October 2015.

Purpose: To discuss the progress of states and EHR vendors with physician reporting and the impact of electronic physician reporting on cancer surveillance, and provide updates on MU Stage 3.

Methods: CDC and NAACCR have worked collaboratively with the cancer registry community, EHR vendors, ONC, CMS, and other partners to prepare for and support successful implementation of electronic physician reporting to cancer registries.

Results: As a result of collaborative efforts between CDC, state cancer registries and EHR vendors, vendors have made significant improvements to their systems which are reflected in fewer structural and content errors seen during testing and validation. Through the state testing and validation activities, CDC identified bugs and enhancements for eMaRC Plus, a tool used by cancer registries to receive and process physician reports and CDA Validation Plus, a tool to be used by EHR vendors, providers, and cancer registries to validate files for improved interoperability. Data will be presented from several states on increased reporting, case identification, and improved treatment data. Changes to MU for the Modification Rule period and Stage 3 will be described.

Conclusions: This presentation will describe the collaborative activities of CDC and the cancer registry community to implement electronic physician reporting. It will report on progress to date, lessons learned, and impacts of electronic physician reporting.

027

MEANINGFUL USE CANCER REPORTING IN MARYLAND: WHAT DO YOU MEAN?

C Groves[2], D Ng[2], D Rich[1]

[1]Maryland Department of Health and Mental Hygiene, Baltimore, MD, United States; [2]Westat, Rockville, MD, United States

Background: With the use of electronic health records (EHRs) in ambulatory health care settings, automated reporting is becoming more common. Meaningful use (MU) establishes the use of EHRs by eligible professionals (EPs) in a standardized manner and includes cancer reporting. MU onboarding requires validation of EHR capacity to submit electronic data with follow-up submission if successful. Westat, on behalf of the Maryland Cancer Registry (MCR), performs validation of electronic files, aided by the use of a tracking database.

Purpose: The presentation aims to describe the operational aspects of validation and the tracking database, provide the status of testing, and identify next steps of onboarding EPs interested in MU and MCR reporting.

Methods: In response to interested EPs registering for MU, Westat created a database to track validation of registered EPs including testing status and submission due dates. Westat developed procedural documents that that describe registry operations, provide guidance to EPs, and identify common testing issues.

Results: Useful tools including established procedures to guide operations and a tracking system that includes information on status, submission due dates, and interactions. As a result of MU, more EPs are reporting to the MCR. As of December 2015, 201 EPs have registered; 121 (60%) are considered active and have either started testing (N=32) or are waiting to begin testing. Of the 32 who have begun testing, 7 have passed and 2 have started reporting to the MCR. The remaining 40% of registrants have been excluded due to technical inability or have opted out of MU.

Conclusions: MU validation is a multi-faceted process involving validation of files and electronic transfer. The ability to track activities in a standardized format and knowledge of processes and procedures are important for registry operations. Next steps are to focus on MU production files and to assess the impact of MU on cancer reporting.

028

SUCCESSFUL ONBOARDING OF PHYSICIAN OFFICE DATA FOR MEANINGFUL USE STAGE 2 CANCER REPORTING

N Salahuddin[1]

[1]North Carolina Central Cancer Registry, Raleigh, NC, United States

This presentation will address the successful transmission of the high-quality cancer records from the physicians' office and highlight workflows involved. The NC-CCR MU2 team has developed a model for improving the data by providing hands-on consulting to the physician offices and EHR vendors all through the MU2 trajectory, by utilizing strategies to track EPs on the registration system, providing consistent feedback, leveraging the available secure transport mechanisms, resolving data quality interoperability issues encountered during testing, and validation to ensure completeness in data quality and content.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

029

DEVELOPMENT OF A NATURAL LANGUAGE PROCESSING (NLP) WEB SERVICE FOR STRUCTURING AND STANDARDIZING UNSTRUCTURED CLINICAL INFORMATION

S Jones[1], T Botsis[2], W Blumenthal[1], J Rogers[1], D Butterworth[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]U.S. Food and Drug Administration, Silver Spring, MD, United States

Background: While Meaningful Use and other activities have tried to implement standardized electronic health record (EHR) systems, there continue to be parts of the medical record, laboratory reports, and other clinical reports that are reported in free-form text narratives. Similarly, a considerable amount of clinical information submitted to the U.S. Food and Drug Administration (FDA) Spontaneous Reporting Systems (SRSs) for vaccines, blood products, and drugs is either not coded at all or not linked to the appropriate Medical Dictionary for Regulatory Activities (MedDRA) terms.

Purpose: The primary goal of this project is to develop a natural language processing (NLP) Web Service on the Public Health Community Platform (PHCP) that will provide Patient-Centered Outcomes Research (PCOR) researchers, as well as researchers at federal agencies and public health agencies with access to NLP tools that convert unstructured data (e.g., cancer data and safety surveillance data) into structured and standardized coded data.

Methods: The CDC and FDA will collaborate on the development of a "generalizable" NLP Web Service that will incorporate NLP algorithms needed to process cancer data and surveillance data for blood products and vaccines as pilot domains. This will demonstrate quality NLP functionality that can be utilized by other domains.

Results: The NLP Web Service will process a block of text, either received from a system interface (i.e., eMaRC Plus) or manual entry on the NLP Web Service, and return a specified set of data elements (i.e. histology, primary site, etc.) with standard coded data values (i.e., SNOMED, ICD-O-3, ICD-10-CM, MedDRA, etc.) that can be consumed by the sending system or viewed on the NLP Web Service.

Conclusion: This presentation will provide information on functional requirements, planned architectural design, and methods to test, evaluate, and implement the NLP Web Service.

030

ENHANCING CAPTURE OF DETAILED ORAL ANTICANCER MEDICATION UTILIZATION IN SEER BY LEVERAGING AN EXTERNAL SOURCE OF PHARMACY DATA

Q Tran[1], K Cronin[1], J Warren[1], D Annett[2], M Barrett[2]
[1]National Cancer Institute, Bethesda, MD, United States; [2]Information Management Services, Inc., Calverton, MD, United States

Background: The Surveillance, Epidemiology and End Results (SEER) Program currently collects information on the first course of treatment among cancer patients for 30% of the U.S. population. However, with the rising number of oral anticancer medications (OAMs), traditional surveillance sources do not adequately capture this change in oncology treatment. Therefore, SEER is leveraging data from IMS Health to capture information about the utilization of OAMs. The purpose of this study is to evaluate the completeness and representativeness of information on OAMs from IMS Health for cancer cases captured in SEER.

Methods: We evaluated the validity of IMS Health pharmacy data to identify receipt of specific OAMs delivered to female breast, colon, CML and myeloma cases diagnosed between 2007 and 2011 in five SEER registries using Medicare, the National Cancer Institute's Patterns of Care studies (POC), Seattle Breast Cancer Treatment (BRAVO) study, and Comparative Effectiveness Research (CER) study as comparators. Cases' Medicare, POC, CER, and BRAVO data were linked to and compared with IMS Health data for 3 months prior to 12 months after diagnosis. An encryption software and proprietary matching algorithm was used to perform the data linkage with IMS Health.

Results: Percentage of SEER cases covered and not covered in IMS Health database will be presented by demographic and clinical characteristics. Agreement rates and kappa coefficients will be calculated for the receipt of specific OAMs.

Conclusions/Implications: This study will provide insight into who is covered and what type of medications are covered in IMS Health. Findings from this study will provide best practices and approaches on utilizing secondary data sources such as IMS Health. Additionally, researchers can utilize the information to make informed decisions about study design and methodology utilizing IMS Health data.

Concurrent 2

C
Gateway to Innovative Data Capture

031

COORDINATED DATA DEVELOPMENT INITIATIVE: ENHANCING THE ACCESS TO AND USE OF STANDARDIZED TREATMENT DATA IN CANADA

C Louzado[1], H Hasan[1], A Reed[1]
[1]Canadian Partnership Against Cancer, Toronto, ON, Canada

Purpose: In Canada, and internationally, many rich repositories of data exist; however, reports have highlighted barriers to the meaningful use of these data, including less than adequate access, poor data linkages and privacy concerns. There are several types of data, including treatment data in particular, which are either unavailable or difficult to access, that would greatly enhance our ability to advance the cancer system. The Canadian Partnership Against Cancer (CPAC), which is an independent organization funded by the Federal Government of Canada to accelerate action on a national cancer control strategy, undertook an initiative (Coordinated Data Development Initiative) to enhance the access to and use of standardized cancer treatment data in Canada through the creation of linkages and/or data collection.

Methods: The initiative consists of developing and establishing a data standard for cancer treatment, determining what data sources currently exist that map to the standard, cataloguing data access policies, and through projects, testing the feasibility of accessing standardized treatment data on a small scale in multiple jurisdictions. The results of these projects may inform future programming with respect to data linkages in Canada.

Results: An expert validated data standard for cancer treatment has been developed which is inclusive of a core set of treatment data elements that are feasible to access/collect across Canadian jurisdictions. Projects are currently underway to test the feasibility of accessing standardized data.

Conclusions: The use of cancer treatment data for planning, management, policy development, research, and monitoring population and public health is fundamental to advancing cancer control efforts. This initiative will accelerate the uptake and translation of the best evidence and knowledge into practice and policy as well as evidence-informed decisionmaking at all levels of the cancer control system.

032

AUTOMATED LANGUAGE PROCESSING OF FREE TEXT MEDICAL REPORTS

G Cernile[1]
[1]Artificial Intelligence in Medicine, Inc., Toronto, ON, Canada

Free text medical reports contain a wealth of information and the volume of these reports is increasing almost exponentially each year. The automated interpretation of these data promises to achieve all sorts of benefits in terms of accuracy, reduction in human labor, and higher throughput. Currently automated systems such as E-Path and RCA perform some level of data extraction but not with 100% accuracy. For example, we have successfully applied the technology to identify and classify cancers in pathology and CNS imaging reports, but the extraction of discrete data elements such as TNM staging can still be improved.

Medical reports are not generally written with the intent to be grammatically or syntactically precise. The main goal of medical reporting is to convey information or provide data. This sometimes contrasts with the goals of formal linguistic approaches and often poses real problems for software developers using NLP techniques. The work required in this area is to improve the accuracy to a high level and hence achieve the proposed full benefits of automation.

Identifying the correct data is only one part of the problem, the other is interpreting these data which are often dependent on the type of report from which they were derived. For example, a radiology report of the CNS vs. a CT scan of the chest may present terms in different contexts. In this presentation, we explore some of the technologies available for NLP and compare the relative strengths of these approaches particularly as these related to cancer and its attributes. We show examples where formal approaches fail and describe how we address these problems.

We show that a hybrid approach combining both formal and heuristic or knowledge based techniques works best.

033

WEB PLUS SURVIVORSHIP MODULE: WHERE WE ARE AND WHERE WE ARE GOING

A Ryerson[1], C Bledsoe[1], S Kolli[1], A Kolli[1], J Rogers[1], R Rycroft[2], F Babcock[1], D Butterworth[1], C Eheman[1]
[1]Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]Colorado Central Cancer Registry, Colorado Department of Public Health and Environment, Denver, CO, United States

Background: Cancer survivors have many heightened health risks related to their diagnosis and treatment, yet delivery of recommended follow-up care is often lacking. In order to address this problem, a number of expert organizations have recommended that patients receive a comprehensive treatment summary and survivorship care plan (SCP) which includes information on diagnosis, treatment and guidelines for follow-up care. However, delivery of SCPs is still rare due to limited resources, lack of reimbursement, and health systems that fail to optimize communication and coordination of care.

Purpose: To use data already collected by cancer registries to pre-populate SCPs so that barriers to delivering SCPs in hospital settings may be reduced.

Methods: In collaboration with the Colorado Central Cancer Registry, CDC has developed an innovative online tool within its existing Web Plus software that uses previously collected cancer surveillance data to pre-populate SCPs. Providers can use the Web Plus Survivorship Module to access data within an easy-to-use and secure online user interface to create a custom package of information for the patient.

Results: The Web Plus Survivorship Module was released in select NPCR registries in 2015 for use in their CoC accredited facilities to help them meet their clinical Program Standards. Release of this tool will continue throughout 2016. We will demonstrate the tool, highlighting enhancements made since the last NAACCR conference, and outline a dissemination plan.

Conclusion: Public health surveillance data is essential for monitoring health outcomes and programmatic efforts. It can also be repurposed to improve clinical care. By building upon information that cancer registries already collect through routine operations, the Web Plus Survivorship Module effectively leverages existing resources to overcome some of the barriers to completing SCPs, thereby providing cancer survivors with a concise tool for navigating ongoing care.

034

USAGE PATTERNS OF A WEB-BASED APPLICATION INTEGRATING CANCER REGISTRY DATA INTO SURVIVORSHIP CARE PLANS

RC Vanderpool[1], B Davis[3], E Dressler[2], J Jacob[3], I Hands[3]
[1]University of Kentucky College of Public Health, Lexington, KY, United States; [2]University of Kentucky Markey Cancer Center, Lexington, KY, United States; [3]Kentucky Cancer Registry, Lexington, KY, United States

Background: Survivorship care plans (SCP) are comprehensive plans that outline past, present, and future care goals for cancer survivors. As of 2015, delivery of SCP to 10% of eligible patients are mandated for ACOS Commission on Cancer (CoC)-accredited programs; this percentage will incrementally increase to 100% by 2019. Cancer program readiness to implement the new standard is suboptimal, and strategies are needed to improve the efficiency of SCP development, including the use of cancer registry data to prepopulate SCP with existing patient data.

Purpose: In January 2015, University of Kentucky investigators were funded to design, implement, and evaluate a web-based application for prepopulating *Journey Forward* SCP templates with patient data collected by hospitals and entered into the Kentucky Cancer Registry's Cancer Patient Data Management System. This presentation highlights application usage patterns since its statewide launch in June 2015.

Approach: We analyzed usage statistics, including number and types of SCP generated, number and types of users, number of hospitals using the application and related hospital characteristics, and SCP generation timeframes.

Results: As of December 2015, 479 SCP have been initiated with two-thirds created for breast cancer (n=314). Forty-eight individuals representing 19 hospitals have requested access to the application; 15 hospitals (79%) are CoC-accredited. Of SCP users, two-thirds (n=32) are registrars. Of the SCP generated to date, the majority (n=310, 65%) were created within one year of the patient's date of diagnosis, aligning with overall CoC guidelines.

Conclusions: Almost 500 SCP have been initiated since the launch of the SCP application with the majority focused on breast cancer. The majority of hospitals using the application are CoC-accredited; the majority of users are registrars. Additional data collection and analysis will allow us to assess trends over time and focus on quality improvement.

035

STRATEGIES TO MAXIMIZE DATA QUALITY IMPROVEMENTS AND ENHANCEMENTS

W Roshala[1]
[1]PHI/Cancer Registry of Greater California, Sacramento, CA, United States

Background: Assessing data quality requires constant data review and analysis as well as having a diverse and multifaceted approach. This can also include or be inspired by data review requests. All these data quality activities involve a multidisciplinary, comprehensive approach with automation, educational and process improvement opportunities.

Purpose: This presentation provides an overview of recent data quality activities developed and implemented by the Cancer Registry of Greater California (CRGC). While the goal is to improve data quality, we also found opportunities to develop tools to assist registrars in capturing the data correctly at the time of data abstraction.

Methods/Approach: Enhanced methods of conducting audits and other quality control activities will be discussed, with an emphasis on identifying causes of data quality problems as well as tool enhancement opportunities. As part of this discussion, the SEER Prostate Specific Antigen (PSA) Data Quality Project will be discussed, how CRGC approached the review of over 10,000 prostate cases within a challenging timeline. Other methods using newly created reports, other data mining, and data review efforts as well as targeted visual editing on low performing abstractors will also be discussed.

Results: The results of various quality assurance activities and subsequent process improvements will be presented.

Conclusions/Implications: A diverse and robust data quality assurance plan involving a multidisciplinary approach can lead to improved overall data quality, educational opportunities as well as operational process improvement efficiencies.

036

VISUALIZING A WORLD WITH LESS CANCER

R Rycroft[1] C Bledsoe[1],
[1]Colorado Central Cancer Registry, Denver, CO, United States

Background: Cancer registries excel at collecting high-quality data which contribute to cancer registries being among the most sophisticated surveillance programs in the country. We have not always focused equal effort on sharing our knowledge with the rest of the world in an easily consumable format.

Purpose: In the past year, the Colorado Central Cancer Registry (CCCR) developed several data visualization and dissemination projects that are easier to access and understand for both internal and external stakeholders. A secondary purpose of these efforts was to identify ways to increase efficiency in the CCCR by reducing data requests, identifying hospitals with potential compliance problems, and reducing the amount of time spent creating reports.

Methods: CCCR staff used data visualization software called Tableau to create several interactive visualizations and dashboards. These included: (1) a special report on cancer and poverty in Colorado, (2) a hospital compliance dashboard, (3) charts and graphs of cancer incidence and mortality trends over time, and (4) a map of cancer rates throughout the state.

Results: Data visualizations will be shown and discussed with the audience, with an emphasis on how processes have changed related to data dissemination. Presenters will also discuss successes and barriers of using the new technology.

Conclusion: While data collection has traditionally been the focus of cancer registry work, the registry community also must focus on data dissemination strategies if we hope to decrease cancer's impact in our communities. In this era of data overload, concise and easily understood messages are key to ensuring that our data are used for research and programmatic decision making. Internally, data visualization offers a way to track data quality and completeness that all staff can embrace and use to improve efficiency in our day-to-day operations.

037

VIRTUAL POOLED REGISTRY PILOT LINKAGES WITH LARGE COHORT STUDIES

A Lake[1], W Howe[1], D Deapen[2], L Penberthy[3], B Kohler[4], R Sherman[4], C Clerkin[4]

[1]IMS Inc., Rockville, MD, United States; [2]Los Angeles Cancer Surveillance Program, Los Angeles, CA, United States; [3]National Cancer Institute, Rockville, MD, United States; [4]North American Association of Central Cancer Registries, Springfield, IL, United States

Multi-state research is costly and difficult due to linkages with multiple cancer registries, each with their own IRB review process. Resulting cohort linkages may yield few or no matches at some registries, raising the question of the benefit of the approval process in those instances. What if the linkages had been performed first to determine the presence or absence of matches? Informed decisions could then be made as to whether to pursue approval for release of identifiable data.

The Virtual Pooled Registry (VPR) has recently been funded to facilitate multi-state cohort linkages and reduce the resources expended by both researchers and central cancer registries. A VPR pilot linkage is currently being implemented to demonstrate the capacity, functionality, and efficiency of using the VPR for cohort matching across multiple state cancer registries. The initial VPR pilot linkages will occur behind registry firewalls and only the number of matches will be released to the researchers.

Large cohort files from the Agency for Toxic Substances and Disease Registry (ATSDR) Camp LeJeune Study and National Cancer Institute (NCI) Radiation Technician Study will be sent to participating pilot registries (25 or more registries representing at least 67% of the U.S. population). Highly automated linkages will be performed. The VPR linkage process, resulting number of matches, and cost effectiveness will be evaluated, presented, and used to guide future VPR development.

NOTES:

_____

_____

_____

_____

_____

_____

_____

038

VIRTUAL POOLED REGISTRY TEST LINKAGE RESULTS USING TWO SOFTWARE SYSTEMS

A Lake[1], W Howe[1], L Penberthy[2], M Yu[2], G Fraser[3], D Deapen[4], Y Chen[5], N Stroup[6], S Vasanthan[6], B Kohler[7], R Sherman[7], C Clerkin[7]

[1]IMS Inc., Rockville, MD, United States; [2]National Cancer Institute, Rockville, MD, United States; [3]Loma Linda University, Loma Linda, CA, United States; [4]Los Angeles Cancer Surveillance Program, Los Angeles, CA, United States; [5]CalCARES, Sacramento, CA, United States; [6]New Jersey State Cancer Registry, New Brunswick, NH, United States; [7]North American Association of Central Cancer Registries, Springfield, IL, United States

The Virtual Pooled Registry (VPR) is designed to facilitate and standardize multi-state research with submission of one application and one researcher file for linkage with state cancer registries. Currently, linkage protocols are not standardized and may default to the methodology specified in each state. The lack of a uniform protocol may lead to over- or under-matching and potential biases. The type of linkage software can also potentially impact the results. One of the VPR goals is to support cancer registries in performing linkages following a uniform procedure to improve scientific rigor and comparability of linkage results.

The purpose of this study was to compare two standardized linkage software systems by linking identical files and comparing the results. Records from the Adventist Health Study-2 (217,942) were linked with cancer records in California (CA) (1,778,968) and New Jersey (NJ) (592,376) from 2002-2012. The linkage run times were measured and both systems produced a count of potential matches. Potential matches are being manually reviewed to identify the number of true matches and assess differences between the two software systems.

Linkage run times were faster for software B (5 minutes in NJ, 28 minutes in CA) than software A (30 minutes in NJ, 6 hours in CA). In NJ, software A identified more potential matches (519) than software B (236); however, in CA, software A identified fewer potential matches (3,143) than software B (3,995). Potential matches are currently undergoing manual review. Results will be presented at the conference.

In conclusion, software B demonstrated faster run times. The two systems identified varying numbers of potential matches, which impacts the degree of manual review. In addition, the number of true matches detected by manual review will be helpful in evaluating software performance and determine the linkage software that will be used by the VPR.

Concurrent

2

WEDNESDAY, JUNE 15 - CONCURRENT SESSION 2
📷 10:15 - 11:45 AM

039

VALUE OF A CENTRAL INSTITUTIONAL REVIEW BOARD FOR MULTI-CENTERED STUDIES USING THE VIRTUAL POOLED REGISTRY

S Stoyanoff[1], L Penberthy[2], B Kohler[3], C Clerkin[3], R Sherman[3], D Deapen[1]
[1]Los Angeles Cancer Surveillance Program, Los Angeles, CA, United States; [2]National Cancer Institute, Bethesda, MD, United States; [3]North American Association of Central Cancer Registries, Springfield, IL, United States

Background: Researchers conducting multi-state or national epidemiological cancer studies face logistical challenges. To date, no study has successfully linked with cancer registry data from all 50 U.S. states. The Virtual Pooled Registry (VPR), coordinated by NAACCR and funded by NCI, addresses these issues and enhances the value of cancer registries. The goal is to support national research with one application and one file submission. One of the obstacles to conducting research using multiple registries is the complex task of obtaining institutional review board approvals from each registry.

Purpose: Establishment of a Central Institutional Review Board (CIRB) for cancer registry linkage studies would increase efficiency and achieve a high level of human subjects protection.

Approach: For each registry linkage study, a CIRB could focus on human subjects specific to cancer registry-based linkage research and reduce, time, effort and cost

Implementation: Just as the VPR will simplify the application process by establishing a standard application for all researchers, a CIRB would develop a standard application that can be adopted by many or all states. Both bodies support multi-state or national research by developing best practices for data access and IRB reviews. A recent NAACCR survey found that 25% of the 55 responding registries stated that their institutions have previously accepted a central IRB approval for a research project.

Implications: The burdens associated with efforts to obtain approvals for and access to multi-centered data are significantly decreased when a CIRB is employed. Benefits of a CIRB include proficient reviews conducted by members with multidisciplinary expertise; consistent, high level of commitment to the protection of study participants; and an increase in efficiency. In addition, proposed changes to the Common Rule include increasing reliance on CIRBs for cooperative research.

040

VALUE OF A VIRTUAL POOLED REGISTRY PROCESS TO IMPROVE DATA QUALITY IN CENTRAL REGISTRIES

L Penberthy[1], B Kohler[2], C Clerkin[2], D Deapen[3], P Mergler[1]
[1]National Cancer Institute, Rockville, MD, United States; [2]North American Association of Central Cancer Registries, Springfield, IL, United States; [3]Los Angeles Cancer Surveillance Program, Los Angeles, CA, United States

Given the increasing mobility of the U.S. population, a challenge to central cancer registries is assuring de-duplication of cases for patients who may receive initial treatment in non-contiguous states for whom data exchange does not routinely occur. The magnitude of this problem is unknown, but it may be higher for certain geographic locations of the country. Additionally, the lack of full data exchange may lead to the underreporting of multiple primary cancers.

Understanding multiple primary incidence is particularly important in the era of precision medicine where cancers may be more similar based on genomic patterns than organ site, and the study of multiple primary cancers could provide valuable insight into understanding cancer risk and etiology.

New technology solutions are available that would support efficient, routine encrypted data matching for all registries through the Virtual Pooled Registry. Through this process, patient identifying information could be maintained behind the registry firewall, while , while encrypted de-identified data and a sophisticated deterministic matching algorithms could be used to efficiently identify duplicate cases and multiple cancers across state boundaries. Subsequent exchange and data sharing would require new processes for registries which are being explored through a NAACCR Task Force, to determine who reports the case. However, current technology and confidentiality methods will facilitate this important effort to significantly enhance our estimates of cancer incidence in the United States. This process is currently being pursued in a pilot study.

041

TRENDS IN COLORECTAL CANCER INCIDENCE IN YOUNGER CANADIANS, 1969-2010

P De[1], P Patel[1]
[1]Cancer Care Ontario, Toronto, ON, Canada; [2]University of Toronto, Toronto, ON, Canada

Background: The overall incidence rate of colorectal cancer (CRC) in Canada has been decreasing but trends in other countries suggest an increase in those under the age of 50.

Purpose: To examine the trends in CRC incidence and associated lifestyle risk factors in Canadians aged 15-49 years.

Methods: Incidence data for colorectal, colon, and rectum/rectosigmoid cancer were obtained for 1969-2010 from the Canadian Cancer Registry and trends in age-standardized incidence rates (ASIR) were examined using Joinpoint regression by sex and for three age groups (15-29, 30-39, 40-49 years). Trends in the prevalence of major CRC risk factors were similarly examined from national health surveys from 1970 to 2012.

Results: In both sexes combined, ASIRs rose 6.7%/year (1997-2010) for 15-29 year olds, 2.4%/year (1996-2010) for 30-39 years, and 0.8%/year (1997-2010) for 40-49 years. Similar trends were observed in each sex. The rise in ASIRs for all age groups was more rapid for cancers of the rectum/rectosigmoid compared to colon. Risk factor trends varied: excess weight rose substantially, vegetables and fruit consumption increased slightly, physical inactivity rates remained high and unchanged, alcohol consumption changed little, and smoking rates declined.

Conclusion: The ASIR of CRC in younger Canadians has increased since about the mid-1990s. The rising prevalence of excess weight and, to a lesser extent the moderately high levels of physical inactivity, in younger generations are potential factors in the observed trends. These findings have future implications on promoting healthy living and awareness of CRC symptoms among younger people.

042

THE RISK OF COLORECTAL CANCER IS INCREASING IN SUCCESSIVE BIRTH COHORTS SINCE THE EARLY 1950S

R Siegel[1], J Ma[1], A Jemal[1]
[1]American Cancer Society, Atlanta, GA, United States

Background: Although colorectal cancer (CRC) incidence in the United States has been decreasing since the mid-1980s, rates are increasing in young adults for reasons that remain unknown.

Purpose: To analyze long-term CRC incidence data by examining age-specific temporal trends and output from age-period-cohort (APC) modeling, which disentangles the effects of factors that have influenced all ages (period effects) from those that vary by generation (cohort effects).

Methods: CRC incidence data for the nine oldest SEER registries were obtained for 14 5-year age groups (20-85+ years) during diagnosis years 1978 through 2012 using SEER*Stat software. APC analysis was conducted using the National Cancer Institute's APC Web tool. Curves were plotted to describe the risk of cancer for each birth cohort and time period relative to the cohort and time period with the highest risk.

Results: CRC risk decreased for successive birth cohorts from the 1890s to the early 1940s, but increased for every birth cohort since circa 1953. Compared to people born in the mid-1940s, who have the lowest risk, people born around 1990 have a three times higher risk of colon cancer and a four times higher risk of rectal cancer. As a result of the oppositional trends, rates in ages 50-54 and 55-59 have converged; the risk of disease in ages 55-59 versus ages 50-54 was two-fold higher in 1982 (RR=1.88; CI, 1.69-2.09), but equivalent in 2012 (RR=1.06; CI, 0.98-1.15). Risk of CRC has been increasing in ages 20-54 since 1995.

Conclusion: The risk of CRC has been continuously increasing in successive birth cohorts since the early 1950s, in contrast to reduced risk for successive cohorts born in the first half of the 20th century. Further research is necessary to elucidate causes for the rising risk of this disease.

043

GEOGRAPHIC VARIATION OF ADVANCED STAGE COLORECTAL CANCER IN CALIFORNIA

J Rico[1], S Kwong[1], K Snipes[1]
[1]California Department of Public Health/California Cancer Registry, Sacramento, CA, United States

Background: California has witnessed significant declines in the incidence and mortality of colorectal cancer (CRC); however, CRC remains the second leading cause of cancer related death in the state. While declines have been substantial, rates of decline for CRC incidence and mortality are not equally distributed among all race/ethnic groups, and more than half of all CRC cases are diagnosed at advanced stage.

Purpose: To help inform colorectal cancer control efforts, the California Cancer Registry identified Medical Study Service Areas (MSSAs) with a higher than average proportion of advanced stage CRC cancer cases.

Methods: CRC cases diagnosed between 2007 through 2011, among men and women 50 years and older (n=64,364) were selected for analysis. Proportional incidence ratios were calculated comparing the proportion of CRC cases diagnosed at advanced stage in each MSSA compared to the proportion of advanced stage diagnoses in a benchmark group (high SES, non-Hispanic whites).

Results: 32 MSSAs throughout the state had significantly higher proportions (≥60%) of advanced stage disease compared to the benchmark group (52%). The results were mapped using the ArcGIS 10.1 software.

Conclusions: This analysis has identified California communities which would benefit from more targeted CRC screening interventions.

NOTES:

044

MEANINGFUL USE IN PRACTICE: WHAT REPORTERS THINK

J Martin[1]

[1]Virginia Cancer Registry, Richmond, VA, United States

Preparing electronic medical records utilities to report from physician offices for Meaningful Use is no easy task. Office staff often are unschooled in the cancer knowledge and IT skills necessary for success. The NIST and CDC message verification utilities work well, and the HL7 CDA Implementation Guide is a lucid and thorough resource. However, effective work is relative to the capacity to understand. For example, a null flavor error:

ClinicalDocument/component/structuredBody/component/section urn:templateId[@root= '1.3.6.1.4.1.19376.1.5.3.1.3.6']]/entry/act/ entryRelationship/...and not (urn:template Id[@root='1.3.6.1.4.1.19376.1 .7.3.1.4.14.1'])]/value/@code "

communicates almost no information absent an understanding of CDA. The difficult position physician office staff are in regarding MU cancer messaging is worth exploring. An ethnographer's viewpoint is appropriate for this task. Therefore, I propose presenting the results of an inquiry into the experiences physician office staff have had with the Virginia Department of Health Meaningful Use Registration System, their experiences with the Virginia Cancer Registry message testing and validation process, and their recommendations for re-configuring MU registration, and message testing and validation. Data collection methods include conversations by phone and email, and soliciting input using anonymous, internet-based surveys. The goal is to understand Meaningful Use cancer reporting from the viewpoint of individuals who must implement such reporting and from this to draft a general Users Guide to help office staff understand and overcome problems they encounter.

045

IMPLEMENTING CANCER CASE REPORTING FROM AMBULATORY ELECTRONIC HEALTH RECORDS

A Austin[1], A Kahn[1], M Schymura[1]

[1]New York State Cancer Registry, Albany, NY, United States

Background: The New York State Cancer Registry (NYSCR) began accepting registrations for cancer reporting as part of the Centers for Medicare and Medicaid's Meaningful Use (MU) Incentive Payment Program in January 2014. The reporting requires transmission of reports in HL7 Clinical Document Architecture (CDA) format from Electronic Health Records (EHRs).

Purpose: We will describe the NYSCR's approach for implementation of MU reporting from providers, success in receipt of production data, and lessons learned.

Methods: We developed a tracking database which augments registration information with data about practice specialty, current reporting status (e.g., hospital reporting), EHR cancer reporting certification status, and prioritization for outreach and implementation. It also includes details of NYSCR-defined processes related to MU rules, and communication logs. Technical development work in progress will automate data flow and validation of CDA reports, provide appropriate notifications to production data submitters, and allow NYSCR to monitor and evaluate reporting.

Results: As of December 2015, 524 practices (2208 providers) registered; 198 (38%) do not have EHR software currently certified for cancer reporting. Of the remaining 326 practices, 69 (13% of all registrations) are among our high-priority specialties: 38 dermatology; 11 hematology/oncology; 9 urology; 6 gastroenterology; and 5 multiple specialty practices. While 9 vendors provide software to the high priority practices, 2 vendors support 45 (65%) of the practices. We initiated preliminary testing with a dozen practices using those two EHR systems. We will expand testing with additional practices and additional vendor software, based on the number of high-priority registrations received and resources available.

Conclusions: Successful implementation of cancer case reporting for MU requires extensive time and effort by cancer registries and IT services, EHR vendors, and providers.

046

ASESSMENT OF THE NATIONAL PROGRAM OF CANCER REGISTRIES (NPCR) PROGRAM EVALUATION INSTUMENT (PEI)
S Van Heest[1], N Apedoe[1], P Ravindhran[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]Leidos, Inc., Atlanta, GA, United States

Introduction: Every 2 years, NPCR uses the Web-based Program Evaluation Instrument (PEI) to assess performance, operations, and adherence to national program standards of its 48-funded central cancer registries (CCR). Information about CCR advanced activities is also collected. Through the PEI assessment, NPCR receives detailed quantitative and qualitative feedback from each of the NPCR-funded registries so that targeted support can be provided to each of the CCRs.

Purpose: PEI is based on CDC's Updated Guidelines for Evaluating Public Health Surveillance Systems and monitors the integration of surveillance, registry operations and health information systems, the usage of established data standards, and electronic data exchange.

Method: This presentation will describe the possible association between CCR size and its caseload, performance in reporting completeness, and adherence to national program standards relating to data exchange and data quality assurance as well as other assessments. The 2015 PEI dataset containing CCR activities in calendar year 2014 will be used for analysis.

Results: Previous PEI evaluations have shown patterns in types of activities pursued by the NPCR funded CCRs. In addition, PEI evaluations help illustrate how CCRs met or exceeded NPCR program standards related to reporting completeness, data exchange, and data quality assurance at rates independent of the size of the CCR. Results can be used to develop a better understanding of the current status of the NPCR registries, including possible patterns in registry operations.

Conclusion: Cancer caseloads have increased for CCRs while staff have decreased for CCRs. Assessments like the PEI can provide insight to the CCRs on how other registries are adapting to changing environments.

NOTES:

047

ANNUAL VERSUS BIENNIAL MAMMOGRAPHY SCREENING AND STAGE AT DIAGNOSIS OF BREAST CANCER IN ILLINOIS

T Dolecek[1], F Dabbous[1], T Macarol[2], W Summerfelt[2], G Rauscher[1]
[1]University of Illinois at Chicago, Chicago, IL, United States; [2]Advocate Heath Care, Downers Grove, IL, United States

Background: Guidelines for breast cancer screening remain under debate in the United States. Screening mammography seeks early detection to reduce mortality and morbidity. However, adverse outcomes are also associated with screening that give rise to substantial clinical, psychological and financial costs. Conversely, delayed screening may result in advanced cancer diagnosis and poorer prognosis. Determining optimal screening intervals that maximize benefits and minimize harms is crucial.

Purpose: To determine the effects of prior screening mammography intervals on stage at diagnosis of subsequent breast cancer.

Methods: Female breast cancer incidence data (2001-2011) from the Illinois State Cancer Registry were linked using probabilistic methods to the breast radiology database of a large healthcare organization. We compared the proportion of breast cancers within 12 months of a screen that were diagnosed at a late to early AJCC stage (II, III, IV vs. 0, I) among women with prior histories of either annual or biennial mammography screening.

Results: 1,999 breast cancer cases aged 40-79 years met the selection criteria (1,462 annual screens; 537 biennial screens). Overall, later stage was somewhat less likely among women receiving annual screening compared to those experiencing biennial mammography (26.3% vs. 29.8%, p=0.124). For younger women aged 40-49 years, biennial screening was associated with an almost 50% increased probability of later stage diagnosis compared to annual screening (38.5% vs. 26.1%, p<.05). As expected, annual screens were also associated with a greater proportion of *in situ* diagnoses than biennial screens (29.7% vs. 27.0%, p=0.241).

Conclusions: Preliminary findings suggest that more frequent screening intervals reduce late stage diagnoses while increasing *in situ* diagnoses and therefore may raise overdiagnosis and excessive treatment concerns. Further analyses will focus on detailed demographic, clinical and tumor characteristics.

048

GATEWAY TO INFORMATION: USING DATA VISUALIZATION TO CREATE INTERACTIVE PROFILES FOR CANCER IN MISSOURI BY STATE SENATORIAL DISTRICT

J Jackson-Thompson[1, 2, 3], CL Schmaltz[1, 2], A Ben Ramadan[1, 3]
[1]Missouri Cancer Registry and Research Center, Columbia, MO, United States; [2]University of Missouri (MU) School of Medicine Department of Health Management and Informatics, Columbia, MO, United States; [3]MU Informatics Institute, Columbia, MO, United States

Background: Cancer incidence and mortality data have traditionally been presented in tables with rates shown by geographic area, tumor characteristics and demographics. Data visualization techniques offer an alternative way of presenting data that is more easily understood by some users and may engage them more. The Missouri Cancer Registry and Research Center has used data visualization to present cancer data for several years. In 2015, we decided to pilot displaying cancer data by state senatorial district and to explore the inclusion of infographics.

Purpose: To improve data visualization by including infographics and displaying cancer incidence, mortality, and female breast cancer survival data by Missouri senatorial district.

Methods: We created the population files necessary to show cancer data by senatorial district. We created a data visualization dashboard for all cancers and several major cancers for each of Missouri's 34 state senatorial districts. We later investigated adding an infographic component to the dashboard.

Results: We used data visualization techniques to create 34 Missouri Senatorial District Cancer Profiles, each containing maps, tables and graphs showing cancer cases, deaths, and survival by demographics and the percent of cases diagnosed at late stage in comparison with the state. We tested the use of infographics to depict each district's percent of the total population and display results in an infographic format.

Conclusions: Data visualization offers a powerful means of showing the impact of cancer in a senatorial district. Senators and constituents can ask and answer a variety of cancer-related questions and easily comprehend the impact of all cancers and specific cancers on residents of the district. This may impact Senators' views of the importance of differences among constituents and contribute to health-related policy decisions. In the future, we hope to expand data visualization to include all legislative districts in the state.

049

NOTES:

BREAST CANCER PREVENTION AMONG AMERICAN INDIAN/ ALASKA NATIVE WOMEN IN MISSOURI:

M Taffa[1,3], T Sparks[2], S Echohawk Taluc[2], S Kloeckner
[1]Washington University in St. Louis, St. Louis, MO, United States; [2]Native Women's Care Circle, St. Louis, MO, United States; [3]Brown School of Social Work, St. Louis, MO, United States

The presentation will discuss collaborative programming efforts between the Kathryn M. Buder Center for American Indian Studies at Washington University in St. Louis (Buder Center), the Program for the Elimination of Cancer Disparities (PECaD), Siteman Cancer Center, Barnes Jewish Hospital, and American Indian community members.

Missouri has no designated reservations present within their borders; however, it does have a significant American Indian and Alaska Native (AI/AN) population. Among AI/AN women, breast cancer is the second leading cause of death. Furthermore, early detection is key to the probability of an individual's survival. It is thus essential that accessible mammography screenings be made available to AI/AN residents of Missouri.

In order to increase rates of breast cancer screening in the AI/AN population in Missouri, the Buder Center began collaborating in 2012 with various divisions to sponsor a mammography van at Washington University in St. Louis's annual Pow Wow. Screenings were free for those who qualified.

This transdisciplinary approach to wellness incorporates professionals in the medical field, public health, social work and American Indian community members to bridge the gap in breast cancer disparities in the region. To ensure culturally competent medical practices, the Buder Center provides training to medical volunteers on American Indian culture, health, and healing. The presentation will share the program's goals, development, implementation, and outcomes.

050

NPCR'S TNM STAGE CALCULATOR: A TOOL FOR CENTRAL REGISTRY QUALITY CONTROL AND CONSOLIDATION ASSISTANCE

J Seiffert[1], P Kim[1], J Rogers[2]
[1]Northrop Grumman, Atlanta, GA, United States; [2]Centers for Disease Control and Prevention, Atlanta, GA, United States

Background: From 2004-2015, cancer registries in North America used the Collaborative Stage (CS) system for standardized recording of cancer stage. CS included an algorithm to derive stage in the TNM system. In the United States in 2016, CS is being replaced by direct coding of TNM.

Purpose: To present CDC's NPCR-developed software for TNM coding assistance and calculation of clinical and pathologic stage groups from directly-entered T, N, and M. Registry Plus now includes: (1) authoritative site-specific pick lists for T, N, M, and directly coded clinical and pathologic stage groups; and (2) an algorithm that calculates clinical and pathologic stage groups from directly-entered TNM categories. The stage group calculation component is available to NPCR central registries as a stand-alone product.

Approach: Software development involved obtaining a licensing agreement with AJCC for use of copyrighted material; re-using some components of CS; creating business rules based on the TNM manual, training materials, and published questions and answers; and creating all of the required site-specific look-up tables.

Results: Methods used to develop the software will be presented, followed by brief demonstrations of the features. Aspects of the stage calculator will then be reviewed in more detail, including:

- Business rules included to accommodate general and site-specific AJCC staging rules

- Advantages and limitations of validating directly entered clinical and pathologic stage groups against TNM components

- Generation or validation of a stage group for consolidated data after TNM components from multiple source reports have been consolidated

- Distribution/availability to NPCR registries

Conclusions: NPCR's software provides timely tools that can facilitate the transition to the new stage data standards for NPCR central registries.

051

COMPARISON OF TNM ASSIGNED BY PHYSICIANS COMPARED WITH REGISTRY REVIEWER-ASSIGNED: RESULTS FROM A SEER FIELD STUDY

A Noone[1]
[1]National Cancer Institute, Bethesda, MD, United States

Background: As part of a training assessment conducted by the Surveillance, Epidemiology and End Results Program, the frequency of physician-assigned TNM in the medical record was examined.

Methods: TNM elements and stage group were collected on breast, prostate, colon, lung and ovarian cancer study cases from multiple sources within medical records. Physician-assigned TNM was recorded and redacted from the records. TNM elements were also directly assigned by a panel of cancer registry reviewers.

Estimates of how often the data elements assigned by the physician were documented in the medical records will be presented. Agreement between physician-assigned TNM and registrar-assigned TNM will be shown. Finally, an assessment of which document types from the medical record contain physician-assigned staging information will be presented.

Conclusions: Agreement between physician-assigned TNM elements and registrar-assigned elements was high. Frequency of these data elements in the medical record and on which types of documents will be discussed.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

052

A CENTRAL REGISTRY RELIABILITY STUDY TO GAUGE VISUAL EDITOR TNM AND SUMMARY STAGE CODING SKILLS

D Hansen[1]
[1]California Cancer Registry, Sacramento, CA, United States

The California Cancer Registry designed and conducted a statewide Reliability Study on assigning TNM and Summary Stage directed towards visual editors. National standard setters have provided evidence that TNM coding is problematic. A decision had been made to begin providing visual editors' feedback on randomly selected cases for TNM codes as well as SEER Summary Stage codes received during 2015. However, it was noted many visual editors had no prior experience or no recent experience in assigning TNM or Summary Stage. Therefore, it was felt that a reliability study should be developed and conducted to assist in boosting confidence levels amongst visual editors as well as provide an opportunity to determine potential areas where additional education and training may be warranted.

Study design was discussed in detail with the Programmer Analyst and programmatic modifications were made to the central registry software to enable this study to be conducted. Included in the software was the ability for the Study Coordinator to populate study cases with appropriate case text information, assign study cases to individual visual editors, receive completed cases, and generate reports for analysis.

The presentation will provide an overview of the reliability study process and include details on the software design. Results will be conveyed with an emphasis on areas of identified strengths and weaknesses. The presentation will also focus on the approach that California CCR took to distribute study results, determine impact of education and training on visual editors' skills in assigning TNM and Summary Stage, as well as include ideas for next steps.

NOTES:

053

EVALUATION OF DIRECTLY CODED AJCC STAGE DATA: ONE LARGE STATE'S EXPERIENCE

M Schymura[1], B Qiao[1], A Kahn[1], C Sherman[1]
[1]New York State Cancer Registry, Albany, NY, United States

Background and Purpose: The New York State Cancer Registry (NYSCR) has required the reporting of directly coded AJCC TNM stage, as available, for many years. The data have been used by various researchers but have never been systematically evaluated by the Registry. With the requirement for central registries to collect directly coded AJCC stage becoming effective in 2016, a comprehensive assessment is long overdue.

Methods: AJCC stage data for cancer cases diagnosed in 2013 will be analyzed for the four major cancer types: prostate, female breast, colorectal, and lung and bronchus. Analyses will be stratified by type of reporting source and class of case. Where possible, directly coded stage will be compared to CS-derived stage.

Results and Conclusions: Preliminary results indicate that 62.3% of abstracts submitted for 2013 cases contained directly coded AJCC clinical stage information. The percentage varied by reporting source and was 71.6%, 56.1% and 33.4% respectively for Commission on Cancer (CoC) approved hospitals, non-CoC hospitals, and physicians. Directly coded AJCC pathologic stage information was only available in 44.3% of all records and in 51.8% of records submitted by CoC hospitals. Detailed analyses will be presented. Since close to 20% of cases reported to the NYSCR come from non-hospital sources or represent non-analytic cases (approximately 50% of prostate cancer cases), collection of directly coded AJCC stage information will represent a significant challenge.

054

COMBINED T, N, AND M BASED ON DIRECTLY CODED CLINICAL AND PATHOLOGIC T, N, AND M: EVALUATION OF THE DERIVATION ALGORITHM AND OPPORTUNITIES FOR REGISTRAR EDUCATION AND COMPUTER EDITS

K Ward[3], J Ruhl[1], N Schussler[2], L Ries[1],
[1]National Cancer Institute, Bethesda, MD, United States; [2]Information Management Services, Rockville, MD, United States; [3]Georgia Cancer Registry, Atlanta, GA, United States

Background: As a new algorithm was being developed for 2016 to calculate stage groups for clinical TNM and pathologic TNM, it was also designed to derive a combined T, N, and M based on merging the clinical and pathologic information using appropriate rules.

Purpose: Since one goal of the new TNM algorithm and the existing CS algorithm is to derive a combined clinical/pathologic T, N, and M, we explored how well they compared to each other on a case-by-case basis and examined where they were different and why.

Methods: Several SEER registries provided de-identified facility-based data for 2014. These data had not been consolidated across facilities and they contained clinical and pathologic T, N, M, and CS fields. Analyses focused on the sites of: breast, colon, rectum, lung, and prostate. Agreement and disagreement percentages were calculated by comparing the new algorithm's derived combined T, N, and M to the comparable CS derived fields. Each case that did not agree for the T, N, or M was individually examined.

Results: The overall agreement was good. Most categories agreed more than 90%. For the combined T, the agreement ranged from 87.8% to 96.1%; for N, agreement ranged from 84.7% to 96.1%; and for M, agreement ranged from 89.9%to 99.7%. We examined the cases that did not agree to see whether the algorithm should be changed and made some very minor changes to it. Very few of the disagreements were issues with the algorithm. These analyses also gave us insights into opportunities for education and computer edits.

Conclusions: The computer algorithm seems to be working very well. Some tweaks may be needed later based on future data. Education for the registrar needs to specifically emphasize the importance of coding the explicit subcategory for the T, N, and M. Computer edits specific to consistency within the T, N, M data and smart site-specific pick lists should also help to lower disagreement rates in future comparisons.

NOTES:

055

RACIAL AND SOCIO-ECONOMIC DISPARITIES IN MELANOMA INCIDENCE RATES IN GEORGIA: 2000-2011

M Culp[1, 5], S Wagner Robb[2], A Bayakly[3], J Vena[4]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]Department of Epidemiology and Biostatistics, College of Public Health, University of Georgia, Athens, GA, United States; [3]Georgia Comprehensive Cancer Registry, Georgia Department of Public Health, Atlanta, GA, United States; [4]Department of Public Health Sciences, School of Medicine, Medical University of South Carolina, Charleston, SC, United States; [5]Oak Ridge Institute for Science and Education, Oak Ridge, TN, United States

Background: Skin cancer is the most frequently diagnosed cancer in the United States with melanoma accounting for 75% of all skin cancer deaths. Melanoma is a highly preventable form of cancer that, if caught at an early stage, can be treated with promising results. In Georgia (GA) from 2002-2006, the rate of new melanoma diagnoses was higher than the national rate. However, limited epidemiological research on melanoma in GA has been conducted, making descriptions of geographic and racial trends a priority.

Purpose: The objective of this research was to investigate melanoma incidence rates and health outcomes in Georgia over time and by race, socioeconomic status (SES), and gender.

Methods: Age-adjusted melanoma incidence rates were obtained from the Georgia Comprehensive Cancer Registry SEER*Stat Database (2000-2011). Maps were generated using Geographic Information Systems (GIS) to compare incidence rates across counties, public health districts, and by race, SES and gender. A cluster analysis was performed by use of SaTScan, and maps were created to visualize clusters of melanoma cases.

Results: In GA, from 2000-2011, age-adjusted incidence rates for melanoma were higher among Whites than Blacks (28.0 vs. 1.1 per 100,000 population). For both races, high rates were found to be associated with high SES. For Whites, high rates were concentrated in urban areas relative to Blacks in rural areas. Clusters of melanoma incident cases were found mainly in the north central region of Georgia.

Conclusions: In GA, the results of map comparisons are consistent with previous research findings that higher melanoma incidence rates are associated with high SES for Whites and, to a lesser extent, for Blacks. Melanoma interventions in Georgia could focus on urban White and rural Black at-risk populations, especially those with high SES.

056

CANCER-SPECIFIC MORTALITY AND RACIAL DISPARITIES AMONG CANCER PATIENTS WITH DIABETES MELLITUS

C Lam[1], K Cronin[1], R Ballard[1], A Mariotto[1]
[1]National Cancer Institute, Rockville, MD, United States

Background: The prevalence of diabetes is increasing in the United States, and racial health disparities among cancer patients with diabetes are growing.

Purpose: The main objective is to quantify population-based cancer-specific mortality risk estimates for cancer patients with and without diabetes.

Methods: SEER-Medicare data provided estimates on cancer-specific mortality and prevalence of diabetes among 15 separate cancer patient cohorts ages 66+ years diagnosed in 2000-2011 residing in 18 SEER areas. Diabetes was identified using previously developed Medicare claims algorithms. Cox proportional hazard models provided probabilities of dying of their cancer by diabetes status adjusted by age, race, stage, gender, and cancer treatment.

Results: Prevalence of diabetes was higher for Black females compared to white females across all 15 cancer sites and higher for most sites when compared to both white and Black males. Cancer-specific mortality risks were increased across all cancer sites for patients with prevalent diabetes with hazard ratios (HR) ranging from 1.02 to 1.38. Among white males, mortality from prostate cancer among diabetics showed the highest risks (HR=1.37, 95% CI=1.35-1.40) whereas among Black males, mortality risks were highest among NHL (HR=1.36, 95% CI=1.31-1.41). Cancer-specific mortality risks were increased among diabetic Black females with NHL (HR=1.39, 95% CI=1.21-1.60) and Hodgkin lymphoma (HR=1.82, 95% CI=0.94-3.51) whereas white females had highest risks for ER positive breast (HR=1.38, 95% CI=1.35-1.41) and corpus/uterus (HR=1.36, 95% CI=1.31-1.42).

Conclusions: Cancer-specific mortality risks significantly increase in the presence of diabetes. Racial disparities exist in both the prevalence of diabetes among cancer patients and the magnitude of mortality risk associated with diabetes. These findings can provide important information to facilitate prevention efforts to reduce the burden of diabetes among cancer populations.

057

SURVIVAL TRENDS BY SOCIOECONOMIC STATUS, 1998-2011: A SHIFT IN DISPARITIES FOR COLORECTAL CANCER SURVIVAL

D Holt[1], S Negoita[1], M Dunn[1]
[1]Westat, Rockville, MD, United States

Background/Purpose: Literature describing cancer disparities by socioeconomic status (SES) tends to analyze trends in incidence and mortality while only highlighting survival rates for all years combined. This study explores disparities in survival trends by SES in order to determine if disparities have persisted or shifted over time.

Methods: The study cohort contains cases diagnosed with colorectal cancers between 1998 and 2011 available in cancer registry data from the Surveillance, Epidemiology, and End Results (SEER) Program. Using linked Census Bureau data, SES is defined as the percentage of the population in a county below the poverty level. This is categorized into three levels: low (<10%), middle (10%-19.9%), and high (>19.9%). Age-adjusted 1-year cause-specific survival is calculated by poverty category at each year of diagnosis. Using JoinPoint software, annual percent change (APC) is computed for each poverty category to analyze survival trends.

Results: For all years combined, 86.5% of patients in the low-poverty category, 84.7% of patients in the middle-poverty category, and 82.2% of patients in the high-poverty category were alive at 1 year after diagnosis. JoinPoint found significant differences in APCs at years 2000 and 2008 in the low-poverty category and at years 2001 and 2008 in the middle-poverty category. For these poverty categories, survival after 2008 began to decline (-0.21 for low poverty; -0.54 for middle-poverty). JoinPoint detected no difference in APC for the high-poverty group, and survival continued to increase (0.24). Results stratified by sex and stage and pairwise comparison between poverty groups will also be presented.

Implications: Across the study period, those in high poverty consistently have lower survival; however, the shift in trend by poverty group after 2008 demonstrates a decrease in disparities by SES over time yet prompts a further exploration into colorectal cancer survival in more recent years.

058

EXAMINING INCOME DISPARITIES IN LUNG CANCER INCIDENCE, MORTALITY AND SURVIVAL IN CANADA

S Fung[1], J Chadder[1], C Allemani[2], M Coleman[2], V Di Carlo[2], D Spika[2], J Xu[1], R Rahal[1], H Bryant[1], ICWTSP Steering Committee and Technical Working Group[1]
[1]Canadian Partnership Against Cancer, Toronto, ON, Canada;
[2]London School of Hygiene and Tropical Medicine, London, United Kingdom

Background: Lung cancer incidence, mortality, and survival are influenced by an interplay of factors, many of which may be affected by income. Linking income to incidence, risk factors, treatment and stage distribution allows for the examination of the causes of inequality in lung cancer outcomes across Canada.

Methods: Age-standardized incidence rates were derived from the Canadian Cancer Registry and age-standardized mortality rates from the Vital Statistics Death Database. Five-year net survival was calculated for Canadian adults as part of the CONCORD-2 study, with data contributed by 10 provincial cancer registries. Provincial life tables specific for each income quintile and sex were used to control for background mortality. Stage distribution and treatment data were derived from provincial cancer registries. Smoking rates were self-reported through the Canadian Community Health Survey. Median neighborhood income quintiles were defined using patients' postal codes.

Results: Lung cancer incidence and mortality were highest in low-income Canadians compared to their higher income counterparts. Incidence ranged from 43.1 cases per 100,000 in the highest income quintile (Q5) to 69.9 in the lowest income quintile (Q1), while mortality ranged from 35.5 deaths per 100,000 in Q5 to 54.7 in Q1. Five-year net survival was lowest in low-income Canadians, ranging from 15.7% in Q1 to 19.5% in Q5. Smoking rates and stage distribution were also affected by income, while treatment utilization was not.

Conclusions: Lung cancer mortality varies greatly across income levels in Canada. Disparities in mortality may be influenced by incidence, which largely results from exposure to risk factors like smoking, as well as by survival, caused by differences in early detection and treatment practices. Highlighting income disparities deepens understanding of the effectiveness of Canada's cancer control system and identifies priority populations in which to target interventions.

059

CONTRIBUTIONS OF HIV TO NON-HODGKIN LYMPHOMA MORTALITY IN THE US (2005-2012)

EA Engels[1], N Howlader[1], MS Shiels[1], AB Mariotto[1]
[1]National Cancer Institute , Bethesda, MD, United States

Background: The HIV epidemic has strongly influenced non-Hodgkin lymphoma (NHL) incidence in the U.S. general population. However, the effects of HIV on NHL mortality are unknown.

Methods: Using data from eight SEER registries, we assessed NHL mortality rates (2005-2012) and mapped NHL deaths to prior incident cases in SEER registries. SEER data included HIV status at the time of NHL diagnosis based on medical record abstraction. We describe the proportion of NHL deaths linked to an HIV-infected case, for three AIDS-defining subtypes (diffuse large B-cell lymphoma [DLBCL], Burkitt lymphoma, and central nervous system [CNS] lymphoma) and within demographic categories for NHL overall. We also present incidence-based mortality (IBM) rates to capture the impact of HIV on mortality trends, and describe survival after NHL diagnosis by calendar year. Calendar trends were fitted with Joinpoint.

Results: Of 11,071 NHL deaths in SEER areas, 517 (4.6%) were in NHL cases infected with HIV. This proportion was higher in deaths mapped to cases of DLBCL (6.6% with HIV), Burkitt lymphoma (31.9%), and CNS lymphoma (17.6%), and for males (7.8%), people aged 20-49 years (26.1%), and Black individuals (21.0%). IBM rates declined more steeply during 2005-2012 for HIV-infected cases (-7.6%/year, p-value=0.006) than HIV-uninfected cases (-2.6%/year, p-value=0.01). This trend for HIV-infected NHL deaths reflects a steep decline in incident NHL among HIV-infected people after 1996 (when highly active antiretroviral therapy [HAART] was introduced). Five-year cancer-specific survival among HIV-infected NHL cases also improved over time, from 9% for cases diagnosed in 1990-1992 to 54% in 2007-2008.

Conclusions: The HIV epidemic has greatly impacted deaths from NHL, especially AIDS-defining NHL subtypes and for groups in which HIV prevalence is high. Declining NHL mortality rates for cases linked to HIV reflect both declining NHL incidence and improving survival after NHL diagnosis as a result of HAART.

060

HIV INFECTION IS ASSOCIATED WITH LOW 5-YEAR RELATIVE SURVIVAL FOR CANCER PATIENTS IN LOUISIANA

X Li[1], C Parsons[2], L Maniscalco[1], P Andrews[1], S Euraque[2], T Reske[2], S Subbiah[2], X Wu[1]
[1]Louisiana Tumor Registry, Epidemiology Program, LSUHSC, New Orleans, LA, United States; [2]HIV Cancer Care Program, LSUHSC, New Orleans, LA, United States

Background: The co-existence of cancer and HIV infection poses unique challenges to oncology and HIV care providers. These include management of co-morbid conditions, drug interactions and side effects, and linkage to care services. Although data indicate less favorable outcomes for several HIV-associated cancers, there are no data addressing this issue in Louisiana, which exhibits some of the highest co-incident rates for HIV infection and cancer in the United States. The objective of this study is to assess disparities in survival for cancer patients in Louisiana with and without HIV, segregated by gender, race, age, cancer type and stage, and geographic region.

Methods: Following linkage of the Louisiana Tumor and STD/HIV Registries, relative 5-year survival was tabulated for patients diagnosed with cancer between 1995 and 2012 in Louisiana. The SEER*STAT database was used for survival analyses. \

Results: Of 322,219 cancer patients, 2,074 were identified as HIV-infected (HIV-CA; 0.6%). Relative to HIV-negative (CA) patients, HIV-CA patients were more likely to be male (80.1% vs. 53.8%), Black (60.0% vs. 27.4%), between the ages of 30 and 59 (82.4% vs. 33.2%), and exhibit regional/distant metastases (55.3% vs. 46.7%). HIV-CA patients were more likely to be diagnosed at a more advanced stage of disease. In addition, 5-year relative survival was significantly reduced for HIV-CA relative to CA patients (37.2% vs. 58.5%), regardless of sex, race, age, stage, and cancer type. Black HIV-CA patients exhibited the lowest survival of any group (34%). Substantial differences in relative 5-year survival for HIV-CA and CA for Kaposi sarcoma (39.5% vs. 80.8%) and diffuse large B-cell lymphoma (22.9% vs. 53.8%) were also observed.

Conclusions: Male sex, Black race, and younger age associate with HIV-CA cases in Louisiana. These patients exhibit substantially reduced survival. Additional analyses should identify HIV- and cancer care-associated co-factors associated with reduced survival.

061

TRENDS IN PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA INCIDENCE AND SURVIVAL IN THE U.S.

M Shiels[1], R Pfeiffer[1], C Besson[2], C Clarke[3], L Morton[1], L Nogueira[4], K Pawlish[5], E Yanik[1], G Suneja[6], E Engels[1]

[1]National Cancer Institute, Rockville, MD, United States; [2]Bicetre University Hospital, Le Kremlin-Bicetre, France; [3]Cancer Prevention Institute of California, Fremont, CA, United States; [4]Texas Department of State Health Services, Austin, TX, United States; [5]New Jersey Department of Health, Trenton, NJ, United States; [6]University of Utah, Salt Lake City, UT, United States

Background: It is suspected that primary central nervous system lymphoma (PCNSL) rates are increasing among immunocompetent people. Monitoring CNS lymphoma incidence and survival in population-based data is challenging because of the need to separate immunocompetent and immunocompromised individuals.

Purpose: Using data from population-based cancer and solid organ transplant registries, we estimated PCNSL incidence and survival rates over time among immunocompetent persons, excluding cases in HIV-infected persons and transplant recipients.

Methods: PCNSL data were derived from 10 SEER cancer registries (1992-2011). HIV-infected cases had reported HIV infection or HIV as a cause of death. Transplant recipient cases were estimated from the U.S. Transplant Cancer Match Study. We estimated PCNSL trends overall and among immunocompetent individuals (without HIV or transplant), and survival by HIV status.

Results: During 1992-2011, 4,158 PCNSLs were diagnosed (36% HIV-infected; 0.9% transplant recipients). HIV prevalence in PCNSL cases declined from 64.1% (1992-96) to 12.7% (2007-11), while the fraction of cases among transplant recipients remained low. General population PCNSL rates during this period were strongly influenced by immunosuppressed cases, particularly in 20-39 year-old men. Among immunocompetent people, PCNSL rates in 65+ year-old men and women increased significantly (1.7% and 1.6%/year, respectively, p-values<0.05), but remained steady in other age groups. 5-year survival was poor, particularly among HIV-infected cases (9.0% [HIV-infected]; 26.2% [HIV-uninfected]). Among HIV-uninfected cases, 5-year survival increased from 19.1% (1992-94) to 30.1% (2004-06).

Conclusions: PCNSLs in HIV-infected people have profoundly impacted general population rates, particularly among young men. PCNSL rates have increased among immunocompetent elderly adults, but not in younger individuals. Survival remains poor for both HIV-infected and HIV-uninfected PCNSL patients.

NOTES:

062

ENHANCING CANCER REGISTRY RESEARCH RECRUITMENT THROUGH CLINICAL TRIAL APPLICATIONS: A COLLABORATION BETWEEN NJSCR AND CLINICAL PERFORMANCE PARTNERS, INC.

N Herman[1,2], B Harper[3], A Stroup[1,2,4], L Paddock[1,2,4]
[1]New Jersey State Cancer Registry, Trenton, NJ, United States; [2]Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, United States; [3]Clinical Performance Partners, Inc., Atlanta, GA, United States; [4]Rutgers School of Public Health, Piscataway, NJ, United States

Background: The New Jersey State Cancer Registry (NJSCR) conducts approximately 10-12 patient contact research studies annually. Consent rates using traditional recruitment methods average approximately 30-40%, although some studies have had higher rates (>70%). Clinical trial recruitment methods may be more varied, personalized, and effective in their approach.

Purpose: Develop methods to improve survey recruitment and retention (RR) of study participants using tactics applied in clinical trial recruitment.

Methods: NJSCR collaborated with Clinical Performance Partners, Inc. (CPP) to conduct a needs assessment and develop a training program, utilizing the theories behind clinical trial recruitment. Four webinars were created to provide instruction on fundamental recruitment theory and how it may be applied to cancer registry survey research. Topics included: Planning, Eligibility Criteria and Patient Profiles, Consent, and Retention. The webinar series served as a primer for an all day workshop that facilitated root-cause analysis of poor recruitment rates and focused brainstorming of strategies to improve recruitment.

Results: While the techniques used in clinical trial recruitment must be modified and adapted to registry research, numerous innovative ideas for RR techniques were identified and prioritized. The priority initiatives included enhancing knowledge of studies, sending postcard primers prior to study materials, and creating a "Research Recruitment & Retention Workgroup" to operationalize ideas. The initiatives are in various stages of deployment with a plan in place to evaluate the impact of these new approaches on enhancing participation in registry research.

Conclusion: As patient contact methods evolve, supplementing traditional approaches can improve patient recruitment. Challenging convention and exploring new ideas via a structured training and brainstorming approach has the opportunity to enhance enrollment and retention in registry-based research.

063

ACCURACY OF SELF-REPORTED CANCER DIAGNOSIS FROM THE MY-HEALTH STUDY COHORT COMPARED WITH PARTICIPATING SEER CANCER REGISTRIES

N Herman[1,2], L Paddock[1,2,3], A Stroup[1,2,3], R Jensen[4], T Lobo[4], G Harris[1,2]
[1]New Jersey State Cancer Registry, Trenton, NJ, United States; [2]Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, United States; [3]Rutgers School of Public Health, Piscataway, NJ, United States; [4]Georgetown Lombardi Comprehensive Cancer Center, Washington, DC, United States

Background: The MY-Health Study, a validation of PROMIS measures in cancer patients cohort, was recruited from four SEER registries in three states (NJ, CA, LA), and focused on NHL, cervical, uterine, lung, prostate, colorectal and female breast cancer in whites, Blacks, Asians, and Hispanics. Eligible participants were surveyed 6-9 months after diagnosis. Accuracy of race reporting has been previously addressed; little research has been done on accuracy of initial cancer diagnosis. This large, diverse population provides an excellent opportunity to examine the relationship between registry-reported (RR) diagnosis date and self-report (SR) diagnosis date. Discordance could affect eligibility criteria, inclusion in analysis, survival calculations, and time between diagnosis and survey completion.

Purpose: The purpose of this study is to compare the accuracy of RR and SR diagnosis date and primary site.

Methods: Accuracy of SR diagnosis dates was measured using cross-tabulations by cancer site and year. For those cases where SR matched RR, percent concordance was calculated for 12, 3 and 1 month; by site, gender, race, age and education. Further analysis will consider time between RR diagnosis date and consent to the baseline survey.

Results: There were 5,506 observations in the cohort; 223 were excluded due to missing data. Reports were > 90% accurate within 1 year for all sites; however, agreement decreased as the time interval decreased. Males, less educated, older, or non-Hispanic Blacks had less agreement between SR and RR. Site was in agreement for most breast cases (98%), and least for NHL and uterus (72.4% and 74.9% respectively).

Conclusions: Agreement between SR and RR diagnosis dates and site are high within a year, it decreases as the time frame shrinks to within 1 month. More research is needed to investigate discordance among uterine and NHL diagnoses. Quality comparisons may help guide future survey questions and/or study inclusion criteria.

4 Concurrent
THURSDAY, JUNE 16 - CONCURRENT SESSION 4
⊞ 11:30 - 12:30 AM

064

NEW JERSEY'S RESEARCH MANAGEMENT SOLUTION: OUR GATEWAY TO SUCCESSFUL POPULATION-BASED CANCER RESEARCH

C Harrell[1], L Paddock[2,3], A Shukla[2], K Pawlish[4], A Stroup[2,3]
[1]CJH Consulting, Brighton, UT, United States; [2]Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, United States; [3]Rutgers School of Public Health, Department of Epidemiology, Piscataway, NJ, United States; [4]Cancer Epidemiology Services, New Jersey Department of Health, Trenton, NJ, United States

Background: Cancer registries are vital to population-based epidemiological research. However, conducting research activities at a cancer registry presents substantial challenges for registry research and administrative staff. The New Jersey State Cancer Registry (NJSCR) must notify physicians and contact patients to obtain permission to share their information with researchers and are only allowed to contact patients for one study at a time. These challenges are further exacerbated without an efficient database management system to track physician notification, patient contact and required administrative data.

Purpose: NJSCR in collaboration with the Rutgers Cancer Institute of New Jersey and CJH Consulting, LLC, created a SQL database to capture, organize, share, and curate all registry research activities into a central, secure, flexible and customizable system.

Methods: Variables in the database are based on SEER and NAACCR definitions, and is interoperable with SEER*DMS, facilitating easy data sharing between systems. Data entry and staff workflows were streamlined reducing redundant and duplicate entry and improving data quality and consistency. Every contact attempt with a patient, physician, or facility is captured as well as the type of contact, date/time, and outcome of the contact. A patient's status at each phase of a study is documented allowing immediate real-time reporting of study participation rates and activities.

Conclusion: Consolidating all research activities into a centralized database allows immediate insights into all registry research activities across all protocols. New processes also decrease data entry errors and reduce time and effort for staff to track study progress. Furthermore, the data captured will provide empirical data to calculate level of effort for staff and study budgets, and inform best recruitment practices.

NOTES:

065

FINDING "IMMORTALS": CAN STATISTICAL MODELS HELP?

D Nishri[1], C Johnson[2], D Hurley[3], B Qaio[4]
[1]Cancer Care Ontario, Toronto, ON, Canada; [2]Cancer Data Registry of Idaho, Boise, ID, United States; [3]South Carolina Central Cancer Registry, Columbia, SC, United States; [4]New York State Cancer Registry, Albany, NY, United States

Even with the most thorough follow-up, sometimes it is not possible to determine a patient's current vital status. These people are often called 'immortals,' because they will live forever in your cancer registry. For highly fatal cancers, the assumption that such lost patients are alive can result in biased survival estimates. In 2013, the Survival Analysis Working Group (SAWG) undertook a project to develop statistical methods for identifying 'immortal' patients in central cancer registry databases. Using 1995-2009 SEER cancer incidence data and accelerated failure time (AFT) models, survival probabilities were predicted for major primary cancer site categories by age at diagnosis, race, sex, Hispanic ethnicity, and SEER Summary Stage at diagnosis. The parameter estimates from these models were then used to predict the survival probabilities of cancer patients in Idaho and South Carolina. For both states, <1% of patients were flagged as potential immortals ("Alive" with survival probabilities <0.001); liver and pancreas were the cancers with the most potential immortals.

Several recent survival studies have shown that Ontario has unusually high pancreatic cancer survival. Loss to follow-up is suspected to be a major reason for these findings. To see if the SEER AFT models could provide further insights, the parameter estimates were applied to Ontario cases diagnosed 1995-2010. Preliminary results show that the total percentage of potential immortal patients is similar to Idaho and South Carolina, but Ontario has a higher percentage of 'immortal' pancreatic cancer cases.

The talk will include additional results, analyses of the characteristics of the 'immortals,' and a discussion of the challenges of adapting Ontario's data for use with the models.

066

FINDING "ZOMBIES" IN YOUR REGISTRY DATABASE BY CONFIRMING SOURCE RECORD VITAL STATUS

D O'Brien[1]
[1]Alaska Cancer Registry, Anchorage, AK, United States

Registries use a number of external sources to determine the vital status of their cancer cases for accurate survival statistics. These include their state mortality database (SMD), Social Security Death Index (SSDI), and National Death Index (NDI). But even after these linkages, there are some cases that were reported to the registry as being deceased but whose vital status were not verified. I refer to these types of cases as "zombies" – deceased cases that may actually be alive. The vital status of these co-called zombie cases is not necessarily incorrect.

There are several reasons why source record vital status can correctly indicate deceased persons who are not found in SMD, SSDI, or NDI:

- People who have died out of country.

- People whose deaths were never reported to the state because no death certificate was ever completed.

- People whose death certificates in other states were submitted late to their state Bureau of Vital Statistics. NDI does not update their database of past year deaths once a death year is closed, so those records are never added to the NDI.

The Alaska Cancer Registry (ACR) did a study to identify its zombie cases and verify their source record vital status. After the annual SMD death clearance linkage, ACR identified 85 such cases, representing about 0.2% of its total number of reportable cases. An unusually high percentage of the 85 cases, 51.8%, were reported to ACR by other central cancer registries with the source record vital status as deceased. After SSDI and NDI linkages, 65 cases (76.5%) were verified as being deceased. ACR used the Alaska Permanent Fund Applicant Database and the Alaska State Troopers Database to verify vital status of the remaining 20 cases. ACR verified that 14 (16.5%) of these cases were still alive and changed their vital status in the database. Of the remaining cases, 3 were out-of-country deaths, 1 was an out-of-state source record, and 2 had in-state deaths confirmed in hospital chart notes.

4 Concurrent

067

UTILIZING STATE DATABASES TO IMPROVE FOLLOW-UP: THE LOUISIANA VACCINATION EXPERIENCE

C Lefante[1,2], M Hsieh[1,2], X Wu[1,2]
[1]Louisiana Tumor Registry, New Orleans, LA, United States; [2]Louisiana State University Health Sciences Center; School of Public Health, New Orleans, LA, United States

Background: The Louisiana Tumor Registry (LTR) consistently looks for ways to improve follow-up data on registry participants. The hardest group to follow are those diagnosed under the age of 20. Sporadic SSN reporting, education related mobility, and out-of-state treatment all contribute to tracking difficulties. By June of 2015, LTR had exhausted the normal follow-up routes including review of voter and US Selective Service registration records and contact with diagnosing and/or treating facilities. To track 90% of these patients, LTR sought help from the state's immunization tracking database.

Purpose: To improve follow-up rate of those under the age of 20 by gaining access to the Louisiana Immunization Network for Kids Statewide (LINKS) database.

Methods: The Louisiana Department of Health and Hospitals established a vaccine tracking database for the State of Louisiana. All vaccines administered to individuals under the age of 18 in Louisiana must be logged with the location, date of administration, and vaccine serial number. This information can be utilized by providers throughout Louisiana for the care and management of vaccine preventable disease. View only access to LINKS allowed LTR to see which children received a vaccination in Louisiana and use that date as the alive date of last contact for that individual.

Results: Through LINKS access, LTR was able to improve follow-up for those under age 20. In 2015, follow-up on cases diagnosed from 2000 to 2012 and followed into 2013 improved from 84.7% in June to 90.6% in July. In addition, we were able to locate 42% of the in-state cases diagnosed and treated out-of-state with a delinquent follow-up of 2011 and earlier.

Conclusions: The need for accurate follow-up will undoubtedly grow as registries adapt to the changing cancer care road map. By partnering with existing healthcare databases, the registry community can work towards capturing a more complete picture of cancer care and survivorship.

NOTES:

Concurrent

4

068

NAACCR V.16 EDITS METAFILE UPDATE
J Hofferkamp[1]
[1]North American Association of Central Cancer Registries, Springfield, IL, United States

069

AJCC CANCER STAGING MANUAL, 8TH EDITION UPDATE
D Gress[1]
[1]American Joint Committee on Cancer, Chicago, IL, United States

The AJCC will provide information regarding the release of the AJCC 8th Edition and the various media formats that will entail. Information will also be provided as to the various partnerships with the 8th Edition such as the CAP protocols, NCCN guidelines, and other endeavors. Plans for AJCC education and training of the Chapter 1 staging rules and disease site topics will be identified. Highlights of the 8th Edition content will be examined such as the expansion of the chapter 1 rules, new disease sites, changes to current disease sites, and the new factors for data collection in the 8th Edition.

070

TIMING IS THE KEY TO AJCC TNM STAGING
D Gress[1]
[1]American Joint Committee on Cancer, Chicago, IL, United States

The timeframe is critical to understanding the AJCC staging classifications. The staging timeframe in relationship to the patient care continuum will be demonstrated to clarify registrars' understanding. This, in conjunction with the criteria for each of the classifications, will provide insight. The differences in the M category rules will be compared to the T and N category rules along with the rationale. Further attention will be given to the differences between the AJCC TX and NX, and leaving T, N, or M categories blank. It will be shown this is not a choice, but rather following the definitions of AJCC.

NOTES:

071

TRENDS IN THE INCIDENCE OF THYROID CANCER, ISRAEL, 1990-2012

B Silverman[1,3], L Keinan-Boker[1,2], R Dichtiar[1], Y Fishler[1]
[1]Israel National Cancer Registry, Israel Center for Disease Control, Israel Ministry of Health, Tel HaShomer, Israel; [2]School of Public Health, Faculty of Social Welfare and Health Sciences, University of Haifa, Haifa, Israel; [3]School of Public Health, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Background: The incidence of thyroid cancer has increased steadily worldwide during the last few decades. Registry data can help clarify the reasons for this trend.

Methods: We searched the Israel National Cancer Registry (INCR) for all cases of thyroid cancer (ICD-O-3 73.9) and the Israel Central Bureau of Statistics (CBS) database for thyroid cancer deaths (ICD-9 193/ICD-10 C73) from 1990-2012. We calculated age-standardized rates (ASR) overall and for selected morphologic categories, stratifying by ethnicity (Jewish/Arab) and gender. Joinpoint analysis was used to identify significant changes and calculate annual percent change in incidence (APC) for the study period. Relative survival was computed as the ratio of 5-year survival in thyroid cancer patients to expected survival in the general population, matched for ethnicity, gender, age, and time period.

Results: ASR for thyroid cancer rose in all population groups, particularly among women (from 7.3/100,000 in 1980 to 18.1/100,000 in Jewish women and from 2.5/100,000 in 1980 to 11.5/100,000 in 2012 in Arab women). Joinpoint analysis demonstrated significant increases for Jewish men and women and Arab women (APC, 3.98, 4.21, 6.93, respectively). Eighty percent of cases were due to papillary carcinoma, accounting for most of the increase in incidence. Thyroid cancer accounted for 0.5% of cancer deaths in 2012. Relative survival for thyroid cancer patients increased during the study period.

Conclusions: Israel has one of the world's highest rates of thyroid cancer; trends in diagnosis mirror those of other industrialized countries. The predominance of papillary cancers suggests over-diagnosis of low-risk tumors identified serendipitously. However, Israel's thyroid cancer rates may also be connected to increased use of fertility treatments and history of radiation exposure. The trends should be closely monitored, and the associated factors investigated further.

072

LEADING CAUSES OF CANCER-SPECIFIC MORTALITY IN THE CARIBBEAN REGION

H Razzaghi[1], S Quesnel-Crooks[4], R Joseph[1], M Saraiya[1], R Sherman[2], B Kohler[2], B Edwards[3], M Ivey[4], G Andall-Brereton[4]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]North American Association of Central Cancer Registries, Illinois, United States; [3]National Cancer Institute, Virginia, United States; [4]CARPHA, Port of Spain, Trinidad and Tobago

Objective: This study examined cancer-related mortality rates among the 21 Caribbean countries that submitted mortality data to the Caribbean Public Health Agency.

Design and Methods: We calculated proportions and age-standardized mortality rates (ASMR) by cancer site and sex for each country using the most recent 5 years of mortality data available from 2003 to 2013. Calculations were completed using SEER*Stat software and the World (Segi 1960) Standard Million population.

Results: ASMR for all cancers combined ranged from 46.1 to 139.3 per 100,000. Among males, prostate cancer was the most common cause of cancer deaths in all countries, accounting for 18.4–47.4% of cancer deaths, and an ASMR of 15.1 to 74.1 per 100,000; lung cancer (4.6-34.0 per 100,000) was the second or third leading cause of cancer deaths among males in most countries. Among females, breast cancer was the most common cause of cancer deaths in 16 of 18 countries (with >6 reported cases), accounting for 16.1–30% of cancer deaths and an ASMR of 10.0 to 27.3 per 100,000. The ASMR of cervical cancer was higher than the world average (6.8 per 100,000) in 11 countries, and accounted for 4.5–18.2% of cancer deaths.

Conclusion: There is great variability in cancer-specific mortality rates within the Caribbean region; however, prostate and breast cancers are consistently the leading causes of cancer-related deaths among males and females, respectively. Lung and cervical cancers—cancers for which World Health Organization "best buy" interventions exist—are also important causes of mortality in many countries.

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

073

SUBSITE OF THE COLON CANCER AND SURVIVAL IN 2000-2013: A POPULATION-BASED ANALYSIS FROM THE ARKHANGELSK OBLAST, NORTHWESTERN RUSSIA

M Valkov[1,2], L Lebedeva[1,2], A Krasilnikov[1, 2]
[1]Northern State Medical University, Arkhangelsk, Russian Federation;
[2]Clinical Oncology Center, Arkhangelsk, Russian Federation

Background: The incidence of colon cancer (CC) has been increasing worldwide and in Russia, including Arkhangelsk oblast (AO). Whilst a clinical presentation of right (r) and left (l) sided CC is different, there is lack of studies addressing the difference of survival between these locations.

Objectives: To compare the difference of cancer specific survival (CSS) between the right- and left-located CC in the AO, Northwestern Russia over the period 2000-2013.

Methods: All new cases of CC in the AO in 2000-2013 and their characteristics were extracted from Arkhangelsk Regional Cancer Register (ARCR). The CSS was estimated using Kaplan-Meier and actuarial methods. The effect of subsite (r-CC, C18.0 - 18.4, l-CC, C18.5 - 18.7) adjusted for stage at diagnosis, age, gender, place of residence, and treatment type was performed using stepwise Cox regression. Tumors covering more than one subsite or of unknown topography were excluded from analysis.

Results: Altogether, 1,759 and 2,424 cases of r-CC and l-CC were registered over the study period. One-year, 5-year and median CSS were 53% (95% confidence interval (CI) 51-55%), 33 (95% CI 30-35%), and 17 (95% CI 15-21) months in r-CC, and 58% (95% CI 56-60%), 34 (95% CI 32-36%), and 24 (95% CI 21-28) months in the l-CC. In univariate analysis, hazard ratio (HR) was 0.93 (95% CI 0.86-1.01), borderline favoring left-located tumors. Correction for stage and type of treatment in multivariate analysis has led to absence of difference between the two locations, HR 1.02 (95%CI 0.95-1.11). Other factors did not change the coefficient.

Conclusions: The registry-based analysis shows that survival from CC in Russia in the absence of population screening remains low. The trend towards worst survival among patients with r-CC is mostly due to more likelihood of advanced stage at diagnosis and less radical surgery.

074

WORLD-WIDE VARIATION IN BREAST CANCER SURVIVAL BY AGE, STAGE, AND MORPHOLOGY

C Allemani[1], V Di Carlo[1], H Carreira[1], A Bonaventure[1], T Tucker[2], M Coleman[1]
[1]London School of Hygiene and Tropical Medicine, London, England;
[2]University of Kentucky, Lexington, KY, United States

Background: The CONCORD-2 study reported age-standardized 5-year breast cancer survival among 5.5 million women diagnosed during 1995-2009 in one of 62 countries around the world. For women diagnosed during 2005-2009, 5-year survival was 80% or above in 34 countries, but below 70% in Malaysia (68%) and India (60%) and very low in Mongolia (57%) and South Africa (53%).

Purpose: To examine trends in 1- and 5-year survival by age, morphology, and stage at diagnosis.

Data and Methods: We are exploring the extent to which patient and tumor characteristics may help explain these huge disparities in survival. Age at diagnosis will be grouped into 4 categories 15-39, 40-49, 50-69, 70-99 years. Stage will be categorized first in broad categories (localized vs. advanced). Where the data allow, more detailed groupings with SEER Summary Stage 2000 and TNM will be considered. We will also explore the morphology distribution.

Results: Preliminary analyses of survival by age reveal the typical inverted u-shape in almost all countries, at both 1 and 5 years after diagnosis. Trends in 1-year survival are rather stable, and above 90% in most countries for all age groups. 5-year survival has also increased in most countries for all age groups, but it remains generally lower for elderly women. In the United States, women aged 70-99 years tend to have a high survival, while women aged 15-39 years showed the lowest survival over time. Analyses including information on stage and morphology are expected to offer further insight into the wide international disparities in survival.

Implications: These results may help policy makers to assess the effectiveness of their cancer plans and to target health policies more effectively to specific groups of women.

075

DISPARITIES IN CANCER INCIDENCE AND SURVIVAL BETWEEN INDIGENOUS AND NON-INDIGENOUS ADULTS IN CANADA: FOLLOW-UP OF THE 1991 CANADIAN CENSUS COHORT

D Nishri[1], M Prummel[1], L Marrett[1, 2], D Withrow[1, 2], M Tjepkema[3]
[1]Cancer Care Ontario, Toronto, ON, Canada; [2]University of Toronto, Toronto, ON, Canada; [3]Statistics Canada, Ottawa, ON, Canada

Background: Canada has three constitutionally recognized Aboriginal groups: First Nations (FN), Inuit, and Métis, comprising 4.3% of the population. Ethnicity is not routinely collected in Canadian cancer registries so periodic studies using different methodologies are needed.

Purpose: Examine cancer incidence and survival in Canada's two largest indigenous groups, FN and Métis.

Methods: Respondents aged 25+ to the 1991 Long Form Census were matched with national cancer registry and mortality databases, and were classified as: FN (approx. 62,000 persons, 5,000 cancers), Métis (approx. 11,000 persons, 1,000 cancers) or non-Aboriginal (approx. 2,653,000 persons, 336,000 cancers) and were followed from 1992-2009. Incidence rates were estimated for common cancers, age-standardized to the World Standard population. Using Poisson regression, relative risk in FN or Métis was assessed compared to non-Aboriginal adults, adjusting for age, income and rurality. Age-standardized 5-year relative survival was estimated and flexible parametric models were used to estimate the excess mortality rate ratio for FN and Métis compared to non-Aboriginal adults.

Results: Compared to non-Aboriginal adults, FN had significantly lower incidence of prostate, male lung, and female breast cancers, yet significantly higher incidence of colorectal, kidney, and cervical cancers. Métis had significantly higher incidence than non-Aboriginal adults of female breast, lung, and cervical cancers, and significantly lower incidence of female colorectal cancer. FN adults with colorectal, lung, female breast, and prostate cancers all had significantly poorer 5-year survival compared to their non-Indigenous peers. Prostate cancer survival was significantly poorer for Métis men compared to non-Aboriginal men.

Conclusions: Novel methods for ongoing monitoring of cancer burden in these populations are necessary to identify appropriate priority areas for intervention, and to support cancer control planning and advocacy.

076

CANCER INCIDENCE AND MORTALITY PATTERNS AMONG CHINESE AMERICANS

L Liu[1], D Deapen[1], A Wu[1]
[1]Los Angeles Cancer Surveillance Program, University of Southern California, Los Angeles, CA, United States; [2]Department of Preventive Medicine, Keck School of Medicine, University of Southern California, Los Angeles, CA, United States

Objective: To examine cancer incidence and mortality trends among Chinese Americans.

Methods: Using data published by SEER and Cancer in Five Continents series, we analyzed the cancer incidence and mortality rate ratios between Chinese Americans and non-Hispanic (NH) whites. Trends in incidence rates were compared among Chinese in the United States, U.S. whites, and Chinese in China.

Results: Chinese Americans demonstrate cancer risk patterns that differ from those of whites or NH whites. Although Chinese Americans have lower incidence and mortality rates than the NH whites for most of the cancers, their risk for developing cancers of nasopharynx, liver, and stomach is exceedingly higher than that of NH whites, regardless of gender. Except lung cancer, for which Chinese Americans have lower risk than U.S. whites and Chinese in China, Chinese Americans display intermediate risk level between the US whites and Chinese in China. This is true in both men and women.

Conclusions: Focused research on specific racial/ethnic populations with migration history is likely to offer new understanding and opportunities in the fight against cancer.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

077

RACIAL DISPARITIES IN CANCER INCIDENCE, STAGING, AND SURVIVAL AMONG THE OLDEST OLD IN THE UNITED STATES

J Krok-Schoen[1], J Fisher[1], R Baltic[1], E Paskett[1]

[1]Comprehensive Cancer Center, The Ohio State University, Columbus, OH, United States

Background: The oldest old, defined as people aged ≥85 years, is the fastest growing segment of the U.S. population. Increased life expectancy and advances in cancer screening have resulted in an increasing number of cancer diagnoses in the oldest old. Few studies have reported cancer incidence rates among the oldest old in the United States; however, none have examined racial disparities in cancer incidence, staging at diagnosis, and survival in this population.

Purpose of the Study: To examine potential racial disparities in the cancer incidence, staging, and survival rates among the oldest old using data from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute.

Methods: Cases were reported to 1 of 18 SEER registries. Differences in cancer incidence and stage at diagnosis were examined for cases diagnosed 2008-2012 and changes in these differences over time were examined for cases diagnosed 1973-2012 those aged ≥85 years by race. Five-year relative cancer survival probability was examined by race for those aged ≥85 years diagnosed 2005-2011.

Results: Among those aged ≥85 years, the highest age-adjusted cancer incidence rates, per 100,000 individuals, were for colorectal (364.9), lung (321.5), breast (256.1), and prostate (181.7) cancers. Black males in this age group had higher colorectal (451.2 vs. 415.2), lung (547.0 vs. 474.7), and prostate (903.3 vs. 568.5) cancer incidence rates than White males, respectively. From 1973-2012, lung and female breast cancer incidence increased while colorectal and prostate cancer incidence decreased among those aged ≥85 years. Regarding stage of cancer at diagnosis, racial minorities aged ≥85 had higher rates of unstaged cancer compared to Whites. Five-year survival probability for all invasive cancers, for all stages combined, was higher for Whites than Blacks in this age group. Notably, Whites had more than three times the survival probability of lung cancer diagnosed at localized (35.1% vs. 11.6%) and regional (12.2% vs. 3.2%) stages than Blacks, respectively.

Conclusion: Racial disparities in cancer incidence, staging, and survival probability exist within the oldest old with cancer. Continued efforts are needed to reduce racial disparities in cancer prevention and treatment among this population.

078

THE ALASKA NATIVE TUMOR REGISTRY: 45 YEARS OF CANCER SURVEILLANCE AMONG ALASKA NATIVE PEOPLE

SH Nash[1], JJ Kelly[1], AP Lanier[1]

[1]Alaska Native Tribal Health Consortium, Anchorage, AK, United States

Cancer is the leading cause of mortality among Alaska Native (AN) people, accounting for over 20% of all deaths. The Alaska Native Tribal Health Consortium's Alaska Native Tumor Registry has collected information on cancer incidence, treatment, and mortality among Alaska Native people since 1969.

The aim of this analysis was to present the most important contributors to the burden of cancer among AN people, examine trends over time, and highlight cancer disparities. Over this 45 year period of surveillance, cancer incidence rates increased for both AN men and women, although trends varied by cancer site. During the most recent 5-year period (2009-13), the most frequently diagnosed cancers among AN people were female breast (incidence rate [IR] per 100,000 [95% CI]: 139.3 [124.1-156.3]), colorectal (IR [95% CI]: 90.9 [81.3-101.7]), lung (IR [95% CI]: 87.5 [77.6-98.5]), and prostate (IR [95% CI]: 59.7 [47.9-74.2]) cancers. Furthermore, disparities in both cancer incidence and mortality were evident between AN people and U.S. whites (USW).

Specifically, 5-year incidence rates (2009-2013) of nasopharyngeal (Rate Ratio [RR]: 17.3), stomach (RR: 3.2), colorectal (RR: 2.21), and kidney (RR 1.47) cancers were significantly higher in AN, relative to USW. Cancer mortality was highest from lung (mortality rate [MR] per 100,000 [95% CI]: 74.5 [65.1-85.2]) and colorectal cancers (MR [95% CI]: 35.4 [29.0-43.1]), with a rate ratio (relative to U.S. whites) of 1.5 and 2.3, respectively.

Data from the Alaska Native Tumor Registry provide information regarding cancer trends and disparities in Alaska, and can inform regarding cancer prevention programs and provision of health services for Alaska Native people.

079

EVALUATION OF COMMERCIAL DATA SOURCES FOR OBTAINING INDIVIDUAL RESIDENTIAL HISTORIES FOR CANCER RESEARCH

D Stinchcomb[1], Z Tatalovich[2], M Yu[2]
[1]Westat, Inc., Rockville, MD, United States; [2]National Cancer Institute, Rockville, MD, United States

Cancer research studies often need data on where people have lived throughout their life course to assess prior exposures, both socioeconomic and chemical. However, cancer registries typically only have the address at the time of disease diagnosis and possibly the current address. Because of the difficulty and expense of obtaining residential history data directly from study subjects, many studies assume that each subject has lived at a single address for the entire relevant time period. Since the U.S. population is highly mobile, this assumption often leads to misclassification and loss of statistical power.

Recently, health researchers have become interested in the availability of commercial data sources that contain information about people's prior addresses. Prior studies have shown that these commercial vendors are viable sources for information about previous addresses associated with individuals.

For this study, researchers at the National Cancer Institute (NCI) sought to identify possible commercial sources of data on people's prior residences and to test the feasibility of using such data to construct individual residential histories that could be linked to cancer surveillance data. We identified three commercial vendors that could provide previous address data. To assess the accuracy of the commercially provided data, a set of self-reported residential histories was collected from volunteer participants at the NCI and the National Institute of Environmental Health Sciences. We developed an algorithm for constructing residential histories from the vendor data and methods to compare the accuracy of these derived residential histories with the self-reported residential histories.

080

EASY INTERACTIVE MAPPING OF CANCER DATA REVISITED

JEA Bartholomew[1]
[1]Geowise Limited, Edinburgh, Scotland

Background: Cancer registries and agencies/institutions often struggle with how to present their data in a way that will be meaningful and engage their audience. With commercial or open source software products, it is easy to share cancer data on the web. Getting started is easy; the process need not be difficult or highly technical. Interactive mapping visualization projects are scalable, from simple web pages and dashboards on limited budgets to more extensive data portals sitting on top of a more elaborate data warehouse.

Purpose: To demonstrate how cancer data can be shared interactively on the web.

Methods: This presentation will look at different live examples of agencies and institutions that are using innovative ways to display and geographically map their cancer mortality, incidence, prevalence, and survival statistics.

Results: Examples of interactive reports from different parts of the world will be provided in a live demonstration. We will take a closer look at three specific and very different and engaging solutions:

1) The National Cancer Intelligence Network, UK
2) Schleswig-Holstein Cancer Registry
3) Missouri Cancer Registry and Research Center

Conclusions/Implications: In all fields of public health in North America and beyond, best practices for communicating health data online have been evolving rapidly. There is more emphasis on using headline messages in combination with engaging visualization tools and clever use of infographics. A new report-building tool with a focus on colorful location profiles rich with infographic elements can also be useful to cancer registries and agencies/institutions with a need to present data to a broad audience (e.g., public health professionals, researchers, cancer patients, legislators and the general public).

081

RESPONDING TO COMMUNITY CONCERNS REGARDING CANCER INCIDENCE - THE ROLE OF THE ISRAEL NATIONAL CANCER REGISTRY

B Silverman[1,2], L Keinan-Boker[1,3]

[1]Israel National Cancer Registry, Israel Center for Disease Control, Israel Ministry of Health, Tel HaShomer, Israel; [2]School of Public Health, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel; [3]School of Public Health, Faculty of Social Welfare and Health Sciences, Haifa, Israel

The Israel National Cancer Registry (INCR) receives frequent requests for information from members of the public. Most requests reflect a suspicion of elevated cancer incidence among residents of a single building, street or neighborhood. Although the vast majority of investigations do not indicate a true cancer cluster, the INCR views these requests as an opportunity to educate the public regarding cancer epidemiology and risk factors.

For cases diagnosed between 1998 and 2012, street address at time of first cancer diagnosis is linked to the Israel Bureau of Statistics geographic-statistical area. We determine the geographic-statistical area(s) included in the region of interest, identify cases among area residents, and characterize cases with respect to age, gender, and cancer type. The study period for analysis is usually 2000-2012.

Responses to data requests are provided in writing, and consist of the following: (1) a description of the INCR database; (2) cancer trends and risk factors; (3) potential pitfalls of regional analysis of cancer incidence, given that latency periods are considered; and (4) a table listing the number of observed cases, the most commonly observed types of cancer, the proportion of cases observed in children under the age of 14 and in adults over the age of 55. When aggregate population data for geographic-statistical areas, stratified by gender, ethnic (Jewish or Arab) and age group are available, we calculate standardized incidence ratios (SIR) for the area of interest based on national cancer incidence rates.

In most cases, analysis of cancer incidence by geographic-statistical area indicates a pattern of morbidity paralleling that of the State of Israel as a whole. When preliminary evaluation suggests higher-than-expected incidence, unusual distribution of cancer types or age at diagnosis, further investigation is conducted according to Ministry of Health guidelines.

082

ESTIMATING NEIGHBOURHOOD-LEVEL BEHAVIOURAL RISK FACTOR PREVALENCE FROM LARGE POPULATION-BASED SURVEYS: A BAYESIAN APPROACH

L Seliske[1], T Norwood[1,2], J McLaughlin[2,3], S Wang[2], C Palleschi[4], E Holowaty[2]

[1]Cancer Care Ontario, Toronto, ON, Canada; [2]Dalla Lana School of Public Health, Toronto, ON, Canada; [3]Public Health Ontario, Toronto, ON, Canada; [4]Lambton Public Health, Sarnia, ON, Canada

Background: Complex survey-based behavioral risk factor estimates are available at the regional level, but public health insights are limited due to unobserved heterogeneity that may exist in these regions. Advanced spatial analysis techniques can produce sensible small-area estimates of risk factors and identify areas of high prevalence.

Methods: A spatial Bayesian hierarchical model estimated small-area prevalence of current smoking and excess bodyweight (body mass index ≥ 25 kg/m^2) by pooling five cycles of the Canadian Community Health Survey for a region in southwestern Ontario. Estimates were obtained for 2006 Census Dissemination Areas ("neighborhoods", avg pop: 400-700) and mapped by sex with 95% credible interval overlays. Model 1 controlled for survey cycle, and Model 2 controlled for survey cycle, age group, and neighborhood-level income. Post-stratification derived neighborhood-level estimates based on population structure due to the complex survey design and absence of neighborhood-level survey weights. For validation, modeled estimates were aggregated to health regions and compared to weighted survey-based regional estimates.

Results: Current smoking was elevated in urban areas for both sexes, and an additional small community for males. Excess body weight was prevalent in an urban core for males, but not females. Precision of the post-stratified current smoking estimates was improved in Model 2, with narrower credible intervals. For excess body weight, precision was similar in Models 1 and 2. Post-stratified estimates aggregated to health regions were similar to the regional survey-based estimates.

Conclusions: This study is among the first to demonstrate the feasibility of a full Bayesian model for complex survey data to identify areas with elevated risk factor prevalence. These spatial analysis techniques provide small-area estimates to inform surveillance activities and may be used to explain cancer incidence at a granular level of geography.

083

DIFFERENCES BETWEEN HISPANIC AND NON-HISPANIC WHITE BREAST CANCER PATIENTS: MOLECULAR SUBTYPES AND SURVIVAL

R Cress[1], M Martinez[2], D Rodriguez[1], C Li[3]
[1]Public Health Institute, Cancer Registry of Greater California, Sacramento, CA, United States; [2]University of California, San Diego, San Diego, CA, United States; [3]Fred Hutchinson Cancer Research Center, Seattle, WA, United States

Background: Hispanic women have been reported to be at higher risk than non-Hispanic white (NHW) women of being diagnosed with molecular subtypes of breast cancer that contribute to poorer prognosis.

Purpose: The objective of this study was to compare Hispanic and NHW women by tumor subtype using data from the California Cancer Registry, and to assess survival after diagnosis within each subtype, adjusting for demographic and clinical factors.

Methods: Hispanic and NHW women diagnosed in California with invasive, first primary breast cancer between 2004 and 2012 were included. Molecular subtypes were classified into four categories: hormone receptor positive and HER2 negative (HR+/HER-), HR+/HER2+, HR-/HER2+, and triple negative (HR-/HER2-). Logistic regression was used to estimate differences in distribution of subtype between Hispanic and NHW women. Cox proportional hazard models were used to estimate differences in survival for Hispanics and NHWs by subtype adjusting for clinical and demographic characteristics.

Results: The majority of women in both groups were diagnosed with HR+/HER2- tumors, but Hispanic women were more likely than NHW women to be diagnosed with the three less frequent tumor subtypes, and this difference persisted when the results were stratified by age and stage. Hispanic women of each subtype had poorer survival than NHW women, but survival differences were no longer statistically significant after adjustment for clinical and demographic factors.

Conclusions: Hispanic women were more likely than NHWs to be diagnosed with HER2 positive and triple negative breast cancer subtypes. Hispanic women of each subtype had poorer survival than NHW women, but not after adjustment for other factors. Reasons for this survival disparity will be further explored. .

084

SOCIO-DEMOGRAPHIC PREDICTORS OF SURVIVAL AMONG ACUTE MYELOGENOUS LEUKEMIA PATIENTS IN CALIFORNIA, 2003-2012

J Morgan[1,2] B Jabo[1], C Chen[3], M Ghamsary[1], S Lum[3]
[1]Loma Linda University School of Public Health, Loma Linda, CA, United States; [2]SEER Cancer Registry of Greater California, Loma Linda, CA, United States; [3]Loma Linda University School of Medicine, Loma Linda, CA, United States

Background: Predictive roles for socio-demographic and hospital characteristics are poorly described for acute myeloid leukemia (AML). We assessed predictive roles for socio-demographic and hospital characteristics on overall survival (OS) and early death (ED) among California AML patient.

Methods: Records for patients diagnosed with AML during 2003-2012 were retrieved from the California Cancer Registry research database. Kaplan-Meier and Cox-regression analyses were used to assess prognostic roles for socio-demographic characteristics that included age; sex; race/ethnicity as Asian/other, Hispanic, non-Hispanic Black and non-Hispanic white; marital status as never married, married, and separated divorced or widowed (SDW); and a quintile neighborhood socioeconomic status (SES) index. Prognostic roles for hospital accreditation (yes/no) and weekend admission (yes/no) were also assessed. Analyses adjusted for AML directed therapies and cytogenetic prognostic risk groups. Separate analyses were conducted for AML and acute promyelocytic leukemia (APL).

Results: Among the 10,789 eligible study subjects, 9,764 had been diagnosed with AML and 1,025 with APL. Poorer AML OS was seen for ten year age increments (HR=1.24; 95% CI= 1.22-1.26) and for marital status contrasts with married for single (HR=1.13; 95% CI=1.06-1.21) and for patients that were separated, divorced or widowed (HR= 1.11; 95% CI= 1.05-1.17), while females showed improved mortality hazards (HR=0.95; 95% CI= 0.90-1.00). Patients living in sequentially lower SES neighborhoods showed declining survival (trend p<0.001) and patients admitted on weekends showed poorer mortality hazards than weekday admissions (HR= 1.14; 95% CI=1.06-1.230). Similar results for APL were seen for age, sex, SES, and weekend admission.

Conclusions: These findings identified unmarried status, weekend admission and low neighborhood SES as potentially actionable predictors of poor AML and APL survival.

085

INVASIVE CANCER INCIDENCE AND SURVIVAL— UNITED STATES, 2012

S Singh[1], S Henley[1], J King[1], R Wilson[1], ME O'Neil[1], AB Ryerson[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States

Cancer surveillance can help public health officials target areas for control efforts and track progress toward meeting the national health objectives set forth in *Healthy People 2020*.

Methods: We analyzed 2012 cancer incidence data from CDC's National Program of Cancer Registries (NPCR) and the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program and survival data from NPCR. The 5-year relative survival was calculated for cases diagnosed during 2001-2011 and followed through 2011.

Results: In 2012, a total of 1,529,078 invasive cancers were reported to central cancer registries in the United States (excluding Nevada), including 767,366 among males and 761,712 among females. Among persons aged <20 years, 14,748 cancer cases were diagnosed in 2012. The age-adjusted annual incidence for all cancers was 440 per 100,000 population. Cancer incidence rates were higher among men (483) than women (412), highest among Blacks (446), and ranged by state from 371 to 515 per 100,000 persons (355 in Puerto Rico). *Healthy People 2020* targets were achieved in 30 states for reduced colorectal and 27 states for reduced cervical cancer incidence. The 5-year relative survival was 66% and was similar for men and women, but higher for white persons (66%) than for Black persons (60%). The 5-year relative survival was highest among those diagnosed with cancer before age 45 years (81%) and decreased with increasing age. Among the most common cancer sites, 5-year relative survival was highest for prostate cancer (97%) and breast cancer (88%), intermediate for colorectal cancer (64%), and lowest for lung cancer (18%).

Conclusion: Surveillance data are essential in maximizing efforts to prevent cancer, improve adherence to cancer screening recommendations, and assure timely and appropriate cancer care which are essential in achieving the national cancer objectives set forth in *Healthy People 2020*.

086

COLLECTION OF OCCUPATION AND INDUSTRY INFORMATION THROUGH NATIONAL PROGRAM OF CANCER REGISTRIES COMPARATIVE EFFECTIVENESS RESEARCH STUDY

M Culp[1,2]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]Oak Ridge Institute for Science and Education, Oak Ridge, TN, United States

Background: In 2009, the Centers for Disease Control and Prevention obtained funding to expand data collection among central cancer registries (CCRs) in 10 states within the National Program of Cancer Registries in support of comparative effectiveness research (CER). This expanded data collection included patient occupation and industry (O/I) information. CCRs were also encouraged to recode textual O/I information into census numeric codes, using the NIOSH Industry and Occupation Computerized Coding System.

Purpose: We examined the feasibility and completeness of O/I data collection submitted through the Enhancing Cancer Registry Data for CER project.

Methods: The quality of O/I data for 304,637 cancer cases diagnosed in 10 states during 2011 was investigated. Both textual and recoded census numeric values of O/I data were examined for completeness by state.

Results: Among the eight states that submitted O/I code, three had fewer than 10% missing data. Within these states, 63% of occupational codes were classified as "Unemployed" and 61% of industrial codes were "Unknown." For O/I textual data, seven states submitted data with fewer than 10% missing for occupational data and five submitted data with fewer than 10% missing for industrial data. O/I completeness varied by state, but 36% of occupational and 33% of industrial text were "Retired," "Unemployed," or "Unknown."

Conclusions: Although states within the CER project were specifically funded and encouraged to collect O/I data, the quality of information collected fell below expectations. States reported similar challenges to the collection of these variables: O/I information from source data such as hospitals were more likely incomplete or not easily coded; the coding process was time consuming and required manual editing; and privacy issues inhibited follow-up with facilities. These findings suggest that more training may be needed to improve the quality of O/I data within medical records as well as central cancer registries.

087

USE OF INFORMATION SYSTEMS TO SUPPORT NAACCR DEATH CLEARANCE STANDARDS

L Giljahn[1], W Ruisinger[1], J Fike[1], B Warther[1], J Mocniak[1], D Schlichting[1], N Gonzalez[1]
[1]Ohio Department of Health, Columbus, OH, United States

NAACCR implemented new standards for Death Clearance effective January 2, 2015 for deaths occurring in 2013. The Ohio Cancer Incidence Surveillance System (OCISS) updated its Death Clearance Application to incorporate the new NAACCR standards. The updated application allows OCISS to adhere to the minimal requirements and best practices for conducting death clearance by reviewing deaths with an underlying cause of death with a reportable cancer but with scalability to include multiple causes of death, contributing cause of death, and tumor linkage.

In addition to update of the Death Clearance Application, OCISS implemented electronic follow-back to hospitals using the Death Certificate Follow-back feature available in CDC's Web Plus. OCISS' Death Certificate Follow-back form in Web Plus mirrors the form used by hospitals for direct entry of cancer case reports and incorporates the same edit set used for hospital cancer case reporting. The form is populated with data fields available from the death certificate; all other fields are defaulted to unknown values.

The process for 2013 death clearance was much more efficient as a result of the updates made to the OCISS Death Clearance Application as well as use of CDC's Web Plus. OCISS will demonstrate the functionalities of both of these systems and how they interface, provide examples of the reports available to monitor progress of death clearance both at the central registry and hospital levels, and share information on end-user satisfaction and feedback as well as planned future enhancements.

This information is applicable to all central cancer registries. Ohio's Death Clearance Application is not proprietary and is available for customization by other registries; Web Plus is available to all central cancer registries.

088

EXPLORING THE EFFICACY OF USING DISEASE INDEX TO IMPROVE CANCER REGISTRY DATA COMPLETENESS AND DEATH CLEARANCE CASEFINDING IN MARYLAND

W Ross[1], D Ng[1], K Stern[2]
[1]Westat, Rockville, MD, United States; [2]Department of Health and Mental Hygiene, Baltimore, MD, United States

Background: To achieve the highest NAACCR certification for complete, accurate, and timely data, central registries must obtain a 95% or higher completeness for case ascertainment and have fewer than 3% of cancer cases sourced from death certificates only. To ensure this goal was achieved, the Maryland Cancer Registry (MCR) sought to assess and develop new methods to improve registry data completeness and casefinding for the death clearance process.

Purpose: This study aims to assess the efficacy of using hospital disease indices to improve registry cancer reporting completeness and guide the death follow back process.

Methods: The MCR requested disease indices from data years 2012 to 2013 from all Maryland reporting hospitals, and matched cancer cases to the MCR database and to Maryland residents who died during this time by using SAS programming and manual review. Completeness reports and death follow back forms were produced from these efforts and sent to hospital facilities. Registrars from reporting hospitals were then asked to reconcile all non-matched patients existing on their disease index for cancer admissions and final dispositions were applied at the central registry.

Results/Conclusion: This presentation will analyze and reveal results from disease indices matching for case reporting completeness and death case finding efforts, discuss how this matching process impacts MCR data, and identify the most common findings for the yielded results. Forty-five Maryland hospitals participated in the disease index requests and the match rate among disease indices submitted ranged from 59% and 96%. The false non-match rate was 3% or less of the total disease index observations, due to quality of the medical record information used in matching algorithms, among other issues. While there were challenges and lessons learned, overall the disease indices proved to be efficacious for death follow back and case ascertainment.

089

TEXT: CAN IT REDUCE YOUR DCO BURDEN? YOUBETCHA!

L Stephenson[1]

[1]Wisconsin Cancer Reporting System, Division of Public Health, Madison, WI, United States

Background: Death-Certificate-Only (DCO) follow up is an NPCR-required data quality core activity. NPCR requires central cancer registries maintain a DCO rate of 3% or less. DCO follow up is labor-intensive, requiring registry staff to contact established reporters, but also nonstandard reporters that are unfamiliar with cancer reporting and often confused about the process. The Wisconsin Cancer Reporting System (WCRS) conducts DCO follow up on 2,300 deaths annually. Thirty-five percent are "tumor-only" DCOs; WCRS has an existing cancer(s) for the decedent, but the DCO is not the same cancer in the WCRS database.

Purpose: Reduce WCRS staff resources required for facility-level follow up by analyzing 2013 tumor-only DCOs through text review of existing cases and determining which can be resolved without facility follow up.

Methods: WCRS CTR staff reviewed all 754 tumor-only DCOs. Each was matched to the existing record in the WCRS CRS Plus database. Text fields were reviewed for the absence or presence of information that corresponded to the DCO. The CRS Plus PE, X-Ray/Scan and Remarks fields provided the best information to determine a match. DCOs that matched a text reference in the abstract were analyzed to determine if the DCO was:

- Metastatic
- Diagnosed prior to reference date
- Diagnosed out of state
- Considered the same primary as a previously reported case

DCOs matching the above criteria were considered resolved, the remainder were sent for facility follow up.

Results:

- Forty-eight percent of tumor-only DCOs were resolved through text review of existing cases.
- Only 393 of 754 tumor-only DCOs needed facility-level follow up.
- WCRS reduced the staff time needed for facility-level follow up by 160 hours.
- WCRS reduced the number of tumor-only DCOs in pending status or lost to follow up by 15%.

Conclusion: Many DCOs can be resolved at the central cancer registry through review of existing text, negating the need for follow up.

090

ANALYSIS OF EXTERNAL DATABASES TO ASCERTAIN VITAL STATUS

S Van Heest[1], R Wilson[1], J Rogers[1]

[1]Centers for Disease Control and Prevention, Atlanta, GA, United States

Introduction: The completeness of vital status information within a central cancer registry (CCR) can be improved through linkages with mortality databases. Each database is unique in its availability, the accuracy and completeness for specific population groups, and the completeness of case ascertainment. Results from linkages with these databases may vary due to differences in data fields available for matching and the linkage methods utilized.

Purpose: This presentation will describe commonly used databases in CCRs and other organizations in the United States and will outline the benefits and potential shortfalls associated with the different databases to enable a researcher to best use each data source.

Method: A systematic review of journals was conducted on using mortality databases to enhance data and the monetary and labor costs of using them. The sources were reviewed for geographic and demographic limitations, accuracy and completeness, cost, and the ability to identify death certificates, verify alive status, and identify potential duplicates. Databases reviewed include: state vital records, Social Security Administration Administrative Records, Social Security Death Master File, National Death Index, as well as the Internal Revenue Service, and the Veterans Administration Beneficiary Identification and Record Location System.

Results: The literature supports that utilizing mortality databases to meet the goals of the organization is key in enhancing the organization's data while balancing time and funding. CCRs need to assess organizational goals and resources to in the best sequence determine the best sequence for their CCR.

Conclusion: These databases can provide an effective method to enhance data at the CCRs and assist them in meeting organizational goals.

091

SORTING OUT THE PRIMARY PAYER JUMBLE, PART A: THE MONTANA EXPERIENCE

L Williamson[1], R Sherman[2], D Lemons[1]
[1]Montana Central Tumor Registry, Helena, MT, United States; [2]North American Association of Central Cancer Registries, Springfield, IL, United States

Background: Information on primary payer at diagnosis is submitted by each reporting facility to central cancer registries. The intent of this item is to capture the insurance status of patients at the time of initial diagnosis or treatment.

Purpose: The purpose of this study was to describe the misclassification of primary payer reported to the Montana Central Tumor Registry (MCTR) among a subset of cases known to be either not insured or covered by Medicare.

Methods: Descriptive statistics of primary payer reported to the MCTR from 2004-2013 were calculated by patient characteristics and facility characteristics. Cases which were expected to be reported as not insured were defined as breast and cervical cancer cases which linked with the National Breast and Cervical Cancer Early Detection and Prevention (NBCCEDP) program. Cases which were expected to be reported as Medicare were defined as invasive cases aged 65 years and older.

Results: For cases which linked with the NBCCEDP program, the majority of facilities reported Medicaid as the primary payer (45.0%) rather than not insured (20.0%). Compared to NBCCEDP enrollment data, for cases which reported no insurance at the time of screening enrollment only 21.0% of facilities reported not insured. Among NBCCEDP cases which reported some insurance at screening enrollment, 73.6% of facilities also reported some insurance. Among cases aged 65 years and older 83.8% of facilities reported Medicare as the primary payer.

Conclusion: It appears that primary payer reported by facilities was misclassified compared to what was expected. This study found that reporting facilities may more accurately capture patients' primary payer when there was, in fact, a payer compared to patients who first present with no insurance. The MCTR plans to educate reporting facilities on the intent of this data item and to work with reporting facilities and with NAACCR to develop strategies to improve primary payer data collection.

092

SORTING OUT THE PRIMARY PAYER JUMBLE: PART B—THE US EXPERIENCE

R Sherman[1], L Williamson[2], D Lemons[2]
[1]North American Association of Central Cancer Registries, Springfield, IL, United States; [2]Montana Central Tumor Registry, Helena, MT, United States

Background: An individual's access to health insurance influences the amount and quality of health care a patient receives for prevention, treatment, and, ultimately, survival. NAACCR Item #630, Primary Payer at DX, is a required field intended to document health insurance status at the time of a patient's diagnosis for the purpose of supporting patterns-of-care studies. However, there are issues with the uniformity of collection and availability of data needed to populate this field.

Purpose: The purpose of this study was to assess the extent of misclassification of primary payer in the CINA dataset and provide guidelines for improving reporting of this field.

Methods: Descriptive statistics of primary payer reported in CINA from 1995-2012 were calculated, focusing on demographic characteristics (specifically age, race, and country of origin). Additional assessment by geography and linkage with the National Breast and Cervical Cancer Early detection and Prevention (NBDDEDP) Program were conducted by participating states.

Results: The quality of Primary Payer at DX is improving overtime. For 1995-2012, 43% of Medicare eligible (65+) had unknown insurance status. For 2012, 11% had unknown insurance status. As expected, percent of private insurance decreased by age for Medicare eligible, but the percent of unknowns increased. Completeness of Primary Payer is highest among whites.

Future Directions: Historically, the uninsured category was an important epidemiologic category for analysis. With the Affordable Care Act, changes in coverage provide unique opportunities to assess the impact of access to care on cancer outcomes. We suggest "best practices" aimed at improving the quality of this data item to support research needs, including proposed systematic changes to historical data and consolidation approaches.

093

DISPARITIES IN QUALITY OF CARE AND OUTCOMES AMONG CANCER PATIENTS IN CALIFORNIA: THE ROLE OF HEALTH INSURANCE AND POPULATION DEMOGRAPHICS

A Parikh-Patel[1], C Morris[1], K Kizer[1]
[1]California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program, Institute for Population Health Improvement, University of California Davis Health System, Sacramento, CA, United States

Background: Despite generally improved cancer treatment, population disparities in the quality of cancer care and survival according to source of health insurance have been documented. This study builds on previous work in this population which identified disparities in cancer quality of care and outcomes by source of health insurance. The purpose of the present analysis was to determine the relative contributions of population demographics in explaining these differences.

Methods: Persons with a diagnosis of breast, lung, colon, rectum, or prostate cancer during the period 2004-2012 were identified in the California Cancer Registry. Descriptive statistics were generated to summarize the demographic characteristics of the study population. Multivariate logistic regression and Cox proportional hazards models were generated to assess the independent effect of health insurance type on stage at diagnosis, quality of care and survival, after adjustment for age, sex, race/ethnicity and socioeconomic status (SES). Cancer treatment across categories of insurance coverage was evaluated using Commission on Cancer quality measures.

Results: Stratified analyses of the effects of SES on late stage at diagnosis by cancer type indicated equitable survival between low SES individuals enrolled in Medicaid and the uninsured. SES adjustment did not eliminate survival differences across type of health insurance for rectal cancer; both uninsured patients and those with Medicaid insurance experienced poorer survival than privately insured patients in the lowest SES groups. Previously observed differences in select quality of care measures were largely attenuated after SES adjustment.

Conclusions: Initial analyses indicate SES is an independent predictor of both survival and quality of care for some cancer types across major categories of health insurance. Further multivariate modeling will be conducted to simultaneously adjust for additional demographic factors and results will be presented.

094

AUGMENTING KENTUCKY CANCER REGISTRY DATA WITH MEDICARE, MEDICAID AND PRIVATE INSURANCE CLAIMS DATA

B Huang[1], E Tai[2], Q Chen[1], B Ryerson[2], J Nee[1], D Butterworth[2], K Ward[3], J Lipscomb[3], J Talbert[1], S Fleming[1], T Tucker[1]
[1]University of Kentucky, Lexington, KY, United States; [2]Centers for Disease Control and Prevention, Atlanta, GA, United States; [3]Emory University, Atlanta, GA, United States

Background: Population-based cancer registry data play an important role in cancer prevention and control. To properly assess quality of care and outcome measures, it is critical to include accurate treatment and other clinical information in the registry data. While linking registry data with health claims data has previously been performed, it has often been limited to a single source such as Medicare. In this study, the Kentucky Cancer Registry (KCR) data will be linked with Medicare, Medicaid and private insurance claims data.

Aims: Objectives of this study include examining: (1) how linkage with claims data adds important comorbidity and treatment information, and (2) whether linked registry data improves the accuracy of statistical analyses.

Methods: The 2007-2011 breast and colorectal cancer cases from the KCR will be linked with Medicare, Medicaid, and private insurance claims data separately and then linked data sets will be consolidated. Comorbidity, outcome measures, and treatment information including surgery, radiation, chemotherapy, and hormonal therapy will be derived from the claims data. We will examine differences in treatment and outcome measures between the original KCR data and augmented KCR data by data sources and cancer sites. Statistical models will also be fit to assess whether the augmented data improve the accuracy of data analyses. This process will be repeated for other cancer types in the future.

Results: Preliminary results showed that KCR data captured only 78% of chemotherapy and 83% of radiation therapy received for age 65+ female breast cancer patients based on the linked Medicare data. The findings thus far impact the statistical significance of several outcome measures between the Appalachian and non-Appalachian population.

Discussion: Clearly, linking registry data with claims data improves registry data quality. The impact of the final augmented registry data will may vary by cancer site and particular outcome being examined.

095

PITFALLS AND OPPORTUNITIES USING CANCER REGISTRY DATA FOR THYROID CANCER RESEARCH

M Whiteside[2], C Kiernan[1]
[1]Vanderbilt University Medical Center, Nashville, TN, United States;
[2]Tennessee Department of Health, Nashville, TN, United States

Cancer registries are increasingly used in thyroid cancer research and results cited in national practice guidelines. Studies using the National Cancer Database (NCDB) report that 20% of thyroid lobectomy (TL) patients receive radioiodine (RI). RI after TL is non-standard care. Given the high percentage of TL patients receiving RI, we hypothesized many abstracts have surgery primary site inaccurately coded as TL.

A total of 918 thyroid cancer cases, seen at Tennessee (TN) facilities during 2004-11 (n=6938 total cases), were coded with TL, surgery primary site code "20"-"23." Certified Tumor Registrars at the TN Cancer Registry reviewed the abstract text and/or telephoned reporting facility staff to confirm that TL was the definitive procedure. Postoperative receipt of RI was reviewed.

There were 369 (40.2%) incorrectly coded cases out of the 918 cases originally coded with TL. Of these 369 incorrectly coded cases, 242 (65.6%) were changed, after review, to total thyroidectomy—surgery primary site code of "50"—and 85.1% of these 242 cases were reported from Commission-on-Cancer (CoC)-accredited facilities. A total of 184 (20.0%) abstracts were originally coded with TL and also received postoperative RI. After review, only 69 of the 184 abstracts were correctly coded as TL and received postoperative RI; therefore, 7.5% of TL cases actually received RI (before and after review comparison, p<0.0001).

This study reveals that the use of RI after TL is probably over-reported nationally. Studies of thyroid cancer treatment that utilize cancer registry data and include extent of surgical intervention in their conclusions should be interpreted with caution. However, using standard quality control measures (e.g. re-abstraction audits), case information could be validated. Most of the incorrectly coded cases were reported from CoC-accredited facilities. These CoC-accredited facilities contribute case information to other large national cancer databases, similar to the NCDB.

096

IASLC 2011 AND WHO 2015 CLASSIFICATIONS OF LUNG ADENOCARCINOMAS: DEMOGRAPHIC PATTERNS, TRENDS, AND IMPLICATIONS FOR CANCER SURVEILLANCE

S Negoita[1], D Holt[1], M Dunn[1]
[1]Westat, Rockville, MD, United States

Background: Adenocarcinoma (ADCA) is the most frequent lung tumor histology diagnosed in the United States; however, the occurrence of ADCA varies by race and other demographic factors. In 2011, major international organizations adopted the new International Association for the Study of Lung Cancer (IASLC) classification of ADCAs. The WHO revised lung cancer histology classification in 2015.

Purpose: This study investigates patterns and trends in lung ADCA occurrence according to the IASLC and WHO classifications, and discusses challenges integrating new classifications with current surveillance model in the United States.

Methods: The study cohort consisted of 628,643 lung cancer patients included in the SEER 18 database diagnosed between 2000 and 2012. Tumors with histology codes corresponding to ADCA based on Multiple Primary/ Histology Manual 2007, IASLC 2011, and WHO 2015 classifications have all been included in the ADCA group. Per IASLC, ADCAs were further classified in preinvasive/minimally invasive, invasive ADCA, and ADCA variants. The association of ADCA histology with certain demographic characteristics has been tested. Trend analysis has been employed to detect the effects of changes in classification.

Results: ADCA accounted for approximately 35.4% of all lung tumors, and 51% of non-small cell lung carcinomas. WHO 2015 classification will slightly decrease the proportions. Among all lung tumors, the proportion of ADCAs increased significantly from 33% in 2000 to 43% in 2012. During the same period, preinvasive/ minimally invasive and invasive variants (all histology groups with better survival) decreased from 14.5% to just 6.7%. ADCA histology was significantly associated with Asian race. Sex ratio was 1 (vs 1.5 for other lung tumors).

Implications: Classification of ADCAs and the frequency this histology is recorded in cancer registries changed significantly over time. Researchers designing or interpreting findings from lung cancer studies should adjust for these changes.

097

USING CANCER REGISTRY DATA TO ESTIMATE THE PERCENTAGE OF MELANOMAS ATTRIBUTABLE TO UV EXPOSURE

M Watson[1], G Guy[1]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States

A study by Armstrong et al. published in 1993 estimated that 65-90% of melanomas are caused by exposure to ultraviolet radiation (UV). The original study was conducted using SEER data and international cancer registry data.

We used more recent NPCR and SEER combined data to update the results of the Armstrong study using the same methodologic approach. Since there is no population truly unexposed to UV, we compared melanoma rates among the most sun-sensitive population (non-Hispanic white; NHW) with the least sun-sensitive population (Black), as well as among sun-sensitive populations in different areas, to re-examine estimates of the attributable role of UV in melanomas.

Using U.S. registry data from 2008-2012 to calculate the population attributable fraction of melanomas that are UV-related, we estimate that 96.5% and 95.2% of melanomas among NHW males and females, respectively, were related to UV, considering Blacks as a proxy for a non-exposed population. By histology, 98.7% of superficial spreading melanomas, 94.7% of nodular melanomas, and nearly 100% of lentigo maligna melanomas were estimated to be UV-related, while acral lentiginous melanomas did not differ between black and NHW populations and were not thought to be UV-related (0% PAF).

Future examination could incorporate UV estimates at the county level, as well as genomic data, to refine these estimates.

NOTES:

P-01

COLORECTAL CANCER PREDICTORS AND COLORECTAL CANCER SCREENING AMONG ADULTS AGED 50-64 YEARS, 2007-2011, GEORGIA

I Solomon[1], V Davis[1], C McNamara[1], A Bayakly[1], T Moon[1]
[1]Georgia Department of Public Health, Atlanta, GA, United States

Background: Colorectal cancer (CRC) is among the leading causes of cancer incidence and mortality among Georgians. Screening can prevent CRC by finding and removing polyps before they turn cancerous. Managing risk factors and targeting screening messages to adults aged 50-64 years can decrease incidence and mortality rates.

Purpose: The purpose of this study was to examine the prevalence of CRC related risk factors among adults aged 50-64 years in Georgia and to provide descriptive screening, incidence, and mortality statistics in this population.

Methods: CRC incidence, mortality, and stage data were obtained from the Georgia Comprehensive Cancer Registry (GCCR) for 2007-2011. Risk factor and screening prevalence data were obtained from the Georgia Behavioral Risk Factor Surveillance System (BRFSS) for 2007-2011.

Results: Males were 41% more likely to be diagnosed with CRC and 58% more likely to die from CRC than females. Adults who had health insurance were nearly twice as likely to meet the recommendation for CRC screening and were half as likely to be current smokers. Georgia's Southwest Public Health District (8-2) had the highest percentage (77%) of adults aged 50-64 years who met the recommendation for CRC screening, while the North Georgia Public Health District (1-2) had the lowest percentage (32%).

Conclusions: Blacks have higher CRC incidence and mortality than whites and are the second-most uninsured population in the United States. Hispanics are the most uninsured population in the United States. Provider education, targeted messages, and media campaigns should be utilized to reach these populations to achieve an 80% CRC screening rate by 2018. Target populations are the newly insured, insured individuals who do not utilize screening services, and financially challenged individuals.

P-02

FINE NEEDLE ASPIRATION CYTOLOGY OF BODY ORGAN MASSES WITH HISTOPATHOLOGICAL CORRELATION: A 5 YEARS AND 5 MONTHS STUDY IN TIKRIT CITY - IRAQ

N Gheni[1]
[1]Tikrit University, Tikrit, Iraq

Fine needle aspiration (FNA) cytology is rapid, easy, cost saving, and convenient for the patient and their families with minimal time for work without preoperative blood tests, radiographic and cardiac testing, no risk of anesthesia, and no postoperative infection.

The aim of this study is to calculate the sensitivity and specificity of FNA cytology as a diagnostic method by correlating it with histopathological findings. This is a retrospective study done in the main histopathological lab in Tikrit city. Around 3,500 cases of FNA mainly from the breast, thyroid, lymph nodes, liver and lung were performed during this period. Out of these, the received cases for histopathological study are categorized into: inflammatory, benign, atypical, suspicious and malignant on FNA, and compared with the results of histopathological findings.

We found that fine needle aspiration cytology is very efficient, simple, and cost effective with high sensitivity and specificity in the diagnosis of different organ masses.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Posters

GRAND BALLROOM EFGH

P-03

COUNTY-LEVEL RACIAL/ETHNIC DISPARITIES OF LUNG ADENOCARCINOMA AND SQUAMOUS CELL CARCINOMA IN THE UNITED STATES, 2004-2012

K Houston[1], K Mitchell[2], J King[1], A White[1], B Ryan[2]
[1]Centers for Disease Control and Prevention, Atlanta, GA, United States; [2]National Cancer Institute, Bethesda, MD, United States

Background: Studies suggest disparities in lung cancer incidence could be driven by the environment and geographic location.

Purpose: Examine county-level differences in histologic lung cancer incidence rates among adults living in metropolitan and non-metropolitan areas of the United States.

Methods: We used data from population-based cancer registries, covering more than 96% of the total U.S. population, to examine lung cancer incidence among non-Hispanic (NH) white, NH black, and Hispanic adults living in counties classified as metropolitan, adjacent to metropolitan, and non-adjacent to metropolitan. Annual percent change was calculated to quantify changes in rates over time.

Results: A total of 943,769 lung cancer cases were included. Squamous cell carcinoma (SCC) and adenocarcinoma rates were significantly lower among Hispanics (rates SCC = 6.0; adenocarcinoma = 12.3 per 100,000) compared with NH whites (rates SCC = 13.9; adenocarcinoma = 22.6 per 100,000) and blacks (rate SCC = 15.4; adenocarcinoma = 23.3 per 100,000). SCC rates significantly decreased among NH black and Hispanic men living in metropolitan counties, whereas rates for NH white women significantly increased in all geographic locations. Overall, adenocarcinoma rates were higher among men and women living in metropolitan counties. Adenocarcinoma rates significantly increased for NH white and NH black men, whereas rates for women significantly increased for all racial/ethnic groups living in metropolitan and adjacent rural counties. Compared with NH white women, adenocarcinoma rates increased more rapidly in NH black and Hispanics living in adjacent rural counties.

Conclusion: The change in patterns of lung cancer incidence varied by geographic location. The increase in rates of squamous cell carcinoma was greatest for NH white women. Moreover, increases in rates of adenocarcinoma were observed for both NH black men and women, and Hispanic women living in adjacent rural counties.

P-04

DESIGNING AN ALL-PURPOSE BASE MAP FOR PRESENTING NORTH AMERICAN CANCER DATA

F Boscoe[1]
[1]New York State Cancer Registry, Albany, NY, United States

Background and Purpose: For a number of years, NAACCR has published simple maps showing certification levels and incidence rates for its member registries. These maps have served their purpose reasonably well, but it is often difficult to identify the values for small areas such as Rhode Island and Prince Edward Island. Moreover, the maps have a blocky, lo-fidelity appearance. In this poster, several alternative base map designs are presented that offer a cleaner, more readable, and/or more humanistic feel.

Methods: An open-source repository of hand-drawn boundary files, www.projectlinework.org, was consulted to identify base map layers that included all of the states and provinces. These layers, plus one created by the author, were used to create maps showing registry certification levels achieved for 2012 data, with SEER sub-state registries were added by the author. Color, scale, projection, and other details were held constant to emphasize the differences in the base maps only.

Results and Conclusions: The poster shows six different ways of rendering the contours of NAACCR member registries, all of which are more generalized than is customary. Bear in mind that for the purposes of these maps, the rapid and accurate communication of cancer information should trump the faithful rendering of coastlines. At the conference, I will solicit opinions from attendees as to which is their preferred map. The results of this informal survey will inform the future publication of maps in *Cancer in North America* and on the NAACCR web site.

NOTES:

P-05

THE RELATIONSHIP BETWEEN BREAST CANCER INCIDENCE, MAMMOGRAPHY AND INCOME IN NEW YORK STATE

F Boscoe[1], X Zhang[1],
[1]New York State Cancer Registry, New York State Department of Health, Albany, NY, United States

Background and Purpose: A positive association between breast cancer incidence and socioeconomic status (SES) has been well established through hundreds of national and international studies. This relationship has been explained by differences in reproductive history, physical activity, genetic factors, and mammography rates. In New York State, there is about a 50% difference in local-stage breast cancer incidence rates among white non-Hispanic women between the wealthiest and poorest communities, as defined by census tract of residence at diagnosis. For *in situ* diagnosis, however, the difference is more than twofold, and exists entirely among the upper half of the income distribution—rates of *in situ* breast cancer are the same in the poorest and the median income communities. Additional explanations are required for this unusual pattern.

Methods: We consider the extent to which the type of mammography received might help explain the patterns seen for *in situ* breast cancer. Using Medicare claims data from a sample of women mainly from New York State without cancer, we examined the rates of receipt of all combinations of digital mammograms, film mammograms with computer-aided analysis, and film mammograms alone, as a function of residential location. We also compared the rates of receipt of diagnostic versus screening mammography.

Results and Conclusions: Women from more affluent communities were more likely to receive more technologically sophisticated screening techniques, which are known to result in higher numbers of cancer diagnoses. Women from more affluent communities were also much more likely to receive diagnostic mammograms. Since all of these diagnostic mammograms were known not to result in a cancer diagnosis, we can conclude that the likelihood of a mammogram being rated as suspicious must be higher in more affluent areas. Together these findings account for some of the unusually strong SES gradient for *in situ* breast cancer.

P-06

LENGTH OF CENTRAL CANCER REGISTRY OPERATIONS: EFFECT ON MULTIPLE PRIMARY CANCERS AND SURVIVAL ESTIMATES

B Qiao[1], M Schymura[1], A Kahn[1]
[1]New York State Cancer Registry, Menands, NY, United States

Background and Objectives: Population-based cancer survival analyses are usually based on the first primary cancer. Several recent studies have brought this practice into question, with one argument being that varying registry reference dates affect their ability to identify earlier cancers, resulting in selection bias. The current study used a theoretical approach to evaluate the extent to which the length of cancer registry operations affects the ascertainment of subsequent primary cancers and consequently survival estimates.

Methods: The study is based on cases diagnosed 2001 to 2010 reported to the New York State Cancer Registry. Sequence number central was used to classify tumors as either the first primary (00 or 01) or a subsequent cancer (>=02). A set of three sequence numbers, each based on an assumed reference year (1976, 1986, or 1996), was assigned to each tumor. Percent of subsequent cancers was evaluated by reference year, cancer site, and age group. Five-year relative survival estimates were calculated and compared under four different selection scenarios.

Results: The percent of cancer cases classified as subsequent primaries was 15.3%, 14.3%, and 11.2%, respectively, for reference years 1976, 1986, and 1996; and varied by cancer site and age group. When only the first primary cancer was included, shorter registry operation time was associated with slightly lower 5-year relative survival estimates. When all primary cancers were included, survival estimates decreased, with the largest decreases seen for the earliest reference year.

Discussion and Conclusions: Significant proportions of newly diagnosed cancers were registered as subsequent primaries. Registry operation time affected the identification of subsequent cancers, but the overall effect of this misclassification on survival estimates was small. Survival estimates based on all primary cancers were slightly lower, but might be more comparable across registries; therefore, they should be recommended.

Posters

GRAND BALLROOM EFGH

P-07

MULTIPLE PRIMARY CANCERS IN THE UNITED STATES, 2007-2011

B Qiao[1], M Schymura[1], X Wu[2], B Wohler-Torres[3], M Hsieh[2], B Huang[4], M Wu[5], Q Yu[2], H Sineshaw[6], R Sherman[7], C Kruchko[8], X Li[2], A Jemal[6]
[1]New York State Cancer Registry, Menands, NY, United States; [2]Lousiana Tumor Registry, New Orleans, LA, United States; [3]Florida Cancer Data System, Miami, FL, United States; [4]Kentucky Cancer Registry, Lexington, KY, United States; [5]Centers for Disease Control and Prevention, Atlanta, GA, United States; [6]American Cancer Society, Atlanta, GA, United States; [7]North American Association of Central Cancer Registries, Springfield, IL, United States; [8]Central Brain Tumor Registry of the United States, Hinsdale, IL, United States

Background and Objectives: With progress toward earlier cancer diagnoses and advances in treatment, cancer survival has improved significantly. However, with prolonged survival after the first cancer diagnosis, survivors face an increased risk of developing subsequent primaries. Studies of multiple primaries have been largely limited to SEER registries, focused on risk estimation, or been limited to a few selected cancer sites. The objective of this study is to measure the occurrence of multiple primary cancers in the United States and to provide some descriptive statistics.

Methods: Data from 48 central cancer registries in the United States were used for this study and were limited to invasive cancer cases diagnosed from 2007 to 2011. Multiple primary cancers were determined based on the assigned value of sequence number central. Tumors with a sequence number of 02 or above were classified as multiple primary cancers. The percentage of multiple primaries was evaluated by registry, cancer site, age, race/ethnicity, and diagnosis year. In addition, the percentage of cases diagnosed at local stage for multiple primaries was compared with that for the first primary.

Results: Overall, about 17.4% of cases were registered as multiple primary cancers. Multiple primary cancers were more likely to be registered for bladder (24.6%), lung and bronchus (22.3%), and melanoma of the skin (22.0%). The percentage of multiple primary cancers was higher among registries with earlier reference dates, older age groups, and non-Hispanic whites. Multiple primary cancers were more likely to be diagnosed at an early stage.

Discussion and Conclusion: The concept of "multiple primary cancers" is important for cancer surveillance and research. This study presents a snapshot of the frequency and pattern of multiple primary cancer occurrence in the United States and thus provides researchers with useful background information.

P-08

INCIDENCE AND SURVIVAL RESULTS FROM THE CANCER IN YOUNG PEOPLE IN CANADA (CYP-C) SURVEILLANCE SYSTEM

D Mitra[1], K Hutchings[1], L Xie[1], J Onysko[1]
[1]The Public Health Agency of Canada, Ottawa, ON, Canada

Background: Established in 2009, the Cancer in Young People in Canada program (CYP-C) is a national pediatric cancer surveillance system in Canada. It includes diagnostic, treatment, outcome, and health care data on all children treated for cancer at one of the 17 pediatric oncology centers across the country.

Methods: Cancers were classified according to the International Classification of Childhood Cancer, Third Edition (ICCC-3). Age standardized incidence rates (ASIRs) and observed survival proportions (OSPs) were calculated for all cases diagnosed between 2001-2006 by age, sex, and diagnosis. OSPs were calculated using the actuarial method.

Results: On average, 840 new cases were diagnosed annually among children (0-14 years). Leukemias (31.9%), CNS cancers (23.8%), and lymphomas (12.9%) were most commonly diagnosed. The ASIR for both sexes was 150 cases per million, with boys having a higher risk of cancer than girls (160 versus 139 cases per million, respectively). Incidence in children under the age of 5 years was nearly twice that of incidence among 5–14 year-olds. Overall 5-year OSP was 82%. The highest OSPs were observed for retinoblastoma (98%), lymphomas (93%), germ cell tumors (90%), and carcinomas (90%); the lowest were seen for malignant bone tumors (65%) and soft tissue sarcomas (70%). These results were similar to other industrialized countries for the same period.

Conclusion: CYP-C is a population-based enhanced surveillance system with high population coverage (>99%), making it a valuable resource both nationally and internationally.

P-09

RACE-SPECIFIC TRENDS IN TESTICULAR CANCER AND OBESITY IN THE UNITED STATES

OA Ayodele[1]
[1]Decision Resources Group, Burlington, MA, United States

Background: Although testicular cancer (TCa) is relatively rare, it is the most common cancer in young men. A strong association has been established between TCa and a few risk factors—cryptorchidism, family and personal history of TCa. Previous studies have documented conflicting results on the relationship between obesity and the risk of TCa.

Study Aim: To describe trends in TCa and obesity in the United States over the past 2 decades, understand what age groups and race are at the highest risk of TCa, and retrospectively predict TCa incidence using trends in obesity.

Methods: Using all primary labelled site codes for TCa we ran a SEER*STAT analysis for nine SEER registries (1975-2012). We fitted race-specific curves to the trends in prevalence of obesity using NHANES data and used the slopes derived to forecast TCa incidence from 2000-2012. We compared derived estimates to the incidence estimates obtained from SEER.

Results: TCa risk was 3.1, 1.3, and 0.6/100,000 in whites, other races, and blacks respectively. The risk of TCa was consistently higher in non-Hispanics than Hispanics regardless of the documented race from 2000-2012. Incidence peaked between ages 25-39 years for all races, at a slightly younger age in whites. TCa incidence rates nearly doubled over the study period but was relatively constant (4% increase) from 2000-2012. A similar pattern was observed in obesity trends. TCa estimates derived using the obesity model were within 1%-10% points of the incidence data reported in SEER.

Conclusions: Similar trends were observed for obesity and TCa. The rapidly increasing prevalence of obesity, coupled with the potential burden of TCa and its implications for quality of life and fertility, because it affects young men, underscores the public health significance of this research endeavor. Studies to further understand the risk factors for TCA would help to develop preventive strategies to halt the increasing trend of TCa incidence.

P-10

THE BURDEN OF CANCER AND BENIGN BRAIN TUMORS AMONG MASSACHUSETTS RESIDENTS REPORTED WITH HEPATITIS B AND HEPATITIS C FROM 2002-2012

R Knowlton[1], V Lijewski[2], S Gershman[1]
[1]Massachusetts Cancer Registry, Boston, MA, United States;
[2]Massachusetts Bureau of Infectious Diseases, Boston, MA, United States

Objectives: To evaluate the incidence of cancer and benign brain tumors diagnosed from 2002 to 2012 among Massachusetts (MA) residents with either a Hepatitis B (HBV) or C infection (HCV) reported during the same period.

Methods: In MA, health care providers and laboratories are required to report HBV and HCV cases to the state health department's Virtual Epidemiologic Network (MAVEN) and cancer and benign brain tumors to the Massachusetts Cancer Registry (MCR). Hepatitis cases were extracted from MAVEN and matched to MCR cases using Link Plus. Frequencies of cancer diagnoses among matched cases were calculated and compared to all MCR cases using SAS 9.3. Chi-square tests evaluated the proportion differences of specific cancers.

Results: Of the 28,070 HBV cases, 1,471(5.2%) matched with a case in the MCR while 5,499 of the 94,701(5.8%) HCV cases matched. Liver cancer was the most common cancer among the matched hepatitis/MCR group. While it represented 1.3% of the 445,264 MCR cases, it represented 22.4% of the 6,970 matched cases, a significantly elevated percentage (p <.05). Non-Hodgkin lymphoma was also more common in the matched group (n=432, 6.2%) compared to all cancer cases (n=15,764, 3.5%), a significantly elevated percentage (p < .05). Of the 5,725 liver cancer cases reported to the MCR, 1,589 (22.8%) were confirmed to be infected with either hepatitis B or C as a result of this match.

Conclusions: Analysis from 2002 to 2012 measured the burden of cancer and benign brain tumors among people infected with hepatitis B or C in MA. Nearly one quarter of all liver cancer cases in the MCR had a hepatitis B or C infection. Opportunities for both primary prevention through vaccination for hepatitis B and secondary prevention through antiviral treatment and early monitoring for liver cancer should be identified and implemented. Further analyses will explore other cancers, trends, and variations among racial/ethnic groups and gender.

Posters

GRAND BALLROOM EFGH

P-11

DESCRIPTION OF BRAIN AND CENTRAL NERVOUS SYSTEM TUMORS ON THE NATIONAL CANCER DATA BASE, 2004-2011

T Dolecek[1], E Dressler[2], M Liu[2], J Villano[2]
[1]University of Illinois at Chicago, Chicago, IL, United States;
[2]University of Kentucky, Lexington, KY, United States

The National Cancer Data Base (NCDB) is a large, high quality hospital-based oncology data set that can provide current and valuable information on brain and central nervous system (CNS) tumors in the United States. We utilized the NCDB to conduct a descriptive epidemiologic study of brain and CNS tumors for the time period 2004-2011 which coincides with the implementation of Public Law 107-206, The Benign Tumor Cancer Registries Amendment Act mandating the collection of benign and borderline malignancy tumors. Brain and CNS tumors were defined as International Classification of Diseases for Oncology Version 3 (ICD-O-3) primary site codes, C70.0-C72.9, C75.1-C75.3. Histologic subtypes were classified according to the 2007 World Health Organization Classification of Tumours of the Central Nervous System (WHO). The data set contains information on more than 90 WHO histology/behavior classifications including some of the rarest tumors. The selection criteria yielded 145,878 records of which 8.4%, 7.3%, and 84.3% were of benign, borderline malignancy, and malignant behaviors, respectively. The most common benign tumor was meningioma 9530/0. Hemangioblastoma 9161/1 counts were highest among the borderline malignancy tumors. Glioblastoma 9440/3 comprised more than half of all malignant tumors. Benign tumors for females substantially exceeded those for males whereas borderline malignancy and malignant tumors were higher for males than females. Median age at diagnosis varied greatly by WHO classification. Whites accounted for more than 80% for benign and borderline malignancy tumors and almost 90% malignant tumors. Tumor location occurred in one of the four brain lobes (C71.2-C71.4) in 38.9% benign and 61.5% malignant tumors whereas the most frequent site for borderline malignancy tumors (24%) was spinal cord and cauda acquina (C72.0,C72.1). Treatment varied by histologic subtype, site and age. The NCDB offers much to the understanding of brain and CNS tumor epidemiology.

P-12

A COMPARISON OF CAUSE-SPECIFIC SURVIVAL WITH RELATIVE-SURVIVAL FOR THE MOST COMMON CANCERS IN TAIWAN

TJ Tseng*[1], LH Chien*[2], FY Tsai[3], CA Hsiung[2], TW Liu[3], IS Chang[1,2,3]
[1]Center of Biomedical Resources, National Health Research Institutes, Miaoli County, Taiwan; [2]Division of Biostatistics and Bioinformatics, Institute of Population Health Sciences, National Health Research Institutes, Miaoli County, Taiwan; [3]National Institute of Cancer Research, National Health Research Institutes, Miaoli County, Taiwan

Background: Cause-specific survival (CSS), which needs accurate cause of death information, and relative survival (RS) are the two basic approaches to net survival, which provides a measure for comparing cancer survival in different populations. Using SEER cause-specific death classification variable, it has been shown that CSS and RS are similar for most of the common cancers in US and hence it facilitates the assessment of non-cancer-related health status for cancer patients.[1,2]

Purpose: To compare CSS with RS for the common cancers in Taiwan and to examine if net survivals for Taiwan common cancers are higher in later period, given age group and socioeconomic status (SES).

Methods and Materials: We collected the data of cancer patients diagnosed at age 15 or older in the period 1992-2010 from Taiwan Cancer Registry (TCR). The 20 most common cancers were selected for study. TCR was linked with the Taiwan Cause of Death Database and National Health Insurance Research Database, which provides SES information. We computed both CSS and RS.

Results: A total of 1,036,754 cancer patients were included in our study. CSS were in very good agreement with RS for all the most common cancers in Taiwan, given age group and SES. Net survivals were generally higher for 2005-2010.

Conclusion: Since CSS and RS are in good agreement, suggesting that the SEER cause-specific death classification variable is applicable in Taiwan cancer patients, we are in a good position to study the non-cancer-related health status for Taiwan cancer patients and to address other issues in cancer survivorship. (*These authors contributed equally.)

References:
1. Howlader N, Ries LA, Mariotto AB, et al. Improved estimates of cancer-specific survival rates from population-based data. *J Natl Cancer Inst*. 2010;102(20):1584-98.
2. Cho H, Mariotto AB, Mann BS, et al. Assessing non-cancer-related health status of US cancer patients: other-cause survival and comorbidity prevalence. *Am J Epidemiol*. 2013;178(3):339-49.

P-13

IMPACT OF CANCER INCIDENCE REPORTING DELAY ON RELATIVE SURVIVAL ANALYSIS

X Dong[1], Y Ren[1], R Wilson[2], K Zhang[1]
[1]ICF International, Atlanta, GA, United States; [2]Centers for Disease Control and Prevention, Atlanta, GA, United States

Background: Reporting delay happens when a cancer case is not reported to a cancer registry within the allowed reporting window. By definition, reporting delay impacts data more prominently in more recent diagnosis years. In the most delayed cases, reports may take 8 or more subsequent reporting years to be regarded as fully reported.

Purpose: The purpose of this study is to assess the difference in relative survival estimates by submission year that may be related to reporting delay.

Methods: The study used the NPCR data submissions from November 2001 to November 2014 from 16 states, whose data quality met the standards for inclusion in the United States Cancer Statistics and relative survival calculations. An NPCR SAS Tool was used to conduct the relative survival analysis. The tool used National Center for Health Statistics decennial and annual complete life tables from 2000 to 2010 and the Ederer II method to calculate expected survival.

Results: Preliminary evaluation shows the difference in relative survival estimates varied by primary cancer site: positive difference of 0.6% for all sites combined and Non-Hodgkin lymphoma of 1%. Differences by sex and race will also be presented for selected cancer sites. In addition, the impact will be assessed by varying lengths of diagnosis year cohorts.

Implications: This study will provide an overview of differences in relative survival estimates caused by reporting delay. The study may provide assistance for researchers on selecting study populations for survival analysis. It may also inform researchers about comparing survival rates over a temporal scale.

P-14

TRENDS IN INCIDENCE OF TOBACCO-RELATED CANCERS IN NEW JERSEY BY SEX AND RACE, 1979-2013

K Pawlish[1], S Burger[1], J Li[2], G Harris[2], S Vasanthan[2], A Stroup[2,3]
[1]New Jersey Department of Health, Trenton, NJ, United States; [2]Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, United States; [3]Rutgers School of Public Health, Piscataway, NJ, United States

Background: Cigarette smoking is the main cause of lung cancer and increases the risk for oral, esophageal, larynx and other cancers. Cigarette use has declined dramatically in the United States since the 1960s.

Purpose: To characterize changes in the incidence of tobacco-related cancers in New Jersey.

Methods: We analyzed data from the New Jersey State Cancer Registry to calculate age-adjusted cancer incidence rates using SEER*Stat and estimated average annual percent changes and changes in time trends by sex and race using Joinpoint regression.

Results: Lung cancer incidence trends changed significantly among men (p < 0.05), decreasing by 0.5% per year from 1979-1991 and by 2.2% from 1991-2013. Similar trends in lung cancer incidence were observed in white and black men. Lung cancer incidence peaked later in women, with a 3.6% increase per year from 1979-1990, a 0.6% increase per year from 1990-2007, and a 2% decrease per year after 2007. Lung cancer incidence started to decline in black women in 1998, which was earlier than white women. Esophageal cancer incidence increased by 0.4% per year in men from 1979-1993 and then decreased by 0.9% per year after 1993, while incidence decreased steadily by 1.1% per year in women from 1979-2013. Esophageal cancer rates were higher in blacks than whites, but the decrease in incidence was more pronounced in blacks. Oropharyngeal cancer incidence declined steadily by 0.6% per year in women during the time period, while the incidence in men decreased by 1.4% per year until 2003, followed by a 0.7% increase per year from 2003-2013. Decreasing trends were also seen with other tobacco-related cancers.

Conclusion: Although there is some evidence showing declines in tobacco-related cancer incidence, gender and racial disparities in cancer incidence remain. Lung cancer remains the leading cause of cancer death in New Jersey, and tobacco use causes substantial morbidity and mortality, emphasizing the importance of smoking prevention and cessation programs.

Posters

P-15

DEVELOPMENT AND IMPLEMENTATION OF A NOVEL WEB-BASED APPLICATION INTEGRATING CANCER REGISTRY DATA INTO SURVIVORSHIP CARE PLANS

R Vanderpool[1], J Jacob[2], JB Bispo[3], I Hands[2]
[1]University of Kentucky College of Public Health, Lexington, KY, United States; [2]Kentucky Cancer Registry, Lexington, KY, United States; [3]University of Miami Department of Public Health Sciences, Miami, FL, United States

Background: Survivorship care plans (SCP) are comprehensive plans that outline past, present, and future care goals for cancer survivors. As of 2015, delivery of SCP to 10% of eligible patients are mandated for ACOS Commission on Cancer (CoC)-accredited programs; this percentage will incrementally increase to 100% by 2019. Cancer program readiness to implement the new standard is sub-optimal, and tools are needed to improve the efficiency of SCP development, including the use of cancer registry data to prepopulate SCP with existing patient data.

Purpose: In January 2015, University of Kentucky investigators were funded to design, implement, and evaluate a web-based application for prepopulating *Journey Forward (JF)* SCP templates with patient data collected by hospitals and entered into the Kentucky Cancer Registry's (KCR) Cancer Patient Data Management System (CPDMS). This presentations will describe activities leading up to the application launch in June 2015 as well as preliminary evaluation findings.

Approach: We conducted a process evaluation, including qualitative interviews with informatics staff and registrars and navigators at several hospitals.

Results: Mapping cancer abstract data into *JF's* SCP template fields required substantial expertise from KCR and informatics staff. An average of 25% of data fields in *JF's* templates can be prepopulated with CPDMS data. Two training webinars were held for 75 registrars and patient navigators. As of December 2015, 479 SCP have been initiated. Feedback suggests the application is easy to use, has decreased SCP prep time, and led to new collaborations between registrars and navigators.

Conclusions: Development of the application was a significant undertaking, but has resulted in a new method for prepopulating SCP with registry data that may ease logistical burdens that hospitals face in meeting CoC-accreditation requirements. Additional data collection and analysis will allow us to study these trends over time.

P-16

DATA REPORTS: THEY CAN ALWAYS GET WHAT THEY WANT

S Gershman[1], A MacMillan[1], R Knowlton[1]
[1]Massachusetts Cancer Registry, Boston, MA, United States

Background: Central cancer registries have been criticized for not providing timely data to address cancer control efforts. The Massachusetts Cancer Registry (MCR) is experimenting with releasing preliminary data.

Purpose: To provide preliminary 2013 cancer incidence data as well as trend data, incidence (2003-2013), and mortality (2003-2014) for four major cancers in Massachusetts. The trends report was a collaborative effort with Massachusetts Department of Public Health Programs to provide within a single source the most recent available data on trends and program information for the following four major types of cancer: prostate, female breast, bronchus and lung, and colorectal.

Methods: Cancer incidence and mortality trends were analyzed using joinpoint regression, which involves fitting a series of joined straight lines on a logarithmic scale to the trends in the annual age-standardized rates with at least three data points between changes in joinpoints. Behavioral Risk Factor Surveillance Survey prevalence provided the proportion of the population found to have some factor of interest (such as screening or smoking).

Results: The death rate for the four leading cancers (prostate, female breast, bronchus and lung, and colorectal) have all dropped in Massachusetts. The incidence of prostate, bronchus and lung, and colorectal also dropped. Breast cancer had a small but statistically significant increase. The report included information about health disparities, screening procedures, cancer-related behaviors as well as activities of the Massachusetts Department of Public Health's and its partners to reduce the incidence and the likelihood of deaths associated with these cancers.

Implications: Early release of cancer incidence and mortality information with cautions may provide more current data for program planning. However, this will need to be confirmed by comparison to more complete data.

P-17

CANCER IN ONTARIO: A REVIEW OF CURRENT AND HISTORICAL CANCER STATISTICS, 1981-2016

T Navaneelan[1], S Fallahpour[1], P De[1], T Norwood[1], Z El-Masri[1]
[1]Cancer Care Ontario, Toronto, ON, Canada

Background and Purpose: While cancer statistics have been routinely collected in Ontario through the Ontario Cancer Registry (OCR), the data have not been regularly disseminated. There was a lack of a comprehensive, consistent and up-to-date report on Ontario cancer statistics. This study was designed to provide such a report and establish a standard, reliable source for cancer statistics for Ontario.

Methods: Data were taken from the OCR on all malignant cancer cases diagnosed between 1981 and 2012. Statistics were calculated on incidence, mortality, relative survival and prevalence outcomes. Analysis was performed using SAS v.9.2 and SEER*Stat software. Joinpoint regression was used for trend analyses. Projected rates were determined using a Nordpred age-period-cohort model.

Results: Incidence and mortality rates with annual percent change (APC) trends for 1981-2016 will be reported for all cancers combined and individually for the most common cancers. Analysis will include the effects of the introduction of new SEER-based multiple primary rules on OCR data. Changes over time in 5-year relative survival ratios and the distribution of 10-year prevalence will also be presented.

In addition, incidence and 3-year survival ratios by stage at diagnosis will be reported, as well as female breast cancer incidence by receptor status and prostate cancer incidence by Gleason score. Incidence trends will also be presented for lung cancer by subtype (small cell, non-small cell), cervical cancer by histology (adenocarcinoma, squamous cell carcinoma), pharynx cancer by site (nasopharynx, oropharynx, hypopharynx) and larynx cancer by subtype (glottis, supraglottis, subglottis).

Conclusions: A better understanding of the current state of cancer in Ontario will help inform other areas of provincial cancer control activities, including a new prevention strategy and the impacts of several ongoing organized screening programs for breast, cervix, and colorectal cancer.

P-18

UTILIZATION OF CANCER REGISTRY DATA TO INCREASE OUTPATIENT PALLIATIVE CARE REFERRALS IN A HOSPITAL SETTING

M LeBeau[1]
[1]Lewis Cancer and Research Pavilion, Savannah, GA, United States

At the Lewis Cancer and Research Pavilion, lack of palliative care referrals caused a challenge in offering pain management and/or end of life care for patients deemed eligible. Referring patients to palliative care when appropriate can significantly improve quality of life during end-stage disease. Case ascertainment was performed weekly by the Cancer Registrar on hospital pathology reports and a list of possible candidates for the study was created. Stage IIIB and IV lung cancer patients were included. This list was shared with the patient navigator, who then contacted the appropriate physician's office to initiate a palliative care referral, resulting in an increase in overall palliative care refers for advanced stage lung cancer patients. This shows that registry data is useful in improving patient outcomes, affording them the opportunity to use palliative care services.

NOTES:

Posters

GRAND BALLROOM EFGH

P-19

RISK OF DEVELOPING COLORECTAL CANCER AFTER SURVIVING A FEMALE-SPECIFIC CANCER IN PUERTO RICO
M Alvarado Ortiz[1], KJ Ortiz Ortiz[1], CR Torres Cintrón[1], DE Zavala Zegarra[1], G Tortolero Luna[1]
[1]Puerto Rico Central Cancer Registry, San Juan, Puerto Rico, United States

Background: Colorectal cancer (CRC) is the second most frequent (12.2%) cancer and the second leading cause of death (13.5%) among women in Puerto Rico (PR). Between 1987 and 2012, secondary malignancies comprised 5.7% of all female cancer cases in PR; of those, 14.2% were CRC. No previous studies have investigated the risk of developing CRC as a secondary cancer in women in PR.

Purpose: To estimate the risk of developing CRC among women who had survived 2 months or longer after the diagnosis of primary breast, ovary, cervix uteri, or corpus uterus between 1987 and 2012.

Methods: A cohort of 54,417 women was followed through time. Standardized incidence ratios (SIR) were calculated for CRC using SEER*Stat 8.2.1 MP-SIR. Analysis was stratified by primary cancer site, age at diagnosis, and follow-up time.

Results: A total of 511 secondary CRC were identified after diagnosis of primary cancer of the breast (64.2%), corpus uterus (19.4%), cervix uteri (9.0%), or ovary (8.0%). The risk of developing subsequent CRC was significantly higher for ovarian cancer (SIR=6.4) followed by corpus uterus (SIR=3.8), cervix (SIR=3.4), and breast (SIR=2.3). Overall, the risk of developing subsequent CRC is higher after 10 years of follow-up (SIR=7.9). Women with a primary diagnosis of ovarian cancer, corpus uterus, and breast have a significant risk of secondary CRC after a follow-up time between 2 months to 1 year (SIR=7.5, 2.3, and 1.9, respectively). Women aged <40 years who survived ovarian cancer between 2 months to 1 year had a higher risk of secondary CRC compared with other age groups.

Conclusions: Women with primary ovarian cancer had a significant higher risk of developing CRC than women with primary breast, cervix, and corpus uterus. Women in PR with an initial cancer diagnosis of ovary, breast, corpus uterus, and cervix should be monitored carefully for the occurrence of a subsequent CRC.

P-20

UNDERSTANDING THEORIES OF CANCER IN POPULATION CANCER SURVEILLANCE
B Riddle[1], J Rees[1], M Celaya[1], A Andrew[1], MS Zens[1]
[1]Geisel School of Medicine at Dartmouth College, Hanover, NH, United States

For at least 50 years, cancer has been seen as a disease caused by mutations in genes within a single somatic (body) cell, transforming the "normal" state of inactivity to uncontrolled proliferation through effects on the cell cycle. This Somatic Mutation Theory (SMT) evolved to incorporate the possibility of gradual, successive mutations and clonal expansion. Developments that were not inconsistent with SMT included the description of (i) oncogenes, initially described as viral material inserted into DNA mutations, but generally regarded as mutations that cause a gain of function that results in cancer; and (ii) tumor suppressor genes, causing a loss of function that results in cancer. A variety of experimental data have been reported that are difficult to explain under SMT. Carcinogenesis can arise in the absence of mutations, and conversely, there are tumors that have thousands of mutations, leading to searches for the few mutations that are "drivers" of carcinogenesis. Further, some mutations can behave as oncogenes or tumor suppressors. For example, NOTCH1 behaves as an oncogene in leukemia and as a tumor suppressor in squamous cell carcinoma. Also, at odds with the SMT conventional view that mutations occur gradually over time is the finding that sudden, massive genetic rearrangements occur in 2 to 3% of tumors. New, complex genomic studies are not easily explained by the current paradigm offered by SMT. A new theory has been proposed as an alternative to SMT, called 'Tissue Organization Field Theory (TOFT).' TOFT regards cancer as the result of "development gone awry," and focuses on changes in tissue organization and intercellular signaling. The tissue environment is the key to this theory; changes in it predispose to cell proliferation, and genetic instability is the byproduct but mutation is not required for cancer to develop. We will discuss controversial issues in cancer theory, and offer thoughts on their implications for cancer surveillance.

P-21

USING NAACCR SURVIVAL TABLES TO LOOK AT DEATHS

B Riddle[1], J Rees[1], M Celaya[1], MS Zens[1]
[1]Geisel School of Medicine at Dartmouth College, Hanover, NH, United States

Annual death clearance even with linkage to the National Death Index is hindered by practical issues associated with identifying variables that are missing, incorrect, or have changed. Missing death information could be investigated for selected patients whose survival seems unusually good. The NAACCR Survival Analysis Task Force tables offer an opportunity to take a new look at deaths. Using the 5-Year Age-Standardized Relative Survival Ratios (RSR) for Cancer Diagnosed 2005-2011, we used New Hampshire's data to investigate survival anomalies. When the RSR data suggest that, on average, there is a low probability of survival in a patient who is thought to be still alive, possible explanations include unusually good survival, or flaws in death ascertainment. We used logistic regression models to describe the characteristics of individuals according to whether they are alive or dead, and then identified patients expected to have died, but who have no death information; we then investigate the reasons their deaths have not been documented. The exercise takes the RSRs by site, 2005-2011, for the New Hampshire State Cancer Registry and incorporates them into a logistic regression model. The model is first used to look at cases 2005-2011 and then expanded to include more recent years. The exercise will compare actual deaths to predicted deaths by site and attempt to identify patterns for potentially missed deaths. A secondary exercise looks at cases where the model predicts survival but the registry records an "early" death. We will look to see if it the cause of death is cancer or something else as recorded in the death certificate; operative mortality (death within 30 days of surgery), will be reported by site. The results will allow us to gain insights into the death clearance process. The poster will present results and guidance to allow other registries to construct their own models.

P-22

ESTABLISH IF THE USE OF BIOMARKER TESTING HAS INCREASED AND THE IMPACT ON TREATMENT OVER TIME

D Rousseau[1]
[1]Rhode Island Cancer Registry, Providence, RI, United States

The Rhode Island Cancer Registry (RICR) was 1 of 10 central cancer registries which were selected to take part in the Comparative Effectiveness Research (CER) project. The overall objective of this project is to provide researchers with a dataset that will enable them to conduct research to improve cancer care. Data were collected for the diagnosis year to establish the level of biomarker testing that was done and the impact testing results had on treatment decisions. Since CER involved a single year of data, it is not possible to establish if the use of biomarker testing and used to determine treatment has changed over time. Rhode Island Cancer Registry staff will be collecting selected data items on colon and breast cancers diagnosed from 2009 to 2013 to track changes in the level of biomarker testing over a 5-year period. Data will primarily come from existing case reports submitted to the RICR. If needed, RICR staff will conduct follow-back in the case of unknown or conflicting data items. RICR staff will present the use frequency of biomarker testing over time and how the use of these tests and their results have impacted treatment decisions. We expect the advent of personalized medicine will have increased biomarker testing.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Posters

GRAND BALLROOM EFGH

P-23

INCIDENCE AND MORTALITY TRENDS OF COLORECTAL CANCER IN PUERTO RICO: 1987–2012
A López-Rodríguez[1,2], K Ortíz-Ortíz[2], C Torres-Cintrón[2], Y Román-Ruiz[2], D Zavala-Zegarra[2]
[1]Biostatistic and Epidemiology Department, School of Public Health, University of Puerto Rico, Medical Science Campus, San Juan, Puerto Rico; [2]Puerto Rico Central Cancer Registry, Comprehensive Cancer Center, San Juan, Puerto Rico

Background: Colorectal cancer (CRC) is the first cancer-related cause of death in Puerto Rico (PR) among both genders. Previous studies for the period 1998-2002 reported an increase in CRC incidence and mortality rates. In order to continue evaluating CRC patterns we updated the CRC incidence and mortality trends to 2012.

Purpose: To analyze and update the incidence and mortality trends for CRC in PR by gender and age-groups for 1987-2012.

Methods: Incidence and mortality rates data from 1987 to 2012 were obtained from the Puerto Rico Central Cancer Registry database. Mortality data were acquired from the PR Demographic Registry. A joinpoint regression model was used to determine changes in trends. Data was analyzed by gender and age-groups.

Results: For the period 1987–2012 there was a significant change in the incidence trend of CRC in 2006. From 1987–2006 the incidence trend showed an increase (APC=2.0, p-value < 0.05), while from 2006–2012 the incidence trend stabilized (APC=-0.4, p > 0.05). Incidence trends for rectum/rectosigmoid showed slight increase (APC=0.8, p < 0.05) but a greater increase in incidence was noted for the population <50 years of age (APC=2.3, p < 0.05). CRC mortality trend has increased overall (APC=0.8, p < 0.05), except for the < 50 years population which remained constant (APC=-0.2, p < 0.05). Mortality trends have diverse behavior when stratified by gender; males experiencing a significant increase (APC=1.2, p < 0.05), while females remained constant (APC=0.1, p < 0.05).

Conclusions: CRC incidence trends have remained relatively constant since 2006. Further studies to evaluate the causes of these changes, especially in the <50 years population are warranted. It is important to continue monitoring the pattern of CRC and evaluate the impact of control cancer programs in PR.

P-24

RISING THYROID CANCER IN PUERTO RICO, 1987-2012: ACCESS, EXCESS, OR WHAT?
CR Torres-Cintrón[1], G Tortolero-Luna[2], N Pérez-Ríos[1], KJ Ortiz-Ortiz[1], E Mora-Piñero[2], M Alvarado-Ortiz[1]
[1]Puerto Rico Central Cancer Registry, San Juan, Puerto Rico; [2]University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico

Background: The incidence of thyroid cancer (TC) is increasing among the Hispanic population living in Puerto Rico (PR). Specifically, for the period 2008-2012, TC was the third most common cancer among women.

Purpose: To describe the incidence of TC for the period 2008-2012 and to assess the trend of TC among the population of PR during the period 1987-2012.

Methodology: Data were obtained from the PR Central Cancer Registry database. Data was stratified by sex, age-groups, histology, and socioeconomic position (SEP). Incidence rates were calculated as per 100,000 and age-adjusted to the 2000 U.S. standard population. Joinpoint regressions were used to examine incidence trends over time.

Results: The overall age-adjusted incidence rate of TC for the period 2008-2012 was 20.3/100,000 (men: 7.5; women: 31.6). Over 45% of cases were diagnosed among men and women aged 40-59 years. Among women the highest incidence rates were observed among those aged 40-59 (58.0/100,000) and 60-79 (52.5/100,000); whereas, among men highest rates were among those 60-79 years (16.5/100,000). Overall, the annual percent change (APC) of TC was 5.5% (1987-2003), 27.9% (2003-2007) and 9.6% (2007-2012). Among women the APCs were: 5.6%, 29.3%, and 9.4%, respectively; whereas, among men it was 5.6%, 25.9%, and 10.7% respectively. Only the incidence of papillary TC increased during this period. Most cases were at an early stage at diagnosis. For the period 1987-2012 the mortality of TC had a significant decrease of 1.7% per year (2.9% in males and 1.1% in females).

Conclusion: There is a statistically significant increase in early stage papillary TC in Puerto Rico with no associated increase in mortality. Several etiologies for these findings include overdiagnosis and access to health services, among others. New cancer programs for education, prevention, and control regarding thyroid cancer should be implemented in PR.

P-25

EMERGENCY PRESENTATION AND SHORT-TERM SURVIVAL AMONG COLORECTAL CANCER PATIENTS ENROLLED IN THE GOVERNMENT HEALTH PLAN OF PUERTO RICO

K Ortiz-Ortiz[1,2], R Ríos-Motta[2], H Marín-Centeno[2], M Cruz-Correa[3], A Ortiz[4]

[1]Cancer Control and Population Sciences Program, University of Puerto Rico, Comprehensive Cancer Center, San Juan, Puerto Rico; [2]Department of Health Services Administration, School of Public Health, Medical Sciences Campus, UPR, San Juan, Puerto Rico; [3]University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico; [4]Department of Biostatistics and Epidemiology, Graduate School of Public Health, Medical Sciences Campus, San Juan, Puerto Rico

Background: Having the first contact with the health care system for a cancer diagnosis through the emergency room (ER) may be indicative of scarce proper screening or a patient that waited too long before seeking health care services.

Purpose: In this study, we examine factors associated with the use of the ER as an entry point into the healthcare system to initiate a cancer diagnosis among Puerto Rico's Government Health Plan (GHP) patients and compare the 1-year survival of GHP patients that initiated cancer diagnosis in the ER with those that initiated the diagnosis in a physician's office.

Methods: We conducted a secondary data analysis based on the Puerto Rico Central Cancer Registry and the Puerto Rico Health Insurance Administration databases. Colorectal cancer patients diagnosed in 2012, aged 50-64 years of age and enrolled in the GHP were included in the study (n=190). Crude odds ratio, adjusted odds ratio and their 95% confidence intervals were reported. We used the Kaplan-Meier method to generate survival curves. Differences between curves were analyzed using the log-rank test. Multivariate Cox regression analysis was performed to evaluate the association between ER presentation and one-year cause-specific survival.

Results: We found that 37.37% of the study population had an ER presentation. Male patients had a higher occurrence of having an ER presentation (66.20%), while 76.06% of the patients with an ER presentation were diagnosed in late stage. ER presentation was a highly predictive factor of cancer mortality in the year following the diagnosis. These patients had between 3.99 to 4.24 times higher mortality risk than non-ER presentation patients (p-value < 0.05).

Conclusion: Late presentation for colorectal cancer diagnosis through an ER visit is a significant concern that influences negatively on the patient's outcome. Efforts at increasing primary care visits and routine screening tests among GHP beneficiaries could improve survival.

P-26

CANCER TREATMENT DELAY STATISTICS FOR SIX MAJOR TYPES OF CANCER IN THE STATE OF MISSOURI

C Schmaltz[1,2], S Homan[3], S Yun[3], J Jackson-Thompson[1,2,4], N Rold[1], J Du[1]

[1]Missouri Cancer Registry and Research Center, Columbia, MO, United States; [2]School of Medicine Department of Health Management and Informatics (HMI), University of Missouri-Columbia, Columbia, MO, United States; [3]Missouri Department of Health and Senior Services, Jefferson City, MO, United States; [4]MU Informatics Institute, University of Missouri-Columbia, Columbia, MO, United States

Background: The Missouri Cancer Registry (MCR) collects population-based cancer incidence and first-course treatment data on Missouri residents diagnosed with reportable malignant neoplasms (192.650-192.657 RSMo). To monitor access to cancer treatment, the Missouri Comprehensive Cancer Control Program used the MCR data to measure cancer treatment delay.

Purpose: To provide statistics on the delay of cancer treatment for Missourians diagnosed with six major types of cancer.

Methods: We initially selected Missouri residents diagnosed between 2010 and 2013 with six major types of cancer: colon, lung and bronchus, melanoma of the skin, female breast, cervix uteri, and urinary bladder. Expertise from Certified Tumor Registrars (CTRs) was obtained to decide exclusion criteria (e.g., patients receiving no treatment or experimental/unproven treatments). For the selected patients, the duration between diagnosis and start of treatment was summarized in terms of percentiles of the duration and the percent of patients treated within specified timeframes.

Results: The data show that the percent of patients receiving treatment within 60 days was generally around 90% or greater with the exception of those diagnosed with lung and bronchus cancer (in the mid-80s). A summary of results, including the distribution of the treatment delays and the percent treated within 30 days, by cancer type and year of diagnosis will be presented.

Conclusions: These data provide quantitative population-based data on the delay to treatment for Missourians diagnosed with one of six types of cancer. Delays may play an important role in outcomes and indicate the ease/difficulty of accessing health care in Missouri. We will continue to track these data to monitor the delay. It is hoped that discussions with staff at other central registries on the use of these kinds of data will result in further refinement to inform public health programs in Missouri and elsewhere.

Posters

GRAND BALLROOM EFGH

P-27

DESCRIPTIVE EPIDEMIOLOGY OF BREAST CANCERS AMONG TAKE CHARGE! SCREENINGS, OKLAHOMA, 2004-2013
AA Sheikh[1], A Pate[2], RE Espinoza[1]
[1]Oklahoma State Department of Health, Oklahoma City, OK, United States; [2]School of Nursing and Allied Health Sciences, Southwestern Oklahoma State University, Weatherford, OK, United States

Background: This study describes the geographic distribution of cancers among women screened through the Oklahoma Breast and Cervical Cancer Early Detection Program, known as Take Charge! (TC!) and highlights areas of need for planning purposes.

Purpose: To describe the geographic patterns of cancers diagnosed, their stage at diagnosis, and their proximity to screening and mammography facilities among women screened through TC!

Methods: Data from TC! were used to describe screening history and geographic distribution of women screened between 2004 and 2013. Cancer cases were linked with the Oklahoma Central Cancer Registry (OCCR) to obtain stage of diagnosis. Descriptive statistics were produced for these cases by age and race. Odds ratios will explore an association between screening history and stage of diagnosis using SAS software. Spatial analysis of geographic patterns will be conducted using ArcGIS.

Results: Over half (51%) of the TC! cancers (472) were diagnosed at an early stage (*in situ* or local). Preliminary analysis shows that most of the breast cancer cases were diagnosed among women who resided in the central region (Oklahoma and Cleveland counties), followed by the southeast region of Oklahoma. We are testing the hypothesis that women with no prior screening history had increased odds of being diagnosed with a late-stage cancer. Additional analyses will investigate stage at diagnosis in association with distance to screening services. These analyses are currently in process.

Conclusions: The study investigates the current literature that regular breast screening improves diagnosis of cancer at an early stage, reducing cost and improving survival. The study also investigates access to screening services in Oklahoma. Increased distance from screening facilities is a hypothesized barrier in obtaining regular screenings, increasing the risk of late stage diagnosis.

P-28

OBESITY, TOBACCO AND ESOPHAGEAL ADENOCARCINOMA IN OHIO
J Stephens[1], J Fisher[2], S Mikhail[3], H Sobotka[4], R Baltic[5], J Krok-Schoen[5], M Lynn[6], J Kollman[4], E Paskett[7]
[1]Center for Biostatistics, Department of Biomedical Informatics, College of Medicine, The Ohio State University, Columbus, OH, United States; [2]James Cancer Hospital and Solove Research Institute, The Ohio State University, Columbus, OH, United States; [3]Department of Internal Medicine, Division of Medical Oncology, College of Medicine, The Ohio State University, Columbus, OH, United States; [4]Chronic Disease Epidemiology and Evaluation, Bureau of Health Promotion, Office of Health Improvement and Wellness, Ohio Department of Health, Columbus, OH, United States; [5]Comprehensive Cancer Center, The Ohio State University, Columbus, OH, United States; [6]Breast and Cervical Cancer Program, Comprehensive Cancer Control Program, Bureau of Health Promotion, Office of Health Improvement and Wellness, Ohio Department of Health, Columbus, OH, United States; [7]Division of Cancer Prevention and Control, Department of Internal Medicine, College of Medicine, Division of Epidemiology, College of Public Health, Comprehensive Cancer Center, The Ohio State University, Columbus, OH, United States

Obesity, gastroesophageal reflux, and smoking have been shown to be risk factors for esophageal adenocarcinoma (EAC). The prevalence of obesity among adults (ages 18+) in Ohio is one of the highest in the United States (32.6%, 8th highest state in 2014). The percentage of Ohio adults who reported current cigarette smoking in 2014 was 21.0%, which ranked Ohio the 12th highest state. The goal of this study was to examine the associations between obesity and/or tobacco use and EAC in Ohio, and examine how Ohio rates compare to the U.S. rates. Preliminary examination of EAC incident cases reported to the Ohio Cancer Incidence Surveillance System (OCISS) at the Ohio Department of Health showed that of the 28 counties with the highest proportion of obesity (2009), 12 counties were in the highest quartile of EAC incidence. This was 71% greater than the 7 counties expected in the absence of a relationship. EAC will be described by demographics (age, sex, race), stage at diagnosis and geography in Ohio. These characteristics will be explored over time (1996-2013) and in combination with obesity and tobacco patterns to determine if patterns of association exist in Ohio. These patterns and associations will help inform public health practitioners in planning interventions in Ohio.

P-29

THE ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND DEPRESSION AMONG CANCER SURVIVORS RESIDING IN BRAZIL

GD de Oliveira[1], SC Oancea[1,2], LB Nucci[3]
[1]University of North Dakota - School of Medicine and Health and Sciences, Grand Forks, ND, United States; [2]University of North Dakota - North Dakota Statewide Cancer Registry, Grand Forks, ND, United States; [3]School of Medicine - Pontificia Universidade de Campinas, Campinas, SP, Brazil

Studies have suggested that in the general population, the lack of Physical Activity (PA) can lead to depression (D).[1] Similar studies have been performed among adult cancer survivors, but mostly in North America.[2] The results of those studies may not necessarily be applicable to populations from all over the globe, due to variations is culture, diet, etc. As an example, the association between PA and D among cancer survivors residing in South American countries has not yet been investigated. The purpose of this study is to utilize the Brazilian National Health Survey to investigate this association among cancer survivors residing in Brazil. The present study will include data collected from 930 adult cancer survivors, respondents to the national household-based survey conducted in Brazil, from August 2013 until February 2014. Multivariable weighted logistic regression analysis will be performed to investigate the association between PA and D among Brazilian cancer survivors, while adjusting for possible confounders such as: sex, race, education, health insurance, marital status, time since cancer diagnosis, and number of comorbidities. All statistical analyses will be performed using SAS v9.4. Statistical significance level will be set to 0.05. The presented results will include descriptive statistics and the unadjusted and adjusted odds ratios. The findings of the present study will open the door to future investigations trying to better understand the risk factors associated with D among cancer survivors residing in Brazil.

References:

1. Mammen G, Faulkner G. Physical activity and the prevention of depression: a systematic review of prospective studies. *Am J Prev Med.* 2013;45:649-57.
2. Mishra SI, Scherer RW, Snyder C, Geigle P, Gotay C. Are exercise programs effective for improving health-related quality of life among cancer survivors? A systematic review and meta-analysis. *Oncol Nurs Forum.* 2014;41:E326-42.

P-30

MISSOURI THYROID NODULE ELECTRONIC DATABASE MU-TNED LONG-TERM STUDY OF THYROID NODULES

I Zachary[1], U Khan[1], M Esebua[1]
[1]University of Missouri School of Medicine, Columbia, MO, United States

Background: Thyroid nodules (TNs) are common findings with a prevalence of palpable thyroid nodules in about 5% women and 1% in men. Differentiated thyroid cancer (DTC) comprises about 90% of all thyroid cancers and the yearly incidence has increased in the United States. Although there is a 99% survival in differentiated thyroid cancer, there is an increasing population of patients that are now post therapy for thyroid cancer.

Purpose: Develop a long-term follow up mechanism to use clinical data including thyroid nodules, patients at risk of developing thyroid cancer, and patients post therapy for thyroid cancer

Methods: MU-TNED was designed to focus on patients with TNs to enable review of epidemiological and clinical data, quality control and quality improvement of fine needle aspiration (FNA), and long-term survival of thyroid cancer patients. With increasing incidence and prevalence of thyroid cancer, experts recommend management of TNs and thyroid cancer and an increasing focus on appropriate use of FNA of thyroid nodules. We designed the MU-TNED database with a multidisciplinary team including departments of pathology, endocrinology, and health informatics.

Results: The MU-TNED web application was successfully used to import 935 TN cases from 2008 to 2012. Increasingly, in healthcare, use of informatics-supported tools enable providers to improve patient care and collaborate in translational research. MU-TNED was specifically designed to follow patients in a longitudinal manner and support multiple aspects of research.

Conclusion: Long-term follow-up of patients and the ability to collaborate is essential because of the nature of this disease; a disease with high prevalence but low mortality, therefore collaborative data analysis may provide more answers, especially related to long-term population outcomes.

Posters

GRAND BALLROOM EFGH

P-31

NEW JERSEY GOES QUACRS! IMPROVING THE QUALITY, COMPLETENESS AND TIMELINESS OF HOSPITAL REPORTING TO THE CENTRAL REGISTRY USING HOSPITAL QUALITY REPORTS

S Hill[1,2], L Paddock[1,2], M Hansen[2], M Lemieux[1,2], H Katz[2], F Krol[2], H Stabinsky[1,2], D Horn[1,2], R Chowdhury[1,2], A Stroup[1,2,3]
[1]New Jersey State Cancer Registry, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, United States; [2]New Jersey State Cancer Registry, Cancer Epidemiology Services, New Jersey Department of Health, Trenton, NJ, United States; [3]Rutgers School of Public Health, Department of Epidemiology, Piscataway, NJ, United States

Background and Significance: Central cancer registries (CCR) are expected to meet quality and completeness standards for state, NCI/SEER, CDC/NPCR, and NAACCR cancer surveillance programs. NJSCR relies on data from hospitals to provide high-quality abstracts to meet these standards. When hospital submissions are not timely and complete, additional time and effort is required by NJSCR to conduct audits, editing, and other quality assurance activities. New Jersey Administrative Code N.J.A.C. 8:57A-1.4 requires hospitals to report all cancer cases to NJSCR within 6 months of diagnosis. As of August 1, 2014, about half (32/62) of New Jersey hospitals had submitted fewer than 90% of their expected cases for the 2013 accession year.

Methods: In 2014, NJSCR convened a Quality Control Workgroup to address the issues with data submitted by hospital registries. The Workgroup developed the Quarterly Hospital Quality and Completeness Report (QuaCR) to provide regular feedback to New Jersey hospitals. NJSCR generates the report using cases submitted by each facility. It measures completeness, timeliness and compliance with 10 data quality metrics (e.g., % Unknown Social Security Numbers, % Non-Specific Histology).

Results: QuaCRs were fully implemented beginning with the 2014 diagnosis year. The number of facilities that were less than 90% complete by August 1st decreased from 32 in 2013 to 26 in 2014, 51% to 42%. The percent of unknown or non-specific values in 10 key fields also decreased significantly, including a 31.3% decline in unknown Social Security number and a 26.9% decline in non-specific histology. NJSCR used the QuaCR to identify facilities eligible for the NJSCR Award for Excellence for the 2014 accession year.

Conclusion: By providing regular feedback to reporting hospitals on the data they submit to the CCR with awards for high performance, the NJSCR has been able to improve the completeness, timeliness and quality of the data it receives.

P-32

PARALLEL OBSERVATIONAL STUDIES IN A POST-MARKETING SETTING ASSESSING THE INCIDENCE OF OSTEOSARCOMA AMONG TERIPARATIDE USERS VERSUS A COMPARATOR GROUP OF NONUSERS BY LINKING STATE CANCER REGISTRY DATA TO DATA FROM TWO LARGE PHARMACY CLAIMS DATABASES

N Kellier-Steele[1], A Gilsenan[2], K Midkff[2], D Harris[2], E Andrews[2], J Acquavella[3]
[1]Eli Lilly and Company, Indianapolis, IN, United States; [2]RTI Health Solutions, Research Triangle Park, NC, United States; [3]Aarhus University Hospital, Aarhus N, Denmark

Background: Long-term post-marketing surveillance studies are used routinely to monitor safety and to quantify the occurrence of safety outcomes among patients being treated with specific medications compared with similar patients with different or no treatment. Challenges to conducting traditional post-marketing surveillance studies for rare cancer outcomes include adequate case identification, exposure assessment, longitudinal follow-up, and sufficient study size.

Objective: To describe the rationale and methods of two parallel post-marketing surveillance studies using claims databases and cancer registries to assess the risk of a rare outcome, osteosarcoma (OS).

Methods/Approach: Study cohorts will be identified using the Medicare database (aged 65 and older) and Symphony Health Solutions' (SHS) national outpatient pharmacy claims database (aged 18 years and older). Drug exposure data will be obtained from pharmacy claims for dispensed medications and OS diagnosis information will be obtained through linkages with state cancer registry files using trusted third parties or de-identification software.

Results: The process for implementing the linkages between the pharmacy claims databases and multiple cancer registries will be described including the average length of time for approval and the linkage process for both claims databases.

Conclusions/Implications: Linkage studies allow for monitoring important drug safety issues with minimal patient burden. Large pharmacy claims databases include a record of outpatient medication dispensing and are not anticipated to be biased with regard to the study outcome. Cancer registry data are the most accurate and complete population-based source of cancer outcomes, which use specific cancer codes, minimizing the possibility of misclassification of the tumor type.

P-33

OPERATIONS AND PRELIMINARY RESULTS OF A LINKAGE OF CANCER REGISTRY DATA AND HIV DATA

L Maniscalco[1,2], X Li[1,2], P Andrews[1,2], W Robinson[2,3], X Wu[1,2]
[1]Louisiana Tumor Registry, New Orleans, LA, United States; [2]Louisiana State University Health Sciences Center School of Public Health, New Orleans, LA, United States; [3]Louisiana Department of Health and Hospitals Office of Public Health, New Orleans, LA, United States

Background/Purpose: HIV/AIDS patients are at an increased risk of developing certain types of cancers due to weakened immune systems and high exposures to some viral infections. Concurrent HIV and cancer also present special challenges in the clinic for simultaneous treatment of cancer and HIV. The linkage of population-based Louisiana Tumor Registry (LTR) data with STD/HIV Program (SHP) data will improve cancer and HIV research in these areas. The purpose of this presentation is to share our experience in linking registry data with the state HIV data.

Methods/Approach: A data-sharing agreement was developed and approved by the authorities from both parties (LTR and SHP) for annual linkage activities. Specific procedures were designed and implemented including the selection of variables for the linkage and crosswalk file to ensure full protection of confidential patient information. Data release policies that will govern all data releases were established. The first linkage included cancers diagnosed from 1995 to 2013.

Results: Overall, 0.6% (n=2,642) of LTR records matched with SPH data. This represented 6.2% of the persons ever living with HIV in Louisiana. Approximately 77% (n=2,033) of those matches were among those with HIV-related cancers. In an analysis of the data from 1995 to 2012, 79.6% of those that were HIV positive were males and 59.5% were black.

Conclusions/Implications: Monitoring cancer and HIV comorbidity is critical to assessing disease trends and may reveal prevention opportunities. With an appropriate data-sharing agreement and specific procedures to protect confidential patient information through the linkage process, a successful linkage is possible. An annual linkage of this nature is planned so that the prevalence of HIV/AIDS within Louisiana's cancer population can remain up to date and provide an excellent starting point for cancer research in the HIV/AIDS community.

P-34

COMPARING ELECTRONIC, SYNOPTIC PATHOLOGY REPORTS TO TRADITIONAL NARRATIVE PATHOLOGY REPORTS

C Moody[1], C Morris[1]
[1]California Cancer Registry, Sacramento, CA, United States

The California Cancer Registry performed an internal evaluation of electronic pathology reports submitted in synoptic format and compared them to narrative reports. The decision was made to evaluate electronic pathology reports in College of American Pathologists Electronic Cancer Checklists (CAP eCC) format as compared to traditional narrative pathology reports for consistency, completeness, and data capture of relevant components of particular interest to surveillance.

The sites reviewed were: colon, lung, breast, prostate, kidney and thyroid. The sample size for electronic path reports was: 10 cases for breast, colon and thyroid; 7 cases for lung; and 2 each for kidney and prostate. Narrative path reports had a total of 9 each across all sites with the exception of breast, which had 10 cases reviewed. Each pathology report was manually reviewed to characterize selected data fields as available/not available in each format, with comments included for analysis.

Data fields reviewed were Patient Address, Sex, Race, Hispanic Ethnicity, Date of Birth, Social Security Number, Specimen Date, Path Report Number, Physician, Sending Facility, Specimen Type, Subsite, Site, Final Diagnosis, Tumor Size, Histology, Behavior, Grade, Laterality, Lymph Nodes Exam, Lymph Nodes Pos, Path TNM, and Path Stage.

Analysis revealed that generally electronic, synoptic path reports were fairly comprehensive; however, tumor markers were absent from all breast and prostate cases reviewed. Whereas, narrative reports contained tumor marker information in comments sections for prostate (n=2) and breast (n=4). Race information was provided for most electronic, synoptic reports with the exception of three colon cases. However, narrative path reports had no race information provided other than "unknown." The poster will illustrate detailed findings across all fields for both path report types (electronic and narrative). Conclusions and recommendations based on analysis of findings will be presented.

Posters

GRAND BALLROOM EFGH

P-35

TUMOUR STREAM IDENTIFICATION FROM OPTICAL CHARACTER RECOGNITION OF FAXES

J Patrick[1], M Li[1], P Asgari[1]
[1]Health Language Analytics Global, Sydney/NSW, Australia

A complete registry workflow requires: case identification, tumor stream identification, content extraction, and codification. This study reports on building part of this workflow for faxes which require optical character recognition to convert reports to digital texts for the Cancer Institute of NSW (CINSW).

A total of 100,000 reports were used to determine an error rate of words of the OCR output. In 33 million words the error was 18.3%. Learning algorithms for spelling correction reduced the error to 10%.

Identifying the structure of a document is key to correctly identifying the tumor stream. From 6,006 reports, 58.1% had identified the Final Diagnosis and History, while 16.0% and 11.0% had only Conclusions and History respectively.

Three rounds of language modelling were conducted on a 21 class tumor stream taxonomy to give an accuracy of 91.82%. A 30 class classification gave an accuracy of 89.94%.

However, the classes computed in the 30 classes were mapped to the 21 classes to yield an accuracy of 90.48%. But the individual class performances indicate that class by class the 30 class results are much better (Table 1). A simplified form of this classifier is now operational at the CINSW.

Table 1. Percentage of classes that reach nominated accuracy levels.

Accuracy Levels by classes	Direct Classification of 21 classes	Direct classification of 30 classes	Inference of 21 classes from 30 classes
Accuracy over 90%	19%	40%	48%
Sensitivity over 90%	38%	63%	76%
Accuracy over 80%	24%	58%	71%
Sensitivity over 80%	52%	80%	86%

The conclusions are that, despite significant errors due to OCR, useful tumor stream identification can be achieved, and, in the long term it is likely to be better to use a higher number of more specific classes for tumor stream identification and then map those results into a smaller taxonomy if needed for workflow or reporting processes.

P-36

CALIFORNIA MEANINGFUL USE DATA REPORTING UPDATE

A Turkseven[1]
[1]California Cancer Registry, Sacramento, CA, United States

With the implementation of Meaning Use (MU) initiatives to use certified electronic health record technology to improve quality, safety, efficiency and reduce health disparities, the California Cancer Registry has made strides to onboard and receive physician files.

This poster will demonstrate the time and resources devoted to educating physicians on MU. This includes, but is not limited to, participation at medical conferences, onsite visits to medical clinics, and communication with software vendors. The poster will illustrate the process required to build our MU public health website as well as the infrastructure necessary for physicians and for our internal software checks and balances.

Additionally, the poster will illustrate the importance of messaging and teaching physicians what role the California Cancer Registry plays in MU reporting. Various methods were employed including creation of a newsletter to physician offices with information on MU. This poster will provide information on the number of physicians registered and the number in testing and approved to submit files. Challenges encountered will also be highlighted, such as inconsistency between physician software vendors, cultural barriers, reluctance to share e-mail address, and philosophical hurdles with regard to access to their reported data. Finally, the poster will document the CCR's process for determining data quality.

NOTES:

P-37

COMPLETENESS OF SOURCE-LEVEL DATA ITEMS BASED ON TYPE OF SOURCE

A Kahn[1], M Schymura[1], T Juster[1]
[1]New York State Cancer Registry, Albany, NY, United States

Background: With increasing expectations from standard setters, researchers, and the public, central registries strive to maximize cancer case ascertainment without sacrificing data quality. Because of the shift to outpatient diagnosis and treatment, completeness of some cancer and personal information, generally available within hospital systems, can no longer be taken for granted.

Purpose: To describe the completeness of demographic and diagnostic information received from the various source types.

Methods: Records received by December, 2015 from New York reporting sources for 2012-2014 diagnoses were analyzed for completeness of key data items. The 555,887 records were also compared to the corresponding 353,792 consolidated cases. Abstracts from inpatient hospital records (IP) accounted for 38% of the sources, while outpatient/ambulatory centers (OP) (37.4%), radiation-oncology centers (RT) (8.2%), physicians' offices (MD) (9.8%), and laboratories (LAB) (6.6%), including lab-only records from hospitals, accounted for the rest. We excluded records received through interstate data exchange, and only included records from independent laboratories for tumors not reported by other sources.

Results: Race was missing in 2.6% of the IP abstracts, 2.9% of RT records, 3.9% of OP records, 13.6% of MD records, and 53% of LAB records. Spanish ethnicity was missing in 4.2% of the IP abstracts, 17.3% of RT records, 6.5% of OP records, 16.1% of MD records, and 57.4% of LAB records. For solid tumors, summary stage was unknown for 11.3% of IP abstracts, 38% of RT records, 12% of OP records, 49.7% of MD records, and 48.3% of LAB records. The presentation will include additional inter-source comparisons and source vs. consolidated record concordance.

Conclusions: While facilities other than hospitals are crucial for identifying the burden of cancer, the data completeness, frequently reported without involving CTRs, differs from that obtained from hospital inpatient abstracts.

P-38

INNOVATIVE APPROACH TO IMPROVE COMPLETENESS OF TREATMENT IN CANCER REGISTRY DATA

M Hsieh[1], B Mumphrey[1], L Pareti[1], X Wu[1]
[1]Louisiana Tumor Registry, School of Public Health, Louisiana State University Health Sciences Center, New Orleans, LA, United States

Background: In meeting the funding agencies' requirement for 12-month data completeness and legislative obligation, hospital registries are required to submit cancer data to the Louisiana Tumor Registry (LTR) within 6 months of diagnosis. However, enforcing timely reporting may result in incomplete adjuvant treatment. Although additional treatment information can be obtained via retransmission of multiple NAACCR modified (NM) abstracts, it involves very time-consuming multiple consolidations of the same case. To avoid this, the LTR has requested facilities to resubmit 15-month data to update treatment related information.

Methods: LTR requested ACoS facilities to resubmit 15-month data for cases diagnosed in 2013 in early April, 2015. Data linkage and comparison between resubmitted records with existing records were conducted using Pearl Script. Data elements used for matching same patient/tumor were name, SSN, DOB, primary site, laterality and facility. Treatment data items were compared as: known vs none/unknown and known vs known with different code. Only matched records with updated treatment data were imported into the LTR database and flagged as NM records for manual consolidation. Non-matched records were also loaded in database as potential new cases for further investigation.

Results: A total of 26,916 resubmitted 2013 NAACCR abstracts were received from 33 ACoS hospitals and freestanding radiation centers. About 19% (5,077 abstracts with updates) had at least one update related to treatment and an average of three updates per updated abstract. The majority of updates (77.6%) were changed from unknown to known value and 53% of updates were related to radiation treatment fields. In addition, 122 potential new cases were identified, 44 of them were truly missed cases after investigated.

Conclusion: Linking 15-month resubmitted data is a cost-effective approach to obtain complete treatment information from reporting facilities and identify potential missed cases.

Posters

GRAND BALLROOM EFGH

P-39

USING GEOGRAPHIC INFORMATION SYSTEMS TO ANALYZE DATA TO EXPAND THE REACH OF THE INDIANA BREAST AND CERVICAL CANCER PROGRAM (IN-BCCP)

K Tewanger[1], C Cunningham[2], L Ruppert[1]
[1]Indiana State Department of Health, Indianapolis, IN, United States; [2]Community Solutions, Indianapolis, IN, United States

Background: The IN-BCCP provides breast and cervical cancer screening and diagnostic services to underserved women. External evaluation consultants conducted a market analysis to determine the reach and scope of the program and identify gaps or areas for improvement.

Purpose: The analysis was conducted to examine where IN-BCCP provider screening sites are in relationship to potentially eligible women not participating in the program.

Methods: Evaluators used geographic information systems to analyze the following data from 2009 to 2013: IN-BCCP, Indiana State Cancer Registry (ISCR), and U.S. Census.

Results: The IN-BCCP has successfully maintained screening providers statewide. Most program participants are less than 30 miles from a screening provider; although several small pockets were identified where participants must travel 30 to 50 miles or more to reach a program provider. The data analysis also identified a higher percentage of breast cancers being diagnosed at the regional stage (32.4%) for IN-BCCP participants compared to the percentage in the ISCR (23.1%), and a higher percentage of distant breast cancers (6.1%) compared to the percentage in the ISCR (5.1%). The IN-BCCP served 23,670 women between 2009 and 2013, which is only 1.8 percent of women potentially eligible for IN-BCCP based on age and income.

Conclusions: The IN-BCCP is reaching rarely or never screened women that do not have access to routine medical care as evidenced by the regional and distant diagnosis data. The IN-BCCP identified several pockets where provider recruitment must be directed to ensure participants have access to screening services within a reasonable driving distance, particularly where the lower income participants are located. The analysis revealed pockets of low-income women potentially eligible for the program, which may be reached through targeted education and outreach to increase early detection of breast and cervical cancer.

P-40

THE ARGUMENT FOR COLLECTING ABSTRACTING RELATIONSHIPS FROM REPORTING FACILITIES

C Klaus[1]
[1]North Carolina Central Cancer Registry, North Carolina, United States

CCRs find themselves compelled to acquire and maintain data on ownership or abstracting relationships between reporting facilities. An abstracting relationship we define as one facility abstracting on behalf of another that it does not own, and that does not take part in meaningful use. Ownership relationships can be tracked by collecting relationship data periodically, as a facility attribute. Abstracting relationships tend to be more tenuous and thus must be collected as a case attribute and therefore require more effort to track. However, without abstracting relationship data it is not possible to use a process of elimination to identify the subset of path reports without corresponding abstracted cases that were ordered by reporters that do not submit a corresponding abstracted case.

We have proposed adding an item to the NAACCR data collection standard, "Abstracted On Behalf Of," to enable the collection of abstracting relationships as case attributes, by storing the facility identification number (FIN) of the facility abstracted for (abstractee), as a case attribute. We propose for discussion a set of procedures and requirements that will: (1) leverage cancer registry software to minimize the amount of additional keystrokes required to record abstractee FIN at hospital registries; (2) set forth a central registry protocol to enable the update of facility, abstracting, and/or ownership relationship data at the speed of facility incorporation/turnover; and (3) enable cases to be correctly credited to diagnosing or treating facilities regardless of abstracting relationship and thereby simplify frequency counts.

P-41

TRY AND TRY AGAIN: EARLY EXPERIENCE WITH MEANINGFUL USE REGISTRATION AND REPORTING, UTAH

CL Bateman[1], K Herget[1], S McFadden[1], S Bair[1], J Garvin[1], C Sweeney[1]
[1]Utah Cancer Registry, Salt Lake City, UT, United States

Background: The Centers for Medicare and Medicaid Services (CMS) Electronic Health Record Incentive Program, also known as Meaningful Use (MU), encourages health care providers to use electronic medical records and to electronically report to public health entities. The Utah Cancer Registry (UCR) declared readiness to receive cancer reports from providers in 2015.

Purpose: To describe UCR's experience assisting providers with the MU process that involves: providers registering their intent, UCR inviting them to submit electronically, testing and validation of submissions, and finally, providers submitting production data.

Methods: The UCR has tracked all registered providers in Utah as they moved through the steps of the process.

Results: As of December 2015, the UCR has had 67 providers register their intent. These included 4 hospitals or large clinics (> 50 individual providers), 21 medium clinics (2 - 50), and 42 sole provider clinics. These provider groups have 25 different electronic medical record vendors in total. Eight providers have been invited to submit electronically, and 4 providers have submitted test cases, taking a median 72 days to submit. So far, three providers have successfully submitted a Health Level 7 Clinical Document Architecture file that has passed National Institute of Standards and Technology validation; however, two of the provider's files have a structural issue and the other has not sent real data so that content validation can occur.

Conclusion: Providers in Utah are interested in participating in cancer reporting through MU. Providing a test file resulting in successful validation is a significant hurdle and source of delay for participation. The UCR is working to identify barriers to successful testing and validation processes.

P-42

METHODS FOR BATCH ESTIMATION OF ATTRIBUTE ASSOCIATION ERROR PROBABILITY

C Klaus[1]
[1]North Carolina Central Cancer Registry, NC, United States

CCRs find themselves compelled to rely heavily on record linkage for acquisition of new attributes to a cancer abstract, or confirmation/ rebuttal of existing ones. We argue that the basic unit by which confidence in linkage results can be assessed is the attribute association (AA), and that the most practical corresponding error metric is attribute association error probability (AAEP). We present an overview of how we have combined AAEP estimates across hierarchical attribute associations such as medical record geocodes, with record level (interactive) methods. In order to make use of AAEP estimates effectively for spatial statistics, all cases in a dataset must be evaluated for AAEP for all associations that enable or modify spatiotemporal relationships. This requires automated or 'batch' estimation of AAEP for all cases not interactively assessed for AAEP. We discuss the results of a series of experiments whereby AAEP estimates were assigned to cancer cases with batch processes using techniques that minimize statistical artifacts.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Posters

GRAND BALLROOM EFGH

P-43

UTILIZATION OF DETAILED TOBACCO USE DATA FOR POPULATION MANAGEMENT

M Le Beau[1], K Johnson[1]
[1]Lewis Cancer and Research Pavilion, Savannah, GA, United States

At the Nancy N. and J.C. Lewis Cancer & Research Pavilion, registrars collect data on tobacco use habits of patients diagnosed with a reportable cancer. The fields currently collected are "never used," "cigarette smoker, current," "cigar/pipe smoker, current," "snuff/chew/smokeless, current," "combination use, current," "previous use/former user," and "unknown." These fields can be further separated to include frequency and duration of tobacco use for those patients who are current and former tobacco users. Cancer registry standard-setting organizations do not currently require the collection of tobacco data. More detailed information on the amount and frequency of tobacco use will allow an institution to better allocate resources for managing current and former tobacco users.

Targeted activities to promote healthy behaviors based on effective data collection and cancer patient population management include tobacco cessation programs and increased symptom management resources that can be further defined by frequency and duration of tobacco use years.

The cancer program can use accurate and consistent tobacco use data collection items to design and implement programs that target patients with high levels of tobacco use. These programs can help in promoting healthy behaviors among the targeted population and assist in reducing the rate of current tobacco use among patients receiving cancer treatment or cancer survivors.

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

P-44

CALIFORNIA'S EFFORTS TO REACH AUTOMATED VISUAL EDITING

J Mazreku[1]
[1]California Cancer Registry, Sacramento, CA, United States

Background: Visual editing is defined in the State of California as a text to code quality control review of an abstract after it has been uploaded into the Eureka database software. Over the years, a slow transition has been made away from 100% visual editing that was in place when Eureka was first deployed to the current 5% that is performed. As California's case load has continued to increase exponentially, previous years' expectations to perform visual editing become no longer possible. This has created a gap between the reduction in manual quality control efforts and data quality.

Purpose: The California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program has implemented automated logic throughout the different processing levels in Eureka: Source Logic, Edit to Auto Change Rules, Class of Case Rules, Linkage Automation, and Multi-Document Consolidation. All of this complex logic works towards expanding the visual editing process to be fully automated and bridge the identified gap.

Methods/Approach: The manual visual editing process is greatly affected by grey areas in interpreting standards, which leads to potential inconsistencies amongst Certified Tumor Registrars performing the task. Automation logic removes this inconsistency and provides a reliable way to document how and why decisions are made in Eureka. Automation logic is implemented in a three-phase process: (1) extensive analysis of current standards and data quality, (2) implementation, and (3) post-implementation analysis to ensure successful application.

Results/Conclusion: The current business practice is missing the focus of adapting current work activities to meet future needs. Manual quality control efforts need to be advanced and adapted to meet where the field is going. Instead of targeting a small percentage of cases on upload, the task can be moved to an analytic auditing process after completion. This transition removes the high level of potential interpretation inconsistencies.

P-45

UTILIZING REGISTRY PLUS™ WEB PLUS AS A GATEWAY TO ELECTRONIC REPORTING: IMPROVING EFFICIENCIES AT THE NEW JERSEY STATE CANCER REGISTRY

A Stroup[2], M Tumblety[1], J Johnson[2]
[1]Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, United States; [2]Cancer Epidemiology Services, New Jersey Department of Health, Trenton, NJ, United States

Background: Registry Plus™ Web Plus ("Web Plus") is a web-based application developed by the Centers for Disease Control and Prevention designed to collect cancer data in a secure manner. This electronic method of submission may significantly reduce the amount of paper management required by the registry and the security risks associated with paper-based reports.

Purpose: Facilitate a process to eliminate cancer data reported via fax to the New Jersey State Cancer Registry (NJSCR) through a collaborative, interagency workgroup, combining content expertise from the New Jersey Department of Health NJSCR and technical expertise from the Rutgers Cancer Institute of New Jersey (RCINJ) Bioinformatics Core. Our primary objective was to promote the use of electronic reporting via Web Plus.

Methods: Eligible non-E-path facilities were identified based on their volume of cancer cases and contacted through phone, U.S. postal mail, or email. Facilities also contacted the NJSCR to express interest in reporting electronically. Facilities were asked to register online through the NJSCR website: http://nj.gov/health/ces/nonhospitalrpt.shtml. A username and password is generated and the facility is identified and matched with a user profile in Web Plus. Each user is given a "Facility Abstractor" role, conforming to the RCINJ access control and security guidelines. NJSCR staff train new users and are consulted for content-specific questions. The Web Plus form templates may be tailored for radiation treatment facilities by NJSCR. Data are exported monthly from the Web Plus database at RCINJ for integration into SEER*DMS.

Results: To date, 129 users associated with 75 facilities have registered for Web Plus. Since our first monthly export in April of 2014, a total of 4,291 cancer cases were reported via Web Plus.

Conclusions: Web Plus can be used to enhance reporting from non-hospital and non-E-path facilities and improve data flow and efficiencies.

P-46

EFFECTIVE ENHANCEMENTS: USE OF TOOLS FOR MONITORING COMPLETENESS OF CANCER REPORTING IN MARYLAND

C Groves[1], D Holt[1], M Mesnard[1], S Negoita[1]
[1]Westat, Rockville, MD, United States

Background: A critical component to cancer registry management is assuring completeness of case ascertainment. The North American Association of Central Cancer Registries and the National Program of Cancer Registries have developed standards that not only address but require data completeness. In order to meet the required standards, Westat, on behalf of the Maryland Cancer Registry (MCR), developed several tools that have enhanced data acquisition including monitoring of reporting facilities and communication.

Purpose: The presentation seeks to describe the elements of process improvement, demonstrate the tools for monitoring completeness, and provide the positive impact on statewide registry operations.

Methods: To assist with monitoring, Westat collects monthly data on abstracts in a spreadsheet for the current case reporting year and calculates the 3 prior years of data to assess expected performance. Westat established written procedures for monitoring activities; developed ComTrack, a database that incorporates the data and serves as a tracking tool for communications with reporters; and created a database-generated facility report that captures completeness (if low/deficient), timeliness of reporting, and receipt of data submissions (if late/delinquent).

Results: Since initiating rigorous tracking, the numbers of deficient and delinquent facilities have decreased. The 2013 case count increased by over 2,000 cases, in part due to the intensive follow-up. Enhanced efforts have facilitated positive communication between reporters and the central registry. Processes led to improved organization in documenting and tracking interactions.

Conclusions/Implications: With the aid of new tools geared toward monitoring facilities, the MCR has experienced substantial gains. Case reporting has increased and data quality is improved. Communication and relationships are enhanced with the central registry having a greater understanding of issues affecting reporting.

Posters
GRAND BALLROOM EFGH

P-47

AUTOMATED LINKAGE: CREATING A NEW TUMOR FOR AN EXISTING PATIENT

M Brant[1], S Wood[1], M Scocozza[1], G Ciornii[1]
[1]California Cancer Registry, Sacramento, CA, United States

Background: To improve data quality and shorten the cycle between file receipt and completion, the Production Automation and Quality Control (PAQC) unit of the California Cancer Reporting and Epidemiologic Surveillance Program (CalCARES) focused on implementing automation solutions in CCR's customized application. The objective is to move towards system-wide continuous quality control and automate processes currently completed manually. Initially, the focus was on linkage automation rules based on the Surveillance, Epidemiology, and End Results Program Multiple Primary and Histology (MPH) Coding Rules. Initial rules were written under the premise that a case would potentially auto-link to a patient and then trigger an automation rule to auto-link to an existing case in the database when the requirement is met. Efforts transformed to resolve the question of how to create a new tumor automatically when it is obvious that it is not the tumor in the database.

Purpose: The overall goal of the negative linkage rule logic is to automatically create a new tumor for an incoming case that is a patient match, but the site-specific tumor linkage rules do not apply to the tumor already collected in the database; thereby sending cases to manual review only when the sites are commonly linked.

Methods/Approach: The PAQC unit, consisting of multiple business analysts (CTRs), programmers, and a system architect used a project management approach. A combined energy was exercised to determine an approach for creating a rule that would identify a new tumor. A decision was made to do further analysis to determine whether implemented site-specific rules that did not fire on complex cases could possibly match a tumor. SQL queries were run to identify tumors that fit the MPH site groupings used in the site-specific rules as well as the associated sites code of the admissions linked to them. Results were placed into spreadsheets and analysis was performed by a central registry CTR.

P-48

WARNING! IS IT REALLY A DCO?

C Santaella-Del Valle[1], C Gonzalez-Mictil[1], O Centeno-Rodriguez[1], C Torres-Cintron[1], K Ortiz-Ortiz[1], Y Roman-Ruiz[1], Y Santiago-Colon[1], D Zavala[1], G Tortolero[1]
[1]Puerto Rico Central Cancer Registry, San Juan, Puerto Rico

Background: To improve data quality and completeness, registries perform various tasks including death clearance procedure. Each registry must meet minimum requirements and choose the best practices for conducting death clearance procedure as established in the Death Clearance Manual of January 2015. Therefore, the Puerto Rico Central Cancer Registry (PRCCR) established collaboration with the Puerto Rico Demographic Registry (PRDR) in which they annually send an electronic mortality file. However, to achieve the standard of less than 3% of death certificate only (DCO) cases, additional procedures where implemented.

Purpose: Assess the impact of the manual review of original paper death certificates (DC) against the electronic DC to confirm the accuracy of the registered data.

Methodology: Death clearance match and follow back were performed. Missing cases or cases with insufficient information were classified as potential DCOs. PRCCR registrars were allowed to review and scan the original paper DC at the PRDR. Identified discrepancies were organized for analysis and a final report with general findings was shared with the PRDR.

Results: For the period 2012-2013, a total of 1,284 paper DC were reviewed from which approximately 10.7% (137) were erroneously coded: 5.3% (68) had no cancer related cause of death, and 5.4% (69) had different primary sites. For the year 2012, the DCO percentage was reduced from 3.6% to 3.4% and for 2013 from 3.3% to 3.1%.

Conclusions: Potential DCOs with no cancer related cause of death were reclassified as non-reportable. This improved the percentage of DCO and overall quality of the PRCCR database. This process benefits both the PRCCR and PRDR by improving the quality of data and related processes. Since 2014, the PRCCR established this protocol as part of the death clearance procedure. As a result of this project, the PRCCR achieved the measure of less than 3% of DCOs required for NAACCR and NPCR certification.

P-49

DEATH CLEARANCE: SINGLE VS. MULTIPLE CAUSES OF DEATH

C González Mictil[1], C Santaella Del Valle[1], O Centeno Rodríguez[1], C Torres Cintrón[1], K Ortiz Ortiz[1], Y Román Ruiz[1], D Zavala[1]
[1]Puerto Rico Central Cancer Registry, San Juan, Puerto Rico

Background: The North American Association of Central Cancer Registries (NAACCR) Death Clearance procedures establish the evaluation of the underlying cause of death (COD) as a minimum requirement of the death clearance procedure. To improve data quality and completeness, the Puerto Rico Central Cancer Registry (PRCCR) signed a collaborative agreement with the Puerto Rico Demographic Registry (PRDR) to receive annually a copy of the electronic death certificates (DC) file that includes the underlying COD and multiple contributing COD.

Purpose: Assess the impact in PRCCR completeness by reviewing DC's multiple COD versus underlying COD in death clearance procedure.

Methodology: ICD-10 codes were used to identify cancer related COD for the period 2009-2013. Death clearance match was performed considering all four COD. Non-matched cases were classified as potential death certificate only (DCO) or follow back. The PRCCR database was updated once missed incidence cases were received from the follow back sources. Cases that were not received from the follow back sources were classified as DCO.

Results: The PRCCR received a total of 147,305 electronic DC for the period 2009-2013 from which approximately 20% had cancer related ICD codes in any of the four COD. Of these, approximately 6% (n=1,777) had a cancer related ICD code in any of the three contributing COD but not in the underlying COD. By reviewing the contributing COD, additional DCO cases were identified each year representing 10.8% of all DCO and 1.7% of the total number of records in the 2009-2013 period.

Conclusion: The review of the contributing COD has impacted the PRCCR's death clearance procedure by allowing the identification of additional cases. This approach ensures that the PRCCR counts all cancer cases in Puerto Rico. Even though this represents additional workload, the results support the review of multiple COD as best practice for death clearance procedure.

P-50

MEANINGFUL USE, ELECTRONIC PHYSICIAN REPORTING, AND THE TEXAS CANCER REGISTRY

P Thompson[1], B Gutierrez[1], A Dixon[1], J Davis[1]
[1]Texas Cancer Registry/Department of State Health Services, Austin, TX, United States

Background: The Centers for Medicare & Medicaid Services administers the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs, which provide incentive payments to eligible providers who successfully demonstrate the meaningful use of EHRs. Providers are required to report clinical data to many different groups and some of the reporting requirements were incorporated into the EHR incentive programs. State cancer registries are one such group to which providers are required to report. Consequently, state cancer registries were encouraged to participate in Meaningful Use (MU) but were not incentivized for their participation. Testing transmitted data and tracking providers is very time consuming and often yields little useable data for the registries.

Purpose: To evaluate the determinants of provider success in transmitting cancer data through an EHR to the Texas Cancer Registry (TCR) for MU.

Methods: Analysis will include comparing providers who have registered to participate in reporting to the TCR to those who registered and are in production.

Results: General statistics will be presented for the number of facilities and physicians registered, those with certified EHRs, and actively testing. Statistics for facilities in production will be shared to include cases received, unique cases, and areas of improved data. In addition, benefits will be discussed, as will future plans.

Conclusion: Upon determining the factors that contribute to providers successfully transmitting data, the TCR can better help other providers, and yield cancer data from which the registry can benefit. Although this project may take an additional year or more, hopefully the benefits will grow and there will be increased successful electronic submissions via EHRs with little human intervention.

Posters

GRAND BALLROOM EFGH

P-51

IMPACT OF CANCER CASES REPORTED BY THE VETERANS AFFAIRS CENTRAL CANCER REGISTRY TO THE OHIO CANCER INCIDENCE SURVEILLANCE SYSTEM ON COMPLETENESS OF REPORTING

J Fisher[1], J Stephens[2], L Giljahn[3], H Sobotka[4], J Krok-Schoen[5], R Baltic[5], J Kollman[4], E Paskett[5,6,7]

[1]James Cancer Hospital and Solove Research Institute, The Ohio State University, Columbus, OH, United States; [2]Center for Biostatistics, Department of Biomedical Informatics, College of Medicine, The Ohio State University, Columbus, OH, United States; [3]Ohio Cancer Incidence Surveillance System, Ohio Department of Health, Columbus, OH, United States; [4]Chronic Disease Epidemiology and Evaluation, Bureau of Health Promotion, Office of Health Improvement and Wellness, Ohio Department of Health, Columbus, OH, United States; [5]Comprehensive Cancer Center, The Ohio State University, Columbus, OH, United States; [6] Division of Cancer Prevention and Control, Department of Internal Medicine, College of Medicine, The Ohio State University, Columbus, OH, United States; [7]Division of Epidemiology, College of Public Health, The Ohio State University, Columbus, OH, United States

In an effort to increase the completeness of reporting of cancer cases to the Ohio Cancer Incidence Surveillance System (OCISS), an exchange of data between the Veterans Affairs (VA) Central Cancer Registry (VACCR) and the Ohio Department of Health (ODH) was initiated in 2013. The data exchange agreement allows the VACCR to send cancer incidence data to the OCISS at ODH for all veterans who are residents of Ohio and diagnosed and/or treated for cancer anywhere in the United States. To determine the impact of the addition of these cancer cases reported to the OCISS *only* by the VACCR, completeness of reporting for diagnosis years 2011-2013 will be calculated with and without VACCR cases (approximately 1,200 additional cases per year). Differences in completeness of reporting will be examined for anatomic sites/types of cancer and for race-sex groups. In addition, cancer cases reported only by the VACCR will be described in terms of demographics (age, sex, race), cancer site/type, stage at diagnosis, and geography. Because the additional cases represent approximately 2% of the total case count for 2011-2013, it is expected that the addition of these cases will have a meaningful impact on completeness of reporting.

P-52

INDUSTRY AND OCCUPATION DATA FROM REGISTRY AND DEATH CERTIFICATES

M Celaya[1], K Armenti[2], B Riddle[1], G Calvert[3], G Hosain[4], J Rees[1]

[1]New Hampshire State Cancer Registry, Geisel School of Medicine at Dartmouth, Department of Epidemiology, Hanover, NH, United States; [2]New Hampshire Occupational Health Surveillance Program, Institute on Disability, University of New Hampshire, Durham, NH, United States; [3]Division of Surveillance, Hazard Evaluations and Field Studies, National, Cincinnati, OH, United States; [4]Bureau of Public Health Statistics and Informatics, Department of Health and Human Services, New Hampshire Division of Public Health Services, Concord, NH, United States

Background: Capturing data on industry and occupation (I&O) for cancer registration depends on the proper completion of several steps. First, the patient who is registered at the hospital or other facility must be asked about their usual I&O. Medical providers or clerical staff may instead ask about current job, or use another method that does not provide ideal information. Next, the registrar must find I&O data in the medical record, resolve any discrepancies between multiple entries, and interpret as needed. Completing death certificates involves a different process to obtain I&O information from relatives of the deceased. Because of the different processes in obtaining data, it is reasonable to expect differences between occupation data in the cancer registry and in death certificates.

Purpose: To investigate whether the I&O data on death certificates and in the cancer registry are comparable, and whether death certificates could be used to supplement missing registry data.

Methods: In this exercise, we will compare the data obtained from these two sources in subsets of New Hampshire residents with cancer. The subsets will include: (1) common jobs such as housewife/homemaker, teacher, healthcare worker, etc.; (2) uncommon jobs; and (3) patients in the registry with missing I&O data.

Results: We will evaluate concordance and discrepancies, and examine the utility of death certificates for completing data on patients whose I&O data are missing in the registry.

Conclusion: We will discuss potential biases that may result because death certificate I&O data can only be used for patients who have died, whereas missing I&O for those who are alive cannot be resolved.

P-53

TREND ANALYSIS OF THE NATIONAL PROGRAM OF CANCER REGISTRIES (NPCR) PROGRAM EVALUATION INSTRUMENT (PEI) FOR THE YEARS 2007-2013

K Zhang[1], S Van Heest[2], R Wilson[2], N Apedoe[2], J Stanger[1], S Bhavsar[1]
[1]ICF International, Rockville, MD, United States; [2]Centers for Disease Control and Prevention, Atlanta, GA, United States

Background: The NPCR PEI is a biennial survey of the NPCR-funded central cancer registries (CCR). It is designed to measure CCR functions and evaluate them against program standards. The functional areas considered by the PEI are: registry operations, health information systems, utilization of established data standards, and electronic exchange of health data. Although this survey was first administered in its current form in 2007, no comprehensive trend analysis of the results has ever been performed.

Purpose: The purpose of this analysis is to identify the ways that CCR characteristics have changed over time. The impact of such an analysis will offer CDC and other public health agencies the necessary guidance to make decisions for technical assistance and other resource allocation to the CCRs.

Approach: There are two distinct approaches taken in comparing the PEI results across years. One considers all of the CCRs as a single entity and tracks response changes across years. This is useful in identifying areas where all of the CCRs are meeting a particular standard. However, since there is the broad variability among CCRs operating environments, a second approach is taken that groups similar registries according to certain characteristics. By considering these groups separately, a deeper understanding of how CCRs address their unique constraints and challenges over time can be achieved.

Conclusion: This trend analysis evaluates progress toward and compliance with program standards. It allows for better resource allocation by identifying areas of need among all CCRs as well as CCRs within a particular group.

P-54

FEASIBILITY AND UTILITY OF PROCESSING PATHOLOGY REPORTS IN EMARC PLUS: A GRADUATE RESEARCH ASSISTANT'S PERSPECTIVE ON A PILOT STUDY

P Patel[1,2], J Jackson-Thompson[1,2,3], N Rold[1,2]
[1]University of Missouri, Missouri Cancer Registry and Research Center, Columbia, MO, United States; [2]University of Missouri, Health Management and Informatics, Columbia, MO, United States; [3]University of Missouri, Informatics Institute MUII, Columbia, MO, United States

Background: Pathology reports from nine national pathology labs and one Missouri lab are securely transmitted to the Missouri Cancer Registry and Research Center (MCR-ARC) in Health Level 7 (HL7) format via the Public Health Information Network Messaging System (PHINMS) through an automated connection at the Missouri Department of Health and Senior Services (DHSS). Upon arrival by secure electronic transmission, the pathology reports are then moved to Electronic Mapping, Reporting, and Coding (eMaRC) Plus by MCR-ARC staff. Prior to initiation of this pilot project, MCR's eMaRC Plus database was the final destination for electronic pathology reports at MCR-ARC. In other words, data that could potentially identify new cancer cases or improve the quality of cases reported by another source and already in the MCR database was received but not used.

Purpose: This study is an initiative to process melanoma pathology reports and re-query reportable melanoma cases from diagnosis year 2013. The study will help to identify unreported melanoma cases/improve the quality of existing cases and assess staff resources required for this process.

Method: Software programs like CRS Plus, Link Plus, eMaRC Plus, and SAS were used to process reports. Melanoma reports (2013) were extracted from eMaRC Plus and matched against CRS Plus cases for 1996 - 2013 using Link Plus. SAS was utilized to delete unwanted cases.

Results: After performing all procedures, 138 uncertain matched cases yielded 98 true matches and 40 false matches, of which 22 had new information on previously reported cases. The remaining false matches and non-matches will yield more than 200 newly identified cases.

Conclusion/Implications: The process is labor intensive. Additional effort will be required to obtain a full abstract on newly-identified cases and update cases already in the database. Further research is needed to improve overall efficiency and make the process viable for registry staff.

Posters

GRAND BALLROOM EFGH

P-55

FEASIBILITY AND UTILITY OF PROCESSING PATHOLOGY REPORTS IN EMARC PLUS: MISSOURI CANCER REGISTRY (MCR) MANAGEMENT'S PERSPECTIVE ON A PILOT STUDY CONDUCTED BY A GRADUATE RESEARCH ASSISTANT (GRA)

N Rold[1], J Jackson-Thompson[1], J Sedovic[1], P Patel[1], S Yemane[1]
[1]Missouri Cancer Registry, Columbia, MO, United States

Background: In 2012, MCR lost funding for 3.5 of 4 non-hospital unit positions. In 2015, MCR management designed a pilot and employed a GRA to process melanoma path reports accumulated in eMaRC.

Purpose: Explore costs and benefits of processing ePath reports.

Methods: We identified 2013 melanoma path reports in eMaRC. A CTR (QA staff member) checked each case for reportability and corrected eMaRC auto-coding of cases from text. Reportable cases were exported from eMaRC and compared to cases in our incidence database (CRS Plus) using Link Plus. Our GRA used the multiple primary/histology rules matrix as a guideline to assess true and possible matches. Her work was reviewed by a CTR (operations manager) who assessed possible matches using text in both eMaRC and CRS cases. Yield of new cases or new information, time spent and barriers encountered were recorded at each step of the process.

Preliminary Results: Of 631 path reports identified/reviewed, 32% were non-reportable; 48% were reportable cases not reported from other sources; 16% were reportable but already captured; and 3% yielded more specific information. Staff spent 62.5 hours (3% of an FTE) processing cases. We identified an estimated 200-250 unreported cases and 22 reported cases whose quality could be improved.

Conclusions/Implications: Incomplete demographics on path reports limited precise identification of patient matches. Experience gained helped refine guidelines for identifying matches by patient, diagnosis date, site, histology, and laterality. Time spent identifying cases that yielded new details may not be cost-effective. One benefit: identification of providers who do not directly report melanoma cases or do not perform adequate case-finding. We overlooked use of the eMaRC "flag for review" feature, which may have reduced the effort and number of reports reviewed by 50%. It is unclear how flag use would have impacted other findings. An additional project is proposed to assess its accuracy and benefit.

P-56

CREATING A GLOBAL UPDATES SCRIPT LIBRARY TO USE FOR DATA QUALITY CONTROL: GATEWAY TO PROCESS IMPROVEMENT FOR THE MISSOURI CANCER REGISTRY AND RESEARCH CENTER (MCR-ARC)

S Yemane[1,2], I Zachary[1], J Jackson-Thompson[1,2], N Rold[1,2]
[1]University of Missouri, Health Management and Informatics, Columbia, MO, United States; [2]University of Missouri, Missouri Cancer Registry and Research Center, Columbia, MO, United States

Background: Central Cancer Registries (CCR) are important for cancer reporting, cancer control, evaluation and research. However only complete, accurate, and timely data are valuable for these activities. MCR-ARC has a SQL Server 2008 database that contains more than 1 million records. All CCR data must pass standard edits and required national edits to be submitted for certification and meet program requirements. This ongoing process takes time and effort and can be more efficient if appropriate global changes are applied to the database.

Purpose: To make the process of quality control more efficient with less effort through global updates.

Methods: As a general practice, we analyze the NPCR Advanced Edits Report to identify the most common errors. After running queries to retrieve data that trigger errors, MCR Operations staff work together to determine the fixes for the errors. The Database Administrator writes scripts to correct the errors. For the errors that are common, the scripts are run against the database on a regular basis. Over the years, we have developed a library of scripts to run against the database to clear edits on a regular basis.

Results: Running the NPCR advanced edits, we found a total of 91,660 errors out of 596,279 records for diagnosis years 1996 to 2014. Four errors accounted for 4,749 to 41,312 counts; 13 errors accounted for 1 to 451 counts. One error had 1,920 counts. Most of the smaller counts were cleaned manually by QA staff. Many of the larger counts were cleaned by writing and running scripts using global updates.

Discussions/Conclusions: By using global updates, we were able to clear about 40,000 error counts. Through the use of standardized global update scripts, we are able to make the process of data cleaning and quality control more efficient and therefore more cost effective. This script library is becoming more comprehensive over time as we add additional scripts for data quality control.

S-01

INCIDENCE AND SURVIVAL OF CHILDHOOD BRAIN TUMORS IN CALIFORNIA, 2004-2012

D Rodriguez[1,2], E Stewart[1]

[1]Cancer Registry of Greater California, Public Health Institute, Sacramento, CA, United States; [2]University of California Davis, Graduate Group in Epidemiology, Davis, CA, United States

Background: Brain cancer is the second most common cancer and most common solid tumor in children <15 years of age in the United States.[1] Childhood cancers have been reported to be on the rise, with evidence pointing towards an increase in leukemia and CNS tumors.[1] In 2004, California registries started collecting information on benign brain tumors. **The purpose** of this analysis was to explore incidence and survival for brain tumors in California children and determine if any differences are present in regards to malignancy among various demographic characteristics.

Methods: Patients <19 years old, diagnosed with a brain tumor during 2004-2012 in California (CA) were included in this analysis. Incidence rates and survival were calculated as well as using Joinpoint regression to define trends. The primary endpoint was the annual percent change, and the average annual percent change. Differences in trends by age, race/ethnicity, sex, site of tumor, year of diagnosis, and stage of diagnosis by malignancy were examined.

Results: From 2004-2012 there were a total of 2,836 cases of brain tumors in CA children. Malignant tumors comprised of 78% of all brain tumors and although Hispanics had the highest proportion (44%), non-Hispanic whites had the highest incidence rate (3.05 per 100,000). Incidence rates and trends by year of diagnosis in both malignant and non-malignant tumors did not fluctuate much, but it appears that incidence rates are increasing in malignant tumors, but decreasing in non-malignant tumors.

Conclusions: Initial analyses found there were notable differences in demographic characteristics between malignant and non-malignant tumors. The trends in malignant brain tumors parallel the notion that the incidence rate of childhood cancer may be increasing. Further investigation on why these findings are occurring is essential to the health of our children.

References:

1. Gittleman, HR. et al. (2015). Trends in central nervous system tumor incidence relative to other common cancers in adults, adolescents, and children in the United States, 2000 to 2010. *Cancer.* 2015;121:102–112. doi: 10.1002/cncr.29015

S-02

PROGRESSION RISK AFTER SPHINCTER-PRESERVING OPERATIONS IN RECTAL CANCER: A REGISTRY-BASED STUDY FROM ARKHANGELSK, NORTHWEST RUSSIA

D Dubovichenko[1], M Valkov[1,2]

[1]Northern State Medical University, Arkhangelsk, Russian Federation; [2]Regional Clinical Oncological Hospital, Arkhangelsk, Russian Federation

Background: The incidence of rectal cancer (RC) has been increasing worldwide and in Russia, ranking seventh among all malignancies. An anterior resection (AR) is widely replacing abdominoperineal (APR) for sphincter sparing, while both are considered as a potentially curative surgery. Adding radiation therapy (RT) to radical surgery evidently results in decrease of local relapse rate and gives benefit in cancer-specific survival (CSS).

Objectives: To compare survival among patients who received AR or APR in the Arkhangelsk Region, Russia over a period from 2000 to 2014.

Methods: All new cases of RC (C20) were obtained from the Arkhangelsk Regional Cancer Registry for the period 2000-2014. Only patients with histologically proven Stage I-III RC and information about radical surgery – AR or APR were chosen for analysis. Survival was calculated using life tables. Adjustment for age, gender, stage at diagnosis, use of radiation therapy, and time period was performed using Cox regression.

Results: Altogether, 611 cases were selected. AR was performed in 222 patients, APR was made in 389 cases. The combination of radical surgery with RT was given to 335 patients. One- and 5-year CSS were 96% (95% confidence interval (CI) 92-98%) vs 91% (95% CI 88-94%), 74% (95% CI 67-80%) vs 64% (95% CI 58-69%), in those received AR and APR, respectively. In univariate analysis of OS APR was associated with significantly higher risk of death (HR 1.51, 95% CI 1.10-2.09), compared to AR. Adjustment for stage slightly changed the association (HR=1.39, 95% CI: 1.01-1.93), other factors, including use of RT, did not influence on coefficient resulting in HR of 1.36, 95% CI: 0.98-1.89.

Conclusions: This population-based analysis shows AR is at least equivalent to APR by means of CSS. The interpretation of the data should be cautious whilst the data on sublocation of the rectal tumor were not included into the model. RT seems to gain a benefit when added to AR or APR equally.

Student

S-03

SURVIVAL FROM OVARIAN CANCER BY MORPHOLOGICAL SUBTYPE: DATA ON 676,987 WOMEN IN 61 COUNTRIES

M Matz[1], A Bonaventure[1], H Carreira[1], V Di Carlo[1], R Harewood[1], J Jégu[1,2,3], M Niksič[1], D Spika[1], M Coleman[1], C Allemani[1]
[1]Cancer Research UK Cancer Survival Group, Department of Non-Communicable Disease Epidemiology, London School of Hygiene and Tropical Medicine, London, England; [2]Department of Epidemiology and Public Health, University of Strasbourg, Strasbourg, France; [3]Department of Public Health, University Hospital of Strasbourg, Strasbourg, France

Background: International comparisons of ovarian cancer survival traditionally have analyzed ovarian cancer as one homogenous group. However, ovarian cancer comprises several morphologically distinct subtypes. We explored the international variation in survival for each morphological subtype to understand differences in overall ovarian cancer survival.

Methods: CONCORD-2 is the largest population-based study of global trends in cancer survival, including data on 676,987 women (aged 15-99) diagnosed with ovarian, fallopian tube, peritoneal, and retroperitoneal cancer during 1995-2009. Women were grouped into six morphological subtypes: Type 1, Type 2, germ cell, sex cord-stromal, other specific non-epithelial, and non-specific morphology. Age-standardized 5-year net survival was estimated for each country, calendar period of diagnosis, and morphological subtype.

Results: Women diagnosed with Type 1 tumors had high 5-year net survival compared to women diagnosed with Type 2 tumors (65.5% vs. 36.0% in the United States). Survival from germ cell tumors (76.1%) was high in the United States compared to survival from Type 2 tumors, but varied widely between countries. Women with sex-cord stromal tumors had the highest survival compared to other morphological subtypes, with over 83.8% surviving 5 years after diagnosis in the United States. Survival for other specific non-epithelial tumors was moderate (44.5%). The estimates for the United States will be analyzed by race in order to understand racial differences in survival more completely.

Conclusions: These results show the importance of analyzing ovarian cancer as distinct morphological subtypes instead of as one homogenous group. International comparisons of survival may be misleading if a region with higher survival has a high proportion of women with a more favorable subtype. Comparison of morphology-specific estimates provides a better understanding of the variations in ovarian cancer survival between and within countries.

S-04

USABILITY ASSESSMENT OF THE MISSOURI CANCER REGISTRY'S PUBLISHED INSTANTATLAS REPORTS USING HEALTH PROFESSIONALS

A Ben Ramadan[1,2,3], J Jackson-Thompson[1,2,3], CLS Schmaltz[2,3]
[1]University of Missouri Informatics Institute, Columbia, MO, United States; [2]Missouri Cancer Registry and Research Center, Columbia, MO, United States; [3]Health Management and Informatics Department/School of Medicine/University of Missouri-Columbia, Columbia, MO, United States

Background: Many users of spatial data find difficulties in interpreting information in health-related spatial reports.[1] The usability of Geographic Information Systems (GIS) tools should be tested with users before and after a tool's release.[2] The GIS reports created by the Missouri Cancer Registry and Research Center (MCR-ARC) have never been tested for usability.

Purpose: Test the usability of the InstantAtlas reports of MCR-ARC to guide revisions.

Methods:
- *Study Design:* Mixed methodology usability testing study.
- *Participants:* Health professionals in Missouri Department of Health and Senior Services and the Master of Public Health Program at the University of Missouri-Columbia, using convenience sampling. The study will include from five to seven participants.
- *Study Procedure:* The test includes a pretest questionnaire, a multi-task scenario, and the System Usability Scale.[3] Software will be used to record the computer screen during the trial.
- *Measured Outcomes:* Several performance and usability metrics will be measured by analyzing the trial's data.

Results: The assessment's data will be analyzed using Excel and will be presented in graphs and tables. The results will be a blend of quantitative and qualitative statistics.

Conclusion: The results may reveal usability issues of our tested reports and help MCR-ARC revise the reports to better serve users.

References:
1. Lipkus IM, Samsa G, Rimer BK. General performance on a numeracy scale among highly educated samples. *Med Decis Making*. 2001 Feb 1;21(1):37-44.
2. Bell BS, Hoskins RE, Pickle LW, Wartenberg D. Current practices in spatial analysis of cancer data: mapping health statistics to inform policymakers and the public. *Int J Health Geogr*. 2006 Nov 8;5(1):49.
3. Brooke J. SUS-A quick and dirty usability scale. *Usability evaluation in industry*. 1996 Sep;189(194):4-7.

S-05

THE ASSOCIATION BETWEEN INSURANCE STATUS AND CHILDHOOD CANCER SURVIVAL

JM Lee[1], K Johnson [1]
[1]Brown School, Washington University in St. Louis, St. Louis, MO, United States

Background: While several studies have investigated the relationship between insurance status and survival among adolescents and adults, the impact of insurance status on childhood cancer survival has not been evaluated in a population-based study. The purpose of this project was, therefore, to examine the association between insurance status and childhood cancer survival in the United States.

Methods: Childhood cancer cases diagnosed at ages 0-14 years between 2007-2012 were ascertained from the Surveillance Epidemiology and End Results database for analysis. Cox proportional hazard models were used to estimate Hazard Ratios (HRs) and 95% confidence interval (CIs) based on insurance type (uninsured/Medicaid and privately insured), age, gender, and ethnicity.

Results: A total of 16,410 individuals with childhood cancer diagnoses comprised the study population. Approximately 49% were non-Hispanic White, 54% were male, and 98% were insured through either private health insurance or Medicaid. There was no significant association between insurance status and overall childhood cancer survival or the most common cancer types: leukemia, lymphoma, neuroblastoma, and central nervous system. In models adjusted for cancer type, infants <1 year old were 1.42 times more likely to die from cancer than individuals 10-14 years (95% CI, 1.21-1.66). Females were 0.91 times less likely to die from cancer than males (95% CI, 0.82-0.99). Black, non-Hispanic, and Hispanic individuals were 1.54 times and 1.26 times more likely to die from cancer than White, non-Hispanic individuals (95% CI, 1.33-1.78 and 95% CI, 1.13-1.42 respectively).

Conclusions: Although no significant relationship between insurance status and childhood cancer survival was observed, age, gender, and ethnic disparities were observed in childhood cancer survival rates. In order to safeguard equal and quality cancer care for all children, further study is recommended to understand the underlying reasons for these patterns.

S-06

INCIDENCE OF TRIPLE NEGATIVE BREAST CANCER IN NEW JERSEY, 2008-2013

A Kulkarni[1], A Stroup[1,2,3], A Werts[2,3], S Hill[2,3], J Li[2,3], L Paddock[1,2,3], A Llanos[1,2]
[1]Rutgers School of Public Health, New Brunswick, NJ, United States; [2]Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, United States; [3]Cancer Epidemiology Services, New Jersey State Department of Health, New Brunswick, NJ, United States

Purpose: Breast Cancer (BC) is comprised of several molecular subtypes. The triple negative (TNBC) subtype (ER-/PR-/HER2-) is known to be associated with poor prognosis and less successful treatment alternatives due to a tendency to develop and spread more rapidly than most other molecular subtypes of BC. The purpose of this study was to assess the risk of TNBC in New Jersey.

Methods: Women diagnosed with invasive BC from 2008-2013 were coded by the New Jersey State Cancer Registry. The relative odds (OR) of incidence associated with TNBCs were explored using multivariable logistic regression, adjusting for age and race/ethnicity.

Results: 3,309 of 32,790 BCs (10%) were TNBC. Compared to women age >65, the odds of TNBC was significantly higher among women age 20-39 (OR 2.11 95% CI: 1.79-2.42), 40-49 (OR 1.29 95% CI: 1.17-1.42), and 50-64 (OR 1.18 95% CI: 1.08-1.29). Non-Hispanic Blacks (OR 2.16, 95% CI: 1.97-2.37) and Hispanics (OR 1.19 95% CI: 1.04-1.35) had higher odds of TNBC compared to non-Hispanic Whites.

Conclusion: Our findings support numerous studies showing that younger, minority women, namely non-Hispanic Black and Hispanic women, are at increased risk for TNBC. Understanding the mechanisms leading to this aggressive BC subtype is essential and will play a major role in the improving prognosis and addressing BC disparities. These findings also highlight a need for enhanced screening, among some subgroups of women, to promote earlier diagnosis.

Student

S-07

MULTILEVEL CORRELATES OF IN-HOSPITAL MORTALITY AMONG HEAD AND NECK CANCER PATIENTS

E Adjei Boakye[1], N Osazuwa-Peters[1], BB Tobo[1], C Geneus[3], KA Mohammed[1], T Burroughs[1], CE Freter[1], MA Varvares[2]
[1]Saint Louis University, Saint Louis, MO, United States; [2]Harvard University, Cambridge, MA, United States; [3]Tulane University, New Orleans, LA, United States

Background: Risk factors for in-hospital mortality among head and neck cancer patients are multi-leveled, and could either be modifiable, such as treatment modality, or non-modifiable, such as age. Although some previous studies have examined the effect of patient-level characteristics on mortality; there is a paucity of research exploring multilevel correlates of mortality.

Purpose: To examine the multilevel effects of patient- and hospital-level factors on in-hospital mortality among patients diagnosed with head and neck cancer.

Methods: Data from the Nationwide Inpatient Sample 2008 – 2013 included 75,984 hospital records with a diagnosis of head and neck cancer using the International Classification of Diseases, 9th Edition. A weighted multivariate hierarchical logistic regression model was used to account for hospital- and patient-level variation in mortality.

Results: The in-hospital mortality rate was 3.9%. Adjusted multilevel analyses indicated that for every unit increase in Elixhauser comorbidity score, odds of in-hospital mortality increased by 18% (aOR = 1.18, 95% CI = 1.15 – 1.21). Having a metastatic cancer was associated with a 47% increase in odds of in-hospital mortality (aOR = 1.47, 95% CI = 1.33 – 1.62). Other patient-level risk factors included age (aOR = 1.02 per 1 year increase, 95% CI = 1.02 – 1.03), male sex (aOR = 1.25, 95% CI = 1.14 – 1.38), and being admitted to the hospital on a weekend (aOR = 1.54, 95% CI = 1.36 – 1.74). At the hospital level, admission to a nonteaching hospital (aOR = 1.67, 95% CI = 1.38 – 2.03) was associated with higher odds of in-hospital mortality.

Conclusion: Patient- as well as hospital- level factors are associated with in-hospital mortality among head and neck cancer patients. These multilevel factors are critical indicators of survivorship, and should thus be considered when planning programs or interventions aimed to improve survival among this unique population.

S-08

END-OF-LIFE COSTS OF BREAST AND CERVICAL CANCER IN MISSOURI'S MEDICAID PROGRAM

A Bouras[1,3,5], S Yun[2], S Homan[2], J Lucht[3,4], CLS Schmaltz[1,2], T Greever-Rice[3]
[1]School of Medicine Department of Health Management & Informatics (HMI), University of Missouri-Columbia, Columbia, MO, United States; [2]Missouri Department of Health and Senior Services, Jefferson City, MO, United States; [3]Office of Social and Economic Data Analysis (OSEDA), University of Missouri-Columbia, Columbia, MO, United States; [4]School of Medicine Center for Health Policy, Columbia, MO, United States; [5]MU Informatics Institute, Columbia, MO, United States; [6]Missouri Cancer Registry and Research Center, Columbia, MO, United States

Background: Studies have shown that the cost for the end-of-life care (EOLC) was substantially higher among Medicaid cancer patients than non-cancer patients. No study has been conducted in Missouri to investigate this issue.

Purpose: To estimate the cost of EOLC for breast and cervical cancer patients on the Missouri Medicaid Program using fee-for-service Medicaid claim data during 2008-2013.

Methods: We linked the data for female Medicaid beneficiaries aged 18 to 64 with a diagnosis of breast or cervical cancer during 2008-2014 to the Missouri Cancer Registry (MCR) data to obtain the information on the date and stage of diagnosis. We selected the breast and cervical patients who died within 1 year of their diagnosis date. These cancer cases were matched to continuously enrolled cancer-free Medicaid beneficiaries by age groupings, race, and disability status. We also computed a modified Charlson Comorbidity Index (CCI) score using the claims data. We calculated the crude and adjusted incremental cost—the cost difference between cancer patients and non-cancer patients—from diagnosis to death. To calculate adjusted incremental cost, we controlled for CCI, age, and race in the analysis. We further stratified the results by the stage of diagnosis and claim type.

Results: The cost for the cancer patients' EOLC is higher than the cancer-free Medicaid beneficiaries for the study period 2008-2014. The average unadjusted costs for providing EOLC for breast cancer are $96,568, $180,505, and $100,498 for local, regional, and distant stage, respectively. For cervical cancer the cost estimates are $110,355, $63,732, and $77,546 for local, regional, and distant stage, respectively. More detailed statistics including adjusted costs will be presented.

Conclusions: The data provide a quantitative, population-based, assessment of the cancer-related cost of EOLC on Missouri's Medicaid program for cancer patients surviving less than one year.

Student Posters Listings

SP-01

CHINA'S GREAT FAMINE AND ITS ASSOCIATION WITH BREAST CANCER TUMOR SUBTYPES: A HOSPITAL-BASED STUDY.

A Alimujiang[1], G Colditz[1], Y Liu[1], Z Shao[2], M Miao[3], G Liu[2], W Xu[4], J Wu[2], Z Shen[2], N Huang[2]
[1]Division of Public Health Sciences, Department of Surgery, Washington University School of Medicine and Siteman Cancer Center, Saint Louis, MO, United States; [2]Department of Breast Surgery, Fudan University Shanghai Cancer Center; Department of Oncology, Shanghai Medical College, Shanghai, China; [3]Clinical Statistics Center, Fudan University Shanghai Cancer Center, Department of Oncology, Shanghai Medical College, Shanghai, China; [4]Department of Epidemiology, School of Public Health, Fudan University; Key Laboratory of Public Health Safety, Ministry of Education, Shanghai, China

Background: The Great Chinese Famine occurred in China between 1959 and 1961, due to a natural disaster together with public policy. The Great Chinese Famine lasted 3 years, impacted all of China, and caused over 30 million deaths. No prior study has examined the long-term effect of the famine on breast cancer occurrence, or by breast cancer subtypes.

Purpose: This study aims to evaluate the unique historical environmental influences on the female Chinese population, and report the famine association with long-term changes of breast cancer tumor subtypes.

Method: 16,469 patients with invasive breast cancer diagnosed in Shanghai Cancer Hospital from 1999 to 2014 are included. Data were collected routinely by the hospital tumor registry. Multinomial logistic regression models were used to compare the distribution of four ERPR breast cancer subtypes by famine exposure and age at famine. The analysis was IRB exempt (45 CFR 46.101(b)).

Results: After adjusting for age at diagnosis, reproductive factors, height, BMI, BBD history, and family history, women exposed to famine had increased risk of ER-PR- subtype compared to women without famine exposure. (OR: 1.60, 95% CI: 1.43-1.81). Among women with breast cancer, those exposed to the famine after age at first birth had higher risk of EP-PR- than women exposed to famine before menarche (OR after age at first birth vs before menarche: 1.66, 95% CI: 1.28-2.15).

Conclusion/ Implications: Women exposed to famine, and those exposed at an older age, were more likely to be diagnosed with ER-PR- breast cancer than women not exposed to famine or exposed before menarche. These results highlight the potential of exposures during these young adult years to impact lifetime risk of breast cancer, including subtype categories. This historical analysis suggests that famine or food insecurity among adult women increases risk of ER-PR- breast cancer, though the mechanism for this association needs more studies.

SP-02

A SPATIO-TEMPORAL INVESTIGATION OF COLORECTAL CANCER INCIDENCE RATES IN MISSOURI

J Du[1,2], D Sun[2], CLS Schmaltz[1,3], J Jackson-Thompson[1,3,4]
[1]Missouri Cancer Registry and Research Center, Columbia, MO, United States; [2]Department of Statistics, University of Missouri, Columbia, MO, United States; [3]Department of Health Management and Informatics, University of Missouri School of Medicine, Columbia, MO, United States; [4]University of Missouri Informatics Institute, Columbia, MO, United States

Background: In the United States, colorectal cancer (CRC) is the third most common cancer in both men and women. Among people over 50 years old, CRC incidence rates have been declining; however, the rates have been increasing among younger people in the United States. In 2012, Missouri ranked in the top quartile for incidence rates. We wanted to examine Missouri's CRC patterns and trends more closely with an emphasis on the trends by age.

Purpose: To provide a spatio-temporal statistical analysis of CRC in Missouri by gender and age group.

Methods: Incidence rates were fitted to a Bayesian Poisson regression model with spatial, gender, age and time main effects along with selected interactions. Some nearby counties were grouped into larger regions to avoid the data suppression, to produce reliable frequentist rate estimates for comparison with the Bayesian estimates, and to reduce sensitivity to the model assumptions (e.g., the degree of spatial smoothness) for counties and age groups with small case counts. Age was in 3 groups (<50, 50-64, 65+) and time was in 5 groups of 3 years from 1998 to 2012. Several models were fitted with OpenBUGS to investigate primarily the temporal effects and elimination of interaction terms. These models were compared using the Deviance Information Criterion.

Results: The model selection results suggested the model with no time trends for ages <50 and parallel trends for men and women in the other age groups. The rates were decreasing for ages 50-64 with a faster decrease for ages 65+. Men had higher rates than women, and older people had higher rates than younger people. There were strong spatial correlations for ages 65+, a weaker one for ages 50-64 and no informative spatial correlations detected for ages <50.

Conclusions: CRC incidence rates declined for ages 50+, while for ages <50, the crude incidence rates increased slightly but not significantly and the selected model's trend was flat. CRC rates among younger people should continue to be monitored.

Student Posters Listings

GRAND BALLROOM EFGH

SP-03

BREAST CANCER STAGE VARIATION AND SURVIVAL BY INSURANCE STATUS AND SOCIODEMOGRAPHIC FACTORS IN INDIVIDUALS 18-64 YEARS OLD

C Hsu[1], K Johnson[1]
[1]Washington University in St. Louis, St. Louis, MO, United States

Background: Few population-based studies have examined the relationship between health insurance status and breast cancer stage at diagnosis and survival. The degree to which sociodemographic characteristics influence these associations is also unclear.

Purpose: Our purpose was to examine breast cancer stage at diagnosis and survival by insurance status and sociodemographic factors.

Methods: Using SEER 18 registries, we identified 172,745 patients between 18 and 64 years with breast cancer diagnoses from 2007 to 2012. Patient characteristics included sex, race/ethnicity, marital status, AJCC stage, and age at diagnosis. Insurance status at diagnosis was classified as insured, uninsured, and Medicaid coverage. We used logistic regression and Cox proportional hazards (PH) regression models to calculate adjusted odds ratios (ORs), hazard ratios (HRs), and associated confidence intervals (CIs).

Results: Individuals were more likely to be diagnosed at a higher stage (3/4 vs 0/1/2) if they had Medicaid (OR=2.06, 95% CI 1.99-2.13) or no insurance (2.39, 2.23-2.55) compared to those with insurance. Those who were male (1.71, 1.46-2.0), younger at diagnosis (0.98, 0.98-0.99), Black (1.37, 1.32-1.42) or Hispanic (1.14, 1.10-1.19) compared to White non-Hispanic and unmarried (1.19, 1.16-1.22) were also more likely to be diagnosed at a higher stage. In Cox PH models adjusted for age, stage of diagnosis, race/ethnicity, sex, and marital status, individuals were more likely to die from their disease if they had Medicaid (HR=1.46, 95% CI, 1.39-1.54) or no insurance (1.98, 1.82-2.16), were Black (1.55, 1.47-1.64) or American Indian/Alaskan Native (1.31, 1.04-1.66) and were unmarried (1.20, 1.15-1.26).

Conclusion: Among breast cancer patients, those with Medicaid or no insurance were more likely to have worse prognosis and to die of breast cancer. Unmarried and Black individuals were also more likely to be diagnosed with higher breast cancer stage and to die from their disease.

SP-04

EXAMINING GASTRIC CANCER SURVIVAL GAP BETWEEN ASIANS AND WHITES IN THE UNITED STATES

H Jin[1], P Pinheiro[1], K Callahan[1], S Altekruse[2]
[1]University of Nevada Las Vegas, Las Vegas, NV, United States;
[2]National Cancer Institute, Bethesda, MD, United States

Background: Globally, Asian countries bear a disproportionate gastric cancer burden. Asian Americans, the fastest growing minority population in the United States, show not only higher incidence of gastric cancer compared to non-Hispanic whites (NHWs), but also significantly higher survival. Benefiting from more uniform staging and treatment practices within the United States, we examine for the first time the heterogeneity in the Asian American population, which may elucidate the causes of these disparities.

Methods: SEER data from 2000 to 2012 were used to calculate 5-year survival estimates for NHWs and the six largest Asian ethnicities. Multivariate analyses were performed to identify critical prognostic factors and survival disparities between Asian groups and NHWs.

Results: We analyzed 33,313 NHW and 8,473 Asian gastric cancer cases. All Asian groups had significantly higher 5-year survival than NHWs, at 29.8%. Among Asians, Koreans and Vietnamese had the highest and lowest survival, 45.4% and 35.7%, respectively. The Korean survival advantage was largely attributable to relatively high proportions of localized stage and low proportions of cardia tumors. After adjusting for major prognostic factors, the survival disadvantage of NHWs, while attenuated, remained significant in comparison to all Asian groups (HR: 1.33; 95% CI: 1.24-1.43; reference: Korean). The survival disparities within the Asian groups vanished with adjustment.

Conclusions: This study characterizes distinctive gastric cancer survival patterns among the six major Asian groups and NHWs in the United States. The causes of the survival disadvantage for NHWs remain elusive. The observed survival disparity affecting NHWs in relation to Asians points to the need for increased awareness of gastric cancer screening and treatment options of NHWs, who account for the majority of cases.

SP-05

WHAT'S LOVE GOT TO DO WITH IT? MARITAL STATUS, AND ITS INFLUENCE ON THE TOBACCO AND ALCOHOL HABITS OF HEAD AND NECK CANCER PATIENTS

N Osazuwa-Peters[1], E Adjei Boakye[1], BB Tobo[1], K Christopher[1], CE Freter[1], MA Varvares[2]
[1]Saint Louis University, Saint Louis, MO, United States; [2]Harvard University, Cambridge, MA, United States

Background: Marital/spousal support is known to improve survival outcomes among head and neck cancer patients, and tobacco and alcohol are two main risk factors for head and neck cancer. However, only a few studies have specifically examined the influence of marital status on tobacco and alcohol use among head and neck cancer patients.

Purpose: To determine the association between marital status and tobacco and alcohol use among a cohort of head and neck cancer patients.

Methods: In this retrospective cohort study, we identified 463 patients aged 20 to 87 (59.31 ± 11.42) years with a diagnosis of head and neck squamous cell carcinoma (HNSCC) who attended an academic medical center between 1997 and 2012. Multivariate logistic regression models were used to assess whether marital status was a predictor of alcohol and tobacco use.

Results: Approximately 50% of the patients were married, 56% were current smokers, and 53% were current alcohol drinkers. In the multivariate logistic regression analysis, marital status was a significant predictor of tobacco use. Patients who were unmarried were 76% more likely to use tobacco compared to married patients (aOR = 1.76; 95% CI: 1.08, 2.84). Patients who used tobacco were almost three times more likely to use alcohol vs. non-users (aOR = 2.90; 95% CI: 1.82, 4.60). Other significant predictors of tobacco use included age and insurance status. However, marital status was not associated with alcohol use but gender was, with males more likely to use alcohol (aOR = 2.29; 95% CI: 1.39, 3.77).

Conclusions: Marital status independently predicts tobacco habits of head and neck cancer patients, and those who are married are less likely to engage in tobacco use. Since tobacco use also predicts survival outcomes, our finding highlights the need for providers to discuss and encourage spousal involvement in reducing risky behaviors that could negatively impact head and neck cancer survival.

SP-06

PREDICTORS OF CERVICAL CANCER AND HPV VACCINATION RATES

R Schulz[1], K Johnson[1]
[1]Washington University in St. Louis, St. Louis, MO, United States

Background: Over 4,000 U.S. women die of cervical cancer (CC) annually. The HPV CC prevention vaccine may eventually reduce CC mortality; however it is unclear if at-risk populations are the beneficiaries of the vaccine or whether state CC control priorities are aligned with CC incidence or vaccination rates. Our purpose was to provide evidence to address these gaps using several national data sources.

Methods: CC data were obtained from SEER 18 (n=45,591) and the CDC (n=68,109) from 2000-2012. HPV vaccination statistics were ascertained from the 2014 CDC National Immunization Survey of teens (n=10,084). 2014 U.S. state CC control priorities for 26 states were from Meyerson et al., 2015. CC incidence rates, stage at diagnosis, and vaccination rates were compared between groups using descriptive statistics and logistic regression.

Results: Hispanic females had the highest CC risk and HPV vaccination rate (16.4 cases/100,000; 46.9%). Lower CC risk and HPV vaccination rates were observed for non-Hispanic Black (14.7; 39.0%), American Indian/Alaskan Native (11.2; 39.4%), White (10.2; 37.5%), and Asian Pacific Islander (10.2; 35.7%) women. Individuals had a higher odds of being diagnosed at stage 3/4 vs. 1/2 if they were on Medicaid (OR=1.6; 95% CI 1.5-1.7) or uninsured (OR=1.7 95% CI 1.6-2.0) than privately insured individuals. Medicaid or uninsured individuals had lower vaccination rates than the privately insured (7.4%, 40.7%, and 51.8% respectively). CC incidence was higher in counties with greater poverty (p<0.0001); however there was no association between individual poverty level and vaccination rates. Finally, state cervical cancer incidence and HPV vaccination rates were not associated with the state CC control priority (p>0.05).

Conclusions: Hispanic women had the highest CC incidence and HPV vaccine rate. However, vaccine allocation should also focus on uninsured and impoverished women. Data from this project may inform U.S. state policy on CC control.

Student Posters Listings

GRAND BALLROOM EFGH

SP-07

HOW DOES PARENTAL RECALL OF THE HUMAN PAPILLOMAVIRUS (HPV) VACCINE INITIATION AND COMPLETION COMPARE TO PROVIDER HPV VACCINATION REPORTS? RESULTS FROM A NATIONAL STUDY

BB Tobo[1], N Osazuwa-Peters[1], KA Mohammed[1], C Geneus[2], E Adjei Boakye[1]
[1]Saint Louis University, Saint Louis, MO, United States; [2]Tulane University, New Orleans, LA, United States

Background: High-risk oncogenic HPV strains are associated with anogenital cancers, many of which could be prevented by the HPV vaccines. HPV vaccination status is typically determined in studies based on provider records, or parental recall/shot card/self-report. However, only a few studies have compared the validity of parent- vs. provider-reported HPV vaccine uptake.

Purpose: To compare the validity of parent- vs. provider-reported HPV vaccine initiation and completion rates among a national sample of adolescents in the United States.

Methods: Data from the 2014 National Immunization Survey-Teen were analyzed for 20,827 adolescents. Information on HPV vaccine uptake (initiation and completion) was obtained using parental (shot cards) and provider reports (electronic medical records). To compare validity of parent- versus provider-reported HPV vaccination, validity measures (sensitivity, specificity, positive predictive value [PPV], negative predictive value [NPV], and kappa) were computed.

Results: Rates reported by provider and parental recall were similar for HPV vaccine initiation (51.3% vs. 50.0%, respectively), and completion (30.7% vs. 27.3%, respectively). Compared to provider report, parent-reported HPV vaccine initiation had a sensitivity of 86.0% (85.3%, 86.7%), a specificity of 87.4% (86.7%, 88.0%), a PPV of 87.5% (86.8%, 88.1%), an NPV of 85.9% (85.2%, 86.6%), and a kappa coefficient of 0.73 (0.72, 0.74). Compared to provider report, parent-reported HPV vaccine completion had a sensitivity of 71.5% (70.4%, 72.7%), a specificity of 91.1% (90.6%, 91.6%), a PPV of 78.5% (77.3%, 79.6%), an NPV of 87.6% (87.1%, 88.2%), and a kappa coefficient of 0.64 (0.63, 0.65).

Conclusions: Our study showed that parent- and provider-reported HPV vaccine initiation and completion rates are comparable. We conclude based on our results that parental recall may be a valid and reliable alternative in assessing HPV vaccine uptake in the United States.

NOTES:

SP-08

THE TRINIDAD AND TOBAGO CANCER REGISTRY: PAVING THE WAY FOR THE EPIDEMIOLOGIC ANALYSES OF CANCER RATES AND TRENDS IN TRINIDAD AND TOBAGO

W Warner[1], DN Martin[2], TY Lee[3], K Badal[4], T Williams[5], V Roach[6], M Lamont-Greene[6], N Felix[6], NA Bascombe[7], R Maharaj[7], M Bondy[8], A Roach[4], S Slovacek[3], M Ellis[8], T Rebbeck[9], AT Toriola[11], AAM Llanos[10]
[1]Oncology Division, Siteman Cancer Center, Washington University School of Medicine, St. Louis, St. Louis, MO, United States; [2]Epidemiology and Genomics Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute, Rockville, MD, United States; [3]California State University, Los Angeles, Los Angeles, CA, United States; [4]Public Health and Primary Care Unit, Department of Paraclinical Sciences, Faculty of Medical Sciences, University of the West Indies, St. Augustine, Trinidad and Tobago; [5]Ecology and Evolutionary Biology, University of Connecticut, Storrs, CT, United States; [6]Dr. Elizabeth Quamina Cancer Registry, Eric Williams Medical Sciences Complex, Mt. Hope, Trinidad and Tobago; [7]Department of Clinical Surgical Sciences, Faculty of Medical Sciences, University of the West Indies, Mt. Hope, Trinidad and Tobago; [8]Dan L. Duncan Cancer Center, Baylor College of Medicine, Houston, TX, United States; [9]Harvard TH Chan School of Public Health and Dana Farber Cancer Institute, Boston, MA, United States; [10]Rutgers School of Public Health and Rutgers Cancer Institute of New Jersey, Rutgers University, New Brunswick, NJ, United States; [11]Department of Surgery, Washington University School of Medicine, St. Louis, MO, United States

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

In Trinidad and Tobago, (TT) cancer mortality rates are among the highest in the world; however, data critical for the development of cancer prevention and control initiatives are lacking in TT. To fill this gap, we conducted the first comprehensive analysis of cancer epidemiology in TT, using data from the Dr. Elizabeth Quamina Cancer Registry (the national cancer registry of TT). The analytic dataset consisted of cancer cases entered into the CANREG software (Version 4.33) for the period 1995-2007. Death certification and population data were obtained from the Central Statistical Office. Analyses were done using Statistical Package of Social Science V.20 and R (version 3.0.1). The highest incidence and mortality rates were observed for cancers related to reproductive organs in women, namely, breast, cervical, and uterine cancers, and prostate, lung and colorectal cancers among men. The cancers with the highest cumulative risk (CR) of incidence were prostate (CR 7.0%, 95% CI 6.7-7.4%), and breast (CR 4.8%, 95% CI 4.6-5.0%). Men of African ancestry age >75 years had the highest incidence rate of prostate cancer (42.38 per 100,000) while the highest incidence rates of breast (44.60 per 100,000) and cervix uteri cancer (18.20 per 100,000) occurred in women 45-54 years. Incidence rates were highest in areas covered by the Tobago Regional Health Authority (188.3 per 100,000), while average mortality rates were highest in areas covered by the North West RHA (106.3 per 100,000). Nationals of African ancestry exhibited the highest rates of both cancer incidence and mortality (242 per 100,000 and 154 per 100,000, respectively) compared to those of East Indian ancestry (115 per 100,000 and 60 per 100,000, respectively) and those of mixed ancestry (111 per 100,000 and 61 per 100,000, respectively). Our findings highlight the importance of cancer surveillance and the need for strategic initiatives to address the increasing cancer burden in TT.

Author Index

All numbers identify Abstracts and Posters, NOT page numbers

Indicates Author is Presenter

Author Index

Author Index

Author Index

Author Index

Author Index

Program-at-a-Glance

TIME	MONDAY, JUNE 13	TUESDAY, JUNE 14	WEDNESDAY, JUNE 15	THURSDAY, JUNE 16	TIME
6:30 am					6:30 am
7:00			BIRDS OF A FEATHER ROUNDTABLE — Park View, Level 4: 7:00 am - 8:00 am	NAACCR 2015 5K RUN/WALK — Meet in Hotel Lobby; 6:30 am	7:00
7:30					7:30
8:00			PLENARY SESSION 3 — Gateway to Information — Grand Ballroom ABCD, Level 4: 8:00 am - 9:45 am		8:00
8:30		KEYNOTE ADDRESS — Grand Ballroom ABCD, Level 4: 8:30 am - 9:30 am			8:30
9:00				CONCURRENT SESSION 3 — Various Rooms: 8:00 am - 9:30 am	9:00
9:30		BREAK/POSTER/EXHIBITS: 9:30 am - 10:00 am	BREAK/POSTERS/EXHIBITS: 9:45 am - 10:15 am	BREAK Grand Ballroom EFGH: 9:30 am - 9:45 am	9:30
10:00		PLENARY SESSION 1 — Gateway to Implementation and Results — Grand Ballroom ABCD, Level 4: 10:00 am - 12:00 pm	CONCURRENT SESSION 2 — Various Rooms: 10:15 am - 11:45 am	PLENARY SESSION 4 — Gateway to Scientific Discovery — Grand Ballroom ABCD, Level 4: 9:45 am - 11:30 am	10:00
10:30					10:30
11:00					11:00
11:30				CONCURRENT SESSION 4 — Various Rooms: 11:30 am - 12:00 pm	11:30
12:00 pm	COMMUNICATIONS STEERING COMMITTEE MEETING (PAN) — Mills 8, Level 4: 12:00 pm - 1:00 pm	LUNCH ON OWN POSTERS/EXHIBITS — 12:00 pm - 1:15 pm / MTC REGISTERED LUNCHEON — Gateway East, Level 18	LUNCHEON & AWARDS CEREMONY — Grand Ballroom ABCD, Level 4: 12:00 pm - 1:30 pm	LUNCH ON OWN/POSTER/EXHIBITS — Grand Ballroom EFGH, Level 4: 12:30 pm - 1:30 pm	12:00 pm
12:30	STANDARDIZATION & REGISTRY DEVELOPMENT STEERING COMMITTEE MEETINGS (PAN) — Sterling 9, Level 2: 1:00 pm - 2:30 pm				12:30
1:00					1:00
1:30		PLENARY SESSION 2 — Gateway to Diversity — Grand Ballroom ABCD, Level 4: 1:15 pm - 3:30 pm	NAACCR BUSINESS MEETING — Grand Ballroom ABCD, Level 4: 1:30 pm - 2:30 pm	CONCURRENT SESSION 5 — Various Rooms: 1:30 pm - 3:00 pm	1:30
2:00					2:00
2:30	RESEARCH & DATA USE STEERING COMMITTEE MEETING (PAN) — Mills 8, Level 4: 2:30 pm - 4:00 pm		NEW UPDATES/FORDS MANUAL UPDATES — Grand Ballroom ABCD, Level 4: 2:30 pm - 3:30 pm		2:30
3:00					3:00
3:30	PROFESSIONAL DEVELOPMENT STEERING COMMITTEE MEETING (PAN) — Sterling 9, Level 2: 4:00pm - 5:00 pm	BREAK/POSTER/EXHIBITS: 3:30 pm - 4:00 pm	BREAK/POSTER/EXHIBITS: 3:30 pm - 4:00 pm	BREAK/POSTER/EXHIBITS: 3:00 pm - 3:30 pm — Grand Ballroom ABCD, Level 4	3:30
4:00		CONCURRENT SESSION 1 — Various Rooms: 4:00 pm - 5:30 pm	NAACCR BIKE EVENT — Meet in Hotel Lobby, 4:00 pm	CLOSING PLENARY SESSION 5 — Gateway to Patient Centeredness & Patient Perspectives — Grand Ballroom ABCD, Level 4: 3:30 pm - 4:30 pm	4:00
4:30				CLOSING REMARKS & ADJOURNMENT	4:30
5:00	Exhibitor Showcase and Poster Pre-Viewing — Grand Ballroom EFGH, Level 4: 5:00 pm - 7:00 pm				5:00
5:30		REGISTRY OF THE FUTURE OPEN FORUM — Park View, Level 4: 5:45 pm - 6:30 pm	ST. LOUIS CARDINAL GAME OUTING — 6:15 pm Game Start		5:30
6:00	NAACCR Program Committee Reception — Grand Ballroom EFGH, Level 4: 6:30 pm - 7:00 pm				6:00
6:30		OPENING RECEPTION — Gateway East & Terrace, Level 18: 6:30 pm - 9:00 pm			6:30
7:00					7:00

Legend:
- Plenary Sessions
- Concurrent Sessions
- Committee Meetings
- Other Sessions
- Awards Luncheon
- Break/Lunch — Breaks: Grand Ballroom EFGH