OBJECTIVES: The study aims to quantify the expected impacts of different cancers through a cost-effectiveness analysis based on QALY (quality-adjusted life year) as the common unit, to aid prevention policy decisions. METHODS: 464,722 patients with pathologically verified cancer registered in the Taiwan Cancer Registry during 1998-2009 were used to estimate lifetime survival by using Kaplan-Meier estimation and the metric method. A convenience sample for measuring the utility value with EQ-5D was conducted in 11,453 cancer patients, with the results then multiplied by the survival time using the QALYs. The loss of QALY was calculated by subtracting the QALE of each cancer cohort from the life expectancy of the corresponding age- and gender-matched reference population. The cumulative incidence rates from age 20 to 79 (CIR20-79) were calculated to estimate the lifetime risk of cancer for each organ system. RESULTS: Liver and lung cancer were found the highest expected lifetime health impacts in males and females, or expected lifetime losses of 0.97 and 0.41 QALYs that could be averted, respectively. While the priority changes for prevention based on expected health impacts were slightly different for females based on standardized mortality rates, those of males involve a broader spectrum, including oral, colorectal, esophageal and stomach cancer. CONCLUSIONS: The integration of incidence rate with loss-of-QALY could be used to represent the expected losses that should be averted by prevention, which may be useful in prioritizing strategies for cancer control.

PCN172 QUALITY OF EVIDENCE SUPPORTING INCLUSION OF PHARMACOGENOMIC BIOMARKERS IN PRODUCT LABELS OF FDA APPROVED ONCOLOGY THERAPIES Gupta J1, Kapoor A2, Mazumder D1 1Drugs for In-House, New York, NY, USA; 2Johnson N.M., Swilling N, Altier J., NCI, Bethesda, MD, USA OBJECTIVES: Pharmacogenomic biomarkers aid in predicting drug response and adverse drug reactions. Drug label provides information about these biomarkers; however, the quality of evidence regarding the biomarker use is unclear. We investigated the FDA-approved drug labels for the availability and quality of evidence supporting the biomarkers used in conjunction with targeted therapies in different cancers. METHODS: We searched the US FDA website to obtain all the information on the FDA-approved drugs with available on-label pharmacogenomic biomarkers of the targeted cancer therapies. The Evaluation of Genomic Application in Practice and Prevention Working Group's guideline was used to assess the clinical validity and utility of the referenced studies. The available evidence was graded as convincing, adequate, or incomplete. We also assessed the completeness of studies and recommendation in the label. RESULTS: Fifty-three drug-biomarker combinations were identified, encompassing 42 unique drugs and 23 unique biomarkers. Combinations were most frequently identified in breast cancer (26%), chronic myeloid leukemia (15%), and colorectal cancer (11%). Half of the supporting evidence in drug labels (51%) were not graded with convincing validity (i.e., the ability to predict the phenotype precisely); more than half (60%) were incomplete pertaining to utility (i.e., the ability to improve measurable clinical outcomes). Complete information of the referenced clinical studies was included in only 11% labels, whereas 62% labels provided partial information. The treatment recommendations about clinical decision were based on the drug's mechanism of action in 75% of the labels and on drug-biomarker association in 21% of drug labels. Also, the biomarker's prediction of improved drug response and contraindications was provided in 77% and 23% labels, respectively. CONCLUSIONS: Majority of the labels lacked convincing validity and utility regarding biomarker use. As biomarkers may enhance clinical care, it has become extremely important for inclusion and rational use of pharmacogenomic information in drug labels, for optimized decision-making.

PCN173 CARBOHYDRATE INTAKE AND BREAST CANCER RISK IN AFRICAN AMERICAN AND EUROPEAN AMERICAN WOMEN IN THE WOMEN'S CIRCLE OF HEALTH STUDY Johnson NC1*, Bandera E2 1ICON PLC, Morrisstown, NJ, USA; 2Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, USA OBJECTIVES: The overall incidence of breast cancer is lower in African American (AA) women in comparison to European American (EA) women, however AA women are more likely to die of the disease. National data has reported that compared to EA women, AA women have a poorer diet quality and are also among the highest consumers of added sugar. This analysis aims to explore the association of carbohydrate intake and breast cancer risk among AA and EA women. METHODS: We evaluated the association in a case-control study including cases (breast cancer positive) and controls (cancer negative). Food consumption was collected using a Food Frequency Questionnaire. Multivariable logistic regression controlling for relevant breast cancer risk factors was used to calculate Odds Ratios (OR) and 95% Confidence Intervals (CI). RESULTS: Our sample size was 3148. Overall, EA women who consumed larger amounts of total carbohydrates (highest quartile) had a significantly decreased risk of breast cancer compared to those who consumed lower amounts of total carbohydrates (lowest quartile) OR = 0.60; 95% CI: 0.43-0.83. In stratified analysis, no significant associations were observed. Majority of the labels lacked convincing validity and utility regarding biomarker use. As biomarkers may enhance clinical care, it has become extremely important for inclusion and rational use of pharmacogenomic information in drug labels, for optimized decision-making.

PCN174 IMMUNE CHECKPOINT INHIBITORS AS ADJUVANTS: FUTURE CHALLENGES FOR PRICING AND REIMBURSEMENT Wieffer HM1, Mc Kendrick J1, Petropoulos A, Saltman D 1PMEA Consulting, Flet, UK OBJECTIVES: Adjuvant therapy is additional treatment administered after the primary treatment (usually surgery) to lower the risk of recurrence. The mechanism of action of the recently developed immune checkpoint inhibitors suggests they have potential as adjuvant therapies; by their action in enhancing the immune response, residual tumor cells may be eliminated. In this study, we identified potential challenges to pricing and reimbursement (P&R) assessment of these drugs as adjuvant given the likely high cost of these innovative agents. METHODS: We analyzed the NICE guidance for cancer to identify current trials of immune checkpoint inhibitors as adjuvant therapies. We then searched the website of the UK health technology assessment agency, NICE, for appraisals of adjuvant cancer therapies, identified the corresponding evaluations by PBAC (Australia) and the SMC (Scotland) on these agencies' websites, and identified key challenges. RESULTS: We identified nine trials with an immune checkpoint inhibitor used as adjuvant therapy, only one of which was Phase 3. Six NICE appraisals of pharmacological agents used as adjuvants were identified, of which had also been assessed by PBAC and the SMC. Particular areas of concern in evaluations were the extrapolation of disease-free survival to overall survival, and the balance between safety and benefit in disease prevention. Restrictions were imposed in several decisions on the duration of adjuvant treatment and the risk status of patients, dependent on the available clinical evidence. So far, adjuvant therapies have rarely tested acceptable cost-effectiveness thresholds. CONCLUSIONS: Development of immune checkpoint inhibitors as adjuvant therapies is still an early stage of consideration of the economic and clinical case for these drugs will be needed to ensure successful P&R. Experience with the evaluation of high-cost therapies in this context is limited, so engagement will be needed between manufacturers and agencies to define the required evidence and willingness to pay.

PCN175 PREDICTORS OF A POSITIVE CANCER DRUG FUND DECISION Taka S., Li, D., Y. Cost Effectiveness, New York, NY, USA OBJECTIVES: Of all the innovations that have happened for the United Kingdom has set aside £200 million per year through the Cancer Drug Fund (CDF) to pay for oncology treatments not reviewed or approved by NICE. The CDF scores drugs on progression-free survival (PFS), overall survival (OS), quality of life (QoL), safety, unmet need, and strength of evidence (SE). The scores determine if the drug will be included on the CDF priority list. This analysis attempts to determine the weight each score has on the reimbursement decision. METHODS: All available CDF decision summaries post April 2013 were analyzed. Scores for PFS, OS, QoL, safety, unmet need and SE were extracted from each decision summary. The CDF decision was classified as positive (recommended) or negative (do not recommend). Deferred decisions or drugs not scored were excluded. A probit model was used to estimate the probability of a positive decision based on the scores. RESULTS: Drugs filling an unmet need, or drugs with the similar/improved toxicity predicted a positive reimbursement decision perfectly. Drugs with significantly worse toxicity predicted a negative decision perfectly. Drugs with no affect predictors predicted a positive decision 99% of the time, and a negative decision 99% of the time with an immune checkpoint inhibitor used as adjuvant given the likely high cost of these innovative agents. So far, adjuvant therapies have rarely tested acceptable cost-effectiveness thresholds. Results of those pricing negotiations compared to the US, and the outcome with an immune checkpoint inhibitor used as adjuvant given the likely high cost of these innovative agents. So far, adjuvant therapies have rarely tested acceptable cost-effectiveness thresholds. Results of those pricing negotiations compared to the US, and the outcome with an immune checkpoint inhibitor used as adjuvant given the likely high cost of these innovative agents. So far, adjuvant therapies have rarely tested acceptable cost-effectiveness thresholds. Results of those pricing negotiations compared to the US, and the outcome with an immune checkpoint inhibitor used as adjuvant given the likely high cost of these innovative agents. So far, adjuvant therapies have rarely tested acceptable cost-effectiveness thresholds. Results of those pricing negotiations compared to the US, and the outcome with an immune checkpoint inhibitor used as adjuvant given the likely high cost of these innovative agents.

PCN176 BARBECUED ONCOLOGY MARKET ACCESS: HOW BBQ-PULLED PORK IS SIMILAR TO EUROPEAN P&R NEGOTIATIONS Swilling N1, Alston J2 1Simon-Kucher and Partners, Cambridge, MA, USA OBJECTIVES: In this study, we look at the market access delays caused by lengthy pricing and reimbursement negotiations in the EU5. In addition, we look at the results of those pricing negotiations compared to the US, and the outcome with regards to access for specific subpopulations. METHODS: We examined over 20 oncology NMGs with EMA approval over the last three years and looked at the date of initial price publication in each market, HTA agency outcomes (where available), and price level at launch to compare the length of the price negotiation and price levels across EU markets as well as with the United States. RESULTS: Coming to a negotiated agreement for reimbursement in France, Italy, and Spain typically takes over a year, but there is no recognizable trend by market. In addition, oncology pricing in the EU5 has been found to be significantly lower than the US. What is less clear is the reason for the lower pricing, particularly in countries with ER+ tumors. However, we could not establish and association between carbohydrate consumption and breast cancer risk in AA women. Moreover, the specific types of carbohydrates and food sources need be studied for both EA and AA women to better understand the association.
PCN177

TOLERANCE PROFILES ON HTA DECISION MAKING IN ONCOLOGY
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OBJECTIVES: To highlight the impact of tolerance profiles on Health Technology Assessment (HTA) decision-making in non-small-cell lung cancer (NSCLC), ovarian cancer and prostate cancer from three European HTA agencies. 

METHODS: HTA assessments on NSCLC, ovarian cancer and prostate cancer products marketed since 2011 were selected from HAS (France), G-BA (Germany) and NICE (UK). 14 reports on NSCLC, 5 on ovarian cancer and 14 on prostate cancer were selected for in-depth analysis.

RESULTS: In the UK, safety profiles of the investigated drugs did not seem to have major impact on the recommendation. It was however seen that drugs with a good safety profile were more often recommended for clinical outcomes in the final decision from NICE was, for example, seen in the assessment of afatinib, where a significant increase in serious adverse events did not negatively impact the recommendation because clinical benefits outweighed safety concerns. Safety data and patient-relevance of endpoints is of high importance in Germany. A beneficial safety profile resulted in a higher benefit rating, whereas a negative safety profile lowered the G-BA rating. Case examples are evaluations of afatinib and crizotinib, where a negative safety profile lowered the benefit rating. 

Efficacy outcomes were weighted against safety outcomes in all assessments in France. An unfavourable safety profile appeared to have a negative impact on the ASMR rating from HAS, while a favorable profile did not have a positive impact. An example is the assessment of cabazitaxel, where the safety data presented at the initial submission was unfavorable, resulting in a lower ASMR rating (IV), however a resubmission with additional safety data resulted in a higher rating (III).

CONCLUSIONS: Different EU payer agencies seem to have a different view on safety profiles, with the highest impact seen in Germany and the lowest impact seen in the UK.

PCN179

HIERARCHY OF CLINICAL ENDPOINTS IN HTA DECISION MAKING IN ONCOLOGY
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OBJECTIVES: To highlight the hierarchy of clinical endpoints in Health Technology Assessment (HTA) decision making in NSCLC, ovarian cancer and prostate cancer from three European HTA agencies.

METHODS: HTA assessments on non-small-cell lung cancer (NSCLC), ovarian cancer and prostate cancer products marketed since 2011 were selected from HAS (France), G-BA (Germany) and NICE (UK). 14 reports on NSCLC, 5 on ovarian cancer and 14 on prostate cancer were selected for in-depth analysis. In addition ASCO and ESMO guidelines were reviewed for recommendations around endpoints.

RESULTS: HTA agencies base their decision on the significance of the presented outcomes, but an analysis of NSCLC assessments showed that when the effect sizes in overall survival (OS) and progression-free survival (PFS) were deemed to be clinically irrelevant, recommendations were less positive. Significant improvements in OS and PFS can still be rejected in the UK because of unacceptable cost-effectiveness. Assessments demonstrating improvements in only PFS were most oftentimes rejected. Significant improvements in OS were associated with a higher ASMR rating in France. Assessments with improvements in surrogate outcomes, including PFS and overall response rate, were also accepted. OS and PFS were the main endpoints in NSCLC patients with a favorable benefit-risk balance in Germany. A combination of OS and QoL improvements was associated with a higher G-BA benefit rating. When OS or QoL data were absent, the benefit rating was lowered. In Germany, the ASMR rating was higher when the evidence was for clinical benefit in oncology, but surrogate outcomes and QoL benefits were also accepted when non-significant OS results were seen. In addition, it seems that statistical significance in itself is not enough, as payers want to see a clinical meaningful difference. Further research in cancer treatment and costs for which thresholds for clinical relevance have been published recently, could validate these results.

CONCLUSIONS: The extent to which individual lung cancer patients undergo guideline-recommended molecular testing in routine care prior to initiation of first-line erlotinib is not known. Prevalence and factors associated with testing and erlotinib therapy were determined in Stage IV non-small cell lung cancer (NSCLC).

METHODS: We identified incident cases diagnosed between 2007-2009 using SEER-Medicare data. Multivariable models were used to identify factors independently associated with testing in order to test the hypothesis that receipt of first-line erlotinib therapy.

RESULTS: Only 6.5% (5007/7678) were treated with first-line erlotinib and of those, only 6.8% underwent a molecular test. Testing and erlotinib therapy were independently associated with phenotypic enrichment using correlates of epidermal growth factor receptor (EGFR) mutations (female gender, Asian ethnicity, non-squamous cell histology). Older age, Medicaid enrollment, and admission to hospice decreased likelihood of testing but increased probability of erlotinib therapy.

CONCLUSIONS: Vast majority of older non-squamous lung cancer patients are not undergoing molecular testing. Clinical enrichment criteria were influential in patient selection for erlotinib therapy and testing, but these attributes do not adequately discriminate between EGFR mutant and wild-type tumors. Provider education and guidelines to promote guideline-recommended testing is needed to increase testing rates.

PCN183

ONCOLOGY DRUGS RECEIVING BREAKTHROUGH THERAPY DESIGNATION: CLINICAL TRIAL CHARACTERISTICS, DRUG PRICING, AND APPROVAL PROCESS Paid, S.1, Vegetova A., Basu R.2, Zhang Y.1
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OBJECTIVES: The Food and Drug Administration (FDA) grants breakthrough therapy designation (BTD) to facilitate faster approval of drug products are intended to treat a serious or life-threatening condition or provide substantial improvement over existing therapies. The purpose of this research is to compare time to approval, treatment cost and key clinical design characteristics of BTD to non-BTD drugs in oncology.

METHODS: This narrative review used publicly reported data from drug manufacturers’ and FDA websites to examine all oncology drugs approved between November 2013 and December 2014. Median time-to-approval was assessed for new molecular entities (NMEs) and monthly treatment cost was calculated for approved indications based on wholesale acquisition cost (WAC) from AnalystSource. Approved oncology drugs were categorized as BTD and non-BTD drugs for comparison.

RESULTS: A total of 25 FDA indications for oncology drugs were approved from November 2013 to December 2014. Nine indications were granted BTD, while 16 were non-BTD drugs. For NMEs, median time-to-approval was 8 months compared to 15 months for non-BTD drugs (p<0.05). Median time-to-approval for BTD drugs was 7.6 months compared to 15 months for non-BTD drugs (p<0.05). Among the BTD drugs, 11% had approval from one FDA center, compared to 77% for non-BTD drugs (p<0.05). Median time from FDA approval to first public release on the website.

CONCLUSIONS: Based on the results of this study, a recommendation for FDA to provide approval guidelines for standardization of approval processes for BTD drugs could be beneficial for expediting approval processes and improving patient access to new oncology drugs.

PCN181

OPTIMIZING MARKET ACCESS OF CANCER DRUGS IN CANADA: A STUDY OF ECONOMIC REVIEWS BY THE PAN-CANADIAN ONCOLOGY DRUG REVIEW (PCODR) EXPERT COMMITTEE Qi K1, Yang Y.1, Gauthier A.1,2,3
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OBJECTIVES: PCODR was established in 2010 to guide drug funding decisions through assessing the clinical, patient perspectives and cost-effectiveness (CE) information of new drugs. A considerable number of oncology drugs do not get recommended or get conditional recommendation. This study aims to analyse the comments provided in PCODR final recommendations and act as a guidance for manufacturers to improve the preparation of PCODR submissions.

METHODS: A review of PCODR assessments was completed evaluating all recommendations made available between May 2012 and December 2014 (N=36) relating to 29 oncology drugs. The comments regarding CE estimates were extracted and analysed based on the comments made available in the PCODR final recommendations. The percentage of CE estimates that were pos-