Journal of Economic Perspectives—Volume 29, Number 1—Winter 2015—Pages 139–162

Pricing in the Market for Anticancer Drugs[†]

David H. Howard, Peter B. Bach, Ernst R. Berndt, and Rena M. Conti

In 2004, Genentech introduced the drug bevacizumab—brand name Avastin—for patients with late-stage colorectal cancer. The drug cost $50,000 per treatment episode and was associated with an incremental increase in life expectancy of five months. Following Genentech's pricing announcement, newspapers ran stories with titles like "Cancer Weapons, Out of Reach" in the *Washington Post* (Wittes 2004) and "Price of Cancer Drugs Called 'Mind-Boggling'" in *USA Today* (Szabo 2004). Some Wall Street analysts worried that bevacizumab's pricing would prompt the US Congress to regulate drug prices (Anand 2007). By 2011, the backlash against bevacizumab was a distant memory. Bristol-Myers Squibb set the price of its newly approved melanoma drug ipilimumab—brand name Yervoy—at $120,000 for a course of therapy. The drug was associated with an incremental increase in life expectancy of four months.

■ *David H. Howard is Associate Professor, Department of Health Policy and Management, Rollins School of Public Health, and Department of Economics, Emory University, Atlanta, Georgia. Peter B. Bach is a Member in the Department of Epidemiology and Biostatistics, Attending Physician in the Department of Medicine, and Director of the Center for Health Policy and Outcomes, Memorial Sloan Kettering Cancer Center, New York City, New York. Ernst R. Berndt is the Louis E. Seley Professor in Applied Economics, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Massachusetts. Rena M. Conti is Assistant Professor of Health Policy, Departments of Pediatrics and Public Health Sciences, University of Chicago, Chicago, Illinois. Their email addresses are david.howard@emory.edu, bachp@mskcc.org, eberndt@mit.edu, and rconti@uchicago.edu.*

[†] To access the Appendix, Data Appendix, and disclosure statements, visit http://dx.doi.org/10.1257/jep.29.1.139

doi=10.1257/jep.29.1.139

Drugs like bevacizumab and ipilimumab have fueled the perception that the launch prices of new anticancer drugs and other drugs in the so-called "specialty" pharmaceutical market have been increasing over time and that increases are unrelated to the magnitude of the expected health benefits (Experts in Chronic Myeloid Leukemia 2013; Kantarjian, Fojo, Mathisen, and Zwelling 2013; Schrag 2004; Hall 2013). A commentary in *The Lancet*, a leading British medical journal, summarized the conventional wisdom: "[T]he cost of the new generation of drugs is getting out of all proportion to the added benefit" (Cavalli 2013). The public debate has focused on a handful of high-profile drugs like bevacizumab. It is unclear in these debates whether these drugs are outliers or reflect broader trends in the industry.

In this paper, we discuss the unique features of the market for anticancer drugs and assess trends in the launch prices for 58 anticancer drugs approved between 1995 and 2013 in the United States. Drugs used to treat other conditions have also been closely scrutinized—most recently the $84,000 hepatitis C treatment Sovaldi—but we restrict attention to anticancer drugs because the use of median survival time as a primary outcome measure provides a common, objective scale for quantifying the incremental benefit of new products.

The market for anticancer drugs is economically significant. Within the market for pharmaceuticals, anticancer drugs rank first in terms of global spending by therapeutic class: $91 billion in 2013, up from $71 billion in 2008 (IMS 2014). The US market size was $37 billion in 2013, of which one-third was spent on 10 patent-protected cancer drugs alone (Conti, Bernstein, Villaflor, Schilsky, Rosenthal, and Bach 2013). The market is also politically salient. Anticancer drugs figure prominently in discussions over health reform, alternately symbolizing wasteful spending and biomedical progress.

We find that the average launch price of anticancer drugs, adjusted for inflation and health benefits, increased by 10 percent annually—or an average of $8,500 per year—from 1995 to 2013. We review the institutional features of the market for anticancer drugs, including generous third-party coverage that insulates patients from drug prices, the presence of strong financial incentives for physicians and hospitals to use novel products, and the lack of therapeutic substitutes. We argue that under these conditions, manufacturers are able to set the prices of new products at or slightly above the prices of existing therapies, giving rise to an upward trend in launch prices. Government-mandated price discounts for certain classes of buyers may have also contributed to launch price increases as firms sought to offset the growth in the discount segment by setting higher prices for the remainder of the market.

Drug Pricing Strategies

The process by which firms establish the "launch prices" of new, branded drugs—that is, the prices firms set immediately following US Food and Drug Administration (FDA) approval—is opaque, and relatively little work has been done on the

subject.[1] At the time of FDA approval, most drugs are on-patent, and so manufacturers are temporary monopolists. They have wide leeway, though not unlimited power, to set prices.

Reekie (1978) and Lu and Comanor (1998) studied the determinants of drugs' launch prices for drugs across multiple therapeutic categories. They found that prices are higher for drugs that offer significant benefits compared to existing products. Hedonic pricing studies of colorectal cancer (Lucarelli and Nicholson 2009) and anti-ulcer drugs (Suslow 1996; Berndt, Bui, Reiley, and Urban 1995) find that manufacturers set higher prices for higher-quality drugs, but studies of antidepressants (Chen and Rizzo 2012) and arthritis drugs (Cockburn and Anis 2001) actually find the opposite. In most therapeutic categories physicians and patients learn about drug quality partly through experience, and so manufacturers may find it advantageous to introduce high-quality drugs at low prices so that the drugs will penetrate the market more quickly (Chen and Rizzo 2012).

Anticancer Drugs

Anticancer drugs are among the only life-prolonging treatments available for patients with metastatic tumors, which means that the tumor has spread beyond its original site to a nonadjacent location. The vast majority of patients with metastatic disease will die of cancer. It has become increasingly common to administer anticancer drugs to patients with early-stage disease after they have undergone surgery or radiotherapy. Because most newly approved anticancer drugs are approved on the basis of their effectiveness in patients with metastatic disease, our analysis focuses on this group of patients.

Rapid progress in the fields of tumor biology, genetics, and immunology has spurred the development of a number of new anticancer drugs. Almost 1,000 anticancer drugs are currently in various phases of pre-approval testing, more than the number for heart disease, stroke, and mental illness combined (IMS 2014; PhRMA 2014). Many new drugs are approved for the treatment of tumors with particular genetic markers. For example, the FDA approved pertuzumab in 2012 for patients with metastatic breast cancer linked to a defective HER2 gene. Targeted therapies are more likely to succeed in clinical trials and may face a less-elastic demand curve, facilitating premium pricing (Trusheim and Berndt 2012).

The scientific knowledge embodied by new drugs is impressive, but progress in basic science has not always been accompanied by proportionate improvements in patient outcomes. Gains in survival time associated with recently approved anticancer drugs are typically measured in months, not years.

[1] Prior work on pricing in the pharmaceutical industry has mostly focused on the effect of generic competition on price levels (for example, Caves, Whinston, and Hurwitz 1991) and post-entry pricing dynamics (Lu and Comanor 1998).

Most anticancer drugs are approved by the FDA on the basis of one or more randomized controlled trials. Some trials have an "active control"; patients are randomized to receive the new drug or an alternative therapy. When a drug is sufficiently novel that it has no close substitutes or it will be used in combination with existing drugs, patients in the control arm may be randomized to receive the new drug or a placebo. Trials of anticancer drugs usually measure patient outcomes in terms of the difference in survival between the treatment and control arms.

Some drugs are approved on the basis of single-arm trials. In a single-arm trial, all patients receive the new drug. There is no control group. Single-arm trials focus on short-term patient safety rather than patient survival, and so they have a much shorter duration. The FDA grants approval for many leukemia and lymphoma drugs on the basis of single-arm trials. Median survival among patients with these types of cancers is two or more years. Requiring manufacturers of leukemia and lymphoma drugs to conduct randomized trials to measure survival benefits could significantly delay the introduction of potentially beneficial drugs. Single-arm trials can show that a drug is safe but cannot determine whether the drug improves life expectancy. Physicians can observe survival in their own patient populations, but it is probably difficult for individual physicians to draw sound inferences about the quality of a new drug because their patient panels are not sufficiently large. Unlike single-arm studies, randomized trials establish efficacy as common knowledge.

Economists have measured the value of anticancer drugs by evaluating changes in life expectancy and costs over time (Howard, Kauh, and Lipscomb 2010; Lichtenberg 2009a, b; Sun, Jenna, Lakdawalla, Reyes, Philipson, and Goldman 2010; Woodward, Brown, Steward, Cronin, and Cutler 2007) or measuring patients' willingness-to-pay (Goldman, Jena, Lakdawalla, Malin, Malkin, and Sun 2010; Lakdawalla, Romley, Sanchez, Maclean, Penrod, and Philipson 2012; Romley, Sanchez, Penrod, and Goldman 2012; Seabury, Goldman, Maclean, Penrod, and Lakdawalla 2012; Snider, Romley, Vogt, and Philipson 2012). A common finding is that the dollar-denominated benefits associated with anticancer drugs are equal to or exceed the cost of an episode of treatment. However, willingness-to-pay estimates must be interpreted cautiously in light of the fact that most patients mistakenly believe that anticancer drugs cure cancer (Weeks et al. 2012). In addition, these past studies do not address trends in launch prices. If new drugs have higher prices per unit of benefit, then we cannot assess the cost-effectiveness of anticancer drugs as a class based on studies of older drugs.

Policies Governing Drug Coverage and Reimbursement

Medicare is the most prominent US payer for anticancer drugs, followed by commercial insurers and then state Medicaid programs. Medicare pays for physician-administered intravenous drugs through the medical "Part B" benefit. By law, Medicare does not directly negotiate with drug manufacturers over prices for prescription drugs covered under the Part B benefit or the oral anticancer drugs

covered under Medicare's pharmacy "Part D" benefit. Section 1861 of the Social Security Act, which requires that the Medicare program cover "reasonable and necessary" medical services, precludes consideration of cost or cost-effectiveness in coverage decisions (Neumann 2005). Consequently, Medicare covers all newly approved anticancer drugs for indications approved by the FDA.

The private insurance plans that provide prescription drug coverage under Medicare "Part D" are required to cover all drugs in six protected classes, one of which is anticancer drugs (Center for Medicare and Medicaid Services 2014). Three quarters of the population reside in states that require insurers to cover anticancer drugs for "off label," non-FDA-approved uses (Bach 2009).

Insurers in states without these requirements and large employers that self-insure have more leeway to determine coverage policies, yet, in the rare instances where third-party payers have tried to place meaningful restrictions on patients' access to anticancer drugs, they have relented under pressure from clinicians and patient advocacy groups. In the early 1990s, many insurers refused to cover a breast cancer treatment consisting of higher-than-normal doses of anticancer drugs followed by a bone marrow transplant. Breast cancer patient advocacy groups waged a high-profile campaign to secure coverage, and most insurers started paying for the treatment. Randomized trials later found that it did not prolong survival, and physicians and patients abandoned the procedure (Howard et al. 2011).

Oregon's Medicaid program recently proposed to limit coverage of anticancer drugs on the grounds that "in no instance can it be justified to spend $100,000 in public resources to increase an individual's expected survival by three months when hundreds of thousands of Oregonians are without any form of health insurance" (as reported in Landsem 2013). The proposal was withdrawn following a public backlash.

The case of bevacizumab illustrates the laxity of payers' coverage policies. The FDA approved the drug for the treatment of colorectal cancer in 2004 and then for treatment of breast cancer in 2008 based on the results of a randomized trial. Results from two additional randomized trials were later released in 2009. The trials found that patients receiving bevacizumab experienced a statistically significant gain in "progression-free survival," which measures the period of time where the cancer is under control, but that differences in overall survival were small and not statistically significant. Based on these findings, the FDA revoked coverage for bevacizumab's breast cancer indication in 2011. However, an expert panel convened by the National Comprehensive Cancer Network (2010), a consortium of major cancer centers, voted against removing bevacizumab from its list of appropriate breast cancer drugs. Faced with these conflicting decisions, Medicare and major multistate insurance plans announced they would continue to cover bevacizumab for breast cancer patients.

Some drug industry critics hold up the British National Health Service as a model for restraining drug prices. Britain's National Institute for Clinical Effectiveness evaluates the cost-effectiveness of new drugs and has restricted National Health Service funding for cancer drugs where the benefits are small in relation to costs. The British government uses the threat of noncoverage to negotiate discounts with drug

manufacturers. However, restrictions on patient access are unpopular, and Prime Minister David Cameron created a 200 million pound Cancer Drugs Fund in 2011 to pay for noncovered cancer drugs outside of normal funding channels (Fleck 2013).

The oncologists who provide care to cancer patients face financial incentives to administer intravenous anticancer drugs. In most industries, there is not much difference between wholesale and retail prices, and so these prices send consistent signals. But wholesale and retail prices for drugs can diverge systematically, providing incentives for dysfunctional behavior. Oncologists and hospitals buy intravenous, physician-administered drugs from wholesalers and bill insurers. They profit on the spread between the reimbursed price and the wholesale cost. Medical oncology practices derive more than 50 percent of their revenues from drugs (Akscin, Barr, and Towle 2007), and many oncologists report that they face financial incentives to administer anticancer drugs (Malin, Weeks, Potosky, Hornbrook, and Keating 2013). Oncologists' drug choices are responsive to profit margins (Conti, Rosenthal, Polite, Bach, and Shih 2012; Jacobson, O'Malley, Earle, Pakes, Gaccione, and Newhouse 2006; Jackobson, Earle, Price, and Newhouse 2010). The use of irinotecan—brand name Camptosar—decreased following the expiration of its patent, even though the price dropped by more than 80 percent, possibly reflecting declines in the spread between the reimbursement level and oncologists' acquisition cost (Conti et al. 2012).

Insurers use cost-sharing—that is, copayments, coinsurance, and deductibles—to make patient demand responsive to the cost of health care, but cost sharing is not always effective in reducing patients' demand for anticancer drugs. Most employer-based insurance policies have an annual out-of-pocket maximum, beyond which the insurer assumes 100 percent of the cost of care. Many patients with late-stage cancer reach the maximum fairly quickly, in which case the insurer bears the full cost of anticancer drugs for the remainder of the benefit year.[2] Consequently, patients may be indifferent between a drug that costs $20,000 and one that costs $100,000.

An analysis of private insurance claims data from 1997 to 2005 found that the annual median out-of-pocket cost for the intravenous drug rituximab was $431 per year (Goldman et al. 2010). Patients' costs were less than 2 percent of total spending on rituximab. Patients' out-of-pocket costs for oral agents, which are covered under insurers' pharmacy benefit, are higher. Still, a separate analysis of claims found that cancer patients' out-of-pocket costs were 5 percent of total drug costs, and only 34 percent of patients faced per claim copayments in excess of $50 (Raborn, Pelletier, Smith, and Reyes 2012).

Even when patients face large out-of-pocket costs for anticancer drugs, they have several options for reducing their liabilities. Patients with private insurance can apply for aid from drug manufacturers' co-pay assistance programs, which offset patients' out of-pocket costs, typically on generous terms. For example, Dendreon's

[2] In the past, some plans did not count spending on prescription drugs towards the out-of-pocket maximum, but this practice is prohibited by the Patient Protection and Affordable Care Act of 2010, beginning in 2014.

patient assistance program covers up to $6,000 of patients' copayments, coinsurance, and deductibles for its $93,000 prostate therapy sipuleucel-T, boasting "75 percent of patients receiving Provenge [the trade name for sipuleucel-T] are expected to have minimal to no out-of-pocket costs" (Dendreon 2014). The program even reimburses patients for the costs they incur during travel to oncology clinics. These funds flow directly from pharmaceutical companies to patients and are not captured in insurers' records. Patient assistance programs lower the elasticity of patient demand, enabling manufacturers to set higher prices (Howard 2014). The federal government does not allow assistance programs affiliated with a pharmaceutical manufacturer to aid Medicare and Medicaid enrollees on the grounds that these programs provide an illegal inducement for patients to receive care, but manufacturers are allowed to donate funds and steer Medicare and Medicaid patients to programs operated by independent foundations. Patients can also use death as a backstop against medical debt. Most patients considering whether to use anticancer drugs have short life expectancies. They may be willing to exhaust their assets to buy small gains in health. Health care providers must write-off debt in excess of the decedent's estate.

Not surprisingly, the elasticity of demand with respect to patients' out-of-pocket costs is low. Goldman et al. (2006) estimate that spending on cancer drugs declines by 0.1 percent in response to a 10 percent increase in patient coinsurance. For the sake of comparison, spending on drugs used to treat arthritis declines by 2.1 percent and spending on drugs used to treat kidney failure declines by 0.7 percent when patient coinsurance increases by 10 percent.

Trends in Launch Prices

We evaluate pricing trends for 58 anticancer drugs approved in the US between 1995 and 2013 (CenterWatch 2014). We restrict attention to drugs administered with the primary intent of extending survival time for cancer patients and drugs for which survival benefits have been estimated in trials or modeling studies. We do not consider drugs administered to treat pain or drugs that are administered to alleviate the side effects of cancer treatments. Details about the selection of drugs, references for survival benefits, and other details about the data are provided in an Appendix available with this paper at the journal's website, http://e-jep.org.

The FDA approves drugs for specific uses, or indications, which are described in each drug's "product label." We focus on the benefits associated with each drug's first FDA-approved indication. Once a drug is FDA-approved, physicians are free to use the drug for any patient with any condition, but manufacturers may not promote the drug for "off label" indications. We did not consider the survival benefits associated with indications approved by the FDA after the initial approval of the drug. In most cases, the benefits associated with these indications are unknown to manufacturers at the time of launch and are thus difficult to incorporate into their initial pricing decisions.

Forty-one of the 58 drugs in our sample were approved on the basis of randomized controlled trials. We obtained information on the incremental survival benefits of these drugs from the results of these trials. Drugs are typically tested against the next-best therapy available at the time the trial was initiated. In some cases the next-best therapy is "nothing," and so patients receive a placebo. We measured benefits by subtracting median overall survival in the control arm from median overall survival in the treatment arm. We used progression-free survival (the period of time the cancer is under control) when trials did not report overall survival.[3] Drug manufacturers may focus on progression-free survival for practical reasons. Trials designed to detect differences in progression-free survival are shorter (progression precedes death) and require a smaller sample size because the variation in progression-free survival is typically lower than the variation in overall survival. There is considerable debate in the oncology community about whether progression-free survival is a good proxy for overall survival. Our view is that even if progression-free survival benefits are only weakly correlated with overall survival benefits, data on progression-free survival benefits provide a useful signal of product quality to a manufacturer who must set a price for a new drug in the absence of information on overall survival benefits and to practicing physicians who must decide whether to use it. In our data, we observe both overall survival and progression-free survival for 20 drugs. The absolute difference between overall survival and progression-free survival is less than one month for five of these drugs and less than two months for 13 of the drugs.

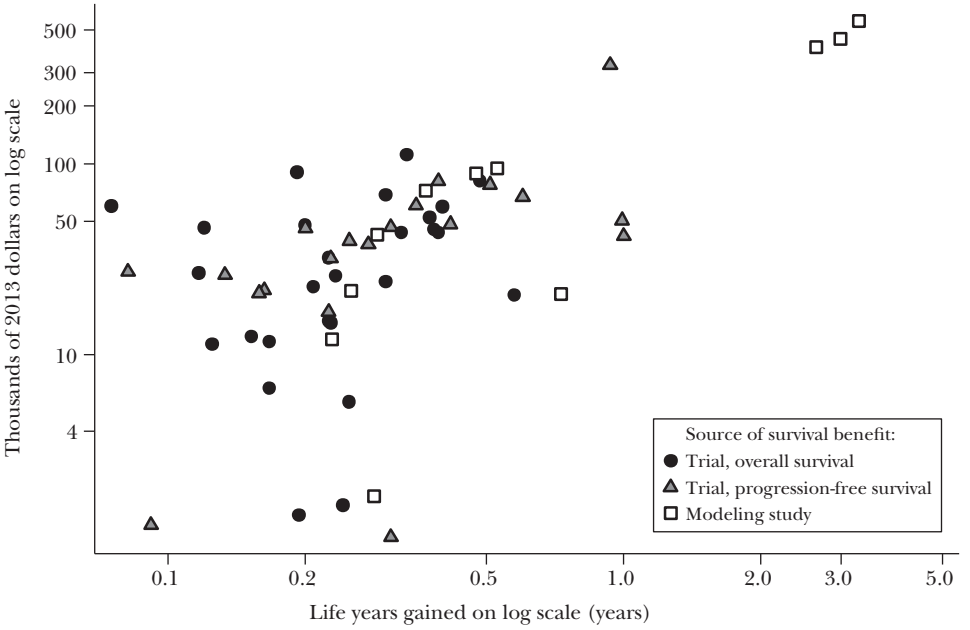
For the 17 drugs that were approved on the basis of single-arm trials, we obtained estimates of survival benefits from post-approval trials ($N = 6$) and cost-effectiveness studies that use simulation models to project survival ($N = 11$). Cost-effectiveness studies typically report benefits in terms of mean life expectancy or mean quality-adjusted life-years. We converted these quantities to median survival gains assuming survival time is distributed exponentially.[4]

We calculated the "episode treatment price" for each drug, which equals each drug's monthly cost to the Medicare program in 2013 dollars (see Bach 2009 for details) multiplied by the typical duration of treatment in months. Medicare costs represent the actual dollar amounts Medicare, the largest public insurance program, pays for drugs. In most cases, Medicare reimbursements will be greater than the prices hospitals, physicians, and pharmacies pay to wholesalers. We do not believe that rebates—refunds from manufacturers to hospitals, physicians, pharmacies, and third party insurers—are large in the market for new anticancer drugs, but pricing is opaque and rebate arrangements are closely guarded. Medicare has adjusted its payment formulae over time to align reimbursement and wholesale prices more closely. For this reason, our price series may understate increases in providers' acquisition prices. As we describe below, drug acquisition costs vary

[3] Trials report medians, because measurement of means is possible only after all patients in the trial are dead. Some trials are not powered to detect changes in overall survival but report it anyway.

[4] If we assume survival time is distributed exponentially, it is possible to convert means to medians without estimating ancillary shape parameters. Median survival is equal to mean survival multiplied by $\ln(2)$.

Figure 1
Drug Prices versus Life Years Gained



Source: Authors.

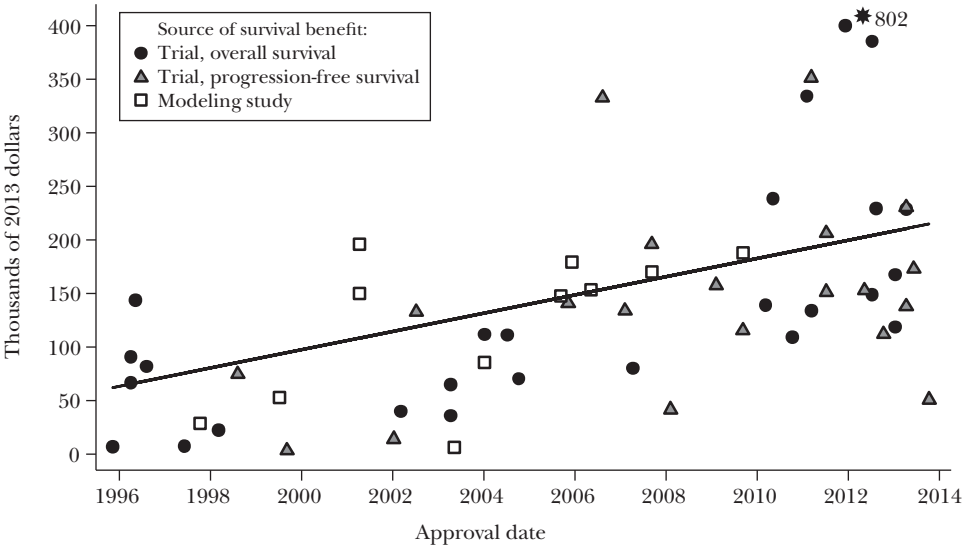
between providers and pharmacies, and Medicare payment rates do not account for differences in acquisition costs across various categories of buyers.

Our approach accounts for differences in the duration of treatment across drugs and is consistent with the notion of measuring the price of a treatment episode, as advocated by Berndt, Cutler, Frank, Griliches, Newhouse, and Triplett (2000) and Busch, Berndt, and Frank (2001). However, a drug's treatment episode price is not a comprehensive measure of the impact of that drug on health care costs. The impact of a drug on total costs depends on whether it is a substitute or complement to existing treatments and whether it increases or decreases the incidence of side effects, some of which can be quite costly to treat.

Prices versus Survival Benefits over Time

Figure 1 plots treatment-episode prices in 2013 dollars against incremental survival benefits, both on the natural log scale. The average drug price is $65,900 (in 2013 dollars), and the average survival benefit is 0.46 years. The markers identify drugs based on the source of survival benefit data: overall survival from a randomized trial; progression-free survival from a randomized trial; and overall survival from a modeling study. There is a positive correlation, 0.9, between treatment episode prices and incremental survival benefits. A regression of the natural logarithm of prices on incremental life-years gained indicates that prices increase by

Figure 2
Drug Price per Life Year Gained versus Drug Approval Date



Source: Authors.
Notes: The best fit line is: Price per life year gained = \$54,100 + \$8,500 × Approval Year. Approval Year = 0 for 1995, 1 for 1996, . . . 19 for 2014. For purposes of display, we recoded one value from \$802,000 to \$400,000.

120 percent (with a 95 percent confidence interval ranging from 74 to 166 percent) for each additional life-year gained (or 14 percent per month gained). The effect in dollar terms is \$75,000 per year gained (with a 95 percent confidence interval from \$12,000 to \$137,000).

Newer drugs are not associated with greater survival benefits compared to older drugs. A regression with life-years gained as the dependent variable and year of approval as the explanatory variable yields a small and insignificant coefficient (0.005 years of life gained, with a 95 percent confidence interval from −0.024 to 0.034 years of life gained).

Prices have increased over time. A regression of the natural logarithm of price on approval year indicates that prices increased by 12 percent per year (with a 95 percent confidence interval from 7 to 17 percent). The result is robust to the inclusion of a control for survival benefits.

For the remainder of the paper, we focus on trends in the price per life-year gained, which equals the price per treatment episode (in 2013 dollars) divided by survival benefits. The price per life-year gained can be thought of as a "benefit-adjusted" price. The sample average is \$150,100 per year of life gained (with a standard deviation of \$130,500). This value is in the range of estimates of the willingness-to-pay for a quality-adjusted life-year (Hirth, Chernow, Miller, Fendrick, and Weissert 2000). Figure 2 plots drugs' price per life-year gained against drugs'

approval date. There is an upward trend. A regression of the price per life-year gained on approval year indicates that benefit- and inflation-adjusted launch prices increased by $8,500 (with a 95 percent confidence interval from $2,900 to $14,100) per year.[5] The intercept (1995 is zero on the x-axis) is $54,100 (95 percent confidence interval: −$16,700 to $124,900). Put another way, in 1995 patients and their insurers paid $54,100 for a year of life. A decade later, 2005, they paid $139,100 for the same benefit. By 2013, they were paying $207,000.

Figure 3 shows trends in the price per life-year classified by different types of anticancer drugs. Upward trends are apparent for most disease types.

Price Per Life-Year Gained and Drug Attributes

We used least squares regression to determine if the relationship between the price per life-year gained (in 2013 dollars) and approval year is robust to the inclusion of controls for other drug attributes. Table 1 presents regression estimates (sample means and other summary statistics for the drug attributes are presented in the Appendix available at http://e-jep.org). We used the natural logarithm of the price per life-year gained as the dependent variable because the price per life-year gained is skewed. Results are qualitatively similar if we use untransformed prices as the dependent variable. Because of the modest sample size, we did not attempt to control for all drug attributes simultaneously.

The model in column A, the baseline specification, indicates that benefit- and inflation-adjusted launch prices increased 10 percent per year over the study period.

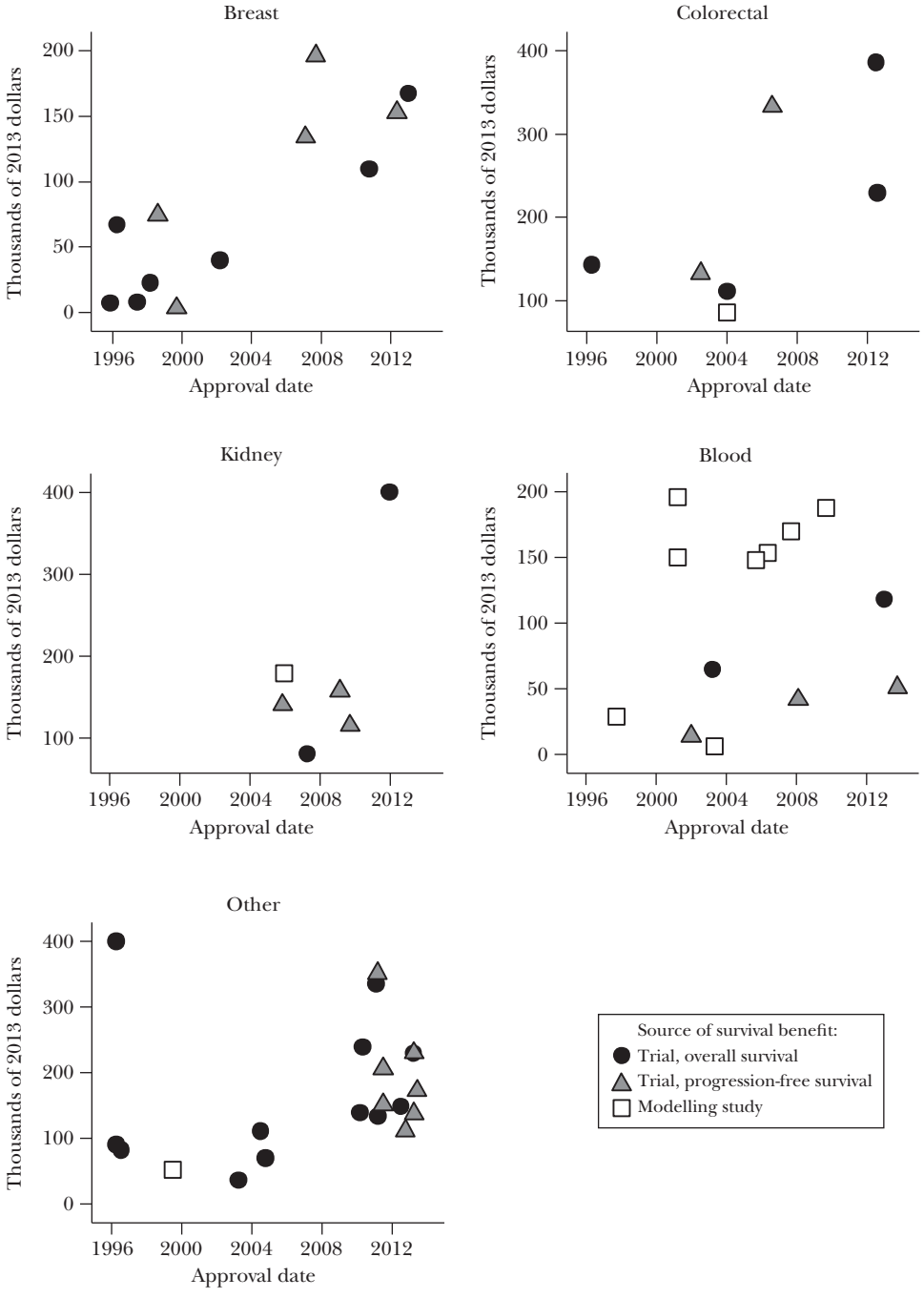
The model in column B adds controls for the gastrointestinal complication and neutropenia rates. The gastrointestinal (GI) complication rate is the average of the nausea, vomiting, and diarrhea rates experienced by patients on the drug. The neutropenia rate is the proportion of patients who experience high-grade neutropenia, a deficit of white blood cells which puts patients at risk of infection. We set missing values to "0." Data on the side effects experienced by patients in the control arms of trials are inconsistently reported. We controlled for absolute rather than relative side effect rates, which may be why the coefficient on the gastrointestinal complication rate is "wrong signed." In general, side effect rates are similar for newer and older drugs (Niraula et al. 2012).

The model in column C includes a control for administration route: intravenous versus oral. Oral drugs are more convenient for patients than physician-administered intravenous drugs, but patients' out-of-pocket costs are typically higher for oral drugs. The positive coefficient on the intravenous administration route is insignificant.

The model in column D explores the hypothesis that increases in prices reflect increased production costs. We test this hypothesis indirectly by examining the link between several proxies for production costs and prices. Biologic drugs are typically more expensive to develop and produce than traditional anticancer drugs.

[5] The marginal effect from a generalized linear model with a log link and a gamma variance function is $8,500 (95 percent confidence interval: $1,800 to $15,300). Details of this approach are available in the online Appendix available with this paper at http://www.e-jep.org.

Figure 3
Drug Price per Life Year Gained versus Drug Approval Date by Indication



Source: Authors.

Table 1

Impact of Approval Year and Other Variables on the Natural Logarithm of the Price per Life Year Gained in 1,000s of 2013 US Dollars for 58 Cancer Drugs Approved between 1995 and 2013

	A	*B*	*C*	*D*	*E*	*F*
Approval year	0.10 [0.06, 0.14]*	0.10 [0.06, 0.14]*	0.10 [0.06, 0.14]*	0.10 [0.06, 0.15]*	0.10 [0.06, 0.15]*	0.09 [0.05, 0.13]*
GI complication rate		1.70 [0.47, 2.94]*				
Neutropenia rate		0.26 [−0.76, 1.28]				
IV drug			0.26 [−0.22, 0.74]			
Biologic				−0.15 [−0.67, 0.36]		
Multiproduct firm				0.38 [−0.14, 0.90]		
Randomized controlled trial					0.12 [−0.45, 0.69]	
Progression free survival					−0.36 [−0.91, 0.20]	
Placebo comparator						0.46 [−0.02, 0.94]+
Constant	3.51 [2.99, 4.03]*	2.95 [2.31, 3.59]*	3.34 [2.73, 3.95]*	3.24 [2.58, 3.89]*	3.48 [2.89, 4.06]*	3.39 [2.87, 3.92]*
R^2	0.28	0.37	0.29	0.31	0.30	0.32

	G	*H*	*I*	*J*	*K*
Approval year	0.10 [0.07, 0.14]*	0.10 [0.06, 0.14]*	0.09 [0.05, 0.14]*	0.09 [0.05, 0.13]*	0.11 [0.06, 0.15]*
Priority drug	0.93 [0.46, 1.40]*				
Orphan drug	−0.17 [−0.67, 0.33]				
Ln competitors		−0.64 [−0.99, −0.29]*			
Gene test			−0.59 [−1.05, −0.14]*		
Second line therapy			0.15 [−0.33, 0.62]		
Baseline survival				−0.29 [−0.53, −0.05]*	
Mortality rate					0.77 [−0.38, 1.92]
Constant	2.83 [2.23, 3.44]*	4.92 [4.01, 5.83]*	3.75 [3.09, 4.42]*	3.89 [3.30, 4.48]*	3.20 [2.50, 3.90]*
R^2	0.44	0.41	0.36	0.35	0.30

Notes: See text for definition of variables. 95 percent confidence intervals are in brackets. "GI" is gastrointestinal; "IV" is intravenous.

* Means significant at the 5 percent level, + means significant at the 10 percent level.

Multiproduct firms—firms that sell two or more anticancer drugs—are able to spread the fixed costs associated with marketing oncology drugs across products and may have equipment that can be used to manufacture two or more products. The coefficients on the cost-shifters are insignificant. These findings are consistent with the observation that there is a large gap between the generic and brand launch prices of anticancer drugs: for example, over 80 percent in the case of irinotecan (Conti et al. 2012). The prices of on-patent anticancer drugs do not appear to be closely related to marginal production costs.

The model in column E examines the relationship between the source of information about survival benefits and prices. We would expect that physicians would be more willing to prescribe drugs about which they have more information. This regression includes controls for whether the drug was approved on the basis of a randomized trial and if survival benefits are measured in terms of progression-free rather than overall survival. The coefficients are of the expected sign but are not significant.

The models in columns F–H consider whether drugs with few close substitutes command higher prices. Characterizing the degree of competition between anticancer drugs is difficult. Some compete, but most are used in a complementary manner, either in a co-administered multidrug "cocktail" regimen or in a sequence of therapy lines (first-line therapy, second-line therapy, etc.) Some drugs are approved to treat all patients diagnosed with late-stage cancer in a specific body part, while other drugs have narrower indications. The model in column F includes a control for whether the drug was compared against a placebo (or "best supportive care") or against another drug. Drugs tested against placebos occupy unique niches in the product space compared to drugs tested against "active" controls. Presumably the FDA and ethical review boards would not allow a manufacturer to test an anticancer drug against a placebo unless the drug had no direct substitutes. The coefficient is positive and significant at the 10 percent level. The model in column G includes controls for whether the drug was granted priority review status by the FDA. Priority review is granted to drugs that demonstrate "significant improvements in the safety or effectiveness of the treatment, diagnosis, or prevention of serious conditions when compared to standard applications." The model indicates that drugs awarded priority review status command significantly higher prices. The model in column H includes a variable equal to the natural logarithm of the number of drugs previously approved for the tumor site (National Cancer Institute 2014). The coefficient is negative and significant. It is unclear if this result can be interpreted as a purely competitive effect because anticancer drugs are often used in a complementary manner. The FDA grants orphan drug status to drugs used to treat rare conditions. The coefficient on orphan drug status (Model G) is not significant.

The model in column I includes controls for whether a drug was approved for use in patients with specific genetic biomarkers (US Food and Drug Administration 2014a) or as a second-line drug, for use in patients whose disease has progressed after an initial course of treatment. Demand may be less elastic, and prices higher, for drugs targeted at narrow patient subgroups. The coefficient on the gene test

variable is negative, contrary to our expectation. The discussion up until this point has implicitly assumed that patients' valuation of gains in life expectancy from a new anticancer drug is independent of how long they could expect to live if they do not receive a new drug. This approach treats anticancer drugs as bundles of comparable attributes. The model in column J includes a control for baseline survival (as measured by survival in the control or comparator arm of the study we used to assess survival benefits). Results indicate that the longer patients survive without the drug, the lower the drug price. Patients' and physicians' willingness-to-pay may depend on absolute survival as well as relative survival gains. They may place a higher value on a drug that extends survival time by 6 months from a base of 8 months than one that extends survival time by 6 months from a base of 12 months.

The model in column K includes a control for the tumor-specific mortality rate, which we calculated by dividing the number of deaths attributed to the tumor by disease incidence. The coefficient on the mortality rate is positive but is not significant.[6]

The coefficient on approval year is economically and statistically significant in all 11 specifications in Table 1. Thus, our basic finding that benefit- and inflation-adjusted launch prices increased by about 10 percent annually appears robust to the inclusion of controls for the various drug attributes described above.

Sensitivity Checks

We performed several sensitivity checks. We re-estimated the baseline model (column A) on the subsample of drugs approved on the basis of randomized trials and for which we had trial-based estimates of overall survival. We also re-estimated the baseline model on the subsample of drugs with prices below the 90th percentile ($94,000) to determine the sensitivity of results to extreme values. In both cases the coefficients on approval date indicate that prices increased by 10 percent annually and were significant at the 1 percent level, consistent with the results from the baseline model.

Explaining Pricing Trends

Our empirical results suggest that the launch prices of anticancer drugs, even when adjusted for inflation and survival benefits, have increased substantially over time. We offer two explanations grounded in our observations of market behavior, economic theory, and current regulatory policy.

Our discussion focuses on the launch prices of branded drugs. If manufacturers make large changes to drugs' prices in the years following launch, our focus may be misplaced. We analyzed the Average Sales Price files from the Center for Medicare

[6] Mortality rates are measured with substantial error. Ideally, we would like to measure mortality among patients diagnosed with late-stage disease, but we do not have data on tumor incidence by stage at diagnosis.

and Medicaid Services for a subset of the drugs in our sample to determine if launch prices are a sufficient statistic for post-launch prices. The files capture prices for the mostly intravenous drugs reimbursed under Medicare's Part B outpatient medical benefit. We excluded three drugs—gemcitabine, irinotecan, and oxaliplatin—that experienced large declines in price following patent expiration and generic entry. We calculated annualized growth rates in the remaining sample of 19 drugs. The average annualized growth rate in real prices after launch was 1 percent. The 25th, 50th, and 75th percentiles were −0.7 percent, 0.9 percent, and 4 percent. The results are consistent with Lu and Comanor's (1998) finding that the prices of innovative drugs do not change much after launch. Launch prices are where the action is.

Reference Pricing

Writing to criticize the "astronomical" prices of new anticancer drugs, a group of over 100 prominent oncologists (Experts in Chronic Myeloid Leukemia 2013) proposed the following model of manufacturers' price setting behavior: "How are the prices of cancer drugs decided? Of the many complex factors involved, price often seems to follow a simple formula: start with the price for the most recent similar drug on the market and price the new one within 10–20 percent of that price (usually higher)." Industry insiders echo this theory of price-setting behavior. For example, from Hutchison (2010): "Gold [CEO of Dendreon] says that the cost of Provenge was based on the 'overall landscape' of treatment prices for cancer." From Marcus (2004): "A spokeswoman for AstraZeneca justified the price of Iressa as 'in line with other cancer treatments.'" From Silber (2005): "The retail price of the drug will be $5,416 per month, an amount that Onyx said is in the range of similarly specialized cancer drugs."

The theory that manufacturers set the prices of new drugs based on the prices of existing therapies (not necessarily competitors), rather than some intrinsic standard of product value, is consistent with reference price models of demand. Reference pricing models depart from the standard economic model of consumer behavior by allowing consumers' purchase decisions to depend on a pricing anchor, or reference price, rather than on an internal comparison of price and willingness-to-pay (Thaler 1985). Consumers may determine reference prices based on observed past prices or the prices of similar, but not necessarily substitute, goods.

Oncologists are in a strong position to influence the market share of anticancer drugs. Although oncologists do not face direct incentives to avoid costly drugs, they may balk at prescribing drugs with prices they perceive as exploitative—in the language of theory, drugs with prices above the reference price level. An extensive literature in economics and marketing describes how perceptions of fairness influence consumers' attitudes towards prices and market behavior (for example, Frey and Pommerehne 1993; Mas 2006; Maxwell 2002; Kahneman, Knetsch, and Thaler 1986; Piron and Fernandez 1995).

There is a "zone of indifference" around a reference price such that consumers ignore small deviations from the reference price (Kalyanaram and Little 1994). The zone of indifference gives manufacturers the ability to set the prices of new drugs

slightly above the prices of existing drugs without reducing quantity demanded. As costlier drugs come to market, oncologists become habituated to higher prices, giving manufacturers leeway to set even higher prices in the future. The characteristics of the market for anticancer drugs, including patent protection, which protects producers from direct competition, and generous third party payment, allow this dynamic to persist. These characteristics are present in other medical product markets but not to the same degree as in the anticancer drug market.

Over time, the use of reference prices leads to forward-looking price complementarities between manufacturers. When a new drug enters with a price in excess of the reference price, it re-establishes price levels, freeing up the next entrant to set its price even higher. Kahneman, Knetsch, and Thaler (1986) write, "[P]rice increases that are not justified by increasing costs are judged less objectionable when competitors have led the way." Shortly after the FDA approved bevazicimab and erlotinib, one Wall St. analyst noted: "Companies will be looking at these products to help them determine the pricing of their own drugs . . . Tarceva and other drugs will likely take their cue from Erbitux and Avastin" (Griffith 2004). According to textbook monopoly pricing theory, the price of Erbitux (generic name cetuximab) should have had no direct bearing on the price of Tarceva (generic name erlotinib), a lung and pancreatic cancer drug, because cetuximab was not a competitor at the time.

If a manufacturer sets a price that is perceived as exploitative, in the sense that the price exceeds the reference price to a large degree, it risks provoking a backlash. One example of where this happened involved a second-line treatment for metastatic colorectal cancer, ziv-aflibercept (brand name Zaltrap). When approved by the FDA in 2012, its price was double that of bevacizumab, its closest competitor, at bevacizumab's common dosing level. Oncologists did not view ziv-aflibercept as particularly innovative, and three prominent physicians at the Memorial Sloan Kettering cancer center wrote an opinion piece in the *New York Times* (Bach, Saltz, and Wittes 2012) stating that they would refrain from using ziv-aflibercept at their center because of its price. One month later the manufacturer, Sanofi, announced that it would provide purchasers with a 50 percent discount off the list price.

According to one Wall Street analyst, "market structure effectively provides no mechanism for price control in oncology other than companies' goodwill and tolerance for adverse publicity" (Anand 2007). The observation begs the question: What is to stop a manufacturer from setting the price of a drug at $1,000,000 or more? Drug manufacturers are able to set higher prices for new drugs, but they must be mindful of physicians' ability to exact retribution when manufacturers violate physicians' norms of fairness in pricing.

Required Pricing Discounts

Recent increases in the launch prices of anticancer drugs may be an unintended consequence of policies to expand access to price discounts. The so-called 340B drug pricing program, authorized by Congress in 1992, requires drug manufacturers to provide deep discounts to 340B-qualified buyers. At the program's inception, only

federally qualified health centers, specialized public health clinics, and "disproportionate share hospitals" (hospitals whose patient population includes a high proportion of low-income patients) qualified for 340B discounts. Discounts are set relative to the average price wholesalers, retail pharmacies, and providers pay manufacturers to purchase drugs, called the "Average Manufacturer Price." The 340B price discount for branded drugs must be at least 23.1 percent of the Average Manufacturer Price. Providers that purchase drugs through a government-designated distributor may receive additional discounts, though these are relatively small, totaling $67 million in 2013 (Drug Discount Monitor 2014). Participation in the 340B program is attractive for health care providers because they do not have to pass the discount on to insurers. They profit on the spread between third-party payers' drug reimbursement rates and the 340B discounted price.[7]

Since 1992, Congress and federal regulators have broadened eligibility to include critical access hospitals, free-standing cancer hospitals, some community hospitals, and outpatient clinics affiliated with disproportionate share hospitals. Mergers between 340B providers and non-340B providers, a predictable effect of the incentives inherent in the program, have also expanded the program's reach. Due to changes in eligibility rules and mergers, the number of providers in the 340B program increased from 8,605 in 2001 to 16,572 in 2011 (US General Accounting Office 2011). Industry sources predict that the volume of drug sales under the 340B program will increase from $6 billion in 2010 to $12 billion in 2016 (Biotechnology Industry Organization 2013).[8]

Because the 340B discount is based on a drug's average price, the program presents manufacturers with an incentive to set higher launch prices to offset discounts. Increases in the number of 340B-eligible providers have magnified the incentive, possibly leading to upward pressure in the prices paid by noneligible providers (Conti and Bach 2013). The 340B program also splits the market into price-elastic and price-inelastic segments. Just as branded drug manufacturers increase prices following generic entry to capture revenues from brand-loyal customers (Frank and Salkever 1997), manufacturers of recently launched drugs may cede large discounts to their price-sensitive segment but increase prices to non-340B providers.

The federal Medicaid program has its own set of drug pricing rules. In exchange for formulary coverage by state Medicaid programs, branded manufacturers give rebates to the federal government on sales to Medicaid patients. Similar to the 340B program, the rebate is based on the Average Manufacturer Price. If a manufacturer increases the price of a drug over and above the rate of inflation, it must pay a larger rebate. This aspect of the program provides incentives for firms to set higher prices initially, rather than increasing prices after launch. Although Medicaid

[7] When calculating average sales prices for purposes of Medicare reimbursement, regulations instruct manufacturers to exclude sales to 340B providers. Hence Medicare reimbursement rates are not affected by growth in the 340B discount program, though providers' acquisition costs are reduced.

[8] This figure includes anticancer and noncancer drugs. Industry sources indicate that the two therapeutic classes having the largest 340B sales are anticancer drugs and anti-infectives.

accounts for less than 10 percent of spending on cancer treatment (Howard, Molinari, and Thorpe 2004), enrollment in the program is growing, presenting manufacturers with additional incentives to increase prices to non-Medicaid patients.

The United Kingdom and other European countries negotiate drug prices with manufacturers. Although negotiated discounts are not legislatively linked to the US price, the US price may serve as an opening bid in negotiations, and discounts are often expressed as a percent of the US list price in contracts. As pressure has mounted on governments to reign in health spending, European health systems have adopted a more aggressive bargaining stance, backed by a credible threat of noncoverage, potentially leading manufacturers to set higher US prices.[9] The United Kingdom and many other countries do not divulge negotiated drug prices, and so we are unable to determine whether launch prices have increased outside the United States. There is anecdotal evidence that they have. For example, a number of signatories to a statement calling attention to the "unsustainable" prices of new anticancer drugs were European physicians (Experts in Chronic Myeloid Leukemia 2013).

Other Potential Causes of Price Increases

What about other possible explanations for pricing trends, such as shifts in patient or physician demand? Changes on the demand side of the market seem inconsistent with observed pricing trends. The income elasticity of the demand for health care is not large enough to account for changes in prices or health care spending generally (Newhouse 1992). Moreover, patient cost-sharing is higher now than it was in 1995 as consumers have shifted to high-deductible plans (Berndt and Newhouse 2012; Kaiser Family Foundation 2013). The structure of insurers' payments to physicians has remained largely unchanged, but payment levels for physician-administered anticancer drugs have declined following passage of the Medicare Modernization Act in 2003 (Jacobson et al. 2006; Jacobson, Earle, Price, and Newhouse 2010).

On the supply side, it is unlikely that changes in development and production costs alone can explain launch pricing trends. The FDA has reduced barriers to approval, and advances in genetics have facilitated drug discovery. The generic versions of anticancer drugs cost much less than the branded versions, suggesting that production costs are low relative to pre-patent expiration price levels. Pharmaceutical manufactures often claim that they set drug prices to recoup research and development costs. Manufacturers' research and development costs may have increased over time. As more drugs come to market, the number of unexploited targets for anticancer therapy shrinks, requiring firms to invest more to develop new drugs. Lacking measures of research and development costs, we are unable to evaluate the claim empirically. However, research and development costs are sunk

[9] The British National Health Service and other national health systems do not disclose negotiated prices, and so we cannot determine whether the spread between domestic and international drug prices has increased.

at the time of product launch and so they ought not to factor into the pricing decisions of a profit-maximizing firm once the product has been developed. We believe the direction of causation runs from prices to research and development costs—as prices increase, manufacturers are willing to spend more to discover new drugs—rather than the other way around.

Discussion

We find that, controlling for inflation and survival benefits, the launch prices of new anticancer drugs have increased over time. We do not anticipate that US payers and providers will change their policies in a way that will fundamentally change pricing dynamics, at least in the near term. The American Society of Clinical Oncology, the main professional group for physicians who treat cancer patients, is encouraging its members to consider costs when they choose drugs, but these efforts are mostly focused on costs to patients rather than systemwide costs. Efforts to increase the sensitivity of physician demand to drug prices still rely on physicians' sense of fairness rather than their pocketbooks. A Congressional advisory board, the Medicare Payment Advisory Commission, recently held a hearing on reforming reimbursement for physician-administered drugs. Many committee members voiced support for proposals that would reduce Medicare reimbursement for drugs if there are less-costly alternatives that have a "similar health effect" (InsideHealthPolicy 2014). However, newly-approved anticancer drugs are, by definition, unique, and will probably be unaffected if Medicare implements the policy.

To supporters of the US health care system, new anticancer drugs are a potent symbol of progress and represent the type of innovation that would be squelched if Medicare and other US insurers denied coverage to costly treatments (for example, Gingrich 2009). To critics, the pricing of new anticancer drugs represents the worst excesses of a system that provides few checks on drug companies' pricing power and prioritizes gains in health, however small, over cost control. Policymakers are quick to agree that the health system should discourage use of ineffective treatments, but it is unclear how regulators, insurers, and physicians should approach treatments that are more costly but also offer small incremental benefits.

The optimistic view of recent trends in cancer drug development is that although individual drugs may not be associated with large gains in survival, the work that goes into developing a new drug contributes to the stock of knowledge about cancer biology. Eventually, scientists will use the information gleaned from the development of existing drugs to develop new drugs with much greater benefits. The pessimistic view is that current coverage, reimbursement, and patent policies (Budish, Roin, and Williams 2013) divert drug manufacturers' attention away from developing drugs that yield truly meaningful survival benefits. If insurers restricted coverage to drugs that improved survival time by an economically significant amount, perhaps there would be more of them.

■ *Rena M. Conti received funding from a K07 CA138906 award from the National Cancer Institute to the University of Chicago.*

References

Akscin, John, Thomas R. Barr, and Elaine L. Towle. 2007. "Key Practice Indicators in Office-Based Oncology Practices: 2007 Report on 2006 Data." *Journal of Clinical Oncology* 3(4): 200–203.

Anand, Geeta. 2007. "Prescribing Caution: From Wall Street, a Warning About Cancer-Drug Prices; Morgan Stanley Analyst Creates Stir in Industry as He Sees a Backlash." *Wall Street Journal,* March 15. http://online.wsj.com/news/articles/SB117391934158537592.

Bach, Peter B. 2009. "Limits on Medicare's Ability to Control Rising Spending on Cancer Drugs." *New England Journal of Medicine* 360(6): 626–33.

Bach, Peter B., Leonard B. Saltz, and Robert E. Wittes. 2012. "In Cancer Care, Cost Matters." *New York Times,* October 14.

Berndt, Ernst R., Linda Bui, David R. Reiley, and Glen L. Urban. 1995. "Information, Marketing, and Pricing in the U.S. Antiulcer Drug Market." *American Economic Review* 85(2): 100–105.

Berndt, Ernst R., David M. Cutler, Richard G. Frank, Zvi Griliches, Joseph P. Newhouse, and Jack E. Triplett. 2000. "Medical Care Prices and Output." Chap. 3 in *Handbook of Health Economics,* Vol. 1A, edited by Anthony C. Culyer and Joseph P. Newhouse. Amsterdam: Elsevier Science.

Berndt, Ernst R., and Joseph P. Newhouse. 2012. "Pricing and Reimbursement in US Pharmaceutical Markets." Chap. 8 in *The Oxford Handbook of the Economics of the Biopharmaceutical Industry,* edited by Patricia M. Danzon and Sean Nicholson. Oxford University Press.

Biotechnology Industry Organization. 2013. *The 340B Drug Discount Program.* https://www.bio.org/articles/340b-drug-discount-program.

Budish, Eric, Benjamin N. Roin, and Heidi Williams. 2013. "Do Fixed Patent Terms Distort Innovation? Evidence from Cancer Clinical Trials." NBER Working Paper 19430.

Busch, Susan H., Ernst R. Berndt, and Richard G. Frank. 2001. "Creating Price Indexes for Measuring Productivity in Mental Health Care." Chap. 5 in *Frontiers in Health Policy Research,* vol. 4, edited by Alan M. Garber. Cambridge, MA: MIT Press for the National Bureau of Economic Research.

Cavalli, Franco. 2013. "An Appeal to World Leaders: Stop Cancer Now." *The Lancet* 381(9865): 425–26.

Caves, Richard E., Michael D. Whinston, and Mark A. Hurwitz. 1991. "Patent Expiration, Entry, and Competition in the U.S. Pharmaceutical Industry." *Brookings Papers on Economic Activity: Microeconomics* 1–48.

Center for Medicare & Medicaid Services. 2014. "CMS Proposes Program Changes for Medicare Advantage and Prescription Drug Benefit Programs for Contract Year 2015 (CMS-4159-P)." January 6. http://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-Sheets/2014-Fact-sheets-items/2014-01-06.html.

CenterWatch. 2014. FDA Approved Drugs for Oncology. http://www.centerwatch.com/drug-information/fda-approved-drugs/therapeutic-area/12/.

Chen, Jie, and John A. Rizzo. 2012. "Pricing Dynamics and Product Quality: The Case of Antidepressant Drugs." *Empirical Economics* 42(1): 279–300.

Cockburn, Iain M., and Aslam H. Anis. 2001. "Hedonic Analysis of Arthritis Drugs." Chap. 11 in *Medical Care Output and Productivity,* edited by David Cutler and Ernst R. Berndt. University of Chicago Press.

Conti, Rena M., and Peter B. Bach. 2013. "Cost Consequences of the 340B Drug Discount Program." *JAMA: Journal of the American Medical Association* 309(19): 1995–96.

Conti, Rena M., Arielle C. Bernstein, Victoria M. Villaflor, Richard L. Schilsky, Meredith B. Rosenthal, and Peter B. Bach. 2013. "Prevalence of Off-Label Use and Spending in 2010 Among

Patent-Protected Chemotherapies in a Population-Based Cohort of Medical Oncologists." *Journal of Clinical Oncology* 31(9): 1134–39.

Conti, Rena M., Meredith B. Rosenthal, Blase N. Polite, Peter B. Bach, and Ya-Chen Tina Shih. 2012. "Infused Chemotherapy Use in the Elderly After Patent Expiration." *American Journal of Managed Care* 18(5): e173–78.

Dendreon. 2014. Patient Access. http://www.dendreon.com/patient_resources/patient_access/.

Drug Discount Monitor. 2014. "340B Sales Totaled $7.5 Billion in 2013, Apexus Says." February 14. Link (for subscribers only): http://drugdiscountmonitor.com/2014/02/340b-sales-totaled-7-5-billion-in-2013-apexus-says/.

Experts in Chronic Myeloid Leukemia. 2013. "The Price of Drugs for Chronic Myeloid Leukemia (CML) is a Reflection of the Unsustainable Prices of Cancer Drugs: From the Perspective of a Large Group of CML Experts." *Blood* 121(22): 4439–42.

Fleck, Leonard M. 2013. "Just Caring: Can We Afford the Ethical and Economic Costs of Circumventing Cancer Drug Resistance?" *Journal of Personalized Medicine* 3(3): 124–43.

Frank, Richard G., and David S. Salkever. 1997. "Generic Entry and the Pricing of Pharmaceuticals." *Journal of Economics and Management Strategy* 6(1): 75–90.

Frey, Bruno S., and Werner W. Pommerehne. 1993. "On the Fairness of Pricing—An Empirical Survey among the General Population." *Journal of Economic Behavior and Organization* 20(3): 295–307.

Gingrich, Newt. 2009. "Trust the Government." *Human Events*, August 12. http://humanevents.com/2009/08/12/trust-the-government/.

Goldman, Dana P., Anupam B. Jena, Darius N. Lakdawalla, Jennifer L. Malin, Jesse D. Malkin, and Eric Sun. 2010. "The Value of Specialty Oncology Drugs." *Health Service Research* 45(1): 115–32.

Goldman, Dana P., Geoffrey F. Joyce, Grant Lawless, William H. Crown, and Vincent Willey. 2006. "Benefit Design and Specialty Drug Use." *Health Affairs* 25(5): 1319–31.

Griffith, Victoria. 2004. "Pricing Weighs on Cancer Treatments." *Financial Times,* June 3.

Hall, Stephen S. 2013. "The Cost of Living." *New York Magazine*, October 20. http://nymag.com/news/features/cancer-drugs-2013-10/.

Hirth, Richard A, Michael E. Chernew, Edward Miller, A. Mark Fendrick, and William G. Weissert. 2000. "Willingness to Pay for a Quality-Adjusted Life Year: In Search of a Standard." *Medical Decision Making* 20(3): 332–42.

Howard, David H. 2014. "Drug Companies' Patient-Assistance Programs—Helping Patients or Profits?" *New England Journal of Medicine* 371(2): 97–99.

Howard, David H., John Kauh, and Joseph Lipscomb. 2010. "The Value of New Chemotherapeutic Agents for Metastatic Colorectal Cancer." *Archives of Internal Medicine* 170(6): 537–42.

Howard, David H., Carolyn Kenline, Hillard M. Lazarus, Charles F. LeMaistre, Richard T. Maziarz, Philip L. McCarthy Jr., Susan K. Parsons, David Szwajcer, James Douglas Rizzo, and Navneet S. Majhail. 2011. "Abandonment of High Dose Chemotherapy/Hematopoietic Cell Transplants for Breast Cancer." *Health Services Research* 46(6, Part 1): 1762–77.

Howard, David H., Nicole A. Molinari, and Kenneth E. Thorpe. 2004. "National Estimates of Medical Costs Incurred by Nonelderly Cancer Patients." *Cancer* 100(5): 883–91.

Hutchison, Courtney. 2010. "Provenge Cancer Vaccine: Can You Put a Price on Delaying Death?" *ABC News*, July 29. http://abcnews.go.com/Health/ProstateCancerNews/provenge-cancer-vaccine-months-life-worth-100k/story?id=11269159.

IMS Institute for Healthcare Informatics. 2014. "Innovation in Cancer Care and Implications for Health Systems: Global Oncology Trend Report." Available at: http://www.imshealth.com/portal/site/imshealth/menuitem.762a961826aad98f53c753c71ad8c22a/?vgnextoid=f8d4df7a5e8b5410VgnVCM10000076192ca2RCRD.

InsideHealthPolicy. 2014. "MedPAC Explores Fixes to Part B Drug Payment Policy, Calls Current System 'Perverse Incentive.'" November 12. http://www.pipcpatients.org/pipc-admin/pdf/cde114_MedPAC%20Explores%20Fixes%20To%20Part%20B%20Drug%20Payment%20Policy.pdf.

Jacobson, Mireille, Craig C. Earle, Mary Price, and Joseph P. Newhouse. 2010. "How Medicare's Payment Cuts for Cancer Chemotherapy Drugs Changed Patterns of Treatment." *Health Affairs* 29(7): 1391–99.

Jacobson, Mireille, A. James O'Malley, Craig C. Earle, Juliana Pakes, Peter Gaccione, and Joseph P. Newhouse. 2006. "Does Reimbursement Influence Chemotherapy Treatment for Cancer Patients?" *Health Affairs* 25(2): 437–43.

Kahneman, Daniel, Jack L. Knetsch, and Richard H. Thaler. 1986. "Fairness as a Constraint on Profit Seeking: Entitlements in the Market." *American Economic Review* 76(4): 728–41.

Kaiser Family Foundation and Health Research & Educational Trust. 2013. *Employer Health Benefits: 2013 Annual Survey*. Washington, DC.

Kalyanaram, Gurumurthy, and John D. C. Little. 1994. "An Empirical Analysis of Latitude of Price

Acceptance in Consumer Package Goods." *Journal of Consumer Research* 21(3): 408–18.

Kantarjian, Hagop M., Tito Fojo, Michael Mathisen, and Leonard A. Zwelling. 2013. "Cancer Drugs in the United States: *Justum Pretium*—The Just Price." *Journal of Clinical Oncology* 31(28): 3600–3604.

Lakdawalla, Darius N., John A. Romley, Yuri Sanchez, J. Ross Maclean, John R. Penrod, and Tomas Philipson. 2012. "How Cancer Patients Value Hope and the Implications for Cost-Effectiveness Assessments of High-Cost Cancer Therapies." *Health Affairs* 31(4): 676–82.

Landsem, Hope. 2013. "Rationing Health Care in Oregon." *Wall Street Journal,* August 8. http://online.wsj.com/news/articles/SB10001424127887324522504579000560184822956.

Lichtenberg, Frank R. 2009a. "The Effect of New Cancer Drug Approvals on the Life Expectancy of American Cancer Patients, 1978–2004." *Economics of Innovation and New Technology* 18(5): 407–28.

Lichtenberg, Frank R. 2009b. "International Differences in Cancer Survival Rates: The Role of New Drug Launches." *International Journal of Healthcare Technology and Management* 10(3): 138–55.

Lu, Z. John, and William S. Comanor. 1998. "Strategic Pricing of New Pharmaceuticals." *Review of Economics and Statistics* 80(1): 108–18.

Lucarelli, Claudio, and Sean Nicholson. 2009. "A Quality-Adjusted Price Index for Colorectal Cancer Drugs." NBER Working Paper 15174.

Malin, Jennifer L., Jane C. Weeks, Arnold L Potosky, Mark C. Hornbrook, and Nancy L. Keating. 2013. "Medical Oncologists' Perceptions of Financial Incentives in Cancer Care." *Journal of Clinical Oncology* 31(5): 530–35.

Marcus, Amy Dockser. 2004. "Price Becomes Factor in Cancer Treatment." *Wall Street Journal,* September 7. http://online.wsj.com/news/articles/SB109450779986210547.

Mas, Alexandre. 2006. "Pay, Reference Points, and Police Performance." *Quarterly Journal of Economics* 121(3): 783–821.

Maxwell, Sarah. 2002. "Rule-Based Price Fairness and Its Effect on Willingness to Purchase." *Journal of Economic Psychology* 23(2): 191–212.

National Cancer Institute. 2014. "Cancer Drug Information." A webpage: http://www.cancer.gov/cancertopics/druginfo/alphalist.

National Comprehensive Cancer Network. 2010. "Guidelines for Breast Cancer Updated; Bevacizumab Recommendation Affirmed." October 18. http://www.nccn.org/about/news/newsinfo.aspx?NewsID=259.

Neumann, Peter J. 2005. *Using Cost-Effectiveness Analysis to Improve Health Care: Opportunities and Barriers.* Oxford University Press.

Newhouse, Joseph P. 1992. "Medical Care Costs: How Much Welfare Loss?" *Journal of Economic Perspectives* 6(3): 3–21.

Niraula, Saroj, Bostjan Seruga, Alberto Ocana, Tiffany Shao, Robyn Goldstein, Ian F. Tannock, and Eitan Amir. 2012. "The Price We Pay for Progress: A Meta-Analysis of Harms of Newly Approved Anticancer Drugs." *Journal of Clinical Oncology* 30(24): 3012–19.

PhRMA (Pharmaceutical Research and Manufacturers of America). 2014. "Medicines in Development." A webpage: http://www.phrma.org/innovation/meds-in-development.

Piron, Robert, and Luis Fernandez. 1995. "Are Fairness Constraints on Profit-Seeking Important?" *Journal of Economic Psychology* 16(1): 73–96.

Raborn Martin L., Elise M. Pelletier, Daniel B. Smith, and Carolina M. Reyes. 2012. "Patient Out-of-Pocket Payments for Oral Oncolytics: Results from a 2009 US Claims Data Analysis." *American Journal of Managed Care* 18(5 No. 2): SP57–64.

Reekie, W. Duncan. 1978. "Price and Quality Competition in the United States Drug Industry." *Journal of Industrial Economics* 26(3): 223–37.

Romley, John A, Yuri Sanchez, John R. Penrod, and Dana P. Goldman. 2012. "Survey Results Show That Adults Are Willing to Pay Higher Insurance Premiums for Generous Coverage of Specialty Drugs." *Health Affairs* 31(4): 683–90.

Schrag, Deborah. 2004. "The Price Tag on Progress—Chemotherapy for Colorectal Cancer." *New England Journal of Medicine* 351(4): 317–19.

Seabury, Seth A., Dana P. Goldman, J. Ross Maclean, John R. Penrod, and Darius N. Lakdawalla. 2012. "Patients Value Metastatic Cancer Therapy More Highly Than is Typically Shown Through Traditional Estimates." *Health Affairs* 31(4): 691–99.

Silber, Judy. 2005. "Onyx Gets OK for Kidney Cancer Drug." *Contra Costa Times,* December 21.

Snider, Julia Thornton, John A. Romley, William B. Vogt, and Tomas J. Philipson. 2012. "The Option Value of Innovation." *Forum for Health Economics & Policy* 15(2).

Sun, Eric, Anupam B. Jena, Darius Lakdawalla, Carolina Reyes, Tomas J. Philipson, and Dana Goldman. 2010. "The Contributions of Improved Therapy and Early Detection to Cancer Survival Gains, 1988–2000." *Forum for Health Economics & Policy* 13(2).

Suslow, Valerie Y. 1996. "Measuring Quality Change in Pharmaceutical Markets: Hedonic Price Indexes for Anti-Ulcer Drugs." Chap. 4 in *Competitive Strategies in the Pharmaceutical Industry,* edited by Robert B. Helms. Washington, DC: American Enterprise Institute.

Szabo, Liz. 2004 "Price of Cancer Drugs Called

'Mind-Boggling.'" *USA Today*, July 21. http://usatoday30.usatoday.com/news/health/2004-07-21-cancer-usat_x.htm.

Thaler, Richard. 1985. "Mental Accounting and Consumer Choice." *Marketing Science* 4(3): 199–214.

Trusheim, Mark R., and Ernst R. Berndt. 2012. "The Segmentation of Therapeutic Populations in Oncology." *Health Management, Policy and Innovation* 1(1): 19–34.

US Food and Drug Administration. 2014a. Table of Pharmacogenomic Biomarkers in Drug Labeling. http://www.fda.gov/drugs/scienceresearch/researchareas/pharmacogenetics/ucm083378.htm.

US Food and Drug Administration. 2014b. "Fast Track, Breakthrough Therapy, Accelerated Approval, Priority Review." http://www.fda.gov/ForPatients/Approvals/Fast/default.htm.

US General Accounting Office. 2011. *Manufacturer Discounts in the 340B Program Offer Benefits, But Federal Oversight Needs Improvement*. Washington, D.C.

Weeks, Jane C., Paul J. Catalano, Angel Cronin, Matthew D. Finkelman, Jennifer W. Mack, Nancy L. Keating, and Deborah Schrag. 2012 "Patients' Expectations about Effects of Chemotherapy for Advanced Cancer." *New England Journal of Medicine* 367(17): 1616–25.

Wittes, Robert E. 2004. "Cancer Weapons, Out of Reach." *Washington Post.* June 15. http://www.washingtonpost.com/wp-dyn/articles/A42035-2004Jun14.html.

Woodward, Rebecca M., Martin L. Brown, Susan T. Stewart, Kathleen A. Cronin, and David M. Cutler. 2007. "The Value of Medical Interventions for Lung Cancer in the Elderly: Results from SEER-CMHSF." *Cancer* 110(11): 2511–18.

This article has been cited by:

1. Tao Wang, Yilin Li, Xiaoqiang Zheng. 2023. Cost-effectiveness of the combination of immunotherapy and chemotherapy for extensive-stage small-cell lung cancer: a systematic review. *BMC Health Services Research* **23**:1. . [Crossref]
2. Jayanth Venkatarama Reddy, Katherine Raudenbush, Eleftherios Terry Papoutsakis, Marianthi Ierapetritou. 2023. Cell-culture process optimization via model-based predictions of metabolism and protein glycosylation. *Biotechnology Advances* **67**, 108179. [Crossref]
3. Timothy L. Hamilton, Erik B. Johnson. 2023. The amenity value of natural views. *Real Estate Economics* **51**:5, 1079-1107. [Crossref]
4. Gabriella Chauca Strand, Naimi Johansson, Niklas Jakobsson, Carl Bonander, Mikael Svensson. 2023. Cancer Drugs Reimbursed with Limited Evidence on Overall Survival and Quality of Life: Do Follow-Up Studies Confirm Patient Benefits?. *Clinical Drug Investigation* **43**:8, 621-633. [Crossref]
5. Daniel Tobias Michaeli, Thomas Michaeli. 2023. Cancer Drug Prices in the United States: Efficacy, Innovation, Clinical Trial Evidence, and Epidemiology. *Value in Health* **122**. . [Crossref]
6. Michal Horný, K. Robin Yabroff, Christopher P. Filson, Zhiyuan Zheng, Donatus U. Ekwueme, Thomas B. Richards, David H. Howard. 2023. The cost burden of metastatic prostate cancer in the US populations covered by employer-sponsored health insurance. *Cancer* . [Crossref]
7. Mrinmayee Joshi, Steven J. Atlas, Molly Beinfeld, Richard H. Chapman, David M. Rind, Steven D. Pearson, Daniel R. Touchette. 2023. Cost-Effectiveness of Nadofaragene Firadenovec and Pembrolizumab in Bacillus Calmette-Guérin Immunotherapy Unresponsive Non–Muscle Invasive Bladder Cancer. *Value in Health* **26**:6, 823-832. [Crossref]
8. Fanni Ispán, Tamás Hegedüs, Marcell Csanádi, Balázs Nagy. 2023. Goals and methods of managed entry agreements – can we get what we want?. *Health Policy and Technology* **12**:2, 100745. [Crossref]
9. Daron Acemoglu. 2023. Distorted Innovation: Does the Market Get the Direction of Technology Right?. *AEA Papers and Proceedings* **113**, 1-28. [Abstract] [View PDF article] [PDF with links]
10. Stefano Capri, Fernando Antoñanzas, Rosella Levaggi. 2023. The impact of conventional cost-effectiveness analysis on pricing dynamics in the market of new medicines: a proposed countervailing approach. *Expert Review of Pharmacoeconomics & Outcomes Research* **23**:4, 431-438. [Crossref]
11. Daniel D. Joyce, Stacie B. Dusetzina. 2023. Financial toxicity of oral therapies in advanced prostate cancer. *Urologic Oncology: Seminars and Original Investigations* **35**. . [Crossref]
12. Lorenzo Gasperoni, Alessandro Cafaro, Eleonora Ferretti, Valentina Di Iorio, Oriana Nanni, Carla Masini. 2023. The role of clinical trials in the sustainability of the Italian national health service cancer drug expenditure. *European Journal of Hospital Pharmacy* **30**:2, 96-100. [Crossref]
13. Lieven J.P. Annemans. 2023. Innovative Public Price Mechanisms for Market Access of Innovative Medicines: A Marriage Between Cost-Effectiveness, Medical Need, and Budget Impact. *Value in Health* **26**:3, 400-401. [Crossref]
14. Elizabeth E. Roughead, Anna Kemp-Casey. Evidence Generation on Access to Medicines by Patients 1-15. [Crossref]
15. Thomas Joly-Mischlich, Serge Maltais, Amélie Tétu, Marie-Noëlle Delorme, Brigitte Boilard, Michel Pavic. 2023. Application of the Failure Mode and Effects Analysis (FMEA) to identify vulnerabilities and opportunities for improvement prior to implementing a computerized prescription order entry (CPOE) system in a university hospital oncology clinic. *Journal of Oncology Pharmacy Practice* **29**:1, 88-95. [Crossref]
16. Shing Cheng Tan, Wen Tsin Poh, Audrey Chee Hui Yong, Eng Wee Chua, Der Jiun Ooi, Rozi Mahmud, Muthukkumaran Thiagarajan, Johnson Stanslas. 2023. Challenges and Strategies for

Improving Access to Cancer Drugs in Malaysia: Summary of Opinions Expressed at the 2nd MACR International Scientific Conference 2022. *Cancer Management and Research* **Volume 15**, 851-862. [Crossref]

17. Sarah Kim, Pamela Nathanson, Chris Feudtner. 2023. Argument analysis of the ethical claims made by the pharmaceutical industry regarding drug pricing. *Bioethics Open Research* **1**, 2. [Crossref]
18. Daniel Tobias Michaeli, Thomas Michaeli. 2022. Overall Survival, Progression-Free Survival, and Tumor Response Benefit Supporting Initial US Food and Drug Administration Approval and Indication Extension of New Cancer Drugs, 2003-2021. *Journal of Clinical Oncology* **40**:35, 4095-4106. [Crossref]
19. Miloš D. Miljković, Jordan E. Tuia, Timothée Olivier, Alyson Haslam, Vinay Prasad. 2022. Association Between US Drug Price and Measures of Efficacy for Oncology Drugs Approved by the US Food and Drug Administration From 2015 to 2020. *JAMA Internal Medicine* **182**:12, 1319. [Crossref]
20. Meng Li, Louis Garrison, Woojung Lee, Stacey Kowal, William Wong, David Veenstra. 2022. A Pragmatic Guide to Assessing Real Option Value for Medical Technologies. *Value in Health* **25**:11, 1878-1884. [Crossref]
21. Orges Alabaku, Taylor N Laffey, Kangho Suh, Meng Li. 2022. Trends in endpoint use in pivotal trials and efficacy for US Food and Drug Administration–approved solid tumor therapies, 1995-2021. *Journal of Managed Care & Specialty Pharmacy* **28**:11, 1219-1223. [Crossref]
22. G. Chauca Strand, C. Bonander, N. Jakobsson, N. Johansson, M. Svensson. 2022. Assessment of the clinical and cost-effectiveness evidence in the reimbursement decisions of new cancer drugs. *ESMO Open* **7**:5, 100569. [Crossref]
23. Ivan Lugovoi, Dimitrios A. Andritsos, Claire Senot. 2022. Novelty and scope of process innovation: The role of related and unrelated manufacturing experience. *Production and Operations Management* **31**:10, 3877-3895. [Crossref]
24. Seidu Dauda, Abe Dunn, Anne Hall. 2022. A systematic examination of quality-adjusted price index alternatives for medical care using claims data. *Journal of Health Economics* **85**, 102662. [Crossref]
25. Thomas G. Knight, Melissa Aguiar, Myra Robinson, Allison Morse, Tommy Chen, Rupali Bose, Jing Ai, Brittany K. Ragon, Aleksander L. Chojecki, Nilay A. Shah, Srinivasa R. Sanikommu, James Symanowski, Edward A. Copelan, Michael R. Grunwald. 2022. Financial Toxicity Intervention Improves Outcomes in Patients With Hematologic Malignancy. *JCO Oncology Practice* **18**:9, e1494-e1504. [Crossref]
26. Richard G. Frank, Mahnum Shahzad, Ezekiel J. Emanuel. 2022. Accelerated Approval Of Cancer Drugs: No Economic Reward For Drug Makers That Conduct Confirmatory Trials. *Health Affairs* **41**:9, 1273-1280. [Crossref]
27. Ciara Silverman, Boon Peng Ng, Chaewon Baek, Chanhyun Park. 2022. Prescription drug coverage satisfaction and medication nonadherence among Medicare beneficiaries with cancer. *Expert Review of Pharmacoeconomics & Outcomes Research* **22**:6, 971-979. [Crossref]
28. Madeleine A. Ochs, Bernard L. Marini, Anthony J. Perissinotti, Charles E. Foucar, Kristen Pettit, Patrick Burke, Dale L. Bixby, Lydia L. Benitez. 2022. Oncology stewardship in acute myeloid leukemia. *Annals of Hematology* **101**:8, 1627-1644. [Crossref]
29. Mariana B. Michalowski, Gutemberg G. do Monte, Amanda V. Pinhatti, Alayde V. Wanderley. 2022. Re: Market access to new anticancer medicines for children and adolescents with cancer in Europe. *European Journal of Cancer* **171**, 22-24. [Crossref]
30. Yichen Zhang, Yuxuan Wei, Huangqianyu Li, Yixuan Chen, Yiran Guo, Sheng Han, Luwen Shi, Xiaodong Guan. 2022. Prices and Clinical Benefit of National Price-Negotiated Anticancer Medicines in China. *PharmacoEconomics* **40**:7, 715-724. [Crossref]

31. Nathan I. Cherny. 2022. An appraisal of FDA approvals for adult solid tumours in 2017–2021: has the eagle landed?. *Nature Reviews Clinical Oncology* **19**:7, 486-492. [Crossref]
32. Claudio Lucarelli, Sean Nicholson, Nicholas Tilipman. 2022. Price Indices and the Value of Innovation with Heterogenous Patients. *Journal of Health Economics* **84**, 102625. [Crossref]
33. Shaohua Chen, Xiaotao Su, Zengnan Mo. 2022. KCNN4 is a Potential Biomarker for Predicting Cancer Prognosis and an Essential Molecule that Remodels Various Components in the Tumor Microenvironment: A Pan-Cancer Study. *Frontiers in Molecular Biosciences* **9**. . [Crossref]
34. Meshal Alshamrani, Muhammad Khalid Khan, Barkat Ali Khan, Ahmad Salawi, Yosif Almoshari. 2022. Technologies for Solubility, Dissolution and Permeation Enhancement of Natural Compounds. *Pharmaceuticals* **15**:6, 653. [Crossref]
35. Ryan D. Chow, Elizabeth H. Bradley, Cary P. Gross. 2022. Comparison of Cancer-Related Spending and Mortality Rates in the US vs 21 High-Income Countries. *JAMA Health Forum* **3**:5, e221229. [Crossref]
36. Afschin Gandjour. 2022. The clinical and economic value of a successful shutdown during the SARS-CoV-2 pandemic in Germany. *The Quarterly Review of Economics and Finance* **84**, 502-509. [Crossref]
37. Ivan Lugovoi, Dimitrios A. Andritsos, Claire Senot. 2022. Manufacturing Process Innovation in the Pharmaceutical Industry. *Manufacturing & Service Operations Management* **24**:3, 1760-1778. [Crossref]
38. Olivia M. Dong, Pradeep J. Poonnen, David Winski, Shelby D. Reed, Vishal Vashistha, Jill Bates, Michael J. Kelley, Deepak Voora. 2022. Cost-Effectiveness of Tumor Genomic Profiling to Guide First-Line Targeted Therapy Selection in Patients With Metastatic Lung Adenocarcinoma. *Value in Health* **25**:4, 582-594. [Crossref]
39. Daniel Resende Faleiros, Juliana Alvares-Teodoro, Everton Nunes da Silva, Brian B. Godman, Ramon Gonçalves Pereira, Eli Iola Gurgel Andrade, Francisco A. de Assis Acurcio, Augusto A. Guerra Júnior. 2022. Budget impact analysis of medicines: estimated values versus real-world evidence and the implications. *Expert Review of Pharmacoeconomics & Outcomes Research* **22**:2, 271-281. [Crossref]
40. Jaya S. Khushalani, Suhang Song, Brian H. Calhoun, Richard W. Puddy, James E. Kucik. 2022. Preventing Leading Causes of Death: Systematic Review of Cost-Utility Literature. *American Journal of Preventive Medicine* **62**:2, 275-284. [Crossref]
41. H. E. Frech, Mark V. Pauly, William S. Comanor, Joseph R. Martinez. 2022. Costs and Benefits of Branded Drugs: Insights from Cost-Effectiveness Research. *Journal of Benefit-Cost Analysis* **13**:2, 166-181. [Crossref]
42. Abe Dunn, Anne Hall, Seidu Dauda. 2022. Are Medical Care Prices Still Declining? A Re-Examination Based on Cost-Effectiveness Studies. *Econometrica* **90**:2, 859-886. [Crossref]
43. Bemnet Atlaw Alemu, Fikreselam Habte Hailemariam. 2022. Price, Availability and Affordability of Anti-Cancer Medicines in Addis Ababa, Ethiopia. *Risk Management and Healthcare Policy* **Volume 15**, 2421-2433. [Crossref]
44. Nicolas Papon, Brent R. Copp, Vincent Courdavault. 2022. Marine drugs: Biology, pipelines, current and future prospects for production. *Biotechnology Advances* **54**, 107871. [Crossref]
45. Eric A. Helland, Seth A. Seabury. 2022. Are Settlements in Patent Litigation Collusive? Evidence from Paragraph IV Challenges. *SSRN Electronic Journal* **119**. . [Crossref]
46. Chirantan Chatterjee, Samarth Gupta. 2022. Public Entry, Heterogeneous Consumers and Private Prices: New Evidence from India. *SSRN Electronic Journal* **28**. . [Crossref]
47. Afschin Gandjour. 2021. The price of curing cancer. *BMC Health Services Research* **21**:1. . [Crossref]

48. Sai Zhao, Zhibing Yang, Guizhi Jiang, Sheng Huang, Mianli Bian, Yunlong Lu, Wukun Liu. 2021. An overview of anticancer platinum N-heterocyclic carbene complexes. *Coordination Chemistry Reviews* **449**, 214217. [Crossref]

49. Yael Rachamin, Christoph Jakob Ackermann, Oliver Senn, Thomas Grischott. 2021. Price trends of reimbursed oncological drugs in Switzerland in 2005–2019: A descriptive analysis. *PLOS ONE* **16**:11, e0259936. [Crossref]

50. Shen Lin, Shaohong Luo, Dian Gu, Meiyue Li, Xin Rao, Changlian Wang, Pinfang Huang, Xiongwei Xu, Xiuhua Weng. 2021. First-Line Durvalumab in Addition to Etoposide and Platinum for Extensive-Stage Small Cell Lung Cancer: A U.S.-Based Cost-Effectiveness Analysis. *The Oncologist* **26**:11, e2013-e2020. [Crossref]

51. Michael Schlander, Karla Hernandez-Villafuerte, Chih-Yuan Cheng, Jorge Mestre-Ferrandiz, Michael Baumann. 2021. How Much Does It Cost to Research and Develop a New Drug? A Systematic Review and Assessment. *PharmacoEconomics* **39**:11, 1243-1269. [Crossref]

52. Cormac Kennedy, Laura McCullagh, Roisin Adams, Lea Trela-Larsen, Lesley Tilson, Michael Barry. 2021. Estimating the Theoretical Cost Implications of Funding New Drugs Considered Not to Be Cost-Effective. *Value in Health* **24**:10, 1402-1406. [Crossref]

53. Derek Raghavan, Nicole A. Keith, Hughes R. Warden, Seungjean Chai, Wendy Jo Turan, Jaynie Moroe, Donna Feild, Thomas Gregory Knight. 2021. Levine Cancer Institute Financial Toxicity Tumor Board: A Potential Solution to an Emerging Problem. *JCO Oncology Practice* **17**:10, e1433-e1439. [Crossref]

54. Kerstin N. Vokinger, Thomas J. Hwang, Paola Daniore, ChangWon C. Lee, Ariadna Tibau, Thomas Grischott, Thomas J. Rosemann, Aaron S. Kesselheim. 2021. Analysis of Launch and Postapproval Cancer Drug Pricing, Clinical Benefit, and Policy Implications in the US and Europe. *JAMA Oncology* **7**:9, e212026. [Crossref]

55. Tomás Rau, Miguel Sarzosa, Sergio Urzúa. 2021. The children of the missed pill. *Journal of Health Economics* **79**, 102496. [Crossref]

56. Amanda Starc, Ashley Swanson. 2021. Preferred Pharmacy Networks and Drug Costs. *American Economic Journal: Economic Policy* **13**:3, 406-446. [Abstract] [View PDF article] [PDF with links]

57. Brian Godman, Andrew Hill, Steven Simoens, Gisbert Selke, Iva Selke Krulichová, Carolina Zampirolli Dias, Antony P Martin, Wija Oortwijn, Angela Timoney, Lars L Gustafsson, Luka Voncina, Hye-Young Kwon, Jolanta Gulbinovic, Dzintars Gotham, Janet Wale, Wânia Cristina Da Silva, Tomasz Bochenek, Eleonora Allocati, Amanj Kurdi, Olayinka O. Ogunleye, Johanna C Meyer, Iris Hoxha, Admir Malaj, Christian Hierländer, Robert Sauermann, Wouter Hamelinck, Guenka Petrova, Ott Laius, Irene Langner, John Yfantopoulos, Roberta Joppi, Arianit Jakupi, Ieva Greiciute-Kuprijanov, Patricia Vella Bonanno, Jf (Hans) Piepenbrink, Vincent de Valk, Magdalene Wladysiuk, Vanda Marković-Peković, Ileana Mardare, Jurij Fürst, Dominik Tomek, Mercè Obach Cortadellas, Corinne Zara, Caridad Pontes, Stuart McTaggart, Tracey-Lea Laba, Øyvind Melien, Durhane Wong-Rieger, SeungJin Bae, Ruaraidh Hill. 2021. Potential approaches for the pricing of cancer medicines across Europe to enhance the sustainability of healthcare systems and the implications. *Expert Review of Pharmacoeconomics & Outcomes Research* **21**:4, 527-540. [Crossref]

58. Wânia Cristina da Silva, Brian Godman, Francisco de Assis Acúrcio, Mariângela Leal Cherchiglia, Antony Martin, Konrad Maruszczyk, Jans Bastos Izidoro, Marcos André Portella, Agner Pereira Lana, Orozimbo Henriques Campos Neto, Eli Iola Gurgel Andrade. 2021. The Budget Impact of Monoclonal Antibodies Used to Treat Metastatic Colorectal Cancer in Minas Gerais, Brazil. *Applied Health Economics and Health Policy* **19**:4, 557-577. [Crossref]

59. Giulia Fornaro, Carlo Federici, Carla Rognoni, Oriana Ciani. 2021. Broadening the Concept of Value: A Scoping Review on the Option Value of Medical Technologies. *Value in Health* **24**:7, 1045-1058. [Crossref]

60. Duygu Sezen, Vivek Verma, Kewen He, Chike O. Abana, Hampartsaum Barsoumian, Matthew S. Ning, Chad Tang, Pervin Hurmuz, Nahum Puebla-Osorio, Dawei Chen, Irwin Tendler, Nathan Comeaux, Quynh-Nhu Nguyen, Joe Y Chang, James W. Welsh. 2021. Considerations for Clinical Trials Testing Radiotherapy Combined With Immunotherapy for Metastatic Disease. *Seminars in Radiation Oncology* **31**:3, 217-226. [Crossref]

61. Jules M Janssen Daalen, Anouk den Ambtman, Mark Van Houdenhoven, Bart J F van den Bemt. 2021. Determinants of drug prices: a systematic review of comparison studies. *BMJ Open* **11**:7, e046917. [Crossref]

62. Godfrey Osinde, Nixon Niyonzima, Vivienne Mulema, Deo Kyambadde, Yusuf Mulumba, Siraj Obayo, Ezra Anecho, Susan Watera, Mughuma Constance, Sylivestor Kadhumbula, Jackson Orem. 2021. Increasing access to quality anticancer medicines in low- and middle-income countries: the experience of Uganda. *Future Oncology* **17**:21, 2735-2745. [Crossref]

63. Catherine Bourgain, Maurice Cassier, Jean-Paul Gaudillière, Pierre-André Juven. 2021. Les félicités du capital en santé. *Revue Française de Socio-Économie* **n° 26**:1, 127-147. [Crossref]

64. N. Grössmann, S. Wolf, E. Rothschedl, C. Wild. 2021. Twelve years of European cancer drug approval—a systematic investigation of the 'magnitude of clinical benefit'. *ESMO Open* **6**:3, 100166. [Crossref]

65. Panagiotis Petrou. 2021. Assessing the pricing and benefits of oncology products: an update. *Expert Review of Pharmacoeconomics & Outcomes Research* **21**:3, 335-342. [Crossref]

66. Anaeze C. Offodile, Malke Asaad, Stefanos Boukovalas, Chad Bailey, Yu-Li Lin, Mediget Teshome, Rachel A. Greenup, Charles Butler. 2021. Financial Toxicity Following Surgical Treatment for Breast Cancer: A Cross-sectional Pilot Study. *Annals of Surgical Oncology* **28**:5, 2451-2462. [Crossref]

67. Meng Li, Dana P. Goldman, Alice J. Chen. 2021. Spending On Targeted Therapies Reduced Mortality In Patients With Advanced-Stage Breast Cancer. *Health Affairs* **40**:5, 763-771. [Crossref]

68. Louis P Garrison, Boshen Jiao, Omar Dabbous. 2021. Gene therapy may not be as expensive as people think: challenges in assessing the value of single and short-term therapies. *Journal of Managed Care & Specialty Pharmacy* **27**:5, 674-681. [Crossref]

69. Alice M. Ellyson, Anirban Basu. 2021. Do pharmaceutical prices rise anticipating branded competition?. *Health Economics* **30**:5, 1070-1081. [Crossref]

70. Marc A. Rodwin, Julien Mancini, Ségolène Duran, Anne-Céline Jalbert, Patrice Viens, Dominique Maraninchi, Anthony Gonçalves, Patricia Marino. 2021. The use of 'added benefit' to determine the price of new anti-cancer drugs in France, 2004–2017. *European Journal of Cancer* **145**, 11-18. [Crossref]

71. Colleen Cunningham, Florian Ederer, Song Ma. 2021. Killer Acquisitions. *Journal of Political Economy* 000-000. [Crossref]

72. Roshal R. Patel, Vivek Verma, Hampartsoum B. Barsoumian, Matthew S. Ning, Stephen G. Chun, Chad Tang, Joe Y. Chang, Percy P. Lee, Saumil Gandhi, Peter Balter, Joe Dan Dunn, Dawei Chen, Nahum Puebla-Osorio, Maria Angelica Cortez, James W. Welsh. 2021. Use of Multi-Site Radiation Therapy for Systemic Disease Control. *International Journal of Radiation Oncology*Biology*Physics* **109**:2, 352-364. [Crossref]

73. Seidu Dauda, Abe Dunn, Anne Hall. 2021. A Systematic Examination of Quality-Adjusted Price Index Alternatives for Medical Care Using Claims Data. *SSRN Electronic Journal* **30**. . [Crossref]

74. Adam Fundytus, Richard Sullivan, Christopher M. Booth. 2020. Toward affordable cancer drugs: Do we need firmer price negotiation, me-too drugs, or a biosimilar silver bullet?. *Seminars in Oncology* **47**:6, 353-354. [Crossref]

75. David B. Ridley, Chung-Ying Lee. 2020. Does Medicare Reimbursement Drive Up Drug Launch Prices?. *The Review of Economics and Statistics* **102**:5, 980-993. [Crossref]

76. Afschin Gandjour. 2020. Willingness to pay for new medicines: a step towards narrowing the gap between NICE and IQWiG. *BMC Health Services Research* **20**:1. . [Crossref]

77. Shuli Brammli Greenberg, Einat Dotan, Rachel Arazi. 2020. The insurability of innovative pharmaceutical cancer technologies. *Israel Journal of Health Policy Research* **9**:1. . [Crossref]

78. Agner Pereira Lana, Julian Perelman, Eli Iola Gurgel Andrade, Francisco Acúrcio, Augusto Afonso Guerra, Mariângela Leal Cherchiglia. 2020. Cost Analysis of Cancer in Brazil: A Population-Based Study of Patients Treated by Public Health System From 2001-2015. *Value in Health Regional Issues* **23**, 137-147. [Crossref]

79. Carolina Zampirolli Dias, Brian Godman, Ludmila Peres Gargano, Pâmela Santos Azevedo, Marina Morgado Garcia, Maurílio Souza Cazarim, Laís Lessa Neiva Pantuzza, Nelio Gomes Ribeiro-Junior, André Luiz Pereira, Marcus Carvalho Borin, Isabella de Figueiredo Zuppo, Roberto Iunes, Tomas Pippo, Renata Curi Hauegen, Carlos Vassalo, Tracey-Lea Laba, Steven Simoens, Sergio Márquez, Carolina Gomez, Luka Voncina, Gisbert W. Selke, Livio Garattini, Hye-Young Kwon, Jolanta Gulbinovic, Aneta Lipinska, Maciej Pomorski, Lindsay McClure, Jurij Fürst, Rosana Gambogi, Carla Hernandez Ortiz, Vânia Cristina Canuto Santos, Denizar Vianna Araújo, Vânia Eloisa Araujo, Francisco de Assis Acurcio, Juliana Alvares-Teodoro, Augusto Afonso Guerra-Junior. 2020. Integrative Review of Managed Entry Agreements: Chances and Limitations. *PharmacoEconomics* **38**:11, 1165-1185. [Crossref]

80. Mark P. Lythgoe, Jonathan Krell, Sarah Mahmoud, Emily C. Mills, Aishwarya Vasudevan, Philip Savage. 2020. Development and economic trends in anticancer drugs licensed in the UK from 2015 to 2019. *Drug Discovery Today* **88**. . [Crossref]

81. T. Joseph Mattingly, Dominique Seo, Adam M. Ostrovsky, David J. Vanness, Rena M. Conti. 2020. 60 Years after Kefauver: Household income required to buy prescription drugs in the United States and abroad. *Research in Social and Administrative Pharmacy* **381**. . [Crossref]

82. Kai Hübel, Florian Kron, Michael Patrick Lux. 2020. Biosimilars in oncology: Effects on economy and therapeutic innovations. *European Journal of Cancer* **139**, 10-19. [Crossref]

83. Thomas J Hwang, Joseph S Ross, Kerstin N Vokinger, Aaron S Kesselheim. 2020. Association between FDA and EMA expedited approval programs and therapeutic value of new medicines: retrospective cohort study. *BMJ* m3434. [Crossref]

84. John W. Cassidy. Applications of Machine Learning in Drug Discovery II: Biomarker Discovery, Patient Stratification and Pharmacoeconomics . [Crossref]

85. Nasuh C. Buyukkaramikli, Peter Wigfield, Men Thi Hoang. 2020. A MEA is a MEA is a MEA? Sequential decision making and the impact of different managed entry agreements at the manufacturer and payer level, using a case study for an oncology drug in England. *The European Journal of Health Economics* **1**. . [Crossref]

86. Jason D. Buxbaum, Michael E. Chernew, A. Mark Fendrick, David M. Cutler. 2020. Contributions Of Public Health, Pharmaceuticals, And Other Medical Care To US Life Expectancy Changes, 1990-2015. *Health Affairs* **39**:9, 1546-1556. [Crossref]

87. Sungju Kim, Jong Hyuk Lee. 2020. Price-Cutting Trends in New Drugs after Listing in South Korea: The Effect of the Reimbursement Review Pathway on Price Reduction. *Healthcare* **8**:3, 233. [Crossref]

88. Angela Y. Jia, Matthew P. Deek, Ryan M. Phillips. 2020. Radiotherapeutic Management of Oligometastatic Disease in Low- and Middle-Income Countries: The Current State of Affairs and Perspectives on Future Implementation. *Applied Radiation Oncology* **68**, 11-15. [Crossref]

89. Aneta Mela, Łukasz A. Poniatowski, Bartłomiej Drop, Marzena Furtak-Niczyporuk, Janusz Jaroszyński, Witold Wrona, Anna Staniszewska, Jan Dąbrowski, Anna Czajka, Beata Jagielska,

Monika Wojciechowska, Maciej Niewada. 2020. Overview and Analysis of the Cost of Drug Programs in Poland: Public Payer Expenditures and Coverage of Cancer and Non-Neoplastic Diseases Related Drug Therapies from 2015–2018 Years. *Frontiers in Pharmacology* **11**. . [Crossref]

90. Moritz Wolf, Jean-Marc Bielser, Massimo Morbidelli. Perfusion Cell Culture Processes for Biopharmaceuticals **34**, . [Crossref]
91. Elsa Bouée-Benhamiche, Philippe Jean Bousquet, Salah Ghabri. 2020. Economic Evaluations of Anticancer Drugs Based on Medico-Administrative Databases: A Systematic Literature Review. *Applied Health Economics and Health Policy* **18**:4, 491-508. [Crossref]
92. Sebastian Salas-Vega, Emily Shearer, Elias Mossialos. 2020. Relationship between costs and clinical benefits of new cancer medicines in Australia, France, the UK, and the US. *Social Science & Medicine* **258**, 113042. [Crossref]
93. Victoria D. Lauenroth, Aaron S. Kesselheim, Ameet Sarpatwari, Ariel D. Stern. 2020. Lessons From The Impact Of Price Regulation On The Pricing Of Anticancer Drugs In Germany. *Health Affairs* **39**:7, 1185-1193. [Crossref]
94. Thomas G. Knight. 2020. Interventions for Financial Toxicity: More Crucial Than Ever in the Time of COVID-19. *Journal of the National Comprehensive Cancer Network* **18**:7, 915-916. [Crossref]
95. Daniel A. Goldstein, Garth W. Strohbehn, Anthony V. Serritella, David A. Hyman, Allen S. Lichter, Mark J. Ratain. 2020. Interventional Pharmacoeconomics. *The Cancer Journal* **26**:4, 330-334. [Crossref]
96. Boon-Cher Goh, Jeremy Fung-Yen Lim. 2020. Cancer Drugs in Asian Populations. *The Cancer Journal* **26**:4, 323-329. [Crossref]
97. Erlene K. Seymour, Jonas A. de Souza, A. Mark Fendrick. 2020. Incorporating Value-Based Care Into Oncology. *The Cancer Journal* **26**:4, 311-322. [Crossref]
98. Nora Franzen, Valesca P. Retèl, Winnie Schats, Wim H. van Harten. 2020. Evidence Underlying Policy Proposals for Sustainable Anticancer Drug Prices. *JAMA Oncology* **6**:6, 909. [Crossref]
99. Lisa Weitz, Luise Bellach, Alicia Faltum, Angelika Berger, Wolfgang Maurer. 2020. Vaccine hesitancy. *Wiener klinische Wochenschrift* **132**:9-10, 243-252. [Crossref]
100. Nathan I Cherny, Elisabeth G E de Vries. 2020. The global imperative to make cancer medications affordable. *The Lancet Oncology* **21**:5, 609-610. [Crossref]
101. Difei Geng, Kamal Saggi. 2020. Optimal price regulations in international pharmaceutical markets with generic competition. *Journal of Health Economics* **71**, 102315. [Crossref]
102. Mark Shepard, Katherine Baicker, Jonathan Skinner. 2020. Does One Medicare Fit All? The Economics of Uniform Health Insurance Benefits. *Tax Policy and the Economy* **34**, 1-41. [Crossref]
103. Courtney R. Yarbrough. 2020. How protected classes in Medicare Part D influence U.S. drug sales, utilization, and price. *Health Economics* **29**:5, 608-623. [Crossref]
104. Marina Morgado Garcia, Pamela Santos Azevedo, Andrew Mirelman, Leandro Pinheiro Safatle, Roberto Iunes, Marion Clark Bennie, Brian Godman, Augusto Afonso Guerra Junior. 2020. Funding and Service Organization to Achieve Universal Health Coverage for Medicines: An Economic Evaluation of the Best Investment and Service Organization for the Brazilian Scenario. *Frontiers in Pharmacology* **11**. . [Crossref]
105. Thomas Hofmarcher, Peter Lindgren, Nils Wilking, Bengt Jönsson. 2020. The cost of cancer in Europe 2018. *European Journal of Cancer* **129**, 41-49. [Crossref]
106. Eun Cho, Seung-Lai Yoo, Youngju Kang, Jong Hyuk Lee. 2020. Reimbursement and pricing of regenerative medicine in South Korea: key factors for achieving reimbursement. *Regenerative Medicine* **15**:4, 1550-1560. [Crossref]

107. Jordan M. Mitchell, Julie A. Patterson. 2020. The Inclusion of Economic Endpoints as Outcomes in Clinical Trials Reported to ClinicalTrials.gov. *Journal of Managed Care & Specialty Pharmacy* **26**:4, 386-393. [Crossref]

108. James R Baumgardner, Michelle S Brauer, Jie Zhang, Yanni Hao, Zhimei Liu, Darius N Lakdawalla. 2020. CAR-T therapy and historical trends in effectiveness and cost–effectiveness of oncology treatments. *Journal of Comparative Effectiveness Research* **9**:5, 327-340. [Crossref]

109. Sayeh S. Nikpay, Melinda B. Buntin, Rena M. Conti. 2020. Relationship between initiation of 340B participation and hospital safety-net engagement. *Health Services Research* **55**:2, 157-169. [Crossref]

110. Pınar TALAY PINAR, Yavuz YARDIM. 2020. Katyonik Surfaktan Varlığında Kalem Grafit Elektrot Yüzeyinde Epirubisin'in Sıyırma Voltametrisi ile Miktar Tayini. *Afyon Kocatepe University Journal of Sciences and Engineering* **20**:1, 19-29. [Crossref]

111. David M. Cutler. 2020. Are Pharmaceutical Companies Earning Too Much?. *JAMA* **323**:9, 829. [Crossref]

112. Mohamed Gad, Ahmed Salem, Wija Oortwijn, Ruaraidh Hill, Brian Godman. 2020. Mapping of Current Obstacles for Rationalizing Use of Medicines (CORUM) in Europe: Current Situation and Potential Solutions. *Frontiers in Pharmacology* **11**. . [Crossref]

113. Anna Kaltenboeck. 2020. Pharmaceutical Products and Their Value: Lessons Learned and the Path Ahead. *Value in Health* . [Crossref]

114. Carlos Camps, Xavier Badia, Rosario García-Campelo, Jesús García-Foncillas, Rafael López, Bartomeu Massuti, Mariano Provencio, Ramón Salazar, Juan Virizuela, Vicente Guillem. 2020. Development of a Multicriteria Decision Analysis Framework for Evaluating and Positioning Oncologic Treatments in Clinical Practice. *JCO Oncology Practice* **16**:3, e298-e305. [Crossref]

115. Caridad Pontes, Corinne Zara, Josep Torrent-Farnell, Merce Obach, Cristina Nadal, Patricia Vella-Bonanno, Michael Ermisch, Steven Simoens, Renata Curi Hauegen, Jolanta Gulbinovic, Angela Timoney, Antony P. Martin, Tanja Mueller, Anna Nachtnebel, Stephen Campbell, Gisbert Selke, Tomasz Bochenek, Celia C. Rothe, Ileana Mardare, Marion Bennie, Jurij Fürst, Rickard E. Malmstrom, Brian Godman. 2020. Time to Review Authorisation and Funding for New Cancer Medicines in Europe? Inferences from the Case of Olaratumab. *Applied Health Economics and Health Policy* **18**:1, 5-16. [Crossref]

116. Jennifer L. Malin. 2020. Charting the Course: Use of Clinical Pathways to Improve Value in Cancer Care. *Journal of Clinical Oncology* **38**:4, 367-371. [Crossref]

117. Scott F. Huntington, Amy J. Davidoff, Cary P. Gross. 2020. Precision Medicine in Oncology II: Economics of Targeted Agents and Immuno-Oncology Drugs. *Journal of Clinical Oncology* **38**:4, 351-358. [Crossref]

118. Angela K. Green, Jennifer A. Ohn, Peter B. Bach. 2020. Review of Current Policy Strategies to Reduce US Cancer Drug Costs. *Journal of Clinical Oncology* **38**:4, 372-379. [Crossref]

119. Nancy L. Keating, A. James O'Malley, Jukka-Pekka Onnela, Stacy W. Gray, Bruce E. Landon. 2020. Association of Physician Peer Influence With Subsequent Physician Adoption and Use of Bevacizumab. *JAMA Network Open* **3**:1, e1918586. [Crossref]

120. Nicolas Carels, Alessandra Jordano Conforte, Carlyle Ribeiro Lima, Fabricio Alves Barbosa da Silva. Challenges for the Optimization of Drug Therapy in the Treatment of Cancer 163-198. [Crossref]

121. Joanna Gotfrit, John J.W. Shin, Ranjeeta Mallick, David J. Stewart, Paul Wheatley-Price. 2020. Potential Life-Years Lost: The Impact of the Cancer Drug Regulatory and Funding Process in Canada. *The Oncologist* **25**:1, e130-e137. [Crossref]

122. Ivan Lugovoi, Dimitrios Andritsos, Claire Senot. 2020. Novelty and Scope of Innovation in Manufacturing: The Role of Related and Unrelated Production Experience. *SSRN Electronic Journal* . [Crossref]

123. Adam J. N. Raymakers, Dean A. Regier, Stuart J. Peacock. 2020. Health-related quality of life in oncology drug reimbursement submissions in Canada: A review of submissions to the pan-Canadian Oncology Drug Review. *Cancer* **126**:1, 148-155. [Crossref]

124. D. Dankó, J-Y. Blay, L.P. Garrison. 2019. Challenges in the value assessment, pricing and funding of targeted combination therapies in oncology. *Health Policy* **123**:12, 1230-1236. [Crossref]

125. Alice J. Chen, Xiaohan Hu, Rena M. Conti, Anupam B. Jena, Dana P. Goldman. 2019. Trends in the Price per Median and Mean Life-Year Gained Among Newly Approved Cancer Therapies 1995 to 2017. *Value in Health* **22**:12, 1387-1395. [Crossref]

126. André Soares Santos, Augusto Afonso Guerra-Junior, Kenya Valéria Micaela de Souza Noronha, Mônica Viegas Andrade, Cristina Mariano Ruas. 2019. The Price of Substitute Technologies. *Value in Health Regional Issues* **20**, 154-158. [Crossref]

127. Colene Bentley, Stuart Peacock, Julia Abelson, Michael M. Burgess, Olivier Demers-Payette, Holly Longstaff, Laura Tripp, John N. Lavis, Michael G. Wilson. 2019. Addressing the affordability of cancer drugs: using deliberative public engagement to inform health policy. *Health Research Policy and Systems* **17**:1. . [Crossref]

128. Gilbert Spizzo, Uwe Siebert, Guenther Gastl, Andreas Voss, Klaus Schuster, Robert Leonard, Andreas Seeber. 2019. Cost-comparison analysis of a multiplatform tumour profiling service to guide advanced cancer treatment. *Cost Effectiveness and Resource Allocation* **17**:1. . [Crossref]

129. Lieven Annemans. 2019. A proposal for value informed, affordable ("via") prices for innovative medicines. *Journal of Medical Economics* **22**:11, 1235-1239. [Crossref]

130. Josep Darbà, Meritxell Ascanio. 2019. The current performance-linked and risk sharing agreement scene in the Spanish region of Catalonia. *Expert Review of Pharmacoeconomics & Outcomes Research* **19**:6, 743-748. [Crossref]

131. Lotte Steuten, Vincent Garmo, Hemant Phatak, Sean D. Sullivan, Paul Nghiem, Scott D. Ramsey. 2019. Treatment Patterns, Overall Survival, and Total Healthcare Costs of Advanced Merkel Cell Carcinoma in the USA. *Applied Health Economics and Health Policy* **17**:5, 733-740. [Crossref]

132. Nguyen Minh Tuan, Chang Hoon Lee. 2019. Penfluridol as a Candidate of Drug Repurposing for Anticancer Agent. *Molecules* **24**:20, 3659. [Crossref]

133. Peter J. Gilbar, James Sung, Vanessa J. Brown, Srinivas Kondalsany-Chennakesavan. 2019. Expanding the war on waste: recycling cancer drugs. *Journal of Pharmacy Practice and Research* **49**:5, 454-459. [Crossref]

134. Ben Caldwell. 2019. Variability of Biologics and its Impact on Biosimilar Development. *European Medical Journal* 22-30. [Crossref]

135. Seung-Mi Lee, Jae-Ho Jung, David Suh, Yu-Seon Jung, Seung-Lai Yoo, Dong-Won Kim, Ji-An Kim, Dong-Churl Suh. 2019. Budget Impact of Switching to Biosimilar Trastuzumab (CT-P6) for the Treatment of Breast Cancer and Gastric Cancer in 28 European Countries. *BioDrugs* **33**:4, 423-436. [Crossref]

136. Wenxi Tang, Jing Xie, Fanxin Kong, Daniel C. Malone. 2019. Per-Prescription Drug Expenditure by Source of Payment and Income Level in the United States, 1997 to 2015. *Value in Health* **22**:8, 871-877. [Crossref]

137. Diana R Withrow, Amy Berrington de González, Susan Spillane, Neal D Freedman, Ana F Best, Yingxi Chen, Meredith S Shiels. 2019. Trends in Mortality Due to Cancer in the United States by

Age and County-Level Income, 1999–2015. *JNCI: Journal of the National Cancer Institute* **111**:8, 863-866. [Crossref]

138. Joseph Biskupiak, Gary Oderda, Diana Brixner, Derek Tang, Christopher Zacker, Anand A. Dalal. 2019. Quantification of Economic Impact of Drug Wastage in Oral Oncology Medications: Comparison of 3 Methods Using Palbociclib and Ribociclib in Advanced or Metastatic Breast Cancer. *Journal of Managed Care & Specialty Pharmacy* **25**:8, 859-866. [Crossref]
139. Ameet Sarpatwari, Jonathan DiBello, Marie Zakarian, Mehdi Najafzadeh, Aaron S. Kesselheim. 2019. Competition and price among brand-name drugs in the same class: A systematic review of the evidence. *PLOS Medicine* **16**:7, e1002872. [Crossref]
140. Angela Acosta, Egdda Patricia Vanegas, Joan Rovira, Brian Godman, Tomasz Bochenek. 2019. Medicine Shortages: Gaps Between Countries and Global Perspectives. *Frontiers in Pharmacology* **10**. . [Crossref]
141. Meng Li, Anirban Basu, Caroline Bennette, David Veenstra, Louis P. Garrison. 2019. How Does Option Value Affect the Potential Cost-Effectiveness of a Treatment? The Case of Ipilimumab for Metastatic Melanoma. *Value in Health* **22**:7, 777-784. [Crossref]
142. Caroline Savage Bennette, Anirban Basu, Scott D. Ramsey, Zachary Helms, Peter B. Bach. 2019. Health Returns to Pharmaceutical Innovation in the Market for Oral Chemotherapy in Response to Insurance Coverage Expansion. *American Journal of Health Economics* **5**:3, 360-375. [Crossref]
143. Ariel D. Stern, Felicitas Pietrulla, Annika Herr, Aaron S. Kesselheim, Ameet Sarpatwari. 2019. The Impact Of Price Regulation On The Availability Of New Drugs In Germany. *Health Affairs* **38**:7, 1182-1187. [Crossref]
144. Judy Truong, Kelvin K. W. Chan, Helen Mai, Alexandra Chambers, Mona Sabharwal, Maureen E. Trudeau, Matthew C. Cheung. 2019. The impact of pricing strategy on the costs of oral anti-cancer drugs. *Cancer Medicine* **8**:8, 3770-3781. [Crossref]
145. Robert Lentz, Al B. Benson, Sheetal Kircher. 2019. Financial toxicity in cancer care: Prevalence, causes, consequences, and reduction strategies. *Journal of Surgical Oncology* **120**:1, 85-92. [Crossref]
146. Radion Svynarenko, Qun Zhang, Hyungsoo Kim. 2019. The Financial Burden of Cancer: Financial Ratio Analysis. *Journal of Family and Economic Issues* **40**:2, 165-179. [Crossref]
147. Sukant Garg, Sajal Afzal, Ahmed Elwakeel, Damini Sharma, Navaneethan Radhakrishnan, Jaspreet Kaur Dhanjal, Durai Sundar, Sunil C. Kaul, Renu Wadhwa. 2019. Marine Carotenoid Fucoxanthin Possesses Anti-Metastasis Activity: Molecular Evidence. *Marine Drugs* **17**:6, 338. [Crossref]
148. Stacie B. Dusetzina, Haiden A. Huskamp, Nancy L. Keating. 2019. Specialty Drug Pricing and Out-of-Pocket Spending on Orally Administered Anticancer Drugs in Medicare Part D, 2010 to 2019. *JAMA* **321**:20, 2025. [Crossref]
149. Jeffrey S. Flier. 2019. Academia and industry: allocating credit for discovery and development of new therapies. *Journal of Clinical Investigation* **129**:6, 2172-2174. [Crossref]
150. Zhiyuan Zheng, Ahmedin Jemal, Xuesong Han, Gery P. Guy, Chunyu Li, Amy J. Davidoff, Matthew P. Banegas, Donatus U. Ekwueme, K. Robin Yabroff. 2019. Medical financial hardship among cancer survivors in the United States. *Cancer* **125**:10, 1737-1747. [Crossref]
151. Derek J Ward, Lucy Doos, Andrew Stevens. 2019. Trends in the costs of drugs launched in the UK between 1981 and 2015: an analysis of the launch price of drugs in five disease areas. *BMJ Open* **9**:5, e027625. [Crossref]
152. Ajaikumar B Kunnumakkara, Devivasha Bordoloi, Bethsebie Lalduhsaki Sailo, Nand Kishor Roy, Krishan Kumar Thakur, Kishore Banik, Mehdi Shakibaei, Subash C Gupta, Bharat B Aggarwal. 2019. Cancer drug development: The missing links. *Experimental Biology and Medicine* **244**:8, 663-689. [Crossref]

153. Graham W. Warren, Kathleen B. Cartmell, Elizabeth Garrett-Mayer, Ramzi G. Salloum, K. Michael Cummings. 2019. Attributable Failure of First-line Cancer Treatment and Incremental Costs Associated With Smoking by Patients With Cancer. *JAMA Network Open* **2**:4, e191703. [Crossref]

154. Aarif Y. Khakoo, Nicole R. Yurgin, Paul R. Eisenberg, Gregg C. Fonarow. 2019. Overcoming Barriers to Development of Novel Therapies for Cardiovascular Disease. *JACC: Basic to Translational Science* **4**:2, 269-274. [Crossref]

155. Simone Zanella, Gianfranco Bocchinfuso, Marta De Zotti, Daniela Arosio, Franca Marino, Stefano Raniolo, Luca Pignataro, Giovanni Sacco, Antonio Palleschi, Alvaro S. Siano, Umberto Piarulli, Laura Belvisi, Fernando Formaggio, Cesare Gennari, Lorenzo Stella. 2019. Rational Design of Antiangiogenic Helical Oligopeptides Targeting the Vascular Endothelial Growth Factor Receptors. *Frontiers in Chemistry* **7**. . [Crossref]

156. Bengt Jönsson, Richard Sullivan. 2019. Mission-oriented translational cancer research – health economics. *Molecular Oncology* **13**:3, 636-647. [Crossref]

157. Irene Eriksson, Mia von Euler, Rickard E. Malmström, Brian Godman, Björn Wettermark. 2019. Did we see it Coming? An Evaluation of the Swedish Early Awareness and Alert System. *Applied Health Economics and Health Policy* **17**:1, 93-101. [Crossref]

158. Jonathan Hummel, Mark Pagkaliwangan, Xhorxhi Gjoka, Terence Davidovits, Rick Stock, Thomas Ransohoff, Rene Gantier, Mark Schofield. 2019. Modeling the Downstream Processing of Monoclonal Antibodies Reveals Cost Advantages for Continuous Methods for a Broad Range of Manufacturing Scales. *Biotechnology Journal* **14**:2. . [Crossref]

159. Patricia M. Danzon. Drug Pricing and Value in Oncology 153-167. [Crossref]

160. Bengt Jönsson. Cost of Cancer: Healthcare Expenditures and Economic Impact 7-23. [Crossref]

161. Karen Fitzner, Frederick Oteng-Mensah. Impact of Cost on the Safety of Cancer Pharmaceuticals 1-20. [Crossref]

162. Aidan Hollis, Paul Grootendorst. Medicine Prices in the United States and Canada 31-43. [Crossref]

163. Mark Shepard, Katherine Baicker, Jonathan S. Skinner. 2019. Does One Medicare Fit All? The Economics of Uniform Health Insurance Benefits. *SSRN Electronic Journal* . [Crossref]

164. Joseph O. Fadare, Olayinka Ogunleye, Reginald Obiako, Samuel Orubu, Okezie Enwere, Adetutu A. Ajemigbitse, Johanna C. Meyer, Ehijie Enato, Amos Massele, Brian Godman, Lars L. Gustafsson. 2018. Drug and therapeutics committees in Nigeria: evaluation of scope and functionality. *Expert Review of Clinical Pharmacology* **11**:12, 1255-1262. [Crossref]

165. C. Micó, A. Berrocal, A. Blasco, C. Caballero, V. Iranzo, M. Lobo, C. Camps. 2018. This is a call to oncologists for action. *Clinical and Translational Oncology* **20**:12, 1493-1501. [Crossref]

166. Wânia Cristina da Silva, Vânia Eloisa de Araujo, Ellias Magalhães e Abreu Lima, Jessica Barreto Ribeiro dos Santos, Michael Ruberson Ribeiro da Silva, Paulo Henrique Ribeiro Fernandes Almeida, Francisco de Assis Acurcio, Brian Godman, Amanj Kurdi, Mariângela Leal Cherchiglia, Eli Iola Gurgel Andrade. 2018. Comparative Effectiveness and Safety of Monoclonal Antibodies (Bevacizumab, Cetuximab, and Panitumumab) in Combination with Chemotherapy for Metastatic Colorectal Cancer: A Systematic Review and Meta-Analysis. *BioDrugs* **32**:6, 585-606. [Crossref]

167. Patricia M. Danzon. 2018. Differential Pricing of Pharmaceuticals: Theory, Evidence and Emerging Issues. *PharmacoEconomics* **36**:12, 1395-1405. [Crossref]

168. Daniel A. Pollyea. 2018. Which novel agents for acute myeloid leukemia are likely to change practice?. *Best Practice & Research Clinical Haematology* **31**:4, 391-395. [Crossref]

169. Matthew Brennan, Timothy Brown, Kristian Koller, Monali Vasekar, Peter Cygan, Ayesha Ali, Jeffrey Sivik, Michael Glantz. 2018. Target wise and pound foolish: A simple technique to evaluate the trade-

off between clinical benefit and economic burden of monoclonal antibodies. *Journal of Cancer Policy* **18**, 11-19. [Crossref]

170. Muhammad Rehan Sarwar, Sadia Iftikhar, Anum Saqib. 2018. Availability of anticancer medicines in public and private sectors, and their affordability by low, middle and high-income class patients in Pakistan. *BMC Cancer* **18**:1. . [Crossref]
171. Sukant Garg, He Huifu, Sunil C. Kaul, Renu Wadhwa. 2018. Integration of conventional cell viability assays for reliable and reproducible read-outs: experimental evidence. *BMC Research Notes* **11**:1. . [Crossref]
172. Etsuko Satoh, Yasutsuna Sasaki, Ryotaro Ohkuma, Takehiro Takahashi, Yutaro Kubota, Hiroo Ishida, Kazuyuki Hamada, Yuji Kiuchi, Takuya Tsunoda. 2018. Lack of correlation between the costs of anticancer drugs and clinical benefits in Japan. *Cancer Science* **109**:12, 3896-3901. [Crossref]
173. Hagop Kantarjian, Donald W. Light, Vivian Ho. 2018. The "American (cancer) patients first" plan to reduce drug prices-A critical assessment. *American Journal of Hematology* **93**:12, 1444-1450. [Crossref]
174. Jiajun Lu. 2018. The value of a south-facing orientation: A hedonic pricing analysis of the Shanghai housing market. *Habitat International* **81**, 24-32. [Crossref]
175. Kristopher J. Hult, Sonia Jaffe, Tomas J. Philipson. 2018. How Does Technological Change Affect Quality-Adjusted Prices in Health Care? Systematic Evidence from Thousands of Innovations. *American Journal of Health Economics* **4**:4, 433-453. [Crossref]
176. Shoyo Shibata, Maiko Matsushita, Yoshimasa Saito, Takeshi Suzuki. 2018. Anticancer Drug Prescription Patterns in Japan: Future Directions in Cancer Therapy. *Therapeutic Innovation & Regulatory Science* **52**:6, 718-723. [Crossref]
177. Thomas G. Knight, Allison M. Deal, Stacie B. Dusetzina, Hyman B. Muss, Seul Ki Choi, Jeannette T. Bensen, Grant R. Williams. 2018. Financial Toxicity in Adults With Cancer: Adverse Outcomes and Noncompliance. *Journal of Oncology Practice* **14**:11, e665-e673. [Crossref]
178. Victoria Rendell, Ryan Schmocker, Daniel E. Abbott. 2018. Expanding the Scope of Evidence-Based Cancer Care. *Surgical Oncology Clinics of North America* **27**:4, 727-743. [Crossref]
179. Omondi Michelle Atieno, Sylvia Opanga, Antony Martin, Amanj Kurdi, Brian Godman. 2018. Pilot study assessing the direct medical cost of treating patients with cancer in Kenya; findings and implications for the future. *Journal of Medical Economics* **21**:9, 878-887. [Crossref]
180. Cássia Rita Pereira da Veiga, Claudimar Pereira da Veiga, Ana Paula Drummond-Lage. 2018. Concern over cost of and access to cancer treatments: A meta-narrative review of nivolumab and pembrolizumab studies. *Critical Reviews in Oncology/Hematology* **129**, 133-145. [Crossref]
181. Xiaohan Hu, Joel W. Hay. 2018. First-line pembrolizumab in PD-L1 positive non-small-cell lung cancer: A cost-effectiveness analysis from the UK health care perspective. *Lung Cancer* **123**, 166-171. [Crossref]
182. Peter J Gilbar, Carole R Chambers. 2018. How can we ensure value for money from expenditure on injectable cancer drugs?. *Journal of Oncology Pharmacy Practice* **24**:6, 473-476. [Crossref]
183. Edouard Debonneuil, Anne Eyraud-Loisel, Frédéric Planchet. 2018. Can Pension Funds Partially Manage Longevity Risk by Investing in a Longevity Megafund?. *Risks* **6**:3, 67. [Crossref]
184. Jonathan D. Campbell, Vasily Belozeroff, Melanie D. Whittington, Robert J. Rubin, Paolo Raggi, Andrew H. Briggs. 2018. Prices For Common Cardiovascular Drugs In The US Are Not Consistently Aligned With Value. *Health Affairs* **37**:8, 1298-1305. [Crossref]
185. Patrice Trouiller. 2018. Chapitre 3. L'économie morale de la disponibilité des innovations thérapeutiques pour les maladies négligées. *Journal international de bioéthique et d'éthique des sciences* **Vol. 29**:2, 53-67. [Crossref]

186. Hagop M. Kantarjian, Ferran Prat, David P. Steensma, Razelle Kurzrock, David J. Stewart, Mikkael A. Sekeres, Joseph Leveque. 2018. Cancer research in the United States: A critical review of current status and proposal for alternative models. *Cancer* **124**:14, 2881-2889. [Crossref]

187. Jin Wang, Lu Qi, Zejuan Wang, Gang Chen, Chen Liu, Ying Liu, Xiaona Liu, Yu Wang, Chunpu Lei, Xinghe Wang. 2018. Bioequivalence study of single-dose lenalidomide capsule vs. Revlimid® capsule in healthy Chinese males. *Cancer Chemotherapy and Pharmacology* **82**:1, 159-164. [Crossref]

188. Reka Pataky, David A. Tran, Andrea Coronado, Riaz Alvi, Darryl Boehm, Dean A. Regier, Stuart Peacock. 2018. Cancer drug expenditure in British Columbia and Saskatchewan: a trend analysis. *CMAJ Open* **6**:3, E292-E299. [Crossref]

189. Stephanie B. Wheeler, Jennifer C. Spencer, Laura C. Pinheiro, Lisa A. Carey, Andrew F. Olshan, Katherine E. Reeder-Hayes. 2018. Financial Impact of Breast Cancer in Black Versus White Women. *Journal of Clinical Oncology* **36**:17, 1695-1701. [Crossref]

190. James C. Robinson, Scott Howell, Steven D. Pearson. 2018. Value-Based Pricing and Patient Access for Specialty Drugs. *JAMA* **319**:21, 2169. [Crossref]

191. Darius N. Lakdawalla. 2018. Economics of the Pharmaceutical Industry. *Journal of Economic Literature* **56**:2, 397-449. [Abstract] [View PDF article] [PDF with links]

192. Ryan D. Nipp, Amy M. Shui, Giselle K. Perez, Anne C. Kirchhoff, Jeffrey M. Peppercorn, Beverly Moy, Karen Kuhlthau, Elyse R. Park. 2018. Patterns in Health Care Access and Affordability Among Cancer Survivors During Implementation of the Affordable Care Act. *JAMA Oncology* **4**:6, 791. [Crossref]

193. Joseph Levy, Marjorie Rosenberg, David Vanness. 2018. A Transparent and Consistent Approach to Assess US Outpatient Drug Costs for Use in Cost-Effectiveness Analyses. *Value in Health* **21**:6, 677-684. [Crossref]

194. Abe Dunn, Bryn Whitmire, Andrea Batch, Lasanthi Fernando, Lindsey Rittmueller. 2018. High Spending Growth Rates For Key Diseases In 2000–14 Were Driven By Technology And Demographic Factors. *Health Affairs* **37**:6, 915-924. [Crossref]

195. Lisa S. Rotenstein, Stacie B. Dusetzina, Nancy L. Keating. 2018. Out-of-Pocket Spending Not Associated with Oral Oncolytic Survival Benefit. *Journal of Managed Care & Specialty Pharmacy* **24**:6, 494-502. [Crossref]

196. André Soares Santos, Augusto Afonso Guerra-Junior, Brian Godman, Alec Morton, Cristina Mariano Ruas. 2018. Cost-effectiveness thresholds: methods for setting and examples from around the world. *Expert Review of Pharmacoeconomics & Outcomes Research* **18**:3, 277-288. [Crossref]

197. Seth A. Seabury, Melissa A. Frasco, Emma van Eijndhoven, Steve Sison, Christopher Zacker. 2018. The impact of self- and physician-administered cancer treatment on work productivity and healthcare utilization. *Research in Social and Administrative Pharmacy* **14**:5, 434-440. [Crossref]

198. Kathryn R Tringale, Kate T Carroll, Kaveh Zakeri, Assuntina G Sacco, Linda Barnachea, James D Murphy. 2018. Cost-effectiveness Analysis of Nivolumab for Treatment of Platinum-Resistant Recurrent or Metastatic Squamous Cell Carcinoma of the Head and Neck. *JNCI: Journal of the National Cancer Institute* **110**:5, 479-485. [Crossref]

199. Ronak Saluja, Vanessa S. Arciero, Sierra Cheng, Erica McDonald, William W.L. Wong, Matthew C. Cheung, Kelvin K.W. Chan. 2018. Examining Trends in Cost and Clinical Benefit of Novel Anticancer Drugs Over Time. *Journal of Oncology Practice* **14**:5, e280-e294. [Crossref]

200. Guy R. Orangio. 2018. The Economics of Colon Cancer. *Surgical Oncology Clinics of North America* **27**:2, 327-347. [Crossref]

201. Catherine Le Galès. 2018. Pourquoi les nouveaux médicaments sont-ils si chers ?. *médecine/sciences* **34**:4, 354-361. [Crossref]

202. Maryam Doroudi, Diarmuid Coughlan, Matthew P Banegas, Xuesong Han, K Robin Yabroff. 2018. Is Cancer History Associated With Assets, Debt, and Net Worth in the United States?. *JNCI Cancer Spectrum* **2**:2. . [Crossref]

203. David M. Cutler. 2018. What Is The US Health Spending Problem?. *Health Affairs* **37**:3, 493-497. [Crossref]

204. Gennaro Paolella, Andrew Boyd, Scott Wirth, Sandra Cuellar, Neeta Venepalli, Stephanie Crawford. 2018. Adherence to Oral Anticancer Medications: Evolving Interprofessional Roles and Pharmacist Workforce Considerations. *Pharmacy* **6**:1, 23. [Crossref]

205. Livia Lovato Pires de Lemos, Augusto Afonso Guerra Júnior, Marisa Santos, Carlos Magliano, Isabela Diniz, Kathiaja Souza, Ramon Gonçalves Pereira, Juliana Alvares, Brian Godman, Marion Bennie, Ivan Ricardo Zimmermann, Vânia Crisitna Canuto dos Santos, Clarice Alegre Pretramale, Francisco de Assis Acurcio. 2018. The Assessment for Disinvestment of Intramuscular Interferon Beta for Relapsing-Remitting Multiple Sclerosis in Brazil. *PharmacoEconomics* **36**:2, 161-173. [Crossref]

206. Noa Gordon, Salomon M. Stemmer, Dan Greenberg, Daniel A. Goldstein. 2018. Trajectories of Injectable Cancer Drug Costs After Launch in the United States. *Journal of Clinical Oncology* **36**:4, 319-325. [Crossref]

207. Sarah E. Lewis, Maryam Doroudi, K. Robin Yabroff. Financial Hardship 111-125. [Crossref]

208. Pricivel Carrera, S. Yousuf Zafar. Financial Toxicity 127-143. [Crossref]

209. Paul Cerrato, John Halamka. Barriers and Limitations 135-148. [Crossref]

210. Syed Shahzad Hasan, Christine Y. Lu, Zaheer-Ud-Din Babar. Access to High Cost Medicines: An Overview 1-10. [Crossref]

211. Chun K. K. Ma, Mark Danta, Richard Day, David D. F. Ma. 2018. Dealing with the spiralling price of medicines: issues and solutions. *Internal Medicine Journal* **48**:1, 16-24. [Crossref]

212. Marcelo Fabiin Ponce. 2018. Exorbitantes Aumentos De Precios De Los Medicamentos De Prescripciin: Opciones De Polltica PPblica Cuando Se Cruza Una LLnea Moral (Exorbitant Prescription Drug Price Hikes: Public Policy Options When a Moral Line is Crossed). *SSRN Electronic Journal* . [Crossref]

213. Amanda Starc, Ashley Swanson. 2018. Preferred Pharmacy Networks and Drug Costs. *SSRN Electronic Journal* . [Crossref]

214. Colleen Cunningham, Florian Ederer, Song Ma. 2018. Killer Acquisitions. *SSRN Electronic Journal* . [Crossref]

215. Jeah Jung, Roger D. Feldman, Marshall McBean. 2017. The Price Elasticity of Specialty Drug Use: Evidence from Cancer Patients in Medicare Part D. *Forum for Health Economics and Policy* **20**:2. . [Crossref]

216. Alessandra Ferrario, Diāna Arāja, Tomasz Bochenek, Tarik Čatić, Dávid Dankó, Maria Dimitrova, Jurij Fürst, Ieva Greičiūtė-Kuprijanov, Iris Hoxha, Arianit Jakupi, Erki Laidmäe, Olga Löblová, Ileana Mardare, Vanda Markovic-Pekovic, Dmitry Meshkov, Tanja Novakovic, Guenka Petrova, Maciej Pomorski, Dominik Tomek, Luka Voncina, Alan Haycox, Panos Kanavos, Patricia Vella Bonanno, Brian Godman. 2017. The Implementation of Managed Entry Agreements in Central and Eastern Europe: Findings and Implications. *PharmacoEconomics* **35**:12, 1271-1285. [Crossref]

217. Richard T Thakor, Nicholas Anaya, Yuwei Zhang, Christian Vilanilam, Kien Wei Siah, Chi Heem Wong, Andrew W Lo. 2017. Just how good an investment is the biopharmaceutical sector?. *Nature Biotechnology* **35**:12, 1149-1157. [Crossref]

218. Anne E. Hall. 2017. Adjusting the Measurement of the Output of the Medical Sector for Quality: A Review of the Literature. *Medical Care Research and Review* **74**:6, 639-667. [Crossref]

219. N. Maniadakis, G. Kourlaba, J. Shen, A. Holtorf. 2017. Comprehensive taxonomy and worldwide trends in pharmaceutical policies in relation to country income status. *BMC Health Services Research* **17**:1. . [Crossref]

220. Jeromie Ballreich, G. Caleb Alexander, Mariana Socal, Taruja Karmarkar, Gerard Anderson. 2017. Branded prescription drug spending: a framework to evaluate policy options. *Journal of Pharmaceutical Policy and Practice* **10**:1. . [Crossref]

221. Erlene K. Seymour, Charles A. Schiffer, Jonas A. de Souza. 2017. Challenges in the Clinical Application of the American Society of Clinical Oncology Value Framework: A Medicare Cost-Benefit Analysis in Chronic Lymphocytic Leukemia. *Journal of Oncology Practice* **13**:12, e1002-e1011. [Crossref]

222. Peter B Bach, Leonard B Saltz. 2017. Raising the Dose and Raising the Cost: The Case of Pembrolizumab in Lung Cancer. *JNCI: Journal of the National Cancer Institute* **109**:11. . [Crossref]

223. Douglas P. Olsen. 2017. What Nurses Talk About When They Are Talking About Ethics. *AJN, American Journal of Nursing* **117**:11, 63-67. [Crossref]

224. G. Caleb Alexander, Jeromie Ballreich, Mariana P. Socal, Taruja Karmarkar, Antonio Trujillo, Jeremy Greene, Joshua Sharfstein, Gerard Anderson. 2017. Reducing Branded Prescription Drug Prices: A Review of Policy Options. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy* **37**:11, 1469-1478. [Crossref]

225. Daniel A. Goldstein, Jonathon Clark, Yifan Tu, Jie Zhang, Fenqi Fang, Robert Goldstein, Salomon M. Stemmer, Eli Rosenbaum. 2017. A global comparison of the cost of patented cancer drugs in relation to global differences in wealth. *Oncotarget* **8**:42, 71548-71555. [Crossref]

226. Judy Truong, Matthew C. Cheung, Helen Mai, Jessa Letargo, Alexandra Chambers, Mona Sabharwal, Maureen E. Trudeau, Kelvin K. W. Chan. 2017. The impact of cancer drug wastage on economic evaluations. *Cancer* **123**:18, 3583-3590. [Crossref]

227. Narcyz Ghinea, Miles Little, Wendy Lipworth. 2017. Access to High Cost Cancer Medicines Through the Lens of an Australian Senate Inquiry—Defining the "Goods" at Stake. *Journal of Bioethical Inquiry* **14**:3, 401-410. [Crossref]

228. OLIVIER J. WOUTERS, PANOS G. KANAVOS, MARTIN McKEE. 2017. Comparing Generic Drug Markets in Europe and the United States: Prices, Volumes, and Spending. *The Milbank Quarterly* **95**:3, 554-601. [Crossref]

229. Louis Garrison, Adrian Towse. 2017. Value-Based Pricing and Reimbursement in Personalised Healthcare: Introduction to the Basic Health Economics. *Journal of Personalized Medicine* **7**:3, 10. [Crossref]

230. Patricia Vella Bonanno, Michael Ermisch, Brian Godman, Antony P. Martin, Jesper Van Den Bergh, Liudmila Bezmelnitsyna, Anna Bucsics, Francis Arickx, Alexander Bybau, Tomasz Bochenek, Marc van de Casteele, Eduardo Diogene, Irene Eriksson, Jurij Fürst, Mohamed Gad, Ieva Greičiūtė-Kuprijanov, Martin van der Graaff, Jolanta Gulbinovic, Jan Jones, Roberta Joppi, Marija Kalaba, Ott Laius, Irene Langner, Ileana Mardare, Vanda Markovic-Pekovic, Einar Magnusson, Oyvind Melien, Dmitry O. Meshkov, Guenka I. Petrova, Gisbert Selke, Catherine Sermet, Steven Simoens, Ad Schuurman, Ricardo Ramos, Jorge Rodrigues, Corinne Zara, Eva Zebedin-Brandl, Alan Haycox. 2017. Adaptive Pathways: Possible Next Steps for Payers in Preparation for Their Potential Implementation. *Frontiers in Pharmacology* **8**. . [Crossref]

231. James C. Robinson, Christopher M. Whaley, Timothy T. Brown. 2017. Association of Reference Pricing with Drug Selection and Spending. *New England Journal of Medicine* **377**:7, 658-665. [Crossref]

232. Ali Bonakdar Tehrani, Norman V. Carroll. 2017. The Medicaid Rebate: Changes in Oncology Drug Prices After the Affordable Care Act. *Applied Health Economics and Health Policy* **15**:4, 513-520. [Crossref]

233. K. Dhingra. 2017. Cancer drug costs—the case for a thoughtful discussion of a manageable problem. *Annals of Oncology* **28**:8, 1694-1696. [Crossref]

234. Tomasz Bochenek, Ewa Kocot, Marcin Rodzinka, Brian Godman, Katarzyna Maciejewska, Susan Kamal, Andrzej Pilc. 2017. The transparency of published health technology assessment-based recommendations on pharmaceutical reimbursement in Poland. *Expert Review of Pharmacoeconomics & Outcomes Research* **17**:4, 385-400. [Crossref]

235. Joseph C Del Paggio, Richard Sullivan, Deborah Schrag, Wilma M Hopman, Biju Azariah, C S Pramesh, Ian F Tannock, Christopher M Booth. 2017. Delivery of meaningful cancer care: a retrospective cohort study assessing cost and benefit with the ASCO and ESMO frameworks. *The Lancet Oncology* **18**:7, 887-894. [Crossref]

236. S. Yousuf Zafar, Jeffrey M. Peppercorn. 2017. Patient Financial Assistance Programs: A Path to Affordability or a Barrier to Accessible Cancer Care?. *Journal of Clinical Oncology* **35**:19, 2113-2116. [Crossref]

237. Joel Lexchin. 2017. Myths and Realities About Why Prescription Drug Prices in the United States Are So High. *Pharmaceutical Medicine* **31**:3, 143-148. [Crossref]

238. Vinay Prasad, Kevin De Jesús, Sham Mailankody. 2017. The high price of anticancer drugs: origins, implications, barriers, solutions. *Nature Reviews Clinical Oncology* **14**:6, 381-390. [Crossref]

239. Philip Savage, Sarah Mahmoud, Yogin Patel, Hagop Kantarjian. 2017. Cancer Drugs: An International Comparison of Postlicensing Price Inflation. *Journal of Oncology Practice* **13**:6, e538-e542. [Crossref]

240. A. Reginald Waldeck, Marc F. Botteman, Richard E. White, Ben A. van Hout. 2017. The Importance of Economic Perspective and Quantitative Approaches in Oncology Value Frameworks of Drug Selection and Shared Decision Making. *Journal of Managed Care & Specialty Pharmacy* **23**:6-a Suppl, S6-S12. [Crossref]

241. Anna Oh, Dang M. Tran, Leann C. McDowell, Dor Keyvani, Jay Andrew Barcelon, Oscar Merino, Leslie Wilson. 2017. Cost-Effectiveness of Nivolumab-Ipilimumab Combination Therapy Compared with Monotherapy for First-Line Treatment of Metastatic Melanoma in the United States. *Journal of Managed Care & Specialty Pharmacy* **23**:6, 653-664. [Crossref]

242. Peter J Gilbar, Carole R Chambers, Erin C Gilbar. 2017. Opportunities to significantly reduce expenditure associated with cancer drugs. *Future Oncology* **13**:15, 1311-1322. [Crossref]

243. Paula K. Lorgelly, Brett Doble, Donna Rowen, John Brazier. 2017. Condition-specific or generic preference-based measures in oncology? A comparison of the EORTC-8D and the EQ-5D-3L. *Quality of Life Research* **26**:5, 1163-1176. [Crossref]

244. Tristan A. Barnes, Eitan Amir, Arnoud J. Templeton, Susana Gomez-Garcia, Beatriz Navarro, Bostjan Seruga, Alberto Ocana. 2017. Efficacy, safety, tolerability and price of newly approved drugs in solid tumors. *Cancer Treatment Reviews* **56**, 1-7. [Crossref]

245. P. Boisseaux, P. Noury, H. Thomas, J. Garric. 2017. Immune responses in the aquatic gastropod Lymnaea stagnalis under short-term exposure to pharmaceuticals of concern for immune systems: Diclofenac, cyclophosphamide and cyclosporine A. *Ecotoxicology and Environmental Safety* **139**, 358-366. [Crossref]

246. Jennifer L. Ersek, Eric Nadler, Janet Freeman-Daily, Samir Mazharuddin, Edward S. Kim. 2017. Clinical Pathways and the Patient Perspective in the Pursuit of Value-Based Oncology Care. *American Society of Clinical Oncology Educational Book* **1**:37, 597-606. [Crossref]

247. Nancy L. Keating. 2017. From the Guest Editor. *The Cancer Journal* **23**:3, 149-150. [Crossref]

248. Matthew S. Dixon, Ashley L. Cole, Stacie B. Dusetzina. 2017. Out-of-Pocket Spending Under the Affordable Care Act for Patients With Cancer. *The Cancer Journal* **23**:3, 175-180. [Crossref]

249. Hagop Kantarjian, Yogin Patel. 2017. High cancer drug prices 4 years later-Progress and prospects. *Cancer* **123**:8, 1292-1297. [Crossref]

250. Sabine Vogler, Nina Zimmermann, Zaheer-Ud-Din Babar. 2017. Price comparison of high-cost originator medicines in European countries. *Expert Review of Pharmacoeconomics & Outcomes Research* **17**:2, 221-230. [Crossref]

251. Laura A. Fennimore, Pamela K. Ginex. 2017. Oral Agents for Cancer Treatment. *Nursing Clinics of North America* **52**:1, 115-131. [Crossref]

252. Anthony J. Culyer. 2017. Ethics, priorities and cancer. *Journal of Cancer Policy* **11**, 6-11. [Crossref]

253. Isabella P. Godói, André S. Santos, Edna A. Reis, Livia L. P. Lemos, Cristina M. R. Brandão, Juliana Alvares, Francisco A. Acurcio, Brian Godman, Augusto A. Guerra Júnior. 2017. Consumer Willingness to Pay for Dengue Vaccine (CYD-TDV, Dengvaxia®) in Brazil; Implications for Future Pricing Considerations. *Frontiers in Pharmacology* **8**. . [Crossref]

254. Chris R. Triggle, David J. Triggle. 2017. From Gutenberg to Open Science: An Unfulfilled Odyssey. *Drug Development Research* **78**:1, 3-23. [Crossref]

255. Paul Workman, Giulio F. Draetta, Jan H.M. Schellens, René Bernards. 2017. How Much Longer Will We Put Up With $100,000 Cancer Drugs?. *Cell* **168**:4, 579-583. [Crossref]

256. Leslie Wilson, Tracy Lin, Ling Wang, Tanuja Patel, Denise Tran, Sarah Kim, Katie Dacey, Courtney Yuen, Lisa Kroon, Bret Brodowy, Kevin Rodondi. 2017. Evaluation of the ASCO Value Framework for Anticancer Drugs at an Academic Medical Center. *Journal of Managed Care & Specialty Pharmacy* **23**:2, 163-169. [Crossref]

257. Jingshu Wang, Bartosz Chmielowski, James Pellissier, Ruifeng Xu, Kendall Stevinson, Frank Xiaoqing Liu. 2017. Cost-Effectiveness of Pembrolizumab Versus Ipilimumab in Ipilimumab-Naïve Patients with Advanced Melanoma in the United States. *Journal of Managed Care & Specialty Pharmacy* **23**:2, 184-194. [Crossref]

258. Ashley E. Glode, Megan Brafford May. 2017. Rising Cost of Cancer Pharmaceuticals: Cost Issues and Interventions to Control Costs. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy* **37**:1, 85-93. [Crossref]

259. Joshua P. Cohen, Joseph A. DiMasi, Kenneth I. Kaitin. Impact of Comparative Effectiveness Research on Drug Development Strategy and Innovation 63-73. [Crossref]

260. Christian Frois, Jens Grueger. Pricing of Pharmaceuticals: Current Trends and Outlook and the Role of Comparative Effectiveness Research 75-93. [Crossref]

261. Augusto Afonso Guerra-Júnior, Lívia Lovato Pires de Lemos, Brian Godman, Marion Bennie, Cláudia Garcia Serpa Osorio-de-Castro, Juliana Alvares, Aine Heaney, Carlos Alberto Vassallo, Björn Wettermark, Gaizka Benguria-Arrate, Iñaki Gutierrez-Ibarluzea, Vania Cristina Canuto Santos, Clarice Alegre Petramale, Fransciso de Assis Acurcio. 2017. HEALTH TECHNOLOGY PERFORMANCE ASSESSMENT: REAL-WORLD EVIDENCE FOR PUBLIC HEALTHCARE SUSTAINABILITY. *International Journal of Technology Assessment in Health Care* **33**:2, 279-287. [Crossref]

262. Katharine Lynch-Kelly, Matthew Singer, Norman R. Williams. 2017. The Landscape of Randomised Controlled Trials of Therapies in Breast Cancer in Low and Middle Income Countries. *International Journal of Breast Cancer* **2017**, 1-6. [Crossref]

263. Scott F. Huntington, Amy J. Davidoff. 2016. High-Cost, High-Value Oral Specialty Drugs: More Evidence on the Impact of Cost Sharing in Medicare Part D. *Journal of Clinical Oncology* **34**:36, 4307-4309. [Crossref]

264. Giyoon Nam, Young Joo Kim, Yun Jung Kim, Yeoun Jae Kim, Jung Ae Seo, Kyunghwan Kim, Kwang Gi Kim. 2016. Development of Dual-Arm Anticancer Drug Compounding Robot and Preparation System with Adaptability and High-Speed. *Journal of International Society for Simulation Surgery* **3**:2, 64-68. [Crossref]

265. JA DiMasi, R Chakravarthy. 2016. Competitive Development in Pharmacologic Classes: Market Entry and the Timing of Development. *Clinical Pharmacology & Therapeutics* **100**:6, 754-760. [Crossref]

266. Anthony Barron, Tim Wilsdon. 2016. Challenging Perceptions About Oncology Product Pricing in Breast and Colorectal Cancer. *Pharmaceutical Medicine* **30**:6, 321-326. [Crossref]

267. Jackie Evans, George Laking, Matthew Strother, Tony Wang, Scott Metcalfe, Gary Blick, Reinhard Pauls, Steffan Crausaz. 2016. Mind the gap: An analysis of foregone health gains from unfunded cancer medicines in New Zealand. *Seminars in Oncology* **43**:6, 625-637. [Crossref]

268. Agnes Vitry, Barbara Mintzes, Wendy Lipworth. 2016. Access to new cancer medicines in Australia: dispelling the myths and informing a public debate. *Journal of Pharmaceutical Policy and Practice* **9**:1. . [Crossref]

269. Jean-Pierre Thierry. 2016. Immunothérapie : une innovation de rupture non soutenable économiquement ?. *Bulletin du Cancer* **103**, S186-S192. [Crossref]

270. Klazien Matter-Walstra, Matthias Schwenkglenks, Stefan Aebi, Konstantin Dedes, Joachim Diebold, Mario Pietrini, Dirk Klingbiel, Roger von Moos, Oliver Gautschi. 2016. A Cost-Effectiveness Analysis of Nivolumab versus Docetaxel for Advanced Nonsquamous NSCLC Including PD-L1 Testing. *Journal of Thoracic Oncology* **11**:11, 1846-1855. [Crossref]

271. Brian Godman, Tanja Novakovic, Danka Tesic, Wija Oortwijn, Antony Paul Martin, Mark Parker, Alan Haycox. 2016. Addressing challenges for sustainable healthcare in Central and Eastern Europe. *Expert Review of Pharmacoeconomics & Outcomes Research* **16**:6, 685-687. [Crossref]

272. Michael Ermisch, Anna Bucsics, Patricia Vella Bonanno, Francis Arickx, Alexander Bybau, Tomasz Bochenek, Marc van de Casteele, Eduardo Diogene, Jurij Fürst, Kristina Garuolienė, Martin van der Graaff, Jolanta Gulbinovič, Alan Haycox, Jan Jones, Roberta Joppi, Ott Laius, Irene Langner, Antony P. Martin, Vanda Markovic-Pekovic, Laura McCullagh, Einar Magnusson, Ellen Nilsen, Gisbert Selke, Catherine Sermet, Steven Simoens, Robert Sauermann, Ad Schuurman, Ricardo Ramos, Vera Vlahovic-Palcevski, Corinne Zara, Brian Godman. 2016. Payers' Views of the Changes Arising through the Possible Adoption of Adaptive Pathways. *Frontiers in Pharmacology* **7**. . [Crossref]

273. Rena M. Conti. 2016. THE ADVANTAGES OF AWARDING THE FEDERAL GOVERNMENT NEGOTIATING POWER OVER THE PRICES OF PRESCRIPTION DRUGS. *Journal of Policy Analysis and Management* **35**:4, 964-970. [Crossref]

274. Padraig Dixon, Charlotte Chamberlain, William Hollingworth. 2016. Did It Matter That the Cancer Drugs Fund Was Not NICE? A Retrospective Review. *Value in Health* **19**:6, 879-884. [Crossref]

275. Weiwei Chen, Mark Messonnier, Fangjun Zhou. 2016. Trends in childhood vaccine purchase costs in the US public sector: 1996–2014. *Vaccine* **34**:39, 4706-4711. [Crossref]

276. David H. Howard, Michael E. Chernew, Tamer Abdelgawad, Gregory L. Smith, Josephine Sollano, David C. Grabowski. 2016. New Anticancer Drugs Associated With Large Increases In Costs And Life Expectancy. *Health Affairs* **35**:9, 1581-1587. [Crossref]

277. N. Cherny, R. Sullivan, J. Torode, M. Saar, A. Eniu. 2016. ESMO European Consortium Study on the availability, out-of-pocket costs and accessibility of antineoplastic medicines in Europe. *Annals of Oncology* **27**:8, 1423-1443. [Crossref]

278. Daniel A. Goldstein, Michal Sarfaty. 2016. Cancer Drug Pricing and Reimbursement: Lessons for the United States From Around the World. *The Oncologist* **21**:8, 907-909. [Crossref]

279. Peter P. Yu. 2016. Challenges in Measuring Cost and Value in Oncology: Making It Personal. *Value in Health* **19**:5, 520-524. [Crossref]

280. Blase Polite, Jeffery C. Ward, John V. Cox, Roscoe F. Morton, John Hennessy, Ray Page, Rena M. Conti. 2016. A Pathway Through the Bundle Jungle. *Journal of Oncology Practice* **12**:6, 504-509. [Crossref]

281. Seth A. Seabury, Dana P. Goldman, Charu N. Gupta, Zeba M. Khan, Amitabh Chandra, Tomas J. Philipson, Darius N. Lakdawalla. 2016. Quantifying Gains in the War on Cancer Due to Improved Treatment and Earlier Detection. *Forum for Health Economics and Policy* **19**:1, 141-156. [Crossref]

282. Melissa M. Garrido, Holly G. Prigerson, Yuhua Bao, Paul K. Maciejewski. 2016. Chemotherapy Use in the Months Before Death and Estimated Costs of Care in the Last Week of Life. *Journal of Pain and Symptom Management* **51**:5, 875-881.e2. [Crossref]

283. Jason C Hsu, Luis A Gonzalez-Gonzalez, Vicky H Lu, Christine Y Lu. 2016. Longitudinal trends in use of targeted therapies for treatment of malignant neoplasms of the eye: a population-based study in Taiwan. *BMJ Open* **6**:5, e010706. [Crossref]

284. Caroline S. Bennette, Catherine Richards, Sean D. Sullivan, Scott D. Ramsey. 2016. Steady Increase In Prices For Oral Anticancer Drugs After Market Launch Suggests A Lack Of Competitive Pressure. *Health Affairs* **35**:5, 805-812. [Crossref]

285. Sebastian Salas-Vega, Elias Mossialos. 2016. Cancer Drugs Provide Positive Value In Nine Countries, But The United States Lags In Health Gains Per Dollar Spent. *Health Affairs* **35**:5, 813-823. [Crossref]

286. Hampig Raphael Kourie, Samer Tabchi, Joseph Kattan. 2016. Express approval of immune checkpoint inhibitors: a conflict between science and finance. *Future Oncology* **12**:10, 1215-1217. [Crossref]

287. Narcyz Ghinea, Wendy Lipworth. 2016. Affordable access to innovative cancer medicines — don't forget the prices. *Medical Journal of Australia* **204**:6, 214-215. [Crossref]

288. Leonard B. Saltz. 2016. The Value of Considering Cost, and the Cost of Not Considering Value. *Journal of Clinical Oncology* **34**:7, 659-660. [Crossref]

289. Donatus U. Ekwueme, Benjamin T. Allaire, Gery P. Guy, Sarah Arnold, Justin G. Trogdon. 2016. Treatment Costs of Breast Cancer Among Younger Women Aged 19–44 Years Enrolled in Medicaid. *American Journal of Preventive Medicine* **50**:2, 278-285. [Crossref]

290. Stacie B. Dusetzina, Nancy L. Keating. 2016. Mind the Gap: Why Closing the Doughnut Hole Is Insufficient for Increasing Medicare Beneficiary Access to Oral Chemotherapy. *Journal of Clinical Oncology* **34**:4, 375-380. [Crossref]

291. Renaud Jacquemart, Melissa Vandersluis, Mochao Zhao, Karan Sukhija, Navneet Sidhu, Jim Stout. 2016. A Single-use Strategy to Enable Manufacturing of Affordable Biologics. *Computational and Structural Biotechnology Journal* **14**, 309-318. [Crossref]

292. J. Martinalbo, D. Bowen, J. Camarero, M. Chapelin, P. Démolis, P. Foggi, B. Jonsson, J. Llinares, A. Moreau, D. O'Connor, J. Oliveira, S. Vamvakas, F. Pignatti. 2016. Early market access of cancer drugs in the EU. *Annals of Oncology* **27**:1, 96-105. [Crossref]

293. Mark R. Trusheim, Ernst R. Berndt. 2015. The clinical benefits, ethics, and economics of stratified medicine and companion diagnostics. *Drug Discovery Today* **20**:12, 1439-1450. [Crossref]

294. Suzanne R Hill. 2015. Affordable innovation: future directions in pharmaceutical policy. *Journal of Pharmaceutical Policy and Practice* **8**:S1. . [Crossref]

295. Jagpreet Chhatwal, Michael S. Mathisen, Hagop M. Kantarjian. 2015. Reply to price and value in cancer care. *Cancer* **121**:22, 4098-4099. [Crossref]

296. Peter B. Bach. 2015. New Math on Drug Cost-Effectiveness. *New England Journal of Medicine* **373**:19, 1797-1799. [Crossref]

297. Jagpreet Chhatwal, Michael Mathisen, Hagop Kantarjian. 2015. Are high drug prices for hematologic malignancies justified? A critical analysis. *Cancer* **121**:19, 3372-3379. [Crossref]

298. Peter B. Bach. 2015. Ramucirumab for Colon Cancer and the Problem of Rising Prices Independent of Benefits. *The Oncologist* **20**:9, 983-984. [Crossref]

299. J. Tabernero. 2015. Proven efficacy, equitable access, and adjusted pricing of anti-cancer therapies: no 'sweetheart' solution. *Annals of Oncology* **26**:8, 1529-1531. [Crossref]

300. Blase Polite, Rena M. Conti, Jeffery C. Ward. 2015. Reform of the Buy-and-Bill System for Outpatient Chemotherapy Care Is Inevitable: Perspectives from an Economist, a Realpolitik, and an Oncologist. *American Society of Clinical Oncology Educational Book* **18**:35, e75-e80. [Crossref]

301. Steven Beckman, James W. Smith. 2015. A Theory of Demand Based on Essential and Inessential Goods. *SSRN Electronic Journal* . [Crossref]