BERKELEY CENTER
FOR HEALTH TECHNOLOGY

Reference Pricing as a Purchaser Strategy for Managing Drug Prices

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Drug Price Variation within Therapeutic Classes

Drug Class	Number of Fills	Price of Lowest-Priced Drug in Class	Price of Highest Priced-Drug in Class	Difference Between Highest and Lowest Price Drug ($)	Share of Lowest Price Drug in Class (%)	Share of Highest Price Drug in Class (%)
HMG CoA Reductase Inhibitors	11,701	$12.3	$447.2	$434.9	0.3%	0.0%
Thyroid Hormones	8,386	$5.3	$33.4	$28.1	0.3%	0.1%
Selective Serotonin Reuptake Inhibitors (SSRIs)	7,287	$10.3	$201.0	$190.7	10.2%	0.1%
ACE Inhibitors	6,601	$5.9	$50.4	$44.5	2.0%	0.1%
Beta Blockers Cardio-Selective	5,490	$6.1	$78.0	$71.9	6.1%	3.9%
Proton Pump Inhibitors	5,345	$25.7	$296.1	$270.4	28.7%	0.5%
Biguanides	4,185	$11.8	$525.2	$513.4	41.0%	0.8%
Hydrocodone Combinations	4,073	$27.8	$297.4	$269.6	7.7%	1.4%
Nonsteroidal Anti-inflammatory Agents (NSAIDs)	4,021	$9.9	$521.0	$511.1	12.3%	0.1%
Calcium Channel Blockers	3,864	$14.6	$221.8	$207.2	3.2%	0.4%
Angiotensin II Receptor Antagonists	3,497	$11.5	$166.6	$155.1	8.6%	0.4%
Benzodiazepines	3,286	$3.0	$15.1	$12.1	0.1%	7.8%
Anticonvulsants - Misc.	3,224	$17.9	$292.2	$274.3	0.2%	0.5%
Nasal Steroids	2,952	$34.0	$422.1	$388.1	60.8%	0.3%
Thiazides and Thiazide-Like Diuretics	2,647	$4.1	$69.4	$65.3	0.3%	0.2%
Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs)	2,644	$41.5	$299.7	$258.2	17.7%	2.6%
Beta Adrenergics	2,379	$8.0	$489.4	$481.3	0.2%	0.0%
Non-Benzodiazepine - GABA-Receptor Modulators	2,233	$34.3	$221.4	$187.1	12.6%	0.1%
Human Insulin	2,070	$108.9	$323.2	$214.3	2.8%	16.0%
Angiotensin II Receptor Antag & Thiazide/Thiazide-Like	1,987	$16.0	$139.5	$123.5	14.0%	6.2%
Antidepressants - Misc.	1,896	$28.0	$97.4	$69.4	2.5%	37.1%

Rising Prices After Drug Launch

Top selling U.S. drug prices over five years

Prices rose 54 percent to 126 percent.

DRUG (COMPANY)	PRICE* Dec. 31, 2010	PRICE* Present	PRICE GROWTH
Humira (AbbVie) 40 mg/0.8 ml pre-filled syringes	$1,676.98	$3,797.10	126.4%
Enbrel (Amgen) 50 mg/ml subcutaneous sol.	$427.24	$932.16	118.2%
Copaxone (Teva) 20 mg/ml subcutaneous sol.	$3,025.04	$6,593.00	118.0%
Crestor (AstraZeneca) 10 mg tablets	$350.17	$745.41	112.9%
Abilify (Otsuka) 10 mg tablets	$454.07	$891.97	96.4%
Lantus Solostar (Sanofi SA) 100 units/ml subcutaneous sol.	$191.96	$372.76	94.2%
Advair Diskus (GlaxoSmithKline) 250/50 inhalation discs	$199.90	$334.63	67.4%
Remicade (Johnson & Johnson) 100 mg IV powder for solution	$657.87	$1,071.48	62.9%
Neulasta (Amgen) 6 mg/0.6 ml subcutaneous sol.	$3,320.00	$5,155.65	55.3%
Nexium (AstraZeneca) 10 mg oral packets	$162.55	$250.94	54.4%

* Reflects wholesale acquisition prices before volume-related rebates and other discounts. Prices are based on most commonly prescribed dose.

Source: Truven Health Analytics

S. Culp, 30/03/2016

REUTERS

What is Reference Pricing?

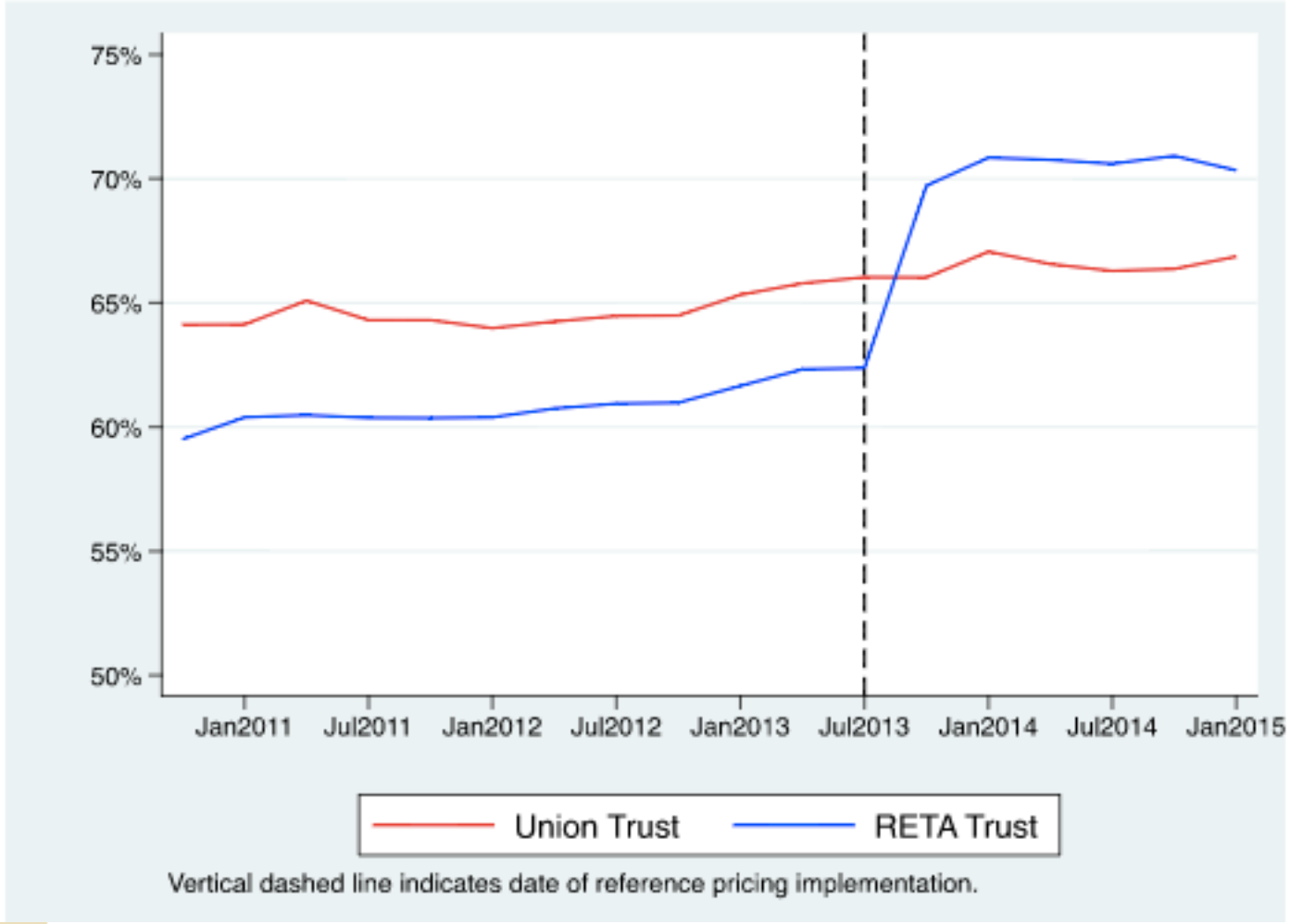
- Sponsor (employer, insurer) establishes a ***maximum contribution*** (reference price) it will make towards paying for a particular service or product
  - This limit is set at some point along the observed price range (e.g., minimum, median)
  - Patient must *pay the full difference* between this limit and the actual price charged
  - Patient may reduce cost sharing by switching to low-priced product or provider
- Patient chooses his/her cost sharing by choosing his/her product or provider
  - Patient has good coverage for low priced options but ***full responsibility for choice***

Impact of Drug Reference Pricing

- RETA Trust, an association of Catholic dioceses the 22,00 lives, implemented reference pricing July 2013
- For this study, RETA drug claims from July 2010 to December 2014 (N=573,456) were compared to claims from a labor union trust (N=549,285)
- Multivariable (difference-in-difference) analyses indicate that reference pricing was associated with:
  - 11.3% growth in probability that a RETA patient selects the low-priced drug within its class
  - 13.9% reduction in average price paid
  - 5.2% increase in employee cost sharing

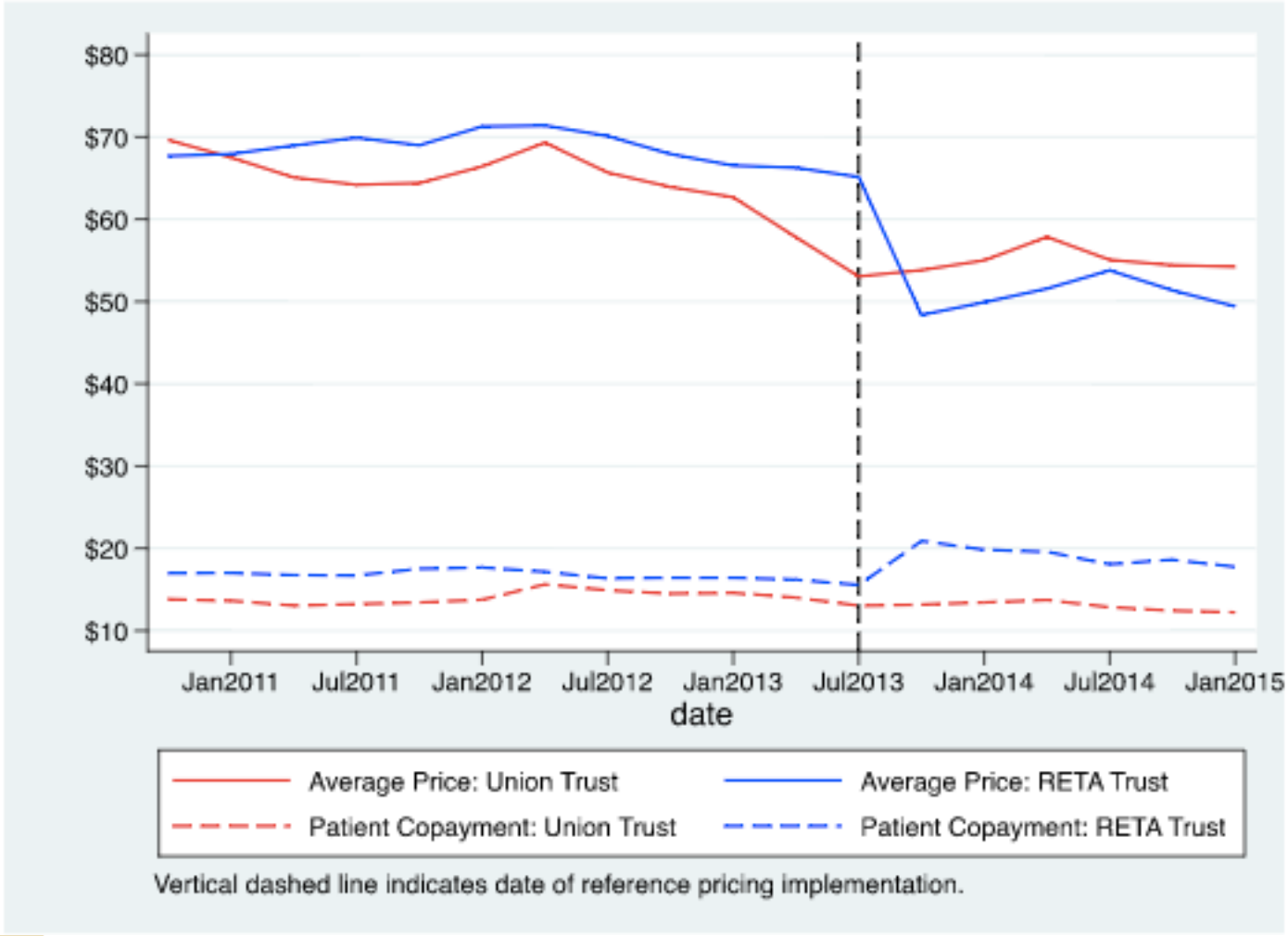
- JC Robinson, CM Whaley, TT Brown. Association of Reference Pricing with Drug Selection and Spending. New England Journal of Medicine 2017;377:658-75.

Increased Share for Low-Price Drug within each Therapeutic Class



Vertical dashed line indicates date of reference pricing implementation.

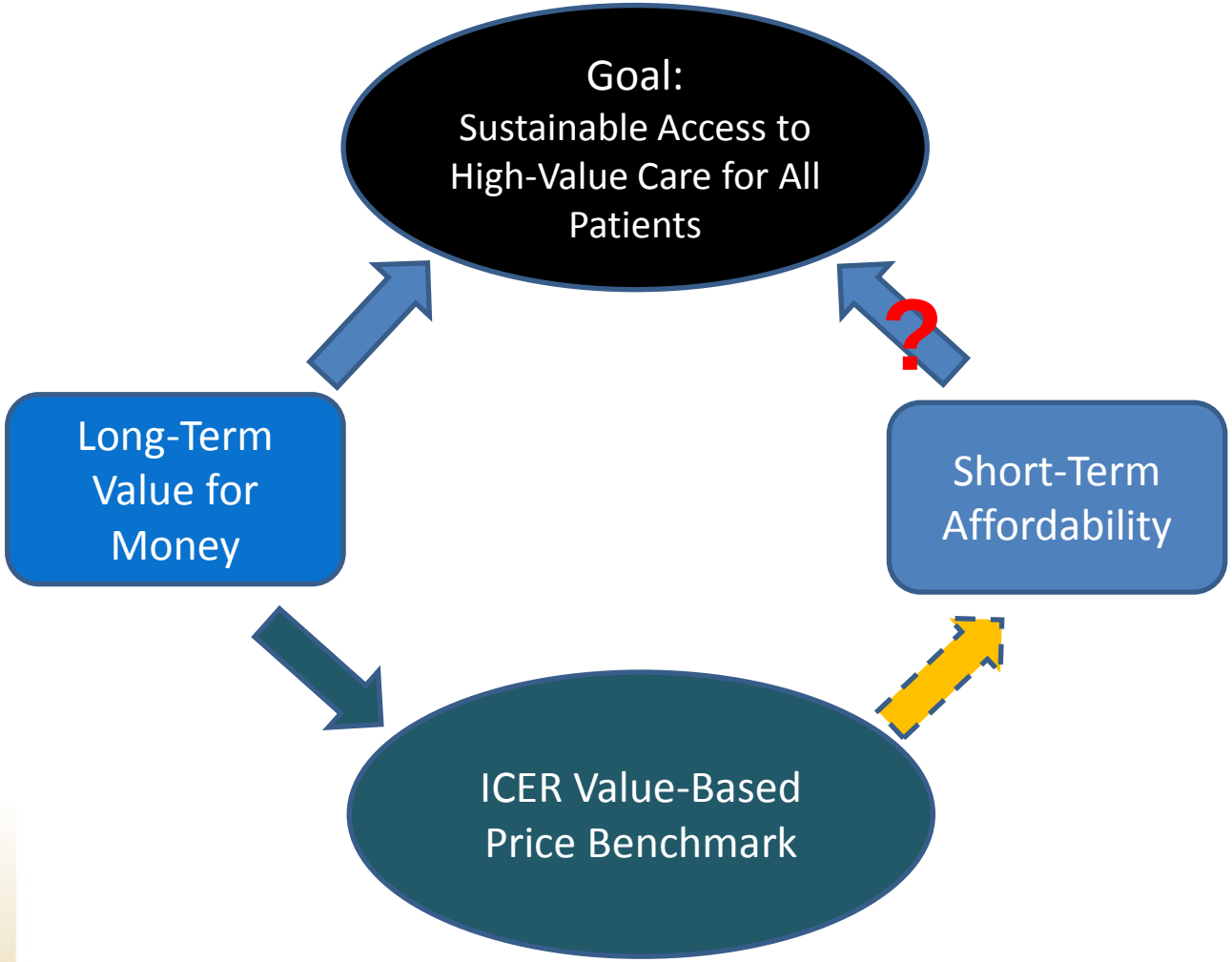
Reduced Prices Paid and Increased Consumer Cost Sharing



Can Reference Pricing Be Applied to Specialty Drugs?

- Much of the price increases and variability have been for specialty drugs, which are more complex and expensive than traditional medications
- There is great potential for price competition among specialty drugs: innovation is producing large numbers of therapeutic equivalents
- However, specialty drugs differ amongst themselves in efficacy, toxicity, mode of administration
- To be effective, reference pricing will need to incorporate comparative effectiveness analysis.
- A better term would be ‘value-based pricing’
- One potential source: Institute for Clinical and Economic Review (ICER)

ICER value-based price benchmark



ICER Reports and Value-Based Pricing

Drug category	Discount to Meet Value-based Price Range
PCSK9 high cholesterol	50%-80%
Heart failure	100% premium
Multiple myeloma	50%
Asthma	70%
Rare liver disease	70%
TKIs for lung cancer	0%
PD-1s for lung cancer	50%
Psoriasis	5% from net prices
Multiple sclerosis	25% from net prices
Rheumatoid arthritis	15% from net prices
Atopic dermatitis	0% from net price
Osteoporosis	50%-80% from net prices
Abuse-deterrent opioids	40% from net prices
Ovarian cancer PARP drugs	50% from net prices for maintenance therapy

Applications of ICER Benchmark Prices:
Walker (WSJ) 2017

- Sanofi/Regeneron faced stringent UM for their PCSK9 drug Praluent, due to charging a price, even after rebates, far above ICER benchmark
- For new drug on atopic dermatitis, Dupixient, it conferred with ICER and chose a launch price near the benchmark ($37K)
- Favorable response from payers, though not all promised to forgo UM. Drug firm still negotiated rebates with PBMs, resulting in post-rebate price of $30K
- IMHO, payers should eliminate onerous UM and cost sharing for drugs charging benchmark prices