US Reimbursement Systems: Effects on R&D

Patricia M. Danzon, PhD
Professor Emeritus
The Wharton School
University of Pennsylvania

Theory: Optimal Reimbursement Rules to Create Efficient R&D Incentives

- Optimal R&D incentives require that payer(s) in each country pay:
  - A consistent price per unit health (e.g. € per QALY gain) for all drugs
    - Possible higher price for priority classes e.g. end-of-life-care
  - This price reflects the willingness-to-pay (WTP) for health of payer, as agent for enrollees in private healthplans or taxpayers in public systems
  - Differences in WTP for health => different price levels across countries
    - WTP and therefore prices likely increase with per capita income

US: Manufacturers Set Prices; Payer Reimbursement not Based on WTP: 1. Pharmacy-dispensed Drugs

- Health plans try to negotiate rebates off mfr. list price in return for putting drug on preferred formulary tier with lower patient co-pay
  - Competitive rebating IF close substitute drugs or generics in class
- For differentiated, specialty drugs, health plans lack leverage =>
- Most specialty drugs are on 4th tier with 20-30% co-insurance
  - Would be unaffordable for most patients ….. but few pay, due to:
    - Stop-loss limits on patient cost-sharing
    - Medicare and Medicaid low-income subsidies, Medigap supplements
    - Manufacturer coupons
- Full coverage makes patients price-insensitive => What limits price?

US: Free pricing + Reimbursement Not Based on WTP (2): Infusions and Inpatient Drugs

2. Infused biologics: Physicians "buy and bill" for infusions etc., reimbursed at Manufacturer's Average Sales Price $(ASP)_{(Q-2)}$ + 6%
   - Higher ASP => *larger* margin for provider
   - Pres. Trump has proposed reimbursement at external reference price + flat fee…….TBD
     - Previous proposals to change/limit ASP+6% were defeated

3. Inpatient drugs: Bundled (DRG) payments to hospitals include drugs => hospitals as price-sensitive customers constrain prices for inpatient drugs

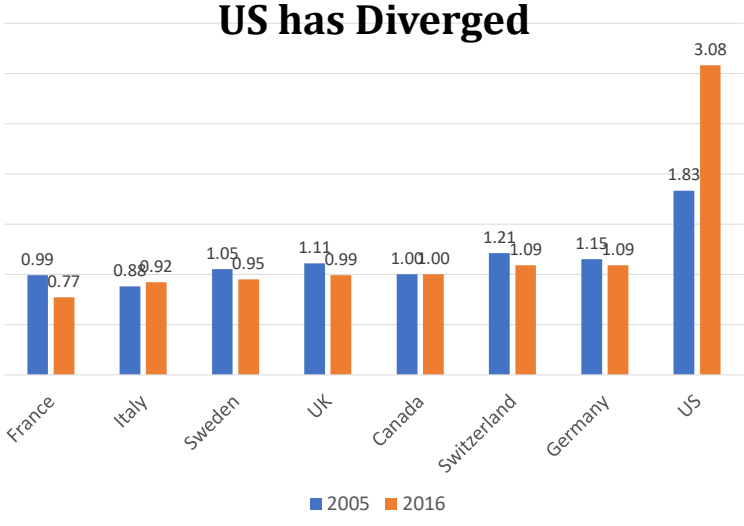
- Pricing Bias: inpatient (e.g. antibiotics) vs. infused biologics and specialty

US Free Pricing with Few Constraints => US Prices Diverge from ex-US Prices

- US Brand price growth exceeds GDP growth
  - Launch price growth exceeds health gain of new drugs
    - Howard, D.H., Bach, P.B., Berndt, E.R. et al. 2015. "Pricing in the market for anticancer drugs." *J. Economic Perspectives* 29:139-162.
  - Post-launch price increases ~ 5-10% p.a.
- Ex-US: Most payers target stable health budget as % of GDP and constrain price vs. incremental value

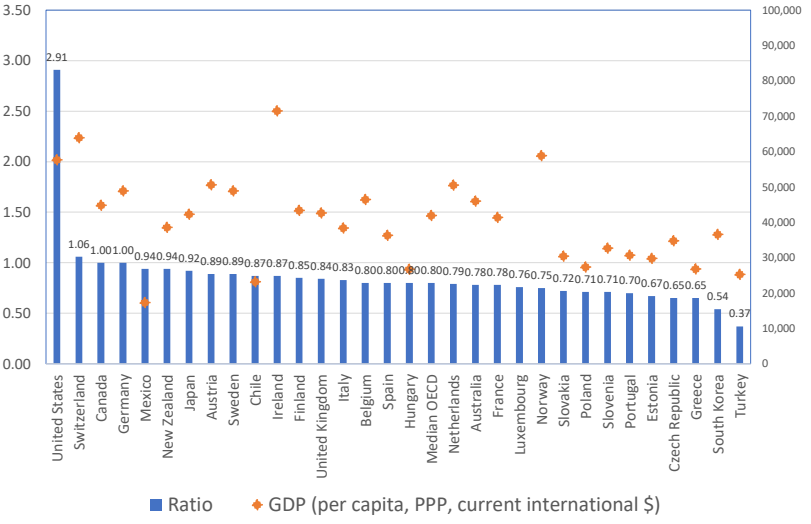
- Implications/Predictions:
  - Divergence of US vs. ex-US prices
  - Bias across classes within US pricing

Average Foreign-to-Canadian Price Ratios, 2005, 2016: US has Diverged



Source: Canada Patented Medicine Prices Review Board, Annual Report 2016, http://www.pmprb-cepmb.gc.ca/view.asp?ccid=1334#a6

Average Foreign-to-Canadian Price Ratios, Patented Drugs, and GDP Per Cap. 2016. OECD Countries



Source: Canada Patented Medicine Prices Review Board, Annual Report 2016, http://www.pmprb-cepmb.gc.ca/view.asp?ccid=1334#a6 and World Bank data, https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD

Orphan Drugs (ODs): Price Premium Necessary or Distortionary?

- 1983 US Orphan Drug Act: R&D tax credits +grants; 7yr market exclusivity (no competitors) for each OD indication; user fee waivers
- Informally, ODs also command much higher prices
- 2016 Av. Cost per patient year: $140,443 OD vs. $27,756 non-OD
  - (Evaluate Pharma, *Orphan Drug Report 2017)*
  - Highest priced ODs > $500,000 and rising
- Rationalization for OD price premium is based on few patients
  - "Producers need to recoup (fixed) R&D cost over few patients"
  - "Budget impact on payers is modest"

Given ODA, OD Price Premium may be Unnecessary and Distorts R&D

- **Phase III cost is 50% lower (75% lower with tax credit) for ODs**
  - (Evaluate Pharma, *Orphan Drug Report 2017)*
- **Many ODs have multiple indications:** some non-OD; ODs also get off-label use
- => Total patients treated often exceeds OD threshold of 200,000
- **Expected ROI now higher on OD vs. non-OD R&D** investment
  - This excludes blockbusters with OD indications (*Evaluate Pharma*)
- **OD sales growth 2017-22 projected at 2X non-OD growth**, and
- By 2022, ODs ~21% of global Rx sales (*Evaluate Pharma*)
- **OD indications now account for > 30-40% of NDAs at FDA**

Conclusions and Implications for R&D

- US reimbursement system do not tie prices to value created or WTP
- Inconsistent reimbursement across pharmacy/infused biologics/inpatient => bias towards biologics + bias against inpatient drugs
- This pricing bias exacerbates bias in data exclusivity protection:
  - 5 years for chemical drugs
  - 12 years for biologics
- ODs get OD premium pricing + pro-biologics reimbursement bias
  - *On top of* statutory ODA (tax credits, market exclusivity) + FDA provisions
- Do we now have an R&D bias towards biologics and especially ODs?
  - => relative neglect of non-biologics + some non-OD disease classes?