March 2019 – FDA, CDER, Office of Generic Drug Policy

Measuring the cost of delayed ANDA approvals

This analysis considers the specific case of delays associated with situations described in the President's FY 2019 budget for HHS where a generic first applicant is not yet approved and the first applicant's 180-day exclusivity is blocking approval of subsequent generic applicants who would be approvable but for 180-day exclusivity.

Data

We used FDA records to identify occurrences of the scenario targeted by the 180-day exclusivity proposal in the President's FY 2019 budget from 2012 through 2017. We observed this scenario to occur approximately five times per year over this period.

We then identified the affected products in the IQVIA National Sales Perspective database, a data set that includes monthly dollar and unit sales of prescription drug products in the United States.[1] Eleven products for which this scenario occurred had adequate sales data both before and after generic entry allowing us to construct estimates of the potential cost savings associated with the proposal.[2]

Analysis – Limited to affected products

Combining the duration of the observed delay for each product with sales data from IQVIA, we estimate potential forgone cost savings that may have been realized if the delays in the first generic approval had not occurred. All dollar values used in this document are CPI-adjusted to a January 2018 base period:

Average delay per ANDA: 12 months, ranging from 2 to 24+ months
Average monthly forgone savings per drug due to delay: $29.5m
Average cost per delay: 12 months * $29.5m = $363m
Observed approximately 5 delays per year
Total forgone savings per year: 5 delays * $363m per delay = $1.8bn

These estimates are based on the observed dollar sales of the brand product during the delay, minus what these sales would have been if the units sold were held constant at their pre-generic level, but the average price of each product was instead set at the level observed after generic entry. Note that this average price accounts for the price and market share of both the brand and generic products after

[1] The IQVIA National Sales Perspectives™ measures the volume of prescription drug products moving from distributors and manufacturers into various outlets within the retail and non-retail markets. Volume is expressed in terms of sales dollars, eaches, extended units, and share of market. These data are estimated based on national projections. Outlets within the retail market include the following pharmacy settings: chain drug stores, independent drug stores, mass merchandisers, food stores, and mail service. Outlets within the non-retail market include clinics, non-federal hospitals, federal facilities, HMOs, long-term care facilities, home health care, and other miscellaneous settings.

[2] Among the products without adequate sales data, this included not having enough pre- or post-generic entry sales data available, recent delays with no generic sales yet available, or inconstancies in the sales data (e.g. no brand sales prior to generic sales, or generic sales listed well before the approval date of the first ANDA).

generic entry. The methods used to generate these estimates are more fully explained in the Technical Note below.

We note that although these estimates are consistent for the limited number of affected products in our 2012-2017 data set that also had sales data available, they may not be representative of cost savings derived from avoiding future delays. These estimates are sensitive to the observed market outcomes and these outcomes may vary in the future for different products, and complete sales data were available for only 11 products in our data set.

Among these 11 products the length of each delay also varied, ranging from 2 months to up to nearly 24 months. The total yearly pre-generic sales also varied; some of the 11 products were small-market drugs with pre-generic brand sales less than $100 million per year while some were large-market products with observed pre-generic brand sales well over $1 billion per year. The extent of the price reductions observed after generic entry also varied, ranging from about a 20% reduction up to nearly 90% price reductions in some cases.

Given the wide variations observed in the values used to estimate cost savings associated with averting delayed generic entry for these 11 products, and because FDA is aware these estimates may not be representative of future outcomes, we also examined (and present below) potential cost saving of this proposal based on an ongoing analysis conducted by FDA that measures the costs associated with delayed generic entry for a much broader group of products.

Analysis – Generalized cost savings

An obvious shortcoming of the above analysis is the limited number of products included. In the future we expect that a similar number of products will be affected by this policy proposal each year (5), but the length of each delay and the savings associated with each product will likely vary.

Using IQVIA sales data, we identified all products with an initial generic entry from the beginning of 2014 through the end of 2016. Observations for each product include brand-only sales for the 18 months before generic entry and sales with both brand and generic products on the market for the first 18 months after generic entry. In total we identified 80 products with initial generic entry and complete sales data during this period.

With both pre- and post-generic sales data available we can compute the costs of theoretical delays by answering this question: If these generic products were approved X months sooner and the observed monthly post-generic prices and market share were in place, how would the total spending at these prices compare to the observed spending when there were no generics on the market?

From this we estimate the following average costs of delays of the initial generic approval for theoretical delays lasting from 1 to 18 months. Estimates are per drug product:

Duration of theoretical generic delay (months)	Total savings estimate if the delay is avoided (millions)
1	$ 15.5
2	$ 34.0
3	$ 55.6
4	$ 76.5
5	$ 97.2
6	$ 121.4
7	$ 148.1
8	$ 173.8
9	$ 204.5
10	$ 235.8
11	$ 266.8
12	$ 299.8
13	$ 333.0
14	$ 366.1
15	$ 401.4
16	$ 435.7
17	$ 469.7
18	$ 504.2

If we use these cost of delay estimates with the number of products per year we identified as being delayed (5 products) and the average delay (12 months) we estimate the savings of avoiding these delays to be approximately $1.5bn per year ($299.8m per delay times 5 delays).

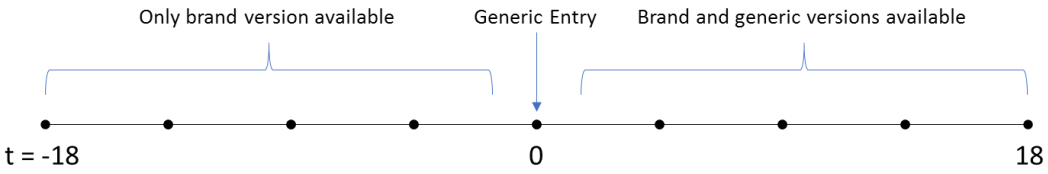
Considering that the length of delay varies from product to product we can see that the expected total costs of these delays will also vary. The above results help to better quantify the range of potential savings from averting delays. These results are based on 80 products that had recent initial generic entry and include a broad representation of product-specific variations in total annual brand sales (from less than $100m per year up to several billions of dollars per year) and also incorporate variations in price reductions associated with generic entry, both of which are directly deterministic of total cost savings associated with generic entry.

Technical note

This section explains the analysis used to estimate the generalized cost savings presented above.

During months t=-18, …, -1 only the brand product is sold. Generic entry occurs in month t=0, and in months t=1, …, 18 both the brand and generic versions are being sold. We drop the month of initial generic entry (t=0) as in most cases the generic is available for only part of that month. For example, a

generic that enters the market on the 24th on January is only sold for one week of that month, leading to the observed generic market share for that month to be much lower than the following months when generics are available for the entire month.



The average savings resulting from avoiding a theoretical delay of a duration of D months for the N observed products is equal to:

$$\frac{\sum_{i=1}^{N}\sum_{t=-D}^{-1} DollarSales_{i,t} - [UnitSales_{i,t} * (Share_{t+D+1}^{Brand} * Price_{t+D+1}^{Brand} + Share_{t+D+1}^{Generic} * Price_{t+D+1}^{Generic})]}{N}$$

In words, this estimate is equal to the observed dollar sales in the pre-generic months ($DollarSales_{i,t}$) minus what the dollar sales would have been in these months if the total units sold were the same ($UnitSales_{i,t}$) but the market share of brand and generic products and the price of brand and generic products were instead in place once generics entered the market. For example, for a theoretical delay of 18 months (D=18) sums the savings from based on monthly sales summed over the 18 months prior to generic entry if the prices were at their corresponding post-generic levels. This is equal to the total estimated savings in month -18 (i.e. 18 months prior to generic entry) minus what these sales would have been if the prices and market share were what was observed in the first month of generic entry (t=1 = t+D+1 = -18+18+1), plus the sales from month -17 using the month 2 shares and prices, …, plus the sales from month -1 using the month 18 shares and prices. The final estimate is the per product average savings associated with averting a delay of a specified duration (from 1 to 18 months) based on the 80 products in the sample.

We estimate the average per product cost of delay separately for each theoretical duration of a delay, with a separate savings estimate for each delay from 1 through 18 months. This is important to note as we expect longer delays to yield a per-month cost that is disproportionately higher than shorter delays. For example, the savings associated with avoiding a one-month delay are derived from price reductions associated only with the products that enter during this month (i.e. only savings from month t=-1). In contrast, a delay of 18 months will derive savings of the approvals that would have occurred in the first month, plus all other approvals occurring over the following 18 months (i.e. the sum of savings from month t=-1 through t=-18). Drug prices continue to drop as more generic versions are approved, so over time the market entry of additional generic products will lead to additional savings.