ABSTRACT

Objectives: Pharmaceutical policies have become paramount in China and other countries of the Asia-Pacific region because of rapidly rising expenditures on drugs. The problems are especially acute in China because expenditures on drugs are typically so large. This article intends to review effects of the policy of drug expenditure containment with primary reference to China, and it proposes some measures to deal with rising pharmaceutical expenditures.

Methods: This article overviews the issues of pharmaceutical pricing, reimbursement, and access in China, and there are a number of policies or measures to control pharmaceutical expenditures. Nevertheless, the effect of those policies of containing drug expenditure is ambiguous so far, and some policies have negative impacts to the manufacturers, providers, and patients. Some underlying reasons are identified. First, the policy’s focus on health-care costs is, to some extent, neglected. Second, the governance of the health sector, including pharmaceutical sector, needs to be improved by both the government and the market.

Results: This article proposes some suggestions to change policies in drug pricing, reimbursement, and access, and make policies more responsive to the main problem of rising health-care expenditures rather than that of pharmaceutical expenditures alone.

Conclusions: The policy suggestions include those of setting the reasonable price for pharmaceuticals, instituting reasonable incentives for all health decision-makers to encourage efficient use of pharmaceuticals and other health resources, and making pharmaceutical markets more efficient, either in the demand or the supply side.

Keywords: access, China, pharmaceutical, pricing, reimbursement.
Setting the Reasonable Price for Pharmaceuticals

In China, The State Commission of Development and Planning is responsible for setting the retail prices for drugs. From 1998 to 2005, the central authority reduced drug prices 18 times. To some extent, expected effects were achieved; however, those price-cut drugs experienced reduced levels of production by pharmaceutical companies, saw reduced levels of distribution by wholesalers or retailers, were less often purchased by hospitals, and were less often prescribed by doctors. It seems to be more difficult for patients to access those reduced price drugs.

Reducing the price of pharmaceuticals will reduce expenditures only if markets are sensitive to price. The pharmaceutical market for Chinese hospitals and clinics is not price sensitive because providers rely on profit from pharmaceutical sales to cover operating deficits. The situation is made worse because the markup is higher for expensive, brand-name products than it is for inexpensive domestic products. Therefore, providers have an incentive to continue prescribing expensive products, even though they may be unnecessary for particular patients.

Once the retail price is set at a low level, it will disrupt the pharmaceutical distribution chain because there is less overall markup to split among the steps. The effect of a mandated price reduction may be to reduce the number of levels in the distribution system, and that would be good because the system lacks efficiency and transparency. There are approximately 17,000 drug wholesalers and 20,000 retailers in China, most of which are very small.

The price of a pharmaceutical for a manufacturer is determined by many factors. Some are supply side, such as costs, and some are demand side, such as quality of the drug, and market characteristics. If the manufacturer cannot cover its production costs or maintain its investment in R&D because of an administered price decision, it will cease the production of a drug. For example, cyclophosphamide is a basic drug for cancer treatment, and its price was 4 yuan per dosage, but it has disappeared from the market for a while. Doctors have to use ifosfamide as a replacement, and patients are complaining about its high price of 200 yuan per dosage. The reason why the previous drug dropped out of the market is that the manufacturers cannot derive any profit from it. There are many similar cases in China, in which cheap, effective, and old drugs are vanishing.

The common means by which a manufacturer stops producing an old, low-priced drug is to develop instead a similar drug with “a little change” and apply for its approval as a new drug. The new drug is likely to sell for a higher price. The Chinese idiom called this phenomenon “the same old stuff with a new label.” The Chinese Finance magazine published a report on this subject in 2005, and it revealed that the State Drug Administration Authority accepted about 10,000 new drug applications, and none of them was really a new molecule. All of them represented only a small change in dosage, route of administration, usage, or packaging.

There is also an important role for health insurers, who now are passive as to treatment decisions by providers. If insurers either set practice guidelines or protocols or pay providers according to a least-cost protocol, providers would be forced to buy only cost-effective inputs. This is the approach used by managed care programs in the United States, and has been effective in achieving efficiencies in care. A variation on this idea is that consumers might have more choice on the treatment option if they are willing to pay for more expensive inputs. “Tiered formulary” health plans in the United States offer physicians and patients a choice in drug therapy, with the product costing the least to the health plan (usually, the generic) offered to patients at a very low price.

Establishing Incentives for Efficient Pharmaceutical Utilization

Besides pharmaceutical price, pharmaceutical quantity is also an important factor contributing to expenditure. Meng et al. examined the impact of drug price cutting policy on the containment of hospital drug expenditures by a pretest and post-test design in two public hospitals in China. The authors found that drug expenditures for all patients still increased rapidly.
in two hospitals after implementation of the pricing policy. They concluded that control of retail prices, implemented in isolation, was not effective in containing hospital drug expenditures in these two Chinese hospitals; utilization, more than price, determined the drug expenditures. How can we encourage providers to prescribe efficient pharmaceutical utilization? The main strategy might be the use of appropriate reimbursement mechanisms, and a prospective payment system that could “internalize” drug expenditures and utilization.

There must be clarity as to the health system’s goal for change: containing pharmaceutical expenditures or containing overall health-care costs. In reality, the issue is not merely containing pharmaceutical costs, but rather, containing overall health-care costs and improving outcomes. Although it seems obvious, health policymakers frequently fail to notice the inter-relationships among inputs when proposals are made to restrict the use of one or another health inputs, assuming that one input can be reduced without affecting the use of other inputs. In the United States, for example, the use of pharmaceuticals was arbitrarily reduced by one state in an attempt to reduce drug costs, and only later was it observed that hospital and nursing home admissions rose to compensate for the restriction on ambulatory drug availability. The increase in health services utilization cost 17 times more than the savings in drug costs [11]. One cannot minimize the use of one input without seeing the impact on other inputs. The goal of health system cost containment must be to consider overall health expenditures and not individual component budgets, and only then can health system efficiency be increased.

For pharmaceutical markets to work efficiently, incentives must exist to encourage cost-efficiency, not only in the pharmaceutical market, but more broadly across all health services. As Towse states [12], “...the emphasis should be on measures that achieve efficient health care rather than the containment of drug spending.”

An example of incentives that are not aligned with overall health system efficiency is the financial role of pharmaceutical expenditures in hospitals in China. In China, reimbursement for medical care services is usually below costs, leading providers to be in deficit. To overcome budget shortfalls, providers are able to charge substantial premiums to the cost of drugs, meaning that the drugs contribute to the overall profitability of the institutions [13]. This incentive leads physicians and administrators to prescribe more drugs than would be optimal for patients and to prescribe drugs that produce the greatest profit.

In addition, under the fee-for-service mechanism, the providers have the tendency to maximize profit: the more services, the more profits. Of course, the providers induce demand for health care, including high-technology services, and new pharmaceuticals, which is sometimes not necessary. This cost-driving reimbursement mechanism is incompatible with the goal of containing health-care costs.

The incentives in a system that pays providers according to their costs of production raise costs without necessarily improving quality. There are many reimbursement models by which providers are paid according to their output rather than the costs of their inputs. One is the British attempt to pay providers with a kind of global capitation budget that includes the costs of pharmaceuticals and other inputs. Another is the American system of Diagnostic Related Group hospital reimbursement, which pays hospitals according to diagnosis of the patient and punishes the hospital if they treat the patient inadequately. The successful experiences of managed care in the United States are mostly based on its reimbursement mechanisms. Fee-for-service reimbursement encourages more services, but capitation favors appropriate services. All of these systems “internalize” production decisions by making the provider responsible for the costs of inputs. These reimbursement models would reduce the incentive in Chinese hospitals to use high-cost inputs. We suggest that prospective reimbursement mechanisms be used to trigger the rational incentives to the hospital and the physician. Reform of the reimbursement mechanism plays the key role of changing incentives to the providers. The incentives therefore are for the provider to be more careful and frugal in the use of all health resources, and to be responsible for all costs of different forms of health care, including drugs. The prospective reimbursement mechanism can be a good countermeasure to solve existing problems in the Chinese health-care system, such as overprescription, abuse of high technology services, cost shifting, and so forth. Therefore, it is also a good measure to curb the escalating health-care costs, including drugs.

**Increasing Competition in the Demand for Pharmaceuticals**

How competitive is the market for pharmaceuticals among decision-makers? For the demand for pharmaceuticals to be efficient, decision-makers must be aware of alternative products, including their attributes and their costs. In health-care delivery, patients are increasingly involved in decision-making, and they are increasingly informed about diseases and drugs. Two countries in the Pacific Rim, the United States and New Zealand, have expanded the scope of drug decision-making to include consumers, through direct-to-consumer (DTC) advertising [14]. Although some see DTC advertising as abruptly changing the nature of the patient–physician relationship, others see it more as a continuation of the public’s quest for more information about health care generally, and new technolo-
gies in particular. Defenders of DTC advertising note that the general public is keenly aware of health issues and therapeutic alternatives from numerous TV programs, newspaper coverage, and magazines and books on health issues. Added to this is a general attitude on the part of patients in the United States, in particular, seeking a greater role in medical decision-making. Economists describe the relationship between a relatively well-informed expert and a less-informed consumer as an “agency” relationship [15]. How well does this agency relationship work? One issue is that the relationship is more complex than originally described. First of all, there are at least two dimensions to therapeutic choice: efficacy and cost. But even “efficacy” contains at least two dimensions: direct effect and side effects, or safety. Many therapies in use today entail risks of substantial side effects. Often patients are more concerned about the severity of side effects than physicians had assumed and so physicians must alter therapeutic decisions to account for patient preferences. Another dimension to the agency relationship is cost. When drugs were nearly always inexpensive, cost was not a serious issue, but today many drugs are extremely expensive and insurance coverage is not complete.

Today there is relatively little research on how physicians and patients view the agency relationship [16,17]. Some patients indicate that they would like their physicians to base drug choice solely upon efficacy criteria. Other patients, when asked about their relative ranking of outcome quality and cost, will reply that they are primarily concerned about cost, as long as the drugs are close to one another in terms of efficacy. Still other patients suggest that they would like their physician (agent) to present alternatives (in terms of efficacy and cost) and that they, themselves, would like to choose the most preferable alternative. The agency relationship assumes that physicians (and perhaps patients) need to know the therapeutic efficacy and cost of drug alternatives. This is highly problematic today.

There is an emerging need for more accurate and unbiased information for physicians and patients. Because this information could be available to the public, it is a kind of public good and must be government-provided. Such information is also related to the development of the academic, such as evidence-based medicine, health technology assessment, and pharmacoeconomic and outcome research.

### Increasing Competition in the Supply of Pharmaceuticals

Competition in the supply of pharmaceuticals has two dimensions: drug availability and financial access. An analysis comparing drug approval lags in China and the United States was done for the 15 top-selling drugs in the United States in 2003 to look at the competition in the drug market. Following the methodology of Schweitzer et al. [18], the month of a drug’s approval in the first country starts the “approval lag clock.” The number of months before the second country approves the drug is noted. A lag approval of greater than 48 months is counted as “not approved,” because it is assumed that the therapeutic contribution of a new product occurs only during this 4-year period. After 48 months we assume that other drugs will be approved that will compete with the first drug, and continued approval delay will have little marginal therapeutic impact. If a drug is approved within 48 months of the first country’s approval, the number of months of approval (out of 48) is made a proportion of the maximum availability (48 months).

The analysis of our results is shown in Table 1. The findings were that drugs were approved in China consistently later than in the United States, and many of

<table>
<thead>
<tr>
<th>Drug</th>
<th>Approval date in the United States</th>
<th>Approval date in China</th>
<th>China lag (mo)</th>
<th>United States availability (%)</th>
<th>China availability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lipitor</td>
<td>December 1996</td>
<td>May 2000</td>
<td>41</td>
<td>100</td>
<td>14</td>
</tr>
<tr>
<td>Prevacid</td>
<td>May 1995</td>
<td>November 2001</td>
<td>78</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Zocor</td>
<td>December 1991</td>
<td>June 1999</td>
<td>90</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Nexium</td>
<td>February 2001</td>
<td>October 2002</td>
<td>20</td>
<td>100</td>
<td>57</td>
</tr>
<tr>
<td>Zoloft</td>
<td>December 1991</td>
<td>August 2001</td>
<td>117</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Advair diskus</td>
<td>August 2000</td>
<td>June 2000</td>
<td>–2</td>
<td>97</td>
<td>100</td>
</tr>
<tr>
<td>Effexor XR</td>
<td>October 1997</td>
<td>June 2000</td>
<td>33</td>
<td>100</td>
<td>32</td>
</tr>
<tr>
<td>Plavix</td>
<td>November 1997</td>
<td>January 2001</td>
<td>39</td>
<td>100</td>
<td>19</td>
</tr>
<tr>
<td>Celebrex</td>
<td>December 1998</td>
<td>August 2000</td>
<td>20</td>
<td>100</td>
<td>58</td>
</tr>
<tr>
<td>Neurontin</td>
<td>December 1993</td>
<td>May 2002</td>
<td>101</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Protonix</td>
<td>February 2000</td>
<td>April 2001</td>
<td>14</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>Norvasc</td>
<td>July 1992</td>
<td>June 1999</td>
<td>84</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Zyprexa</td>
<td>September 1996</td>
<td>January 2002</td>
<td>64</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Singulair</td>
<td>February 1998</td>
<td>December 1999</td>
<td>23</td>
<td>100</td>
<td>52</td>
</tr>
<tr>
<td>Ambien</td>
<td>December 1992</td>
<td>December 1999</td>
<td>85</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

Average 100 27
the lags were long. The average availability index is only 27%, compared to the United States.

A more restricted array of approved drugs for physicians and patients to choose from decreases the competitiveness of supply side of the pharmaceutical market. With fewer drug alternatives available, physicians have fewer therapeutic options from which to choose. In some markets, such as antidepressants, clinical outcomes tend to vary widely among patients, and it is not unusual for a physician to try several drugs for a patient before finding one that works best for a particular patient. Second, new products, even if similar to existing drugs, have some advantages, such as greater convenience or fewer side effects. For some patients, these “secondary” benefits may be of small value, but for other patients, they are extremely important. The more drugs in the market, the more downward price pressure there is on existing drugs, so that even patients who do not use other new drugs will benefit from their availability.

In some cases, countries may be slow to approve new drugs because they feel that new products are likely to be less cost-effective than older drugs, and there is an assumption that hesitancy in approving new drugs may lead to cost savings. Studies in the United States have suggested that this assumption is largely incorrect, with new drugs saving more in total health-care costs than the increase in direct drug costs that new products often entail. Lichtenberg found strong evidence to support the hypothesis that the replacement of older drugs by new drugs resulted in reductions in total medical expenditures, and a reduction in the age of drugs utilized reduces nondrug expenditure 7.2 times as much as it increases drug expenditure [19].

Conclusions
We have shown a number of cases in which pharmaceutical expenditures are related to the competitiveness of the market for pharmaceuticals, either on the demand or the supply side. We have shown that some programs that are generally accepted as useful (including financial responsibility by physicians for the cost of drugs) can actually have perverse effects on health system efficiency because of the incentives that are created. Perhaps the most important lesson of all that can be derived from this article is that pharmaceutical cost containment may not be the optimal objective of health planners at all because pharmaceuticals are only one of many inputs into the health production function, and pharmaceutical cost containment may be inconsistent with overall health system efficiency, so that great care must be exercised when choosing health policy that will affect pharmaceutical markets.

To contain health-care costs in a reasonable range, policy recommendation are both regulatory and market-based. With market failure, it can be addressed either with regulations to improve the functions of markets or regulations to replace the market. Changing to a prospective reimbursement system will improve the functions of markets for hospital inputs because costs and efficacy of inputs will be the determinants of what is purchased, not merely profit for the hospital. But improving hospital reimbursement so that costs are covered (so that hospitals do not have to cover deficits by buying expensive pharmaceuticals) is also a regulatory step because this is payment by government or the third payer—insurance.

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References