

# CPI revision provides more accuracy in the medical care services component

*Expenditures dropped because of increases in employer- or government-financed payments; health insurance premiums are now allocated to appropriate commodities and services; unique categories for professional services and hospital and related services were created*

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The medical care services component of the Consumer Price Index (CPI) underwent several changes when the CPI was revised. We analyze these changes in expenditure weights, definitions, and structure of the component. We also discuss the methodology (pricing and treatment of quality changes) and data sources used for construction of the medical care services component.

In January 1987, the Bureau of Labor Statistics began publication of the revised Consumer Price Index (CPI). The major objectives of this revision were (1) to update the content and weights of the market basket of goods and services priced for the CPI; (2) to update the statistical sample of urban areas, outlets, and unique items used in calculating the CPI; (3) to improve the statistical methods used for computing a number of CPI components; and (4) to improve operating procedures.<sup>1</sup> This article describes the changes in consumption patterns, definitions, methodology, and data sources of the medical care services component of the revised CPI.

## Expenditure weights

The expenditure weights for the CPI-U (all urban consumers) and CPI-W (urban wage earners and clerical workers) were developed from the Consumer Expenditure Survey.

The revised CPI expenditure weights are based on Consumer Expenditure Survey data for 1982-84 and replace the expenditures for 1972-73 that were used in the CPI from 1978 through 1986.

The Consumer Expenditure Survey is composed of two separate surveys—an interview survey and a diary survey—both conducted by the Bureau of the Census for BLS. The interview survey is used to collect data for expenditures that respondents can remember fairly accurately for periods of approximately 3 months. The diary survey is designed to obtain expenditure information for small, frequently purchased items that consumers tend to forget. Approximately 5,000 consumer units are contacted each year for each type of survey.<sup>2</sup>

All of the categories under medical care services had their expenditure weights calculated from the interview survey. These expenditures reflect both out-of-pocket expenses not covered by insurance and health insurance premiums paid by survey households.

The 1982-84 Consumer Expenditure Survey data showed that as a proportion of total consumption, the medical care services component was smaller than that of the 1972-73 survey. This decline results from changes in the ways consumers pay for medical care. Major medical expenses very frequently are partially paid for (and sometimes fully paid for) by health insurance, and many insurance premiums are fully or partially paid by employers or by government. Be-

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cause the CPI reflects only consumer expenditures, employer- and government-provided benefits are not included. In the decade between the two expenditure surveys, the number of these third party-provided benefits increased.<sup>3</sup> During this period, the percentage of full-time workers covered by plans that were fully employer-paid rose from 71 percent in 1971-72 to 73 percent in 1982.<sup>4</sup> Thus, while medical care prices have risen at a rapid rate over the past decade, average consumer unit expenditures on medical care rose less rapidly due to employer- and government-provided benefits.

Table 1 compares relative importances for the old series, based on the 1972-73 Consumer Expenditure Survey, updated by price change through December 1986, to those for the current CPI, based on the 1982-84 Consumer Expenditure Survey, updated by price change to December 1986. For some items, changes in relative importance between the old series and the current index arise not only from the previously mentioned changes in insurance coverage levels and distribution of premium payments between employer and employee, but also from definitional changes.

### Health insurance defined

A number of definitional changes have been introduced in the medical care area; the most significant of these relate to the way health insurance premiums in the CPI are represented in the expenditure weights. While this change has no effect on the final index result and is mathematically equivalent to the former procedure, it is believed that the new structure provides a clearer picture of the role of health insurance in the CPI. Health insurance represents only expenditures by consumers for premiums—employer contributions are, of course, not included. Insurance premiums can be viewed as purchasing (1) the medical care for which benefits are paid, and (2) the services of the insurance carrier in administering the policy. This second element has been labeled retained earnings and refers to the operating cost and any profit of the insurance carrier.

In the old series CPI, the entire insurance premium was classified as health insurance. However, within health insurance, it was broken into many subcategories for pricing—one for each type of benefit paid and one for the retained earnings associated with each type of benefit. The price movement for a health insurance benefit stratum (for example, insurance-paid hospital rooms) was the same as the price movement for the corresponding medical item in the CPI (hospital rooms). The price movement for a retained earnings stratum was the combination of price change for the relevant medical care item and an estimate of changes in retained earnings as a proportion of benefits. In the revision, instead of using the price change for hospital rooms (or any other medical item) for both the hospital room out-of-pocket-paid index and the hospital-room-paid-by-insurance index, the expenditures for the two types of hospital room payments are combined in a single index. Thus, the expend-

iture weight for each medical care item is the combination of the direct out-of-pocket expense for the item and the indirect expense for the item paid from consumer-purchased health insurance.

The current CPI item labeled health insurance, which is defined as the portion of premium payments retained by the insurer in the form of operating expenses and profit, represents the weighting together of the retained earnings of the following carrier groupings:<sup>5</sup>

Grouping	Percentage of health insurance as of December 1986
Commercial Carriers .....	35
Blue Cross/Blue Shield .....	26
Health Maintenance Organizations .....	2
Other (Medicare Part B and Medicare supplement policies) .....	37

Improvements in refining the health insurance component were obtained through expanding the allocation of health insurers' benefit payments.<sup>6</sup> The following tabulation shows the allocation of health insurance benefit payments and percent of total premium payments represented by retained earnings.

	Blue Cross/ Blue Shield	Commercial Carriers <sup>1</sup>	Medicare Part B <sup>2</sup>	HMO's
Hospital room .....	27.5	21.6	—	11.0
Ancillary services .....	25.2	19.9	—	17.9
Outpatient services .....	10.8	8.4	24.4	4.4
Physicians' services .....	25.6	23.8	69.1	38.1
Other provider's fees (physical therapy, psychiatry, and so forth) .....	2.4	.8	6.5	7.9
Prescription drugs .....	2.9	1.9	—	4.4
Eye care .....	.2	—	—	1.5
Nursing home charges ...	.2	.3	—	.3
Dental benefits .....	1.8	6.9	—	5.2
Retained earnings .....	3.4	16.4	—	9.3

<sup>1</sup> Also used to allocate Medicare supplement policies because no other data were available.

<sup>2</sup> Medicare Part A (hospitalization) is not relevant to the CPI because it is an entitlement program paid through payroll deduction as opposed to insurance or a prepayment plan that consumers purchase by paying premiums, that is, Medicare—Part B—Medical Insurance.

NOTE: Dashes indicate data are not available.

### Health insurance pricing

Prior to the 1964 CPI revision, health insurance premiums were directly priced as a fixed amount of protection for the individual consumer by pricing the most widely held Blue Cross/Blue Shield family policy being sold to consumers. Using this method entailed a number of problems involving quality changes over time.

**Table 1. Relative importance of the medical care services component in the Consumer Price Index, U.S. city average, December 1986**

[In percent]

Item and group	All urban consumers (CPI-U) (1)	Urban wage earners and clerical workers (CPI-W) (1)	All urban consumers (CPI-U) old series	Urban wage earners and clerical workers (CPI-W) old series
Medical care services .....	4.663	3.975	5.738	5.112
Professional medical services .....	2.926	2.476	2.600	2.468
Physicians' services <sup>2</sup> .....	1.554	1.319	1.327	1.310
Dental services <sup>3</sup> .....	.866	.773	.950	.877
Eye care <sup>4</sup> .....	.343	.286	—	—
Other professional medical services .....	—	—	.277	.252
Services by other medical professionals <sup>5</sup> .....	.164	.099	—	—
Unpriced items .....	—	—	.047	.029
Other medical care services .....	—	—	3.138	2.644
Hospital and related services .....	1.516	1.335	.564	.477
Hospital rooms <sup>6</sup> .....	.608	.580	.262	.222
Other inpatient hospital services <sup>7</sup> .....	.567	.487	—	—
Outpatient services <sup>8</sup> .....	.337	.265	—	—
Other hospital and medical care services .....	—	—	.299	.252
Unpriced items .....	.004	.003	.003	.002
Health insurance .....	—	—	2.574	2.168
Health insurance <sup>9</sup> .....	.221	.163	—	—

<sup>1</sup> These relative importances reflect corrections to the originally published December 1986 values. See "Relative Importance of Components in the Consumer Price Index, 1987," for further details.

<sup>2</sup> Benefits provided by consumer-paid health insurance constitute 35.1 percent of the relative importance, CPI-U.

<sup>3</sup> Benefits provided by consumer-paid health insurance constitute 8.7 percent of the relative importance, CPI-U.

<sup>4</sup> Benefits provided by consumer-paid health insurance constitute 0.7 percent of the relative importance, CPI-U.

<sup>5</sup> Benefits provided by consumer-paid health insurance constitute 24.7 percent of the relative importance, CPI-U.

<sup>6</sup> Benefits provided by consumer-paid health insurance constitute 61.0 percent of the relative importance, CPI-U.

<sup>7</sup> Benefits provided by consumer-paid health insurance constitute 62.6 percent of the relative importance, CPI-U.

<sup>8</sup> Benefits provided by consumer-paid health insurance constitute 57.0 percent of the relative importance, CPI-U.

<sup>9</sup> Only health insurance premiums paid by the consumer are included in the CPI. The health insurance relative importance includes only that portion of the premium that is retained by the insurance carrier for administrative cost and profit, 9.7 percent of the total premiums for the CPI-U. The portions of the premium that are paid as benefits have been assigned to the relevant medical care categories.

NOTE: Dashes indicate data are not available.

Four basic factors affect changes in the cost of health insurance premiums: (1) increased or decreased medical care costs; (2) changes in health insurance provider administrative costs, surplus requirements, and profit (for commercial carriers); (3) changes in the benefits covered by health insurance policies; and (4) utilization changes. Utilization is the frequency of claims made under a health insurance policy. For example, during an epidemic, the frequency of hospitalization and the number of patient-practitioner contacts would likely go up. This increase in claims changes the policy utilization rate and might cause premium increases. Changes in the costs of covered services and in retained earnings rates are price changes that should be reflected in the index, whereas changes in the other two factors reflect

quality and quantity changes and should not be reflected in the CPI. Changes in coverage clearly affect the quality of the policy. Utilization changes are a redefinition of the risk covered by a policy, and thus are also a change in the quality of the policy that should not be reflected in the CPI.

In pricing premiums directly, the Bureau found it impossible to account for quality differences because of changes in the benefits provided by policies and in the utilization of benefits. These problems led the Bureau to switch to the current indirect method of pricing health insurance in the 1964 revision of the CPI. This indirect approach enables the Bureau to reflect in the CPI an estimate of the impact on premium levels of changes in the prices of medical care services covered by health insurance policies, as well as changes in the costs of administering the policies and maintaining reserves and as appropriate, profits. Directly pricing policies would not enable BLS to measure constant quality policy premium changes accurately, because the Bureau has not been able to develop the methodology to factor out of premium changes the impact of changed levels of coverage and utilization. Recent research has made some progress, but direct measurement remains elusive. (See appendix.)

Price movement over time for the health insurance item in the CPI is determined by the following procedures.

**Retained earnings ratio.** The Bureau obtains calendar year data for premium income, benefit payments, and retained earnings for commercial carriers. For each year, the ratio of retained earnings to benefits is calculated, yielding a retained earnings ratio. Next, the latest year's ratio is divided by the previous year's ratio, and the percent change in the ratios is calculated. Finally, the percent change is allocated into 12 equal portions using the geometric mean, and the change is reflected over 1 year.<sup>7</sup> This method enables BLS to measure the change in price caused by changing retention margins in monthly increments, which is preferable to reflecting the entire annual change in only 1 month.

A similar method is used for Blue Cross/Blue Shield; however, instead of annual data, BLS obtains quarterly data and calculates a four-quarter moving average of these data. For example, the Bureau would calculate a retained earnings ratio using combined data for all four quarters of 1986 and divide it by the ratio calculated from the last quarter of 1985 combined with the first three quarters of 1986. The percent change between the former and latter ratios is allocated equally for the next 3 months using the geometric mean.

**Insurance price relatives.** The total price movement for each health insurance stratum is estimated using the product of two relatives. The first relative is the change in the retained earnings ratio mentioned previously. The second relative reflects the price change for each of the items to which benefits were separately allocated for Blue Cross/Blue Shield and commercial carriers. (See previous text tabulation showing allocation of health insurance benefit pay-

ments.) For example, within Blue Cross/Blue Shield, the physician services category is moved by the product of the relatives for physicians' services and Blue Cross/Blue Shield retained earnings. These two relatives are both required, because retained earnings levels change with both the change in benefits paid and the change in the unit cost of administering these benefits. This process yields a measure of price change for insurance of constant coverage and utilization. That is, changes in benefit coverage and utilization levels will generally be offset by compensating premium changes, and thus, not significantly affect retention rates. Implicit in the process also is an assumption that the level of service from the individual carriers is strictly a function of the benefits paid. Other changes in the amount of service provided for policyholders, such as more convenient claims handling, will affect the index, but the affects are probably small.

*Data changes.* Since 1964, the Bureau had been using Health Care Financing Administration data provided by Blue Cross/Blue Shield and the Health Insurance Association of America to compute the retained earnings adjustment for the health insurance component of the CPI. In recent years, the Health Care Financing Administration data for commercial carriers have shown inconsistencies, reflecting many revisions and changes in methodology. Both the commercial carrier data and the Blue Cross/Blue Shield data obtained from the Health Care Financing Administration suffered from lengthy lags between the reference period and release of the data. These limitations on the data led BLS to investigate alternative data sources.

After careful study, the Bureau determined that alternative data sources would be used. The Argus Health Chart, published by the National Underwriters, was an improved data source for commercial insurance carriers. Argus uses a large sample and has a shorter lag for data release than the Health Care Financing Administration. Also, the data used are those the insurance companies are legally required to report to the State insurance regulatory agencies as a legal requirement. In addition, BLS could improve the timeliness of the Blue Cross/Blue Shield retained earnings information by obtaining data directly from Blue Cross/Blue Shield on a quarterly basis, rather than obtaining it annually through the Health Care Financing Administration.

### Pricing medical services

A sample of 91 urban areas was selected to represent all urban areas in the country. Within each of these areas, the Census Bureau conducts a Point of Purchase Survey for BLS, which identifies not only how much consumer units spend for each category of consumption, but also where they make the purchase. From this list, BLS selects a sample of medical service providers for each medical service item category.

The process used by the Bureau in the selection of a unique service for direct pricing from a medical provider is

called disaggregation. To disaggregate, BLS field representatives start with a general entry-level category, such as physicians' services, and successively narrow the definition stage by stage, using probability selection methods based on revenues and volume information supplied by the respondents. This process yields a representative sample of the variety of services provided, and the resulting price index is, thus, an accurate reflection of price change for the entry-level category.

Continuing with the physician services' example, 10 physician service categories have been identified for the CPI: general medical practice; pediatrics; obstetrics and gynecology; allergy; surgery; psychiatry; orthopedics; cardiology; ear, nose, and throat; and other specialties. The category from which specific services are selected for pricing varies with the specialty of the physician. Within each of the 10 categories are a number of preselected services representative of the category: 15 services for general medical practice (8 types of visits and 7 procedures), and at least 6 for each of the remaining categories. Each service has an accompanying definition that the field representative may adjust according to a specific physician's procedures.

Within each physician's office, the field representative selects, through disaggregation, the specific service to be priced on a continuing basis. To minimize the burden on the physicians of determining the actual sales or volume of their services, the field representative disaggregates through a ranking process. This ranking process is an ordering of eligible services provided by the physician from largest to smallest in terms of revenue. For example, at a general practitioner's office, if we were selecting a quote from among the eight preselected types of visits, the selection process would be as follows: the physician ranks the eight types of visits by revenue; then, using a ranking value table and a random number table, the field representative selects the type of service to be priced. The following tabulation illustrates this process:

Type of visit	Perform visit	Ranking value	Cumulative value	Selection value (from random number table)
Office visit, brief . . . . .	Yes	30	30	.....
Office visit, limited service . . . . .	Yes	20	50	.....
Office visit, comprehensive service . . . . .	Yes	15	65	.....
Hospital visit, initial care . . . . .	Yes	10	75	.....
Hospital visit, subsequent care . . . . .	Yes	10	85	.....
Home visit, brief service . . . . .	No	.....	.....	.....
Emergency department visit . . . . .	Yes	10	95	.....
Consultation comprehensive . . . . .	Yes	5	100	96

**Exhibit 1. Definition of published medical care service indexes**

Item	Old series	New series
Medical care services	Professional and hospital services; health insurance imputation	Professional and hospital services; health insurance imputation and dispensing of eyeglasses and outpatient services at hospitals.
Professional medical services (old title: Professional services)	Physicians; dentists; other professionals, such as optometrists, ophthalmologists, podiatrists, chiropractors.	Physicians; dentists; other professionals, such as optometrists, ophthalmologists, opticians, psychologists, and therapists.
Physicians' services	Includes all services by medical physicians in private practice, other than dental and eye care, that are billed by the physician. Includes house, office, clinic, and hospital visits by general practitioners, internists, osteopaths, and other specialists. Excludes podiatrists and other medical practitioners who are not MD's. Ophthalmologists are included in other professional services.	Includes all services by medical physicians in private practice, other than dental and eye care, that are billed by the physician. Includes house, office, clinic, and hospital visits by general practitioners, internists, osteopaths, and other specialists. Excludes podiatrists and other medical practitioners who are not MD's. Ophthalmologists are included in Eye care.
Dental services	Includes dental services performed by dentists, oral or maxillofacial surgeons, orthodontists, periodontists, or other dental specialists in group or individual practice. Some of the specific services included are cleanings, extractions, fillings, orthodontic work, periodontal treatment, bonding, dental sealants, treatment for temporomandibular joint problems, root canal therapy, dentures, bridges, crowns, and orthognathic surgery. Treatment can be provided in the office or in the hospital.	Includes dental services performed by dentists, oral or maxillofacial surgeons, orthodontists, periodontists, or other dental specialists in group or individual practice. Some of the specific services included are cleanings, extractions, fillings, orthodontic work, periodontal treatment, bonding, dental sealants, treatment for temporomandibular joint problems, root canal therapy, dentures, bridges, crowns and orthognathic surgery. Treatment can be provided in the office or in the hospital.
Other professional services	All services performed by other medical professionals, such as podiatrists, chiropractors, psychologists; eye care provided by optometrists and ophthalmologists.	Discontinued.
Eye care	New index	Services provided by optometrists, ophthalmologists, and opticians. Includes dispensing of eyeglasses and surgical procedures performed by ophthalmologists in or out of the office.
Services by other medical professionals	New index	Includes services performed by other professionals such as, psychologists, chiropractors, therapists, and nurse practitioners in or out of the office.
Other medical care services	Hospital services, nursing homes, and health insurance imputation.	Discontinued.
Hospital and related medical services (old title: Hospital and other medical services)	Hospital services that include hospital room and board, inpatient services, emergency room visits, and nursing home care.	Hospital services that include hospital room and board, inpatient services, and outpatient services that include emergency room, and nursing home care.
Hospital room	Room and board for any type of hospital room, such as private, semiprivate, routine nursery,	Room and board for any type of hospital room, such as private, semiprivate, rou-



**Exhibit 1. Continued—Definition of published medical care service indexes**

Item	Old series	New series
Other hospital and medical care services	ward, intensive care, or coronary care that is billed by the hospital.  Inpatient hospital services such as laboratory tests, radiology, operating room, pharmacy, and emergency room that are billed by the hospital and nursing home care.	tine nursery, ward, intensive care, or coronary care that is billed by the hospital.  Discontinued.
Other inpatient services	New index	Hospital services for inpatients, such as pharmacy, laboratory tests, radiology, and operating room that are billed by the hospital and nursing home care.
Outpatient services	New index	Hospital services for outpatients, such as laboratory tests, radiology, short stay units, ambulatory surgery, physical therapy, and emergency room that are billed by the hospital.

“Consultation comprehensive” is selected, because its cumulative ranked value (100) is the smallest number greater than or equal to the selection value (96), the number selected from a table of random numbers. If ranking of services is not possible, then equal probability is used to select the service for pricing.

The following is an example of service selection for a hospital price quotation. In each hospital, fees for hospital rooms and inpatient and outpatient ancillary services are priced. The field representative determines, through probability methods, the category of inpatient ancillary service as well as the specific services to be priced for each hospital. For instance, to determine the specific hospital room services that will be priced over time, the field representative obtains information about fees for standard rooms (semiprivate, ward, nursery, and so on) and special care units (intensive care, coronary care, and so on) from the hospital administration. Using this information and probability tables, the representative may select semiprivate room. The field representative then further defines the service by identifying the type of patient in the room, the bath facilities available, the room location, and other services included with the room.

Other inpatient hospital services are similarly selected. For example, preliminary disaggregation may select, first, the broad category “radiology” (x-ray); then, the more specific category, “diagnostic radiology.” The next stage of disaggregation may select “skull examination” from a list of specific types of diagnostic radiology. One more disaggregation step will select the type of skull examination from a list provided by the respondent indicating the four or five most frequently performed tests. Finally, the field representative notes the additional factors, such as the length of treatment and the number of personnel required, to render the final definition of the service to be priced.

### Pricing improvements

Prior to the 1987 revision, the collected medical care service prices represented the paying patient rate for professional services and the published charges for hospitals. However, because professional and hospital-related services were used to move the index weights for both out-of-pocket expenses not covered by insurance and insurance benefit payments, the Bureau decided that it would be appropriate to determine if alternate fees were available for such priced services. These alternative fees include private insurance, Blue Cross/Blue Shield, Medicare, and preferred provider organizations. To determine the availability of alternative fees, the Bureau conducted a study during 1985 in eight pricing areas to identify the prevalence of medical care service providers charging different rates to patients covered by health insurance. Where alternative rates existed, the study determined if the rate varied with the insurance provider, and where it did, it was determined if such rates would be readily available to the Bureau each price collection month. Separate Medicaid or other public assistance rates were not considered eligible because they are government subsidized and apply to individuals and households who must meet certain income requirements. Physicians were the only respondents to the survey that reported available alternative fees for selected services, with enough frequency to make selection of payment basis part of the disaggregation process. During 1987, BLS will again be surveying hospitals and dentists to identify the availability of multiple rates for the specific services selected for pricing. If the results warrant, BLS will add selection of payment basis to the initiation procedures for hospitals, dentists, or both during 1988.

To ensure that the CPI properly reflects the marketplace on a continuing basis, a Point of Purchase Survey is conducted

in one-fifth of the CPI's 91 pricing areas each year. From these surveys, a new outlet sample is selected and new unique items identified for pricing. Thus, over a 5-year period, the entire CPI outlet sample and unique item sample are updated.

### Restructuring published indexes

As part of the CPI revision, BLS created three new indexes by separating previously combined items, for example, eye care from other professional services, and inpatient and outpatient treatment from other hospital and medical care services.

In exhibit 1, definitions of the indexes in the old and revised CPI are given and the new and discontinued series are indicated. A separate health insurance index is not published, as it is not directly priced and the data are available only with a significant lag.

Exhibit 1 reflects a restructuring that provides unique categories for "professional services" and "hospital and related services." Eye care (including purchase of eyeglasses and contact lenses) has been combined with physicians' services, dental services, and other professional services to form the "professional medical services" index. In the former CPI, a distinction was made between the purchase price of eyeglasses and contact lenses (commodities), and the charge associated with fitting eyeglasses and contact lenses for the consumer (services). It has grown increasingly more difficult to separate provider charges into these components so, in the revised CPI, both eye care commodities and services are included in a single index in the medical care service component. Fees for laboratory tests and x-rays have been moved from professional services and, along with emergency room charges, make up the outpatient services category.

The following tabulation contains the number of current outlets and price quotes for each of the published medical care services.

Service	Outlets	Quotes
Physicians' services	536	1,099
Dental services	295	635
Eye care	401	402
Other medical professionals	382	392
Hospital rooms	339	562
Inpatient services	323	903
Outpatient services	317	354

### Quality changes

One of the most difficult conceptual problems faced in compiling the CPI is to identify accurately and factor out of price measurement any changes in the quality of priced items. The Bureau attempts to identify the quality level of an item by including all of the relevant quality-determining attributes in the description of each unique item priced. To determine if a quality change has occurred, the Bureau obtains the current specifications for the item, and compares

them to the previous specifications. When any of these specifications change, a quality improvement or deterioration may have occurred. As a further aid in identifying whether a quality change may have been introduced, the field representative asks each respondent to identify the specific cause of any significant price change.

The respondents may identify the change as (1) a pure price change (2) a change in the characteristics of the currently priced procedure/service, or (3) a combination of the two. When pricing physicians' services, for example, if the description of the item being priced is a limited office visit for treatment of a sore throat at \$35, and the physician indicates that a rate increase has taken place in the office visit to \$40 and now will also include a throat culture at \$15, making the total cost \$55, the following action is taken. The addition of the throat culture would not be reflected as a price increase, because it was not in the described service and would be considered a substitution. The price increase in the office visit, \$35 to \$40, would be shown in the current month's index. For subsequent pricing comparison, the new service would include the office visit *and* throat culture.

Another example where adjustments can be made for quality differences is the change in a hospital's average length of stay. When pricing hospital rooms, the hospital reports the price of the selected room for 1 day. The hospital respondent also indicates any additional fees that would apply to the selected room/patient type. These fees may be per day (for example, for use of a tv or telephone), or per admission (for example, for an admission kit or admitting charge). The hospital also provides an average length of stay for the type of patient selected or the hospital average. The length of stay is used to prorate the per-admission charges and arrive at an average price per day. The price per day for the CPI, then, includes the base room rate, per day charges, and prorated charges. When the length of stay changes, the total price will change, but the CPI will not reflect this as a price change. An adjustment is made to reflect only the pure price change. The following is an example of a price change and a change in length of stay that resulted in an increase of 8 percent being reflected in the index.

	February 1987	April 1987
Base room rate	\$210.00	\$225.00
Per day charge for tv	3.00	3.00
Length of stay	5 days	4 days
Per-admission, charge for admission kit	\$25.00	\$35.00
Prorated charge	5.00	8.75
Total price	\$218.00	\$236.75

The February 1987 adjusted price for use in calculating the final change between February and April, based on a 4-day length of stay is \$219.25 (\$210 base room rate, \$3.00 TV charge, and \$6.25 prorated admission charge for a 4-day stay).

Change reflected in the index:

$$\left( \frac{\text{April 1987 price}}{\text{February 1987 price}} \right) - 1 \times 100 = \text{Percent change}$$

$$\left( \frac{\$236.75}{\$219.25} \right) - 1 \times 100 = 8 \text{ percent}$$

Another situation involves hospital inpatient pharmacy prices. A specific medication and dose is selected for pricing with the brand (manufacturer) or generic designation indicated. Although there is an ongoing discussion in the medical community as to what, if any, quality difference exists between branded and generic medications, if the hospital switches from brand to generic or vice versa, the change is reflected in the index. Hospitals normally purchase their drugs in bulk supply negotiating the best possible price, and shifts between brands and to or from generic occur with some frequency in our sample. In the hospital environment, the patient receives the prescribed drug from the pharmacy, therefore, inventory prices are compared, regardless of manufacturer.

Potentially, some quality changes may be counted as price changes. Items that are not accounted for in the description of the item being priced or that the respondent does not know about, such as hospital room modifications, changes in the number and type of nurses that minister to the patient, or the availability of new equipment, are all likely to contribute to determining the price level of the room service priced; these changes are normally treated as price changes because the Bureau either is not aware of the change or has no method available to deal with the change. For instance, it has not been possible to develop a description of a hospital semiprivate room that not only includes the specific room characteristics, but also accounts for all of the hospital plant, equipment, and staff size factors that contribute to the cost of that semiprivate room. Thus, BLS is able to factor out from price change the inclusion of unlimited local telephone usage should it now be included in the price of the room, but the Bureau is not normally able to factor out the effect on the room charge of a change in the nurse to patient ratio.

Also, improved technologies and procedures can lead to quality changes that cannot necessarily be measured by the Bureau. For instance, many physicians have switched from using plaster casts for broken bones to a variety of more

comfortable, versatile casts. Inflatable casts are lightweight, removable, and easily refitted to the limb when swelling subsides. Cloth casts are lightweight, removable, and breathable. The new fiberglass casts are much lighter than plaster and can be immersed in water, so that the patient can now bathe while wearing a cast. New advances in the development of porous materials in the manufacturing of prosthetic implants, as in hip replacement surgery, allow the bone to grow around the prosthesis. This is not the case with the nonporous materials that have been commonly used in hip replacement prosthetic implants. Many doctors believe this new procedure offers a great improvement in the results of hip replacement surgery, the outcome being a stronger hip joint than when the nonporous materials are used. These are two examples of improved technologies and procedures that can result in quality changes that currently are hard to identify and adjust for in the CPI. Not only is it difficult to identify the change when it occurs, but at present, no method for assessing the economic value of the change is available.

### Summary

This revision, as in the past, enabled the Bureau to update medical care service expenditure weights in the CPI, including a more complete allocation of health insurance premiums. Instead of keeping the portion of premiums that go to benefits under health insurance, the expenditure weight for each benefit category has been added to the appropriate out-of-pocket expense. The unpublished health insurance item represents only the retained earnings portion of premiums paid by households. The specific item categories included in medical care services have also been updated and expanded. A study conducted during the developmental phase of the revision indicated that the Bureau should expand the eligible priced rates for physicians in the CPI to include not only the "self-pay" rate, but also other categories of payment as well. Another study indicated that the direct pricing of health insurance is not feasible because of the difficulty of factoring out from premium changes the effect of utilization levels and modified coverage. In pricing medical care service items, as with other item categories in the CPI, BLS attempts to exclude from price movement the effect of quality changes. However, some quality changes are difficult to assess or are not readily identified, for example, a change in the ratio of nurses to patients, and such changes may be reflected as part of the price change movement in the CPI. □

### FOOTNOTES

<sup>1</sup> For additional information on the revised CPI, see Charles Mason and Clifford Butler, "New basket of goods and services being priced in revised CPI," *Monthly Labor Review*, January 1987, pp. 3-22.

<sup>2</sup> In the interview survey, the respondent is visited in each of five consecutive quarters. The purpose of the first interview is to collect information on the characteristics of the consumer unit and to establish inventories of items held by the respondent—properties, vehicles, major durable goods,

and insurance policies. In each of the subsequent four interviews, expenditure data are collected for the previous 3 months on all varieties of major consumer expenses.

The diary survey consists of 2 consecutive week-long records of purchases. The goal is to record every purchase made during the 2-week period by any member of the consumer unit, including spouse or children. The diary is used primarily to capture information on grocery store purchases,



gasoline, meals, snacks and beverages, many apparel items, and other small, routine purchases. Spending out of town is not included in the diary survey. In cases where the same expenditures appear in both surveys, the data are evaluated to determine which source should be used.

<sup>3</sup> Robert M. Frumkin, "Health insurance trends in cost control and coverage," *Monthly Labor Review*, September 1986, pp. 3-8.

<sup>4</sup> Frumkin, "Health insurance trends."

<sup>5</sup> The 1982-84 Consumer Expenditure Survey weights updated by the changes in retained earnings as reflected in the CPI between 1983 and December 1986. The retained earnings changes calculated for Commercial Carriers are also used for Health Maintenance Organizations, as no Health Maintenance Organization data currently are available. The retained earnings changes calculated for Blue Cross/Blue Shield are also used for the "Other" category, as currently BLS has no data to calculate combined retained earnings changes for Medicare supplement policies.

<sup>6</sup> Health Care Financing Administration-Insurance Benefit Data, Selected Health Maintenance Organizations, Blue Cross/Blue Shield, se-

lected plans and Selected Commercial Carriers.

<sup>7</sup> A hypothetical example of the calculation of the change in retained earnings for commercial carriers:

Year	Income	Benefits	Retentions	Retentions—Benefits Ratio
1	\$100,000	\$ 94,000	\$6,000	.063830
2	108,000	100,000	8,000	.080000

Year 2 adjustment for change in retentions:

- (a)  $\frac{\text{Year 2 Ratio}}{\text{Year 1 Ratio}} = \frac{.080000}{.063830} = 1.253329$  relative of change, or 25.33 percent, which is the annual increase in retentions for year 2.
- (b) Spreading this annual change equally over 12 months is done as follows:

$$12\sqrt{1.253329} = 1.018995 = 1.9 \text{ percent per month.}$$

## APPENDIX: Test of direct pricing of health insurance policies

During 1984 and 1985, another effort was made to test the feasibility of directly pricing health insurance policies. Underlying this direct estimation technique is the basic assumption that health insurance premium changes that are to be reflected in the CPI should include only those items related to changes in the cost of medical care services covered by health insurance policies, and related to changes in the health insurance provider's administrative costs, surplus requirements, and profit needs (of commercial carriers). Changes in premiums related to changes in the utilization of health insurance benefits or changes in the benefit packages themselves have to be factored out of this measure, because they are considered to be changes in the quality of the policies being priced. An accurate index reflecting only changes in the cost of covered medical care services and changes in administrative costs, surplus requirements, and profit needs of health insurance companies will therefore require the pricing of constant quality policies (over time).

First, a data collection document (checklist) was created to describe accurately the numerous variable qualities and characteristics of the many health insurance policies. The checklist is used to rate, classify, and differentiate between the various health insurance policies that were included for test purposes.

Second, health insurance pricing schedules of insurance company policies available from a 1976-77 test pricing program were examined, and a sample of potential respondents was picked to be priced. The sample was chosen to represent commercial carriers and Blue Cross/Blue Shield, individual and group plans, single and family plans, and to exhibit different coverages, qualities, price ranges, geographical areas, and so on. Next, sample respondents were contacted to collect 1984 and earlier pricing and benefit package information on these (or other similar) policies that were initiated in the mid-1970's. From this back-pricing information, an experimental health insurance index was constructed for the period 1977-84.

About 70 health insurance companies were contacted in the survey. Of the 22 companies that provided data, 16 responses representing 95 price quotes were deemed com-

plete. The poor response rate principally reflects the low number of the 1976-77 initiated policies that were still in force when the carriers were contacted again in 1984. Completed responses were described on the checklist along with the annual price trend of the rates they charged to subscribers. The reported health insurance premiums used in this survey were for policies purchased by consumers or policies purchased at work that reflect combined employer/employee contributions. The responses consisted of a fairly representative geographic distribution of policies.

Utilization data, one aspect of quality change, were also requested from insurance company respondents, but only five respondents were willing or able to provide limited utilization data. At this time, appropriate data on utilization and a methodology to account for utilization (quality) changes in the direct pricing of health insurance are not available, and thus are not accounted for in the experimental index. This lack of data had serious effects on the acceptability of the direct pricing approach.

Quality changes stemming from changes in benefit packages were handled in two ways. In some cases, insurance companies indicated the effect on premiums of a given benefit change, allowing the Bureau to adjust these policies for quality changes. In those cases where the impact on premiums of benefit changes was unavailable, comparisons for unadjusted benefit changes were not made. The experimental index is based strictly on the premium changes of policies that did not change coverage plus those for which premium adjustments could be made for changes in coverage. Comparison of the results of the experimental direct price index for health insurance with the indirect method for the same period is shown in the following tabulation (December 1977=100).

December	Experimental direct pricing	Current indirect method
1977	100.0	100.0
1978	116.8	110.5
1979	128.7	123.6

1980 .....	164.0	133.7
1981 .....	174.4	152.9
1982 .....	211.6	177.2
1983 .....	246.6	183.9

As is evident in the comparison, the direct pricing method indicates a faster rate of increase than the indirect method currently used in the CPI. The differences between the indexes resulting from the two pricing methods may be due to a number of possible causes. Each method measures somewhat different things.

The indirect method is based on price changes in current medical care commodities and services and previous years retained earnings figures. The experimental direct pricing method looks at premiums based on current figures, and even projections by carriers for medical care costs and utilization in coming years. Some of the large price jumps in

the direct pricing index between 1979-80 and between 1981-82 were attributed to shifts by many of the healthiest subscribers out of their current plans into Health Maintenance Organizations or lower-cost/higher-deductible plans. It has been suggested by some insurers that a disproportionate number of those who made the shift were the young and healthy consumers who use less medical care and, hence, make fewer claims against health insurers or Health Maintenance Organizations. This left the affected plans with an older, less healthy pool of subscribers who made a higher level of claims. The resulting increased costs for the health insurers may have caused some of the sharp increases in the direct pricing index. This type of utilization change is exactly the type of quality change that should not be included in the index, and the inability to obtain data on the premium impact of these utilization changes is the chief roadblock to developing a directly priced health insurance index.

### No 'rules of the game'

When Congress passed the National Labor Relations Act in 1935, there was some expectation that labor and management would come to an implicit understanding on the "rules of the game" in labor relations and that the regulatory apparatus set up in the act would seldom be needed. Fifty years later, the most striking feature of U.S. labor relations policy is the sheer volume of regulatory activity. The number of unfair labor practice charges filed with the National Labor Relations Board (NLRB) was 6,807 in 1938, the year after the Supreme Court upheld the act's constitutionality, and in the postwar period the number rose from 5,809 in 1950 to 44,063 in 1980.

—ROBERT J. FLANAGAN

*Labor Relations and the Litigation Explosion*  
(Washington, The Brookings Institution, 1987),  
p. 24.