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Medical Care in the Consumer Price Index

Ina Kay Ford and Daniel H. Ginsburg

5.1 Introduction

The medical care component of the Consumer Price Index (CPI) is evolving into a more comprehensive measure of household medical expense price movement in the economy. We discuss the CPI's use of medical care expenditures, measurement approaches, and other methodological issues to obtain weights and prices. Highlighting issues and our plans to address them, we emphasize the organization of the CPI medical care major group as of January 1998, when a revised CPI was introduced.

For both the CPI for all urban consumers (the CPI-U) and CPI for urban wage earners and clerical workers (the CPI-W), medical care is one of the CPI eight major groups. The medical care group contains thirteen item strata. The thirteen medical care strata form the basic framework within which the CPI defines and measures the change in medical care costs. The medical care item strata are

Prescription drugs and medical supplies
Internal and respiratory over-the-counter drugs
Nonprescription medical equipment and supplies
Physicians' services
Dental services
Eyeglasses and eye care
Services by other medical professionals

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Hospital services[1]
Nursing homes and adult daycare[2]
Commercial health insurance
Blue Cross/Blue Shield health insurance
Health maintenance plans
Medicare and other health insurance

5.2 Index Construction

Item strata within each of the thirty-eight CPI index areas[3] (the item/area strata) are the basic building blocks of the CPI. The Bureau of Labor Statistics (BLS) constructs a price index—called a basic index or elementary aggregate—for each item/area stratum. A basic index is computed from a sample of items belonging to the stratum in each index area. Every month or every other month (depending on the index area), BLS collects the prices of the items in the samples of each item/area stratum. The basic indexes are measures of the change in the prices for one item stratum in one index area. For example, there is a basic index for prescription drugs and medical supplies in the Boston metropolitan area. (It is an unpublished index because its sample size is too small to permit its publication, but it is a basic building block of higher-level published indexes.)

To construct higher-level indexes from the basic indexes for the item/area strata, the CPI needs a weight for each item/area stratum in addition to its basic index. Higher-level indexes, which BLS calls aggregate indexes, are weighted averages of the stratum-level basic indexes. For example, the CPI index for U.S. medical care is the weighted average of the thirteen medical care strata in the thirty-eight index areas. The weight of an item stratum in an index area is the average annualized expenditure that consumers living in the index area incurred to purchase items in the stratum during the CPI expenditure base period, which is 1993–95;[4] these weights come from the Consumer Expenditure Surveys (CEX) for those years.

5.3 Published Series

BLS publishes U.S. indexes for the first nine medical care strata (Grandits 1996). There are no published indexes for the health insurance strata because—as explained in detail below—BLS uses an indirect

1. Prior to January 1997, separate hospital and related services indexes existed for hospital rooms, other inpatient services (including nursing homes), and outpatient services. See Cardenas 1996.
2. See n. 1.
3. Prior to the January 1998 CPI, there were 44 index areas. See Williams 1996.
4. Prior to the January 1998 CPI, the expenditure base period was 1982–84. See Greenlees and Mason 1996.

method for pricing health insurance. BLS also publishes indexes for groups of strata; for example, the group for professional services combines the fourth through the seventh strata above. BLS publishes indexes for medical care in the four Census regions, thirteen region-size classes, and twenty-six metropolitan areas. BLS also produces U.S.-level substratum indexes, such as the indexes for inpatient and outpatient hospital services. Substratum indexes are byproduct indexes that are not building blocks of the CPI; we make them available for user convenience and to provide continuity with older series. The definitions of the CPI's published medical care series are in table 5.3, below.

5.4 Changes to the Medical Care Component of the CPI

Over the years BLS has made changes to the CPI medical care indexes and is considering future modifications. In addition, many outsiders have suggested changes. The proposals involve one or more of the following: changing the way we define the basic indexes of one or more of the strata; changing the way we define the weights for the strata; and changing the strata themselves. The change in January 1995 to the way BLS handled shifts from brand to generic prescription drugs is an example of the first type of change. Proposals to expand the realm of medical care beyond the CPI's traditional out-of-pocket coverage to include expenditures made by third parties, such as employers or governments, is an example of the second type of change. The January 1997 change, which reconstituted three hospital strata into two strata, is an example of the third type of change. These changes are discussed in detail below.

5.5 The Scope of the CPI for Medical Care

The CPI covers the prices of goods and services that people buy for day-to-day living. This means that the scope of most CPI components is limited to the costs that consumers incur out of pocket. Payments by other parties are out of scope. For example, the elementary and secondary education component of the CPI excludes the cost of public schools, which are funded through taxes rather than direct consumer expenditures.

The CPI has always treated medical expenses this way. Expenditure weights for the item strata in the medical care major group are what consumers directly paid for in the base period. They include insurance premiums paid by consumers, but do not include the expenditures of governments, employers, or charitable organizations made on behalf of consumers. Nor do they include the cost of medical care that is not paid for and that the industry absorbs. For this reason medical care's share of the CPI is smaller than its share in broader statistical measures such as those of the National Income and Product Accounts. Medical care's share

of the CPI of other countries, where medical care is largely provided by the government, is usually very small; this can affect comparisons of inflation between countries.

The long-standing BLS practice of limiting the CPI to just the out-of-pocket cost of medical care is not without controversy. For example, the Report of the Advisory Commission to Study the Consumer Price Index,[5] which is commonly referred to as the Boskin Report, recommended that the medical care weights be expanded to include all medical care expenditures.

5.6 CPI and PCE Expenditure Comparison

The personal consumption expenditure (PCE) is the part of gross domestic product that approximately corresponds to the CPI.[6] The PCE for medical care covers expenditures of consumers, employers, and government, including expenditures on Medicare and Medicaid as well as employer payments for health insurance. Medical care accounts for 17.9 percent of total expenditures measured by the 1995 current dollars PCE, but only 7.362 percent of expenditures as measured in the December 1995 CPI-U. Since the expenditure weights used in the CPI are limited to consumer out-of-pocket spending, items eligible to be priced in the medical care component are also limited.

Federal and state governments fund the entire Medicaid program while the federal government, nonfederal employers, employees, and participants fund the Medicare program. This funding arrangement limits what services and prices are eligible for inclusion in the CPI. Medicaid prices are totally ineligible for the CPI because the program is funded completely by the government. Medicare is composed of two parts, Medicare Part A and Part B. Medicare Part A is an entitlement program funded by taxes that provides compulsory hospital insurance, and Medicare prices are not eligible within hospitals for the CPI. Medicare Part B, which covers physicians and other medical care providers, is voluntary supplementary medical insurance purchased by the participants as a form of health insurance; these prices and services are eligible to be priced in the CPI and the premium for Part B is included in the CPI weights.

In recent years, as the cost of providing health insurance has increased, there has been a trend toward employers paying less of their employees' insurance premiums. Because the CPI expenditure weight includes only the employee-paid share, such a trend would ultimately be reflected as an increase in the relative weight of medical care. It would not be treated, however, as an increase in price.

5. U.S. Senate Committee on Finance, December 1996.
6. For a complete decomposition of the CPI versus the PCE see Fixler and Jaditz 1997.

5.7 The 1998 CPI Revision: Expenditure Weights

Medical care strata are grouped into two aggregates: Medical care commodities comprise the first three strata; medical care services are the remaining strata. Weights for the medical care commodities item strata are calculated from the diary portion[7] of the CEX. The interview portion of the CEX is the source for the weights of the medical care services item strata. These expenditures reflect both out-of-pocket expenses not covered by health insurance and health insurance premiums by survey households. Effective with the CPI for January 1998, the CPI expenditure weights are based on CEX data for 1993–95; these replaced the weights based on expenditures for 1982–84, which were in use from January 1987 through December 1997.

Table 5.1 provides the shares of medical care components in total consumer spending reported in the CEX for 1982–84 and 1993–95. The percentages reflect spending by all urban consumers, the population base for the CPI-U. Table 5.1 also includes a column identifying the percentage each item stratum and aggregate comprises of total medical care for both time periods.

Many changes have taken place in how health care is purchased and paid for over the past decade. How consumers purchase and pay for health care contributes to small shifts in relative importance that many not be evident in other categories of the CPI. Consumers purchase health insurance directly or through their place of employment. If they purchase it through their place of employment, the employer may pay a portion of the cost of the health insurance, which is not included in the CPI weight. Changes in the portion of the cost of the health insurance the employers pay affects the out-of-pocket spending by the employee, and, in turn, the share of consumption spending recorded in the CPI. Changes in what type of health insurance the employee purchases—fee-for-service, health maintenance organizations (HMOs), or preferred provider organizations (PPOs)—also affect spending by consumers on health care and the CPI weights.

The shares of consumption spending shown in table 5.1 differ from relative importances (such as those given in section 5.6). Medical care's share of 1982–84 consumer spending, as shown in table 5.1, is much lower than its 1995 CPI relative importance in section 5.6. The difference reflects the CPI's Laspeyres formulation. Because medical care prices have been rising

7. The CEX is composed of two separate surveys—an interview survey and a diary survey—both conducted by the Census Bureau for BLS. The interview survey is used to collect data for expenditures that respondents can remember fairly accurately for periods of approximately three months. The diary survey is designed to obtain expenditure information for small frequently purchased items that consumers tend to forget. Approximately five thousand consumer units are contacted each year for each type of survey.

Table 5.1 **CPI Medical Care (MC) Components' Shares of Urban Consumers' All Items (AI) and the Medical Care Consumption Spending during the Two CPI Expenditure Base Periods from the Consumer Expenditure Surveys for Those Periods**

	Expenditure Base Periods			
	1982–84		1993–95	
Item Strata and Aggregates	AI (%)	MC (%)	AI (%)	MC (%)
Medical care	4.796	100	5.434	100
Medical care commodities	0.946	19.7	1.225	22.5
Prescription drugs & medical supplies	0.583	12.2	0.810	14.9
Nonprescription drugs & medical supplies	0.363	7.6	0.415	7.6
Internal & respiratory over-the-counter drugs	0.232	4.8	0.279	5.1
Nonprescription medical equipment & supplies	0.131	2.7	0.136	2.5
Medical care services	3.850	80.3	4.209	77.5
Professional services	2.546	53.1	2.691	49.5
Physicians' services	1.313	27.4	1.392	25.6
Dental services	0.767	16.0	0.751	13.8
Eye care	0.320	6.7	0.285	5.2
Services by other medical professionals	0.147	3.1	0.264	4.9
Hospital and related services	1.178	24.6	1.246	22.9
Hospital services	n.a.		1.200	22.1
Nursing homes	n.a.		0.046	0.8
Unpriced items	0.003	0.1	n.a.	
Health insurance	0.125	2.6	0.272	5.0

Notes: 1982–84 was the CPI expenditure base period from January 1987 through December 1997. 1993–95 is the expenditure base period of the CPI effective January 1998. n.a. = not available. Hearing aid expenditures moved from nonprescription medical equipment and supplies to services by other medical professionals effective January 1998. Expenditures from the "unpriced" category under hospitals were moved to prescription drugs and medical supplies. The category represents expenditures for the rental and repair of hospital equipment. Health insurance reflects the retained earnings of health insurance providers—see section 5.12 in the text.

relatively rapidly, the fixed-quantity assumption underlying the CPI implies a growing relative importance of medical care in the CPI market basket. This, in turn, yields the somewhat surprising result that although consumers allocated a greater proportion of their total expenditure to medical care in 1993–95 than in 1982–84, the relative importance of medical care in the CPI fell in 1998 when the expenditure weights were updated. The relative importance of Medical care for the CPI-U as of December 1997 reflecting 1993–95 CEX data, updated for price change, is 5.614 percent.

The 1993–95 CEX data show that the medical care component increased its proportion of total consumption since 1982–84. The increase results primarily from changes in what consumers are purchasing and how they are paying for medical care. Looking at expenditure data for 1993–95 the medical care share increased by 13.3 percent (0.638 percentage points) from the 1982–84 period. An examination of the data at lower levels reveals that expenditures on prescription drugs, other medical professional services, and health insurance constitute a greater proportion of medical care based on the 1993–95 CEX versus the 1982–84 CEX. Other categories such as physicians' services, dental services, and eye care decreased as a proportion of medical care from the 1993–95 CEX.

One of the major observations is that spending on health insurance increased from 0.125 percent (2.6 percent of medical care) in 1982–84 to 0.272 percent (5.0 percent of medical care) in 1993–95. As the CPI reflects only consumers' own expenditures and employer- and government-provided benefits are not included, higher health insurance premium payments by households has contributed to this increase. According to the Employee Benefit Survey, in the eleven-year period between the two expenditure surveys, the average employee contribution for individual medical care coverage tripled from $10.13 to $31.55 per month (Foster 1996). Contributions for family coverage also tripled, from an average of $32.51 to $107.42 per month.

The changes taking place in the individual categories reflect changes that are taking place in the delivery of health care. A greater percentage of employed persons have switched their health insurance provider from fee-for-service to HMOs and PPOs. According to the Employee Benefit Survey, participation in health plans by type of provider for full time employees of medium and large private establishments for the period 1984–93 were as follows: Fee-for-service decreased from 95 percent to 50 percent; HMOs increased from 5 percent to 23 percent; and PPOs increased from 1 percent in 1986 to 23 percent in 1993 (Kane, Blostin, and Pfuntner 1996). HMOs and PPOs typically charge for health care based on all-inclusive fees rather than individual billing for each service provided as in fee-for-service plans. The shift to all-inclusive providers has led to more out-of-pocket spending on health insurance but less out-of-pocket spending on

individual medical services. According to Gregory Acs and John Sabelhaus of the Urban Institute, "Consumers reacted to rising health care prices by purchasing more insurance, in the sense that the share of health spending attributable to co-payments and deductibles for hospitals and physicians actually fell from 30.1% to 20.9% between 1980 and 1992" (1995, 36). While medical care prices have risen at a rapid rate over the past decade, the average consumer's expenditures on medical care actually increased less rapidly due to changes in provider arrangements coupled with changes in the overall delivery of health care services.

5.8 Selection of Outlets for Pricing

The sample of retail outlets for most CPI basic indexes is drawn from the Point of Purchase Survey (POPS), which the Census Bureau conducts for BLS. To conduct the POPS, the Census Bureau surveys households in each of the CPI's pricing areas and identifies the name and location of the retail establishments where the surveyed household made purchases in each of the survey's categories of consumption. In addition, the survey collects how much the households spent at each establishment. BLS selects outlets within a CPI pricing area with probability proportional to expenditure. The outlets selected for medical care are selected from the POPS, with the exception of nursing homes.

The Census data collectors question consumers about expenditures they make for specific categories of goods and services; these categories correspond to one or more item strata. Each category has a specific recall period or length of time for the consumer to consider if they made a purchase. The recall periods are designed to allow a greater length of time for purchases that are not made frequently, such as hospital stays, and a shorter recall period for purchases that are made more frequently, such as prescription drugs. Table 5.2 provides the POPS categories and recall periods.

Table 5.2 **Point of Purchase Survey (POPS)**

Category	Recall Period
Physicians' services	1 year
Dental services	1 year
Eyeglasses and eye care	1 year
Services by other medical professionals	1 year
Hospital services	1 year
Adult day care	1 year
Nonprescription medical equipment, supplies, topicals, and dressings	1 month
Prescription drugs and medical supplies	2 weeks
Internal and respiratory over-the-counter drugs	2 weeks

The nursing home sample is selected from a secondary source of data, the 1991 National Health Provider Inventory: Nursing Homes and Board and Care Homes, which is conducted by the National Center for Health Statistics. The use of an alternate data source for the nursing home sample was necessitated due to insufficient outlets reported in the POPS. Nursing homes are an unusual consumer item in that only a small share of households incur expenses for them, but for those households they are often very large expenditures; this is a situation that is difficult for the POPS to cover accurately.

5.9 Sample Rotation

To ensure that the outlets where items are priced and the unique items selected for pricing at each outlet are current, samples are rotated each year using POPS data. Such rotation yields totally new outlet and unique item samples every five years. In the past, sample rotation took place in one-fifth of the CPI's area samples each year. Thus, over a five-year period, the entire CPI outlet sample and unique item sample were updated. Beginning in 1999 the CPI is changing to a new sample rotation methodology. The new sample rotation process rotates categories of commodities and services rather than a subset of the CPI pricing areas. The new methodology allows the updating of selected groups of item strata more frequently. The BLS will have more flexibility to update samples of items that need more frequent changes by moving to a rotation schedule based on category.[8]

5.10 Improvements to Procedures for Prescription Drugs

As of publication of the January 1995 CPI, BLS changed the way the CPI treats prescription drugs that lose patent protection (Knudsen 1994). Under the old procedure, the CPI did not allow for the opportunity to substitute to generic versions of the drug unless the selected retail outlet in which we were pricing stopped selling the brand name drug. (Sample rotation—the CPI process that keeps item samples up to date—brings new items such as generic drugs into the CPI samples, but the rotation process does not compare prices between the old and new versions of an item.) The new procedure gives generic versions of a drug a one-time chance to be substituted for the original brand name drug regardless of whether or not the store discontinues the brand name version. Six months after a drug in the sample loses patent protection, CPI field staff select among all therapeutically equivalent versions of the drug (including the original brand name version) sold in the store. The timing of the reselection allows the emerging generic drugs an opportunity to gain market

8. See Cage 1996 for further information on the new sample rotation process.

share, because the chance of selection is proportional to the number of prescriptions dispensed. When a therapeutically equivalent substitute is selected, the CPI treats the price difference between the original drug and its selected substitute as a price change that is reflected in the index.

The CPI is attempting to get more transaction prices in the index, and as CPI item and outlet samples rotate over time, outlets where prescription drugs are priced are now asked to provide transaction prices rather than cash or list prices. The transaction price is the documented amount the outlet actually is reimbursed for providing the prescription to the customer—the total payment received from all eligible sources, including the customer, the insurance provider, and any other party. Each part of the transaction price is incorporated into the reported price (the price the CPI uses). The pharmacist is usually able to identify any specific third-party payment plans, such as a specific commercial insurance PPO plan or an employer-based plan, and to determine if the customer must pay a portion of the price. The particular insurance provider payment arrangement for the identified drug is followed during subsequent visits to the outlet. This allows the index to reflect more actual transaction price changes.

Unfortunately, selecting a payer type at initiation has proved to be easier than obtaining the price associated with the payer during subsequent pricing. Too often the pharmacy's computer system does not allow access to the payer price for the prescription being priced, without actually filling a prescription. In such cases we must substitute to a cash price, unless the pharmacist has an alternative source for the selected payer's price.

The CPI excludes HMOs from outlet samples for prescription drugs. Because these outlets are owned and operated by insurance companies, purchases usually are based on only a copayment and not related to the real cost of the services. HMO third-party purchases are eligible in non-HMO-owned pharmacies where the total reported price is based on the HMO reimbursement and patient payment.

5.11 BLS Improvements to the Hospital CPI

Effective with the CPI for January 1997, BLS has restructured the CPI hospital index to make it better able to handle new items and changes in the way medical problems are treated within hospitals, and to allow for new ways of looking at the hospital sector of consumption. The previous structure of the CPI hospital index divided hospital room expenses, charges for other inpatient services, and the cost of outpatient services into three separate compartments, forcing the CPI to regard items that are actually inputs to medical treatment in hospitals as consumer items. There is a growing consensus that the correct view of medical services is treatment outcomes and that they, ideally, should be our consumer items. From this distinct vantage point, a day occupying a hospital room or the time

spent in an operating room are not separate consumer services but part of an entire hospital visit that ultimately contributes to a treatment outcome for a patient. However, a strictly "outcomes" approach to pricing hospital services is still not possible.

For many diseases and injuries, the number of inpatient hospital days to achieve a given outcome is decreasing. Furthermore, other treatments that once required an inpatient hospital stay are now performed as outpatient procedures. In response to these prevailing conditions, BLS combined the current three CPI categories into one category called hospital services. Differentiation between inpatient and outpatient settings and among service types now will occur under the umbrella of this broad category. This restructuring allows for price comparisons not possible before, when procedures shift from inpatient to outpatient delivery settings.

In addition to the changes in classification structure, BLS introduced new procedures for hospital collection. The goal of the new process is to identify a payer, a diagnosis, and the payer's reimbursement arrangement. The item description is derived from a "live" hospital bill. Collecting information to describe a hospital visit from a real bill and recording the price based on the terms of the contract between the insurer and the hospital (the reimbursed amount) represent major improvements over the current use of the hospital chargemaster (the published list prices) as the reported price for the CPI. As always, BLS continues in its strong commitment to full confidentiality of all collected information.[9]

An additional benefit of the change to pricing hospitals was the creation of a separate index for nursing homes and adult daycare. Until late 1999, the index will reflect price movement for nursing homes only; subsequently, it will include prices for adult daycare as well. Out-of-pocket expenditures on adult daycare are included in the weight for the nursing home component.

As part of the 1998 CPI revision, BLS created two new indexes by separating hospital and related services into two major components, hospitals and nursing homes. BLS also calculates and publishes two substratum indexes (SRC), one for inpatient hospital services and one for outpatient hospital services. Substratum indexes are not used directly in the calculation of the overall CPI because the item samples are not designed to support them. Their weights are allowed to shift, and in the case of hospitals, medical treatments may move between them. These indexes are calculated using specification data. Additionally, as noted above, the nursing home stratum will be expanded to include adult daycare.

The only other significant change to the medical care component was to move expenditures for hearing aids from nonprescription medical

9. See Cardenas 1996 for further information on the 1997 change in the CPI hospital component.

equipment and supplies to services by other medical care professionals. In table 5.3, definitions of the indexes as they appear for the revision are given. Table 5.4 identifies the number of current quotes as of February 1998.

5.12 Health Insurance Pricing

The CPI has not been able to develop a feasible method to directly price medical insurance. To measure the change in the price of medical insurance appropriately, the CPI would need to exclude changes in both the quality of the insurance and in the quantity consumed. This means that for any medical insurance policy selected BLS would need to obtain values for any modifications of policy benefits from year to year (they are quality changes). In addition, BLS would need information on utilization, the increased or decreased use of medical insurance, or the health status of the insured group, because these are quantity changes in medical insurance. Because changes in benefits are changes to the quality of the insurance, and increased use is a higher quantity of medical insurance consumed, these are not changes in its price and the price index must isolate them from real price change.

Prior to the 1964 CPI revision, the CPI did price health insurance premiums directly. Since this was prior to the 1978 adoption of comprehensive probability sampling in the CPI, the CPI followed the prices of items that BLS staff judged to be representative of an item stratum. For health insurance before 1964, the CPI priced as a fixed amount of protection for the individual consumer the most widely held Blue Cross/Blue Shield family policy being sold to consumers. Using this method led to a number of problems involving quality and quantity changes over time. In pricing premiums directly, the BLS found it impossible to account for quality differences due to changes in both the benefits provided by policies and in utilization of the provided benefits. These problems led the BLS to switch to the current indirect method of pricing health insurance in the 1964 revision of the CPI (Fixler 1996). The feasibility of directly pricing health insurance policies was retested during 1984 and 1985 (Ford and Sturm 1988). The test results identified problems with obtaining data from insurers on quality changes and utilization changes in the benefit packages at that time. Further research on directly pricing health insurance is planned for 1998 and 1999.

The BLS does not publish indexes for health insurance premiums because the CPI employs an indirect method to measure price change for health insurance. This indirect approach decomposes medical insurance into three parts: changes in the prices of medical care items covered by health insurance policies; changes in the cost of administering the policies; and changes in the cost of maintaining reserves and, as appropriate, profits.

Table 5.3 Definitions of Published Medical Care Indexes

Item	Definition
Medical care	Medical care commodities and medical care services
Medical care commodities	Prescription drugs, nonprescription over-the-counter drugs, and other medical equipment and supplies
Prescription drugs	All drugs and medical supplies dispensed by prescription; mail order outlets included; prices reported represent transaction prices between the pharmacy, patient, and third party payer if applicable
Nonprescription drugs and medical supplies	All nonprescription medicines, vitamins, dressings, equipment, and supplies
Internal and respiratory over-the-counter drugs	Nonprescription medicines taken by swallowing, inhaling, as suppositories, or enemas, e.g., aspirin, cough medicine, or vitamins
Nonprescription medical equipment and supplies	Nonprescription medicines and dressings used externally, contraceptives, and general supportive and convalescent medical equipment, e.g., adhesive strips, heating pads, athletic supporters, or wheelchairs
Medical care services	Professional medical services, hospital services, nursing home services, and health insurance imputation
Professional medical services	Physicians, dentists, eye care providers, and other medical professionals
Physicians' services	Services by medical physicians in private practice, including osteopaths, that are billed by the physician; house, office, clinic, and hospital visits (excluding ophthalmologists—see eye care)
Dental services	Services performed by dentists, oral or maxillofacial surgeons, orthodontists, periodontists, or other dental specialists in group or individual practice; treatment may be provided in the office or hospital
Eye care	Services provided by opticians, optometrists, and ophthalmologists; eye exams, dispensing of eyeglasses and contact lenses, office visits, and surgical procedures in the office or hospital
Services by other medical professionals	Services performed by other professionals such as psychologists, chiropractors, physical therapists, podiatrists, social workers, and nurse practitioners in or out of the office
Hospital and related services	Services provided to inpatients and outpatients, emergency room visits, nursing home care, and adult day care; includes transaction and chargemaster prices
Hospital services	Services provided to patients during visits to hospitals or ambulatory surgical centers or other similar settings
Inpatient hospital services[a]	Services for inpatients, including a mixture of individual services, DRG-based services, per diems, packages, or other bundled services
Outpatient hospital services[a]	Services provided to patients classified as outpatients in hospitals, free standing facilities, ambulatory, and urgent care centers
Nursing home services and adult daycare	Includes charges for care at nursing homes, nursing home units of retirement homes, and convalescent or rest homes; adult daycare data will be included in this index in late 1999

[a]Substratum index.

Table 5.4 Number of Current Quotes as of February 1998

Category	Quotes
Prescription drugs	694
Internal & respiratory over-the-counter drugs	423
Nonprescription medical equipment and supplies	252
Physicians' services	1,050
Dental services	927
Eye care	290
Services by other medical professionals	365
Hospital services	3,236
Nursing home services	438

Most of the expenditure for health insurance goes for the first item—the part that reflects the insurers' payments for medical treatment. The CPI allocates this part of health insurance spending to the indexes for those treatments. This means that most of the expenditures for health insurance reported on the CEX are assigned to the other medical care strata; the share assigned to each stratum is based on insurance industry information. The remaining weight, for the other two parts of insurance, is for the overhead of the insurers; this is all that remains in the unpublished health insurance index.

Price movement over time for the unpublished health insurance indexes in the CPI is determined by the movements of the other medical care strata, adjusted by changes in the retained earnings ratio. Movement in the unpublished medical insurance index reflects both changes in benefits paid and changes 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 charges and thus will not significantly affect retention rates. Implicit in the process is the 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 policy holders, such as more convenient claims handling, will affect the movement of the index when—strictly speaking—they should be removed, but the effects are probably small.

The BLS obtains calendar year data for premium income, benefit payments, and retained earnings. Blue Cross/Blue Shield supplies their data directly to BLS. BLS gets data for commercial carriers from Bests Insurance. For each year, the ratio of retained earnings to benefit payments is calculated, yielding a retained earnings ratio. Next, the latest year's ratio is divided by the previous year's ratio, to obtain the relative of change in

the ratios. Finally, this annual relative of change is converted to a monthly relative (by taking its twelfth root) so that the CPI can reflect the change month by month over the calendar year.[10] Because it is not feasible to obtain the monthly change in price caused by changing retention margins, spreading the annual change evenly over the year is preferable to reflecting the entire annual change in one month.

5.13 Alternative Approaches to the Measurement of Medical Care Price Change

Definition of what constitutes an item for pricing in the medical care component of the CPI has been a source of debate. Traditionally, items that were eligible for the CPI have been those that we could observe the consumer buying. In medical care these are items that today, at least, one might view as the inputs to medical care. Examples are a visit to a doctor, a purchase of a particular drug, a day in a hospital, an amount of time in an operating room, or a diagnostic test. This view of medical care is not concerned with what benefit, if any, the consumer receives from consuming medical care items; the presumption is that the consumer would not purchase them unless they wanted them.

This traditional way of viewing medical care items is sometimes called the *input* approach because the items eligible for the CPI are inputs to medical treatments. The input approach is inconsistent with the idea that the CPI should be a cost-of-living index. The cost-of-living index theory suggests that the items that should be included in the CPI should be those that directly yield consumer utility.

The *outcomes* approach is an idealized but as yet infeasible alternative to the inputs approach. It would price the cost of achieving a given degree of improvement for some medical condition. In theory this would allow new treatments for the medical condition, say a drug rather than surgery, to count as price change. The advantage of the outcomes approach is that it is patient-centered rather than inputs-centered. It is one path toward focusing on the consumer procurement of not just the inputs of health

10. 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) (Year 2 ratio)/(Year 1 ratio) = .080000/.063830 = 1.253329 relative of change, or 25.33 percent, which is the annual increase in the retention to benefits ratio. (b) Spreading this annual change equally over twelve months is done as follows: $\sqrt[12]{1.253329} = 1.018995 = 1.9$ percent per month.

care but what they aim to achieve—improved health. Nevertheless, even an outcomes approach would not address every concern about measuring the change in price of medical care.[11]

Although with an outcomes approach it should be possible to follow the cost of recovering from an illness or injury, such as a heart attack or a broken leg, it would not be possible to account for reductions in the incidence of certain illnesses due to nonmedical reasons.[12] From the outcomes perspective, each medical condition would still have to be handled as an individual illness, rather than as a potential precursor to a more serious disease; and each condition's treatment would be seen only as corresponding to itself, rather than as a step toward prevention of a more serious condition. With respect to the CPI, implementing an outcomes approach would require radical modifications to the item structure, moving from strata composed of various health care inputs to strata consisting of various diseases or diagnoses.

Intermediate between the traditional and the ideal is what we call the *treatment* approach. BLS is attempting to move to this approach within the new hospital item stratum with the distinction that the treatment considered occurs within the confines of a discrete hospital visit defined by an individual patient bill. Under this approach, the CPI can replace old methods of delivering treatment for a given medical problem with new methods as long as they are in the hospital item stratum. For example, if a hospital in the CPI sample moves to an outpatient microsurgery treatment that replaces a more invasive inpatient surgery, we may be able to show the price difference as price change. In the future, we may extend this to other medical care strata, for example, allowing a new drug to replace an older, less effective drug.

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11. It should be emphasized that this issue is not confined to the medical care components of the CPI. Ideally, for example, one would price transportation outcomes, such as vacation travel or access to work, rather than inputs such as automobiles and gasoline. More broadly, health outcomes depend on both medical care and food inputs.

12. Factors external to the science of medicine that might serve to improve individual and public health are lifestyle changes such as reduced smoking, better nutrition, and increased physical activity; environmental improvements such as cleaner air, safer cars, and better roads; or enhancements in the quality and safety of the workplace. The outcomes approach would have to handle preventive medical care (such as treating high blood pressure and cholesterol) by viewing those conditions as illnesses, even though their treatment brings no immediate improvement to well-being. It would still miss the improvement to consumer welfare, such as the reduced incidence of major illness, that results from treating these conditions.

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Comment

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I thank the authors for providing an accessible but detailed description of the CPI. There are, of course, descriptions in Bureau of Labor Statistics publications and in the *Monthly Labor Review,* but this paper should reach a different audience. The paper indicates how BLS has been improving the index, despite severe budget constraints, and it is clear that it is a much improved index.

This paper stimulated two thoughts that had not been so well brought out before in my reading of the literature. First, the assumption of competitive markets is a problem with pricing managed care health insurance because there is no assurance that rationing is in accordance with willing-

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ness to pay. More specifically, the consumer/patient has no basis to express his or her willingness to pay at the point of service, and the contract is incomplete. Alas, we do not have a theory of rationing in this setting. Hence, one cannot use changes in a plan's retention as a measure of welfare.

Second, suppose the effect of managed care is to obtain discounts from providers, thereby transferring rents to insurers. Suppose further that the plan market is not competitive, so the retention/profits at managed care companies increase as the rents are transferred. As I understand the CPI, this would show up as an increase in the price of health insurance. But because the CPI is based on out-of-pocket price, there would probably be no corresponding fall in the price of hospital and physician services. Hence, this transfer of rents would show up as a spurious price increase.

An old but still important chestnut relates to the exclusion of government programs. This means any cost shifting from (or even to) government payers to private payers shows up as a price change. This is sensible from the point of view of the purpose of the overall CPI, but not sensible from the point of view of a medical care sector price deflator.

Also in my view the outcomes approach is more important with medical care than with transportation because of role of insurance and role of the physician as an agent.

I have two suggestions: The first is on collaboration among the groups constructing the various indexes. The CPI is obtaining the actual transaction price of prescription drugs, including the insurance payment, but it is not clear what it is doing with this. Could it give this information to the PPI, which should want the transaction price?

I applaud the movement of the CPI to pricing the hospital episode (end of paper), but as my second suggestion I recommend exploring the inclusion of post/acute care (e.g., for ninety days following discharge) to get at substitution for hospital days. One could do this easily for Medicare patients (who of course are not part of the CPI); it may not be as easy elsewhere.