Families with Catastrophic Health Care Expenditures

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This article describes the characteristics of families with catastrophic health care expenditures. Based on data from a national sample, three overlapping groups of families are considered: those incurring annual out-of-pocket expenditures that exceed, respectively, 5, 10, and 20 percent of the family's income. Such families represent a small percentage of all families, but they account for a disproportionally large share of total health care expenditures. Nevertheless, the actual amounts spent out of pocket by most of these families are relatively small. Modest sums are financially burdensome to these families because they are more likely to be low-income and to be headed by someone who is not employed. Families with catastrophic expenditures are also more likely to be headed by someone 65 or older and, consistent with that, a greater share of their total expenditures is covered by Medicare. However, all other third-party payers cover a relatively smaller share of total expenditures for these families than they do for all families, reflecting the generally worse third-party coverage of families with catastrophic health expenditures. The implications of these findings for several current issues are discussed, including catastrophic coverage proposals for Medicare and proposed programs to help the medically indigent and the uninsured.

The goal of protecting everyone against financially catastrophic health care expenditures has been on the national public policy agenda for several decades. The current interest in catastrophic coverage is only the latest in a long line of developments that include many proposals for catastrophic health insurance and the actual enactment, by a number of states, of catastrophic health insurance programs [1-3].

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The continuing and at times intense interest in catastrophic health coverage has led to several major efforts to determine how many people in the United States would qualify for and benefit from such coverage. In the last decade, Kasper, Anderson, and Brown [4], Birnbaum [5], and the Congressional Budget Office [6, 7] have provided estimates of the number of potential beneficiaries. However, only Kasper, Anderson, and Brown, and to a limited extent Birnbaum, also dealt with the demographic and other characteristics of that population. This article, based on an analysis of data from the 1977 National Medical Care Expenditure Survey (NMCES), focuses on such characteristics and on their implications for policy.

THE DEFINITION OF CATASTROPHIC HEALTH CARE EXPENDITURES

Those described as having incurred financially catastrophic health care expenditures have been identified in a number of different ways. Kasper, Anderson, and Brown [4] and the Congressional Budget Office [7] even provide estimates of the number of catastrophic cases for each of several alternative definitions. One of the definitions that has been used focuses on families whose annual health services expenditures have exceeded a dollar amount considered to be large. In Birnbaum's study the threshold was set at total annual health care expenditures of $5,000 in 1974 [5]. However, such cases are more properly described as being *high-cost*, since large expenditures for health care services are not always catastrophic in the sense of imposing a severe financial burden on the affected person or family.

Whether the expenditures prove to be financially catastrophic to a person depends on health care coverage and, more generally, on the person's ability to pay for the care. That is why most catastrophic health insurance proposals and programs take into account only out-of-pocket expenditures, thereby eliminating from consideration any health care expenditure paid by a third party. There is no consensus, however, on how large an out-of-pocket expenditure must be in order to warrant the "catastrophic" label. Some have set the threshold at a single amount. For example, the 1979 Long-Ribicoff catastrophic health insurance bill (S. 530) was designed to cover those who had annual out-of-pocket expenditures exceeding $2,000 per family.

It is also common to specify the catastrophic threshold as a percentage of income. Feldstein's proposal for "major-risk insurance" seeks to protect families from spending more than 10 percent of their annual

income on health care [8]. The 1980 Martin Bill sets the limit at about 20 percent of family income, with some variation in the actual percentage depending on income level [9]. Similarly, one of the definitions used by Kasper, Anderson, and Brown [4] and the Congressional Budget Office [6] focuses on families whose annual out-of-pocket health care expenditures exceeded 15 percent of income.

This latter, income-related approach to defining catastrophic health expenditures was adopted for this analysis, even though, ideally, a more complete specification of what constitutes a catastrophic health care expenditure would take into account not only family income but also any assets deemed available to pay for care. In addition, differences in obligations faced by individual families also should be included. However, since very few catastrophic health insurance programs or proposals have adopted these and other similar definitional refinements, there is little guidance regarding the levels and types of income, assets, and obligations that would constitute a reasonable definition for the purposes of this study. Furthermore, as noted in the next section, data on family assets are not available from the 1977 NMCES public use file on which the analyses presented here are based.

In addition to adopting an income-related definition of catastrophic health expenditures, the associated practice of considering *family* income was also followed, since the kind of resources that are called upon to pay for health care expenditures, particularly income and health insurance, are usually pooled at the family level. For that same reason this report focuses on the characteristics of families rather than those of individuals.

Three overlapping groups of families will be described: those which incurred annual out-of-pocket expenditures exceeding, respectively, 5, 10, and 20 percent of family income. All three levels are examined, because existing catastrophic coverage proposals and programs point to no one single level as the best for identifying catastrophic health care expenditures. The 5 percent level is of interest primarily because current Internal Revenue Service regulations stipulate that expenditures for medical care greater than 5 percent of adjusted gross income are tax-deductible. This legislatively imposed level is the only expression we have of what, in our society, is the point beyond which medical expenses exceed what a family is expected to budget for that purpose. It does not necessarily mean, however, that all expenditures above 5 percent of family income are deemed to be "catastrophic." Judging by catastrophic health insurance proposals and programs, 10 and 20 percent, and even higher levels, are more likely to fit the definition. While both the 10 and 20 percent levels are considered

here, higher levels are not, primarily because in the NMCES file the number of cases with expenditures exceeding, for instance, 30 percent of income was too small to provide reliable estimates for most characteristics of interest.

THE NMCES DATA

The characteristics of families with catastrophic expenditures described here were obtained from an analysis of the public use data file of the 1977 National Medical Care Expenditure Survey. In that survey a nationally representative sample of persons was asked how health services were used and how the care was paid for. Detailed descriptions of NMCES can be found in Bonham and Corder [10] and Cohen and Kalsbeek [11], and the documentation on the public use data file is provided by Kasper, Walden, and Wilson [12].

The NMCES public use data file provides information on a sample of 14,615 families. The data on health expenditures in that file refer only to care received in hospitals or in the offices of physicians and other practitioners. It excludes, in particular, care received in nursing homes. In addition, while data on amount of equity in housing were collected as part of the survey, other family assets were not covered, and the data on equity in housing were not included in the public use data file.

To obtain national estimates, all analyses were carried out on weighted data. The weight applied to each family in the sample is that of the family's head of household. For every estimate reported, a standard error is given. The calculation and interpretation of the relative error for each estimate is briefly described in the appendix. Also included in the appendix is a brief discussion of the inclusion in the analysis of a small number of families that reported either no income or a negative income in 1977.

As a source for national estimates of the characteristics of families with catastrophic health care expenditures, the 1977 NMCES has important comparative advantages. Chief among them is the size of the NMCES sample. It is twice as large as the sample for the 1980 National Medical Care Utilization and Expenditure Survey (NMCUES), the most recent data source that is similar to NMCES [13]. The size of the sample is important because relatively few families incur catastrophic expenditures. As noted earlier, even with the larger sample it is not possible to obtain from NMCES sufficiently precise estimates of certain characteristics of families with out-of-pocket

expenditures that represent more than 30 percent of income—because less than 3 percent of families fall into that category. In addition, on a more practical level, as of mid-1986, the data file on families from NMCUES was not available yet although it was expected to be released before the end of the year.

Still, the lack of recency of the NMCES data is a concern. To deal with it, some of the latest analyses of NMCES data have included in their calculations several corrective factors designed to reflect changes since 1977 [14, 15]. That strategy was not adopted here because of the added complexity and uncertainty in interpreting results that incorporate all the necessary adjustments, which would have to reflect changes since 1977 in such relevant areas as the overall income distribution, levels of health care coverage, and different inflation rates in wages versus those in medical care costs. Therefore, the results based on the 1977 data are presented here without any corrective factors, but whenever appropriate they are discussed in light of changes that have occurred in the intervening period.

CHARACTERISTICS OF FAMILIES WITH CATASTROPHIC EXPENDITURES

CATASTROPHIC FAMILIES IN RELATION TO ALL FAMILIES

Relatively few families in the NMCES sample had out-of-pocket health care expenditures that were large in relation to their income. Nearly 80 percent of all families had out-of-pocket expenditures that were less than 5 percent of income (Table 1), and out-of-pocket expenditures exceeded 20 percent of income for only 4.2 percent of families (Table 2). On the other hand, families with high out-of-pocket expenditures relative to their income incurred *total* health care expenditures that represent a disproportionate share of all expenditures for all families (Table 2). For example, families with out-of-pocket expenditures exceeding 10 percent of income constituted 9.6 percent of all families, yet accounted for 25.3 percent of total health expenditures for all families.

DEMOGRAPHIC CHARACTERISTICS

The greater the percentage of income represented by out-of-pocket expenditures, the more likely the family is to be low-income (Table 3). Of the families spending more than 20 percent of their income on

Table 1: Number and Percent Distribution of Families by Intervals of Annual Out-of-Pocket Expenditures for Health Services as a Percent of Family Income (NMCES Household Data, 1977)

Out-of-Pocket Expenditures as Percent of Family Income	*Percent Distribution of Families (Standard Error)*
0.0 to 4.9	79.5 (0.45)
5.0 to 9.9	10.3 (0.30)
10.0 to 14.9	3.7 (0.18)
15.0 to 19.9	1.7 (0.14)
20.0 to 24.9	0.8 (0.08)
25.0 or more	3.4 (0.19)
Unknown*	0.6 (0.07)
All families	100.0

*Families with zero or negative net incomes.

Table 2: Total Annual Health Services Expenditures Incurred by All Families and Families with Out-of-Pocket Expenditures Exceeding 5, 10, and 20 Percent of Family Income (NMCES Household Data, 1977)

Out-of-Pocket Expenditures as Percent of Family Income	*Number of Families*	*Percent of All Families in the Category (Standard Error)*	*Total Health Services Expenditures (in Billions)*	*Percent of Total Expenditures Represented by Category (Standard Error)*
5.0 or more	15,600,648	19.9 (0.45)	$44.0	41.9 (1.23)
10.0 or more	7,514,111	9.6 (0.31)	$26.6	25.3 (1.18)
20.0 or more	3,330,883	4.3 (0.20)	$14.0	13.3 (1.01)
All families	78,360,064	100.0	$105.0	100.0

Table 3: Percent Distribution by Income and Poverty Status of All Families and Families with Out-of-Pocket Expenditures for Health Services Exceeding 5, 10, and 20 Percent of Family Income (NMCES Household Data, 1977)

	Percent Distribution (Standard Error)			
		Families with Out-of-Pocket Expenditures Exceeding Specified Percentage of Family Income		
Income Categories and Poverty Status	*All Families*	*5 Percent or More*	*10 Percent or More*	*20 Percent or More*
Less than $12,000	46.1	73.4	86.2	93.9
	(0.77)	(0.98)	(1.02)	(1.14)
$12,000 to $19,999	24.0	18.4	10.9	5.1
	(0.45)	(0.76)	(0.91)	(0.97)
$20,000 or more	29.9	8.2	2.9	1.0
	(0.70)	(0.57)	(0.46)	(0.52)
All income categories	100.0	100.0	100.0	100.0
Below poverty level	15.3	31.5	47.5	66.1
	(0.45)	(0.89)	(1.44)	(2.18)

health care, only 6.1 percent had annual incomes above $12,000, even though 53.9 percent of all families had incomes exceeding that amount. Similarly, the higher the out-of-pocket expenditures in relation to income, the greater the proportion of families below the poverty level, where poverty was determined based on household income, adjusting for household size in accordance with U.S. Bureau of the Census guidelines [12]. Two-thirds of families with out-of-pocket expenditures above 20 percent of income were below the poverty level, as were nearly one-third of those with expenditures exceeding 5 percent, compared with only 15.3 percent of *all* families that were below the poverty level. Similarly, the percent of families with a head of household who was not employed is directly related to the percentage of income spent on health services by the family (Table 4).

A disproportionately large percent of families with high out-of-pocket health expenditures relative to income were headed by someone 65 years of age or older; a correspondingly smaller percent were headed by someone 25 to 54 years old (Table 5). Whereas 19.3 percent of all families were headed by someone over 65, the corresponding proportion was 32.4 percent for families with out-of-pocket expenses exceeding 5 percent of income.

Table 4: Exployment Status of Family Head in All Families and Families with Out-of-Pocket Health Services Expenditures Exceeding 5, 10, and 20 Percent of Family Income (NMCES Household Data, 1977)

	Percent Distribution (Standard Error)			
		Families with Out-of-Pocket Expenditures Exceeding Specified Percentage of Family Income		
Employment Status of Family Head	*All Families*	*5 Percent or More*	*10 Percent or More*	*20 Percent or More*
Employed all year	64.9	46.9	38.9	31.3
	(0.63)	(1.17)	(1.43)	(2.04)
Employed part of the year	9.4	12.1	13.1	13.8
	(0.28)	(0.75)	(1.12)	(1.60)
Not employed all year*	22.4	35.3	42.4	50.6
	(0.61)	(1.20)	(1.53)	(2.14)
Unknown	3.3	5.7	5.6	4.3
	(0.19)	(0.47)	(0.67)	(0.88)
All families	100.0	100.0	100.0	100.0

*Includes those not in the labor force.

EXPENDITURES

Families with out-of-pocket expenditures that were high relative to their income incurred both mean *total* health expenditures and mean out-of-pocket expenditures that were substantially larger than those of all families (Table 6), and a greater proportion of both types of expenditures went to inpatient care services (Table 7). On the other hand, the actual amount these families paid were relatively modest. Even among families incurring 20 percent of income in out-of-pocket expenditures, over one-quarter (26.5 percent) paid less than $500 and nearly half (46.4 percent) paid less than $1,000, while only 9.5 percent had out-of-pocket expenditures exceeding $4,000 (Table 8). Among families that had out-of-pocket expenditures exceeding 5 percent of their income, the level of direct expenditures is even lower: 34 percent spent less than $500, 63.1 percent had out-of-pocket expenditures below $1,000, and only 2.4 percent incurred expenditures above $4,000.

The relatively low dollar amounts that account for a relatively high percent of many of these families' incomes suggests that most of the families incurred catastrophic expenditures not so much because the amounts involved were very large, but because their incomes were relatively low (see Table 3) *and* their health coverage was less adequate.

Table 5: Age of Family Head in All Families and Families with Out-of-Pocket Health Services Expenditures Exceeding 5, 10, and 20 Percent of Family Income (NMCES Household Data, 1977)

	Percent Distribution (Standard Error)			
		Families with Out-of-Pocket Expenditures Exceeding Specified Percentage of Family Income		
Age of Family Head in Years	*All Families*	*5 Percent or More*	*10 Percent or More*	*20 Percent or More*
18 or less	0.5	1.0	1.6	2.7
	(0.06)	(0.21)	(0.37)	(0.82)
19 to 24	10.1	10.1	12.1	12.1
	(0.32)	(0.59)	(0.85)	(1.23)
25 to 34	21.8	16.8	14.2	14.1
	(0.59)	(0.76)	(0.99)	(1.41)
35 to 44	16.2	13.5	12.3	11.3
	(0.39)	(0.71)	(0.96)	(1.22)
45 to 54	16.8	11.6	11.6	13.0
	(0.39)	(0.61)	(0.98)	(1.44)
55 to 64	15.3	14.6	15.5	15.0
	(0.34)	(0.70)	(1.14)	(1.70)
65 to 74	11.7	17.9	17.3	14.7
	(0.38)	(0.74)	(1.13)	(1.56)
75 or older	7.6	14.5	15.4	17.1
	(0.31)	(0.84)	(1.14)	(1.54)
All age groups	100.0	100.0	100.0	100.0

The latter is evident from the higher percentage of total health expenditures that these families had to pay themselves (see Table 6). In addition, one of the likely reasons for inpatient care accounting for a larger share of out-of-pocket expenditures—and for the proportions being directly related to the ratio of out-of-pocket expenditures to income (see Table 7)—is that families with disproportionately high out-of-pocket expenditures tend to have more inadequate coverage for inpatient care services than all families, even though the coverage for such services traditionally has been the most widespread and comprehensive.

SOURCE OF PAYMENT

Families with high out-of-pocket expenditures in relation to income relied to a greater extent than all families not only on their own resources but also on Medicare to pay for their health care (Table 9).

Table 6: Mean Annual Total and Out-of-Pocket Health Services Expenditures for All Families and for Families with Out-of-Pocket Expenditures Exceeding 5, 10, and 20 Percent of Family Income (NMCES Household Data, 1977)

	Percent Distribution (Standard Error)			
		Families with Out-of-Pocket Expenditures Exceeding Specified Percentage of Family Income		
Type of Expenditure	*All Families*	*5 Percent or More*	*10 Percent or More*	*20 Percent or More*
Total expenditures	$1339.71	$2820.79	$3539.23	$4203.06
	(25.76)	(90.12)	(152.85)	(278.84)
Out-of-pocket expenditures	$ 411.92	$1059.39	$1355.88	$1733.59
	(8.19)	(25.76)	(42.32)	(83.70)
Out-of-pocket as a percent of total	30.7	37.6	38.8	41.2
	(0.65)	(1.05)	(1.43)	(2.48)

Whereas the proportion of total health expenditures paid directly by families was 30.7 percent among all families, it was 41.2 percent for families with out-of-pocket expenditures exceeding 20 percent of income. Similarly, the proportion of the total bill paid by Medicare was 15 versus 28 percent, respectively. Correspondingly smaller shares of the total expenditures of families with disproportionately high out-of-pocket expenditures were paid by private insurance, Medicaid, and "other payers," which include federal sources such as the military and the Veterans Administration, and state, county, and city payers, as well as private philanthropy and union clinics. This suggests that families with high out-of-pocket health care expenditures in relation to income, to the extent that they had any third-party coverage, were less likely to have either Medicaid or private insurance, while they were more likely to have Medicare coverage.

DISCUSSION

The findings from this analysis of NMCES data are similar to those reported by Kasper, Anderson, and Brown [4] on the characteristics of families that in 1970 had out-of-pocket health care expenditures exceeding 15 percent of income. Similarly, the inference from these data—that families with high out-of-pocket expenditures relative to their income are for the most part low-income and inadequately cov-

Table 7: Percent of Total and Out-of-Pocket Health Care Expenditures Represented by Expenditures for Inpatient Care Services, for All Families, and for Families with Out-of-Pocket Expenditures Exceeding 5, 10, and 20 Percent of Family Income (NMCES Household Data, 1977)

	Percent (Standard Error)			
		Families with Out-of-Pocket Expenditures Exceeding Specified Percentage of Family Income		
	All Families	*5 Percent or More*	*10 Percent or More*	*20 Percent or More*
Percent of *total* expenditures represented by inpatient care services*	58.0 (0.80)	65.6 (1.09)	70.2 (1.48)	73.5 (1.98)
Percent of *out-of-pocket* expenditures represented by inpatient care services*	23.0 (0.94)	36.5 (1.40)	45.6 (1.91)	54.3 (2.49)

*Expenditures for inpatient care services include amounts spent on hospital services, inpatient physician visits, and all other inpatient services.

ered by third parties—is consistent with the findings in a report by Howell, Corder, and Dobson [16] based on NMCUES, that compares out-of-pocket expenses for Medicaid recipients and other low-income persons to those of the general population.

In this section the findings are discussed in terms of their implications for three areas: shielding all families from financially catastrophic health care expenditures; catastrophic coverage under the Medicare program; and the definition of a catastrophic health care expenditure.

SHIELDING FAMILIES FROM FINANCIALLY CATASTROPHIC EXPENDITURES

Catastrophic health coverage proposals and programs are designed to protect families from facing out-of-pocket health services expenditures that exceed the family's ability to pay. However, behind most of these catastrophic proposals and programs is the more narrow—and not always explicitly stated—goal of protecting families or individuals who had such high *total* health services expenditures that the deductibles, copayments, and services not covered by third parties add up to a considerable sum, creating severe financial hardship. In other words, they are meant to be "stop-loss" catastrophic insurance programs geared to the kind of high-cost health care expenditures that are usually

Table 8: Percent Distribution of All Families and Families with Out-of-Pocket Expenditures for Health Services Exceeding 5, 10, and 20 Percent of Family Income, by Levels of Annual Out-of-Pocket Expenditures (NMCES Household Data, 1977)

	Percent Distribution (Standard Error)			
		Families with Out-of-Pocket Expenditures Exceeding Specified Percentage of Family Income		
Annual Out-of-Pocket Expenditures	*All Families*	*5 Percent or More*	*10 Percent or More*	*20 Percent or More*
< $200	47.6	9.7	8.2	8.2
	(0.67)	(0.63)	(0.83)	(1.16)
< $500	75.3	34.0	28.6	26.5
	(0.53)	(0.95)	(1.36)	(1.82)
< $1000	90.4	63.1	53.4	46.4
	(0.34)	(1.04)	(1.29)	(2.03)
< $1500	95.3	79.3	68.9	59.5
	(0.22)	(0.87)	(1.26)	(2.32)
< $2000	97.4	88.0	79.6	69.9
	(0.17)	(0.81)	(1.32)	(2.20)
≥ $4000	0.5	2.4	4.9	9.5
	(0.06)	(0.31)	(0.57)	(1.21)

associated with certain cancers, open heart surgery, critically ill infants, and major trauma resulting from automobile accidents.

For the small proportion of families that experience catastrophic health care expenditures because of incurring costs high enough to exceed insurance coverage limits, stop-loss coverage is both needed and desirable. However, the findings reported here suggest that for the remaining, great majority of families with catastrophic health care expenditures, stop-loss insurance is not the protection needed. Even among families with out-of-pocket expenditures representing more than 20 percent of family income, one-fourth had out-of-pocket expenditures of less than $500, and nearly 60 percent had expenditures below $1,500. Those relatively small amounts proved burdensome to a large proportion of the families because of low incomes: only 6 percent of these families had annual incomes over $12,000, whereas among *all* families 54 percent had incomes above that level. For many of these families with high out-of-pocket expenditures in relation to income, the problem was no doubt compounded by the lack of adequate coverage, either public or private, that would account in part for the disproportionate share of these families' out-of-pocket expenditures that went to

Table 9: Percent Distribution of Amounts Paid for Health Services of All Families and Families with Out-of-Pocket Expenditures for Health Services Exceeding 5, 10, and 20 Percent of Family Income, by Source of Payment (NMCES Household Data, 1977)

	Percent Distribution (Standard Error)			
		Families with Out-of-Pocket Expenditures Exceeding Specified Percentage of Family Income		
Source of Payment	*All Families*	*5 Percent or More*	*10 Percent or More*	*20 Percent or More*
Family	30.7	37.6	38.3	41.2
	(0.65)	(1.05)	(1.43)	(2.48)
Private insurance	34.6	27.5	24.1	20.6
	(0.93)	(1.23)	(1.74)	(2.84)
Medicare	15.0	23.0	27.1	28.0
	(0.85)	(1.48)	(2.14)	(3.20)
Medicaid	8.6	3.8	3.4	3.0
	(0.72)	(0.42)	(0.60)	(0.80)
Other payers	8.8	5.3	4.2	3.6
	(0.60)	(0.58)	(0.51)	(0.66)
Unknown	2.3	2.7	3.0	3.6
	(0.25)	(0.41)	(0.48)	(0.83)
All payers	100.0	100.0	100.0	100.0

inpatient care—the one area most likely to be covered when there is any coverage at all.

In fact, from the description that emerges from this analysis, most families with high out-of-pocket health services expenditures relative to their income resemble very closely the medically indigent and the uninsured who are currently the focus of much attention. This is particularly noteworthy, because in 1986, the proportion of the population that qualifies for both the catastrophic label and the medically indigent one can be expected to have increased substantially since 1977. Not only has the proportion of families below the poverty level increased, but the eligibility rules for Medicaid have been tightened, so that a smaller proportion of those who are below the poverty level qualify for Medicaid [17, 18]. In addition, people without coverage have more limited options than ever. Hospitals and other providers of services are now noticeably less inclined to provide care to those who cannot pay,

even as many public hospitals and clinics that were the providers of last resort have had to close down or curtail their services during the past decade [19].

Those at the other end of the spectrum have also been affected by changes since 1977. Because individuals and families with relatively comprehensive insurance have faced a trend toward increased cost-sharing, a greater proportion of families will incur financially catastrophic expenditures when faced with a high-cost illness: their share of those large costs will more easily exceed their ability to pay. However, the greater need for some kind of stop-loss insurance for such cases should not divert attention from the large and growing need for very basic protection for most of those who incur high out-of-pocket expenditures in relation to their income.

CATASTROPHIC COVERAGE UNDER THE MEDICARE PROGRAM

The most visible proposals for catastrophic health coverage, both currently and in recent years, have been directed at Medicare beneficiaries. From the perspective of the findings described here, the concern for the Medicare population is justified. Families headed by someone over the age of 65 were found to be disproportionately represented among those with high out-of-pocket health services expenditures relative to family income.

On the other hand, given some of the other findings from this analysis—on the disproportionate number of low-income families that have catastrophic expenditures and the relatively small amounts that constitute most of the financially catastrophic expenditures—it is difficult to justify the proposal made repeatedly in the last few years, whereby stop-loss catastrophic coverage for Medicare beneficiaries is coupled with increases in premiums and cost-sharing. Increases in cost-sharing for Medicare are likely to expose many more low-income elderly families to out-of-pocket expenditures that exceed 10 or 20 percent of their income. Yet most of the amounts involved will be too small to qualify for stop-loss coverage.

Therefore, if Medicare beneficiaries—and, for that matter, the overall population—are to have truly catastrophic coverage, protection must be provided not only for cases that result from very large expenditures but also for the even more frequent cases where relatively small out-of-pocket amounts become major financial burdens because of low family income.

SPECIFICATION OF CATASTROPHIC THRESHOLD

Three alternative specifications of catastrophic health expenditures were used in this analysis, reflecting the continuing lack of consensus about the level of out-of-pocket expenditures in relation to income that best represents a catastrophic health expenditure. Unfortunately, the results of this analysis do not provide any clear reason to choose among the three levels. It is true that as the percent of income represented by out-of-pocket expenses increases, many characteristics of the families become more accentuated. For example, it becomes more likely that the families will be lower-income; that they will be headed by someone over 75 years of age or by someone who is not employed; and that these families will pay for a higher percent of their inpatient care from their own pockets. But these differences among the three overlapping groups are in degree and not in kind, and therefore do not provide any obvious basis for a cut-off point. Even in the absence of more clear-cut differences, however, the results presented here can contribute to a more informed judgment by policymakers regarding the level that best reflects an unbearable financial burden for all families.

APPENDIX

CALCULATION AND INTERPRETATION OF RELATIVE ERRORS OF ESTIMATES

The statistics presented in this report are based on a sample of the U.S. civilian noninstitutionalized population, and they will differ somewhat from the figures that would have been obtained from a complete census of the same population. Each possible sample provides a set of estimates, and these estimates will vary from sample to sample. The variability among the estimates from all the possible samples which could have been selected is defined to be the standard error of the estimate, or the sampling error. The chances are about 68 out of 100 that an estimate from the sample would differ from a complete census by less than the standard error. The chances are about 95 out of 100 that the difference would be less than twice the standard error and about 99 out of 100 that it would be less and 2½ times as large. For this report, standard errors were calculated for each estimate using a Taylor Series approximation, taking into account the complexity of the sample design.

Based on the standard error, the *relative error* of each estimate can

be calculated. The relative error is given by the coefficient of variation (*cv*) of the estimate, defined as the standard error of the estimate divided by the estimate itself. For example, the *cv* for the estimate of the percent of families with out-of-pocket health services expenditures less than 5 percent of family income (Table 1) is:

$$cv = 0.45/79.5 = 0.0057$$

A *cv* of 0.0057 is considered quite small and the estimate a reliable one. As a general rule of thumb, estimates are considered fairly reliable if the *cv* is less than 0.2

A more detailed description of how standard errors were calculated is provided elsewhere [20], along with a discussion of the formation of confidence intervals and the evaluation of differences between estimates.

FAMILIES WITH NEGATIVE OR NO INCOMES

Of the 14,615 families in the NMCES public use data file, 43 reported negative incomes and another 43 no income at all. Although the 86 families are included in the totals that refer to all families, obviously it is not possible to calculate the percent of their family income represented by out-of-pocket expenditures for health services.

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