# Covering the Uninsured: Estimates of the Impact on Total Health Expenditures for 2002

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## ABSTRACT

This study estimates the change in national health expenditures that would result if all uninsured persons in the non-elderly population were given health insurance coverage. Our analysis assumes that, after adjusting for individual characteristics, the uninsured, when given coverage, would spend the same for health care as the previously insured. We find that expanding public coverage would have cost $38.1 to $41.3 billion in 2002, while expanding private coverage would have cost $53.8 to $67.4 billion. These estimates are adjusted for uncompensated care and administrative costs. Public coverage is less costly than private coverage because of lower provider reimbursement rates.

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## Introduction

In 2000, an estimated 61.7 million non-elderly persons in the United States were uninsured for hospital and physician services at some point during the year. This represents 25.9 percent of the non-elderly population. More than half of these people, 31.5 million, were uninsured for the entire year (Rhoades et. al. 2002). Lack of insurance is associated with less use of preventive care services, delayed diagnosis and treatment of medical conditions, and poorer health outcomes (IOM 2002). The estimated cost of expanding insurance coverage to this large group of uninsured persons is certain to play a major role in the evaluation of any comprehensive reform proposal. It is also a benchmark against which to evaluate the costs of smaller incremental proposals. No matter what the details are of any plan to cover the uninsured, extending coverage to this group will increase their use of services. The aggregate increase in health care costs can be estimated based on the experience of privately insured and publicly insured persons, after adjusting for differences in age, health status, and other variables.

The purpose of this study is to provide estimates of the change in total health expenditures and the net social cost of expanding access to health insurance coverage to the entire non-elderly population. The emphasis of our study is cost rather than plan design. We estimate the change in total health expenditures that would result if all uninsured persons were given access to a "typical" private group policy or made eligible for a "typical" Medicaid program. The basic assumption behind our estimates is that after adjusting for observable individual characteristics, the uninsured, when given access to insurance, would spend the same for health care as persons who previously had access to coverage. This information should be useful to policymakers who

address the problem of lack of health insurance in the United States.

The aggregate cost of a comprehensive reform depends, critically, on whether the reform extends a typical private plan or a typical Medicaid plan to the uninsured. Public coverage is much less expensive in terms of overall costs than private coverage simply because Medicaid reimburses medical care providers at a significantly lower rate than do private insurers. Our analysis shows that persons with Medicaid and other public plans pay an average of 60.2 percent of total charges while the privately insured pay an average of 81.4 percent of total charges. The difference in reimbursement rates results in a large difference in total aggregate costs of covering the uninsured under public and private plans.

An important part of any estimate of the cost of covering the uninsured is an estimate of the amount of uncompensated care already received by the uninsured. Since these costs are already being incurred on behalf of the uninsured, they must be deducted from a final estimate of total new costs. If the uninsured were given coverage they would not need the free or uncompensated care previously received and these funds would be freed up. The newly freed funds might be applied towards the health system reforms needed to provide coverage to the uninsured. A recent report finds that the uninsured received a total of $34.5 billion in uncompensated care in 2001 (Hadley and Holahan 2003). This total includes $18.8 billion of care for which an explicit payment was made on behalf of an uninsured person and $15.8 billion of in-kind care. Following their methodology, we estimate the cost of in-kind care received by the uninsured and deduct this from our final estimates. Finally, as a last step in our calculations, we add the cost of administering public and private health insurance programs to produce estimates of the net cost to society of expanded coverage.

A central issue in estimating the cost of covering the uninsured is measuring the true impact of health insurance coverage on the use of health care services. Lack of health insurance is related to access and affordability issues as well as unmeasurable differences between individuals in health status, preferences for medical care, attitudes toward risk, and other factors. Although we can control for many variables, there are still unobservable variables that are correlated with both insurance status and health expenditures. In more specific terms, individuals and families are more likely to become insured if they believe that they will use health care services. Conversely, individuals are more likely to go without coverage if they anticipate they can do without health care services. Econometric models which do not account for the possibility of unobserved differences across individuals in their propensity to use services are likely to overstate the impact of insurance on health expenditures and thus overstate the cost of extending coverage to the uninsured.

In our analysis we attempt to adjust for unobserved differences between the insured and the uninsured populations by defining insurance status in terms of both actual coverage and presence of an offer of private insurance or eligibility for public coverage. This measure of insurance is less endogenous with use of health care services since we include persons with offers and eligibility among the insured. Given the importance and difficulty of accounting for unobserved differences in the propensity to use health care services, we estimate two econometric models where the first model produces a lower bound estimate by controlling for selection effects and the second model produces an upper bound estimate of the cost of covering the uninsured without these controls.

**Data**

The primary data for our study are from the 1996 through 1998 Medical Expenditure Panel Surveys – Household Component (MEPS). The MEPS is sponsored by the Agency for Healthcare Research and Quality and is designed to provide annual estimates of health care use, spending, sources of payment and insurance coverage for the U.S. civilian, non-institutionalized population. The MEPS data also contain detailed information on insurance status, socioeconomic variables, health and disability status, medical conditions as well as employment characteristics. The MEPS uses an overlapping panel design in which data are collected through a preliminary contact followed by a series of five rounds of interviews over a two and a half year period. Each year a new two year panel is begun.

For this study we pool three years of MEPS data in order to increase the sample size. We use the 1996, 1997 and 1998 full year files. The study population is restricted to persons who are less than 65 years old, and who were not covered by Medicare in any month. The study sample includes all persons who were in the survey for the full 12 months of any given year and have a positive full-year weight for that year. Also included are newborns, decedents, and some others who were not in the survey for 12 months, but who have a positive full-year weight. Our total sample is 70,289 person-year observations. Many persons are included in the sample twice since they were followed by MEPS for two years and this somewhat reduces the effective size of the sample. However, we adjust for the complex sample design using the appropriate strata and primary sampling unit variables in all of our statistical analyses. These survey adjustments also correct for correlation across time between the two records for a given individual (Sommers 1994 and Williams 2000).

*Aging the Data*

To produce current cost estimates we aged the three years of MEPS data to 2002. The process of aging the data comprised two separate steps. First, we used the March 2002 CPS to adjust the MEPS person-level sample weights to reflect changes that occurred in the U.S. non-institutionalized population. All individuals in the MEPS and the CPS are placed into cells based on age, race, sex, poverty status and census region.[1] Population calibration factors are computed for each cell by dividing the CPS weighted population by the MEPS weighted population. These factors are used to multiply MEPS sample weights so that the weighted cells equal the 2002 CPS weighted cells. Since we have three years of data, we then divide each sample weight by three so that the final population is equal to the final CPS population.

The second step in the aging process is a calibration of expenditures in the re-weighted MEPS file to match the growth rates of the National Health Accounts (NHA).[2] Aging the MEPS population to the 2002 CPS increases medical expenditures a small amount but further calibration is needed to reflect the growth rates observed in the NHA. Expenditure calibration factors are calculated for 63 cells which are defined by seven major types of health care services and nine sources of payment. The calibration factor for each cell is calculated as the growth rate in NHA expenditures from a sample year to 2002 divided by the growth rate in MEPS expenditures between the original sample and the population-aged MEPS. These calibration factors are then

[1] We did not control for insurance status when we aged the data because the MEPS and CPS estimates of the uninsured are not directly comparable. In spite of not controlling for insurance status, however, the trends in our aging process and in CPS data are quite similar.

applied to expenditures in the population aged MEPS. This process ensures that the growth rates in expenditures match the expenditure growth rates predicted by the NHA.

*Defining Insurance Status*

One of the main analytic goals of the MEPS is to capture detailed information about insurance status and related variables such as employer offers of insurance. Coverage is measured on a month by month basis. We make use of this detailed information to define insurance status in two distinct ways. The first measure of insurance distinguishes our "lower bound" regression model and is designed to be less correlated with unobserved propensities to use health care services than a measure based only on actual coverage. For this model, we define insurance status based on both coverage and the presence of an offer of insurance or eligibility for public coverage. In all cases insurance is defined as coverage that includes both hospital and physician care.

Insurance categories are hierarchical and mutually exclusive and are defined, in order, as private group insurance, private non-group insurance, Medicaid, and uninsured. The private group insurance category includes persons who were covered by private group insurance for at least one month of the year. It also includes persons who had offers of private insurance, but who were uninsured for the entire year. Some persons who were covered for part of the year with private group insurance were uninsured for the rest of the year. Others were covered by private non-group insurance or a public policy for the rest of the year. Similarly the Medicaid category

[2] Our expenditure calibrations use methods developed by Julie Hudson, John Moeller and Tom Selden to project MEPS expenditures. For more details see AHRQ 2002.

includes all persons who were covered by Medicaid for at least one month of the year. It also includes persons who were deemed eligible for Medicaid, but were uninsured for the entire year. The uninsured category for this "lower bound" model is limited to individuals who did not have coverage in any month, who did not have an offer of private insurance, and who were not eligible for Medicaid.

We also use a second measure of insurance status that defines our "upper bound" model. This measure is based mainly on coverage status alone although we break out the uninsured population into four subgroups. As in our first measure, insurance categories are hierarchical and mutually exclusive. In addition to the private group, private non-group and Medicaid categories, we also define four categories of the uninsured: the part year uninsured who lacked coverage for less than six months, the part year uninsured who lacked coverage for 6 to 11 months, the full year uninsured who had offers or eligibility, and the full year uninsured without offers or eligibility. Included in the private group category are some individuals who had private group coverage for at least one month, but not the entire year, and who were covered for the full year by a combination of private group, private non-group and public plans. Included in the Medicaid group are persons who were covered by Medicaid for the full year.

Medicaid eligibility status is an important component for both of our measures of insurance status. We use Medicaid eligibility variables which were simulated for Selden (2004). The simulation determines eligibility for Medicaid and the State Children's Health Insurance Program (SCHIP) based on detailed analysis of family structure, income, and assets as of the first part of the year. The simulation determines eligibility for all children, age 0 to 18, and identifies parents who, through AFDC/TANF or medically needy programs, are jointly eligible with their

children. Women with pregnancy-related Medicaid eligibility are identified separately. Eligibility for children who join the survey after the first part of the year (mostly newborns) is determined using the pregnancy eligibility of the newborns' mothers and the eligibility of siblings who were present in round 1. Finally, all adults who received Supplemental Security Income in 1997 are deemed to be eligible for Medicaid.[3]

*Control Variables*

In addition to the insurance variables our models control for a wide array of family and individual characteristics. Family-level variables include the number of persons in the family, the highest level of education in the family, family income as a percent of the poverty line and an indicator variable that equals one if there were no adults in the family unit. Individual-level variables include: age, race, sex, indicators for decedents and for women between the ages of 15 to 44; census region and Metropolitan Statistical Area (MSA) status; and various measures of health and disability status: instrumental activities of daily living (IADL), activities of daily living (ADL), functional and activity limitations; perceived health status, and perceived mental health status.

We also control for chronic conditions. We classify all medical conditions in MEPS as chronic and acute following the method used in Hwang et. al (2001). Although we could make use of the detailed information MEPS collects on medical conditions and control for the number

[3] Our eligibility variables do no identify individuals who are eligible for Medicaid through optional state programs such as poverty level groups, state supplementary payment groups, and the medically needy group for aged, blind and disabled.

of chronic conditions or specific high cost conditions, we prefer to limit ourselves to an indicator variable that indicates the presence of any chronic condition. We take this approach because medical conditions are likely to be under-reported for the uninsured in comparison to insured groups in our data. All MEPS respondents are asked whether any condition is currently bothering them, or whether a condition has resulted in a bed day or a lost workday. In addition to questions that are asked of all MEPS respondents, however, conditions are also recorded in connection with health care utilization (i.e., a person who reports a physician office visit will be asked the reason for the visit). Since the uninsured use fewer services they may be less likely to report chronic conditions.

**Analytic Approach and Statistical Methods**

We estimate four part models of the impact of insurance status on total health expenditures. The first and second parts of the models are logistic regressions. Part one estimates the probability that a person has positive total health expenditures. Part two estimates the conditional probability that a person with positive health expenditures has inpatient expenditures. The third and fourth parts of the models are OLS regressions in which the dependent variable is the natural log of total health expenditures. Part three is estimated for individuals with positive expenditures, but no inpatient expenditures. Part four is estimated for individuals with inpatient expenditures.

Using the natural log of expenditures reduces the skewness of our expenditure distribution. This reduces the influence of outliers on our estimates and increases the precision of our estimates. Estimating two separate conditional expenditure equations allows us to account for

differences in the expenditure distributions between those with inpatient expenditures and those with outpatient expenditures only. Further, the separate equations allow insurance coverage, and other demographic and health status measures, to have different effects on conditional expenditures for these two groups.

Using the results from our models, predicted expenditures for each individual are calculated according to the following expression (Manning 1987):

$$E[\text{Expenditure}_i] = \rho_i[(1-\pi_i)\exp(x_i\beta_3)S_3(x_i) + \pi_i\exp(x_i\beta_4)S_4(x_i)]$$

where

$\rho_i = \Phi(x_i\beta_1)$ = estimated probability of any health expenditures
$\pi_i = \Phi(x_i\beta_2)$ = estimated conditional probability of inpatient expenditures given any expenditure
$\exp(x_i\beta_3)S_3(x_i)$ = estimated expenditures conditional on having outpatient expenditures only
$\exp(x_i\beta_4)S_4(x_i)$ = estimated expenditures conditional on having outpatient and inpatient expenditures
$S_3(x_i)$, $S_4(x_i)$ = smearing factors for conditional expenditure models

Estimating expenditures requires that we calculate two smearing, or retransformation, factors: $S_3(x_i)$, $S_4(x_i)$. Following standard practice we use the natural log of expenditures as the dependent variable in our conditional expenditure models. To be meaningful, however, results from these models must be retransformed from log dollars back to dollars. Duan (1983) proposed a robust, nonparametric smearing factor that produces consistent estimates for homoscedastic distributions. Manning (1998) and Mullahy (1998), however, show that in the presence of heteroscedasticity the smearing factor may be a function of some of the right hand side variables in the model and that ignoring heteroscedasticity may result in biased and misleading estimates.

In our models, we use Duan's basic method of estimating smearing factors as the mean of the exponentiated residuals from the conditional expenditure models. To account for heteroscedasticity, however, we follow Manning in extending Duan's method and estimating separate smearing factors for various sub-groups. In the part three expenditure equations sub-groups are defined by insurance status, gender and chronic conditions. In the part four expenditure equations sub-groups are defined by insurance status.

We estimate a lower bound model and an upper bound model that differ in how insurance status is defined. In the lower bound model we predict expenditures for the full-year uninsured with no offer or eligibility under three scenarios: the baseline scenario when they are uninsured, and two reform scenarios when they are given an offer of private insurance, and when they become eligible for Medicaid. In the upper bound model we predict expenditures for four subgroups of the uninsured: the part year uninsured for less than six months, the part year uninsured for more than six months, and the full year uninsured with and without offers and eligibility. As in the lower bound model we predict expenditures for all full-year and part-year uninsured under three scenarios: the baseline scenario when they are uninsured, and two reform scenarios when they are covered by full-year private group insurance and when they are covered by full-year Medicaid. All of our models include the demographic, health status, disability status and family-level variables described above.

By using offer and eligibility status in our lower bound model we use a measure of insurance status that is more plausibly exogenous than coverage alone, and is, therefore, less likely to be correlated with unobserved differences across individuals in their propensity to use health services. The regression estimate from our lower bound model will not overstate the

impact of insurance coverage on the use of services by the uninsured. The only disadvantage of this definition of insurance status is that our final results apply only to a subset of the uninsured population. For policy purposes we want to report on the costs of covering the entire uninsured population. So we scale up our final results, as explained in more detail below, to account for the part year uninsured and the uninsured with offers and eligibility.

Persons who were uninsured for a full twelve months without any offers of private coverage or eligibility for public coverage number 21.1 million persons in our aged 2002 data and form the core of uninsured with the least access to any other sources of coverage. In our lower bound model we limit our definition of uninsured to this core group and move the other groups of uninsured into insured categories. In our lower bound model we make the assumption that uninsured persons who turned down offers of insurance, delayed enrolling for public programs for which they were eligible, or were covered for part of the year had access to coverage and chose not to use it in part because they anticipated using few health care services. Grouping these persons with the insured reduces the estimated impact of insurance on use of health care services. Thus this model produces a lower bound estimate of the impact of expanded coverage on the cost of covering the uninsured population.

The upper bound regression model focuses on covering the total uninsured population including persons who were uninsured for short periods of time or who turned down offers and eligibility. The insured are limited to persons who were actually covered by insurance for the full year. The estimated impact of insurance on use of services, either private group insurance or Medicaid coverage, is larger when the insured groups are limited to full year insured. The assumption behind the upper bound model is that lack of insurance is mainly an exogenous

variable not subject to modification as a result of decisions and preferences of individuals. The upper bound model also assumes that an expansion of coverage to the uninsured implies that they would always take up the coverage. This contrasts with the assumption behind the lower bound model where an expansion of coverage means that offers or eligibility will be extended but not all uninsured persons will take up the coverage.

**Results**

In Table 1 we present baseline total and per capita health expenditures by insurance status. In this table the insured are defined as those covered by private group, private non-group, or Medicaid for the full year as defined above for the upper bound model. We break out the uninsured population into four categories, including part year uninsured for less than six months, part year uninsured for more than six months, full year uninsured with offers or eligibility and full year uninsured without any offers or eligibility. Per capita health expenditures vary across these seven groups in ways that illustrate how the groups might be expected to differ from one another. Persons insured for the full year by private group, private non group, or Medicaid coverage all have per capita expenditures above $2000 per person. Medicaid enrolled persons average $2404 per person, while private group insured average $2347 per person. Those with private non-group are slightly lower at $2155 per person. These figures stand in sharp contrast to those for the full year uninsured who spend less than half as much on average. The full year uninsured that turned down offers or eligibility spend $778 per person, while the full year uninsured without offers or eligibility average only $934 per person. Part year uninsured are a little closer to covered

populations in terms of their per capita spending, $1779 per person for those uninsured less than six months and $1350 for those uninsured six months or more.

*Demographic and Health Status Differences*

In Table 2 we present selected demographic and health status measures by three main categories of insurance status. In this table we focus on the core group of 21.1 million uninsured without offers and eligibility and compare them to persons with any private coverage or offer (184.4 million) and persons with any Medicaid coverage or eligibility (27.1 million). The private non-group category is not included in any tables for the rest of the paper. Compared to those in the private category the uninsured less likely to be children, and more likely to be young adults, Hispanics, Blacks and males. In addition, the uninsured are much more likely to have low levels of education and low family incomes than persons in the private group category.

Overall, according to several health measures, the uninsured are less healthy than those in the private category. The uninsured are more likely to be in fair or poor general health, fair or poor mental health, and more likely to have functional or activity limitations. The one exception to this pattern is the presence of chronic conditions. The data show that the uninsured are less likely to have one or more chronic conditions, and this pattern is true among both adults and children. As discussed above, however, we believe the uninsured tend to underreport medical conditions because they use fewer services than the insured.

To further investigate the association between health status and insurance status we ran logistic regressions on all of our health measures adjusting for age, sex, and race. The patterns highlighted above still hold. Compared with the private group insured, the uninsured are significantly less healthy by several measures except for the presence of chronic conditions

(results not shown). Because of this apparent reporting bias we use the indicator variable (presence of any chronic conditions) rather than more detailed chronic condition variables. Specifying models which count chronic conditions or which use indicator variables for specific conditions would bias results in the direction of making the uninsured appear healthier and less expensive to cover than they really are.

The core group of uninsured is much healthier, on the other hand, than those covered or eligible for Medicaid. Compared to the Medicaid population, the uninsured include are less likely to be children or Black, and are much more likely to be young adults, whites and male. The uninsured also have higher levels of education and income than the Medicaid population. The uninsured are less likely to report fair or poor general health, fair or poor mental health, disabilities, limitations as well as presence of chronic conditions. These patterns in health measures persist and grow more pronounced after adjusting for age, race, and sex in logistic regressions (results not shown).

*Per Capita Expenditures*

In Table 3 we present our simulated per capita expenditures. Table 3 summarizes the simulated effects of expansions of insurance to the total uninsured population, for both a private expansion as well as a public expansion of coverage. These simulation results are based on our upper bound model which may overstate the impact of insurance on use of services. For the entire uninsured population, including the part year and full year uninsured as well as those with offers or eligibility, the average per capita expenditures were $1217 in the baseline before any expansions of coverage. Health expenditures increase to $2302 per capita when we simulate an expansion of private coverage, an increase of 89.2 percent. Health expenditures increase to $1962

per capita when we simulate the expansion of Medicaid coverage, an increase of 61.2 percent. As mentioned earlier Medicaid expansions result in a smaller increase in expenditures because of the lower reimbursement rates that providers receive.

Simulated per capita expenditures vary considerably across different segments of the uninsured, however, and the core group of full year uninsured without offers or eligibility shows the largest percent increases in expenditures. Per capita expenditures for the core uninsured increase 204.6 percent to $2844 under a private expansion. In contrast, the full year uninsured who turned down offers or eligibility are simulated to have expenditures of just $1978 per capita under a private expansion. The simulation takes into account the fact that this group turned down available coverage, an indication that this choice was correlated with a lower demand for health care services among some in the group. The part year uninsured show smaller increases in per capita expenditures than either of the full year uninsured groups. Those who were uninsured for less than six months are simulated to increase their expenditures by just 14.0 percent to $2028 per capita.

Under an expansion of public coverage, the core group of full year uninsured without offers or eligibility would increase their health expenditures to $2421 per capita, while the full year uninsured with offers or eligibility would increase their health expenditures to $1685 per capita. Among those who were uninsured for less than six months, health expenditures are simulated to drop by 2.6 percent under an expansion of Medicaid coverage, from $1779 to $1732 per capita. This result reflects the lower reimbursement rates that Medicaid pays to providers. Some persons in the part year uninsured group were covered by private policies for much of the year.

*Adjustments for Uncompensated Care and Administrative Costs*

A recent report based on the same three years of pooled MEPS data as used in this paper, finds that the uninsured received a total of $34.5 billion in uncompensated care in 2001 (Hadley and Holahan 2003). For the majority of this uncompensated care, $18.8 billion, the MEPS records an explicit payment by a known third-party payer on behalf of the uninsured individual. Hadley and Holahan interpret any short-falls in these payments as contractual arrangements between insurers and providers, or as bad debt. The remaining $15.8 billion in uncompensated care is interpreted as in-kind care: care for which no payment, or an insufficient payment, is recorded in the MEPS, and for which no known third-party payer made a payment on behalf of the uninsured individual. This is the category of uncompensated care that we need to deduct from our aggregate estimates of the cost of covering the uninsured in 2002. In-kind services, by definition, are not fully compensated in the baseline, but would be compensated at the rate paid by a public or private insurer once all persons are insured.

To identify and place a value on in-kind care we generally adopt the methods used in Hadley and Holahan (2003). On average, privately insured individuals have total expenditures equal to 81% of their total charges. Hadley and Holahan (2003) use this percentage, along with total charge information to place a value on the in-kind care received by the uninsured. We modify their approach in two ways. First, we find that the payment to charge ratios vary by service so we use service-specific ratios to value uncompensated care. Second, we find that payment to charge ratios vary substantially across public and private payers. To estimate the net cost of Medicaid expansions, therefore, we use Medicaid payment to charge ratios to place a value on uncompensated care.

Using private insurance payment to charge ratios we find that the uninsured received $13.5 billion in in-kind care in 2002 (see Table 4). The majority, $9.15 billion, was received by the full-year uninsured and the remainder, $4.4 billion was received by the part-year uninsured (not shown). Using Medicaid payment to charge ratios we value in-kind care received by the uninsured in 2002 at $10.6 billion (see Table 4). Again the majority, $7.0 billion, was received by the full-year uninsured and the remainder, $3.6 billion, was received by the part-year uninsured (not shown).[4]

Another important consideration in estimating the cost of covering the uninsured is the administrative costs generated by new, or expanded, insurance programs. To incorporate new administrative costs into our estimates of aggregate net costs we begin by using NHA data to calculate the percentages of public and private health expenditures that are spent on administration of insurance programs. In 2000, the most recent year for which the data were available, government administrative costs were 4.5 percent of total public health spending. The net cost of private health insurance was 8.3 percent of private consumer health spending in 2000. Using these percentages we estimate that expanding Medicaid to cover all uninsured persons would result in new administrative costs of $3.1 to $3.3 billion (see Table 4). We estimate that expansion of private insurance would result in new administrative costs of $8.9 to $10.0 billion (see Table 4).

*Aggregate Expenditures Under Expansions in Coverage*

[4] When we use a payment to charge ratio of 0.81 to value all in-kind care our estimates of the value of uncompensated care for all uninsured ($15.6 billion), for the full-year uninsured ($10.7 billion), and for the part-year uninsured ($4.8 billion), are all very close to estimates in Hadley and Holahan (2003).

In Table 4 we present aggregate results from both our lower and upper bound models that incorporate adjustments for uncompensated care and administrative costs. To make the estimates from both models comparable, we scale up the results from our lower bound model to apply to the entire uninsured population, including part year uninsured and those with offers and eligibility. We first compute the ratio of the total expenditure change from the lower bound model ($33.3 billion) to the total expenditure change from the upper bound model ($40.4 billion) for the full year uninsured without offers or eligibility (figures not shown in tables). This core group of uninsured is defined as uninsured in both models. We then apply the resulting ratio of 0.82 to the results from the upper bound model which includes the entire population of uninsured.

Under an expansion of private insurance to the entire uninsured population we estimate that total health expenditures would increase by $ 58.4 billion under the lower bound assumptions or by $70.9 billion under the upper bound assumptions. After deducting uncompensated care and adding back in administrative costs the total net cost to the nation would range from $ 53.8 billion to $67.4 billion.

As previously mentioned an expansion of Medicaid coverage to the entire uninsured population would be less expensive than an expansion of private insurance because of the lower reimbursement rates paid by Medicaid to providers. Our final results show that expenditures on health care services would increase by $45.7 billion to $48.7 billion under such a scenario. After deductions for uncompensated care and the addition of administrative costs, the total net cost to the nation of an expansion of public coverage to the uninsured would range from $38.1 billion to $41.3 billion.

**Discussion**

Our final estimates provide important information for policymakers who address the problem of lack of health insurance in the United States. The total net costs for covering all of the uninsured represents a small fraction of total expenditures for health care. As shown in Table 1, total expenditures for the non-Medicare population under age 65 are $494.0 billion according to our aged MEPS data. Thus the total net cost of expanding private insurance to the uninsured represents an increase in total annual health expenditures of 11 to 14 percent. The total net cost of expanding public coverage to the uninsured represents an increase in total annual health expenditures of about 8 percent.

The actual cost of expanded coverage will depend on factors that are beyond the scope of our analysis. Our study makes no attempt to describe the plan design of the private or public insurance policies the uninsured would obtain for coverage, nor how these policies could be designed to minimize spending increases. We also do not address the issue of crowd out – individuals and families dropping private coverage and taking up public coverage in response to expansions in eligibility for public programs. Crowd out may result in cost-shifting across public and private insurers, and may also result in some increased costs. Finally, it is important to note that our study estimates changes in net social costs, but does not estimate the incidence of expanded coverage on various sources of payment for health care.

There are also methodological limitations to our analysis. A central assumption in our analysis is that after adjusting for individual characteristics, the uninsured, when given access to insurance, will spend the same for health care as persons who previously had access to coverage. There may, however, be unobserved characteristics such as attitudes toward risk and propensity to

invest in human capital which affect health expenditures and which vary systematically across insurance groups. In our analysis we have attempted to control for these unobserved variables by estimating both a lower bound and an upper bound model. Our lower bound model uses a measure of insurance status which is plausibly less correlated with unobserved propensities to use medical care services and thus avoids overstating the impact of insurance on utilization. To the extent that we have not perfectly controlled for systematic unobserved characteristics, however, our estimates may not reflect the true additional costs of covering the uninsured

We performed several sensitivity tests of our models to examine the robustness of our results. We estimated two part models to compare with the four part models. Two part models combine all persons with positive expenditures together, making no distinctions between persons with inpatient expenditures versus persons with ambulatory expenditures only. The two part model is not as flexible as the four part model in capturing the extreme tail of the distribution consisting of persons with very high expenditures largely caused by hospitalizations. As a consequence the estimated costs for covering the uninsured produced by the two part model are lower than those produced by the four part model. This increases our confidence in defining the upper bound results using a four part model. Further, the estimates of total spending increases that we report are very similar to estimates in a study by Hadley and Holahan (2003) which also used MEPS data but which made a number of different methodological assumptions.

We also tested the sensitivity of our results to different specifications of overall health status. Including more conditions variables makes the uninsured appear healthier and reduces the estimated cost of expanding coverage to them compared to the estimates we have presented. Dropping all measures of medical conditions, including our indicator of any chronic conditions,

makes the uninsured appear sicker and increases the cost compared to the estimates we have presented. Despite the limitations of our analysis, however, we believe the range of cost estimates we have defined with our lower and upper bound models are robust to many different specifications of the four part model.

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## Table One

**Baseline Health Expenditures by Insurance Status: Non-Medicare Population, 2002**

| Insurance Category | Population (millions) | Percent of Total Population | Total Expend. (billions) | Per Capita Expend. |
|---|---|---|---|---|
| **Total** | 242.3 | 100.0 | $494.0 | $2,039 |
| | (5.7) | | (15.1) | (48.3) |
| **Full-Year Insured** | | | | |
| Private Group | 149.4 | 61.7 | $350.6 | $2,347 |
| | (4.2) | (0.7) | (13.5) | (68.3) |
| Private Non-group | 9.5 | 3.9 | $20.5 | $2,155 |
| | (0.6) | (0.2) | (1.7) | (136.5) |
| Medicaid | 18.1 | 7.4 | $43.4 | $2,404 |
| | (0.9) | (0.4) | (3.1) | (135.5) |
| **Part-Year Uninsured** | | | | |
| < 6 months | 18.0 | 7.4 | $32.0 | $1,779 |
| | (0.6) | (0.2) | (1.8) | (84.6) |
| > 6 months | 12.9 | 5.3 | $17.4 | $1,350 |
| | (0.5) | (0.2) | (1.3) | (91.2) |
| **Full-Year Uninsured** | | | | |
| With offer or eligibility | 13.3 | 5.5 | $10.4 | $778 |
| | (0.5) | (0.2) | (1.0) | (68.1) |
| No offer or eligibility | 21.1 | 8.7 | $19.7 | $934 |
| | (0.8) | (0.3) | (1.8) | (83.7) |

**Source:** Authors' calculations from 1996-1998 MEPS Full-Year File Aged to 2002.
**Note:** 1. Some persons in the private group, private non-group, and Medicaid categories were covered for the full-year by combining part-year coverage from more than one source.
2. Standard errors are in parentheses.

## Table Two

**Demographic Characteristics and Health Status Measures by Insurance Status: Non-Medicare Population, 2002**

| | | Private Group[1] | Medicaid | Uninsured |
|---|---|---|---|---|
| **Population[2] (Millions)** | | 184.4 | 27.1 | 21.1 |
| **AGE** | 0 to 18 | 29.8* | 59.3* | 12.9 |
| | 19 to 30 | 17.6* | 15.7* | 35.1 |
| | 31 to 45 | 28.0 | 14.2* | 28.1 |
| | 46 to 64 | 24.5 | 10.7* | 23.9 |
| **RACE** | Hispanic | 11.1* | 28.2 | 29.2 |
| | Black | 11.0* | 26.1* | 14.1 |
| | White | 74.0* | 40.4* | 51.3 |
| | Other | 3.9 | 5.3 | 5.4 |
| **GENDER** | Male | 49.6* | 43.0* | 59.2 |
| **EDUCATION[3]** | | | | |
| | Less than HS | 5.8* | 37.8* | 24.9 |
| | HS Grad | 27.3* | 39.9 | 37.5 |
| | Some College | 22.9* | 14.8* | 18.5 |
| | College | 44.0* | 7.5* | 19.2 |
| **Vital Stats:** | Decedents | 0.18 | 0.63 | 0.36 |
| | Newborns | 1.14* | 3.59* | 0.16 |
| | Women 15 to 44 | 25.5 | 25.6 | 24.2 |
| **INCOME (% Pov Line)** | | | | |
| | LT 124% | 4.4* | 54.3* | 22.2 |
| | 125 to 199% | 13.5* | 29.8 | 31.1 |
| | 200 to 399% | 35.2* | 11.2* | 28.4 |
| | GE 400% | 46.8* | 4.8* | 18.3 |
| **Fair/Poor Health** | | 6.2* | 17.1* | 13.3 |
| **Fr/Pr Mental Health** | | 2.7* | 11.6* | 6.3 |
| **DISABILITY** | IADL | 0.65 | 4.1* | 0.86 |
| | ADL | 0.39 | 2.1* | 0.46 |
| **LIMITATIONS** | Functional | 4.2* | 8.5* | 6.3 |
| | Activity | 2.9* | 11.7* | 5.3 |
| **1+ Chronic Conditions** | | | | |
| | Adults | 38.4* | 47.4* | 25.9 |
| | Children | 17.3* | 18.2* | 12.3 |

**Source:** Authors' calculations from 1996-1998 MEPS Full Year File aged to 2002.

**Notes:** 1. The private group category includes persons with any private group coverage or offer. Medicaid includes persons with any Medicaid coverage or eligibility. The uninsured are persons with no coverage in any month, no private group offer, and no Medicaid eligibility.

2. Populations totals are given in millions. All other results are given as percentages.

3. Education is determined by the highest level of education of any person in the CPS family.

* $p < .05$ for difference with uninsured estimate

## Table Three
### Per Capita Simulation Results

| Sub-group of Uninsured | Baseline: Predicted Expenditure | Predicted Expenditure with Insurance | Expenditure Change | Percent Change in Expenditures |
|---|---|---|---|---|
| | | **with Private Group Coverage** | | |
| **All Uninsured** | $1,217 | $2,302 | $1,085 | 89.2% |
| **Part-Year Uninsured** | | | | |
| Uninsured < 6 months | $1,779 | $2,028 | $249 | 14.0% |
| Uninsured > 6 months | $1,350 | $2,128 | $779 | 57.7% |
| **Full-Year Uninsured** | | | | |
| with offer or eligibility | $778 | $1,978 | $1,200 | 154.2% |
| no offer or eligibility | $934 | $2,844 | $1,911 | 204.6% |
| | | **with Medicaid Coverage** | | |
| **All Uninsured** | $1,217 | $1,962 | $745 | 61.2% |
| **Part-Year Uninsured** | | | | |
| Uninsured < 6 months | $1,779 | $1,732 | -$47 | -2.6% |
| Uninsured > 6 months | $1,350 | $1,815 | $466 | 34.5% |
| **Full-Year Uninsured** | | | | |
| with offer or eligibility | $778 | $1,685 | $907 | 116.5% |
| no offer or eligibility | $934 | $2,421 | $1,487 | 159.3% |

**Source:** Authors' calculations using 1996-1998 MEPS Full-Year Files.
**Notes:** 1. All expenditures are given in 2002 U.S. dollars.

## Table Four
### Aggregate Simulation Results

| | Expenditure Change | Uncompensated Care | Administrative Costs (New) | Total Net Costs |
|---|---|---|---|---|
| | | **Private Insurance Expansion** | | |
| **Lower Bound** | $58.4 | ($13.5) | $8.9 | $53.8 |
| **Upper Bound** | $70.9 | ($13.5) | $10.0 | $67.4 |
| | | **Medicaid Expansion** | | |
| **Lower Bound** | $45.7 | ($10.6) | $3.1 | $38.1 |
| **Upper Bound** | $48.7 | ($10.6) | $3.3 | $41.3 |

**Source:** Authors' calculations using 1996-1998 MEPS Full-Year Files.
**Notes:** 1. Total net costs = expenditure change - uncompensated care + new administrative costs. For the part-year uninsured only new administrative costs associated with increased expenditures are included.
2. All results are given in billions of 2002 U.S. dollars.