AMERICAN INDIAN AND ALASKA NATIVE ELIGIBILITY AND ENROLLMENT IN MEDICAID, SCHIP, AND MEDICARE

ESTIMATING ELIGIBILITY AND ENROLLMENT: A METHODOLOGICAL AND DATA EXPLORATION

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ACKNOWLEDGMENTS

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[1] Kathryn Langwell, Project Director, was with Project HOPE when the contract began but is now employed at Westat.

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OVERVIEW AND OBJECTIVES

In September 2001, the Centers for Medicare & Medicaid Services (CMS) funded a two-year study to examine barriers to enrollment of AI/ANs in Medicaid, SCHIP, and Medicare (including the Medicare Savings Programs)[2] and to identify strategies that may be effective for increasing AI/AN enrollment into these programs. Historically, the primary source of health care services for AI/ANs has been the Indian Health Service (IHS). Additional funding is available through Medicare, Medicaid, and SCHIP when enrolled members obtain health services through IHS facilities. These programs constitute an important source of additional revenues for the IHS, which is funded at around 60 percent of the level needed to provide comprehensive services to AI/AN people.[3] Some limited studies have been conducted that suggest that under-enrollment may be a significant issue. Available research on AI/AN enrollment in public programs, however, is limited and the existing research does not provide the information that is necessary to identify whether, and to what extent, under-enrollment is a significant problem. The primary objectives of this study were to:

1. Estimate eligibility for, and enrollment of, AI/ANs in the Medicaid, SCHIP, and Medicare programs in 15 selected States.

2. Conduct in-depth case studies in 10 of the 15 States to identify both barriers to enrollment and effective strategies for addressing these barriers in order to increase program enrollment among AI/ANs.

The original objective of the quantitative component of this project was to develop estimates of AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare and to estimate the ratio of enrollment to eligibility by State and sub-State areas. However, significant data limitations were identified during the project and, as a result, the analysis conducted was primarily methodological to illustrate the effects of data and other issues that affect the feasibility of estimating AI/AN eligibility and enrollment in these programs.

The assessment of the feasibility of producing reliable estimates of AI/AN eligibility and enrollment focused on 15 States: Alaska, Arizona, California, Michigan, Minnesota, Montana, North Dakota, New Mexico, New York, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wisconsin. These States were selected for study based on AI/AN population as measured by the 2000 Census, Bureau of Indian Affairs Tribal Enrollment data, Indian Health Service Patient Users data, geographic diversity, diversity of State Medicaid and SCHIP programs, and presence

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[2] The Medicare Savings Programs are Federally mandated programs in which State Medicaid programs must pay some or all of Medicare's premiums, and may also pay Medicare deductibles and coinsurance, for people who have Medicare and limited income and resources. The programs include the Qualified Medicare Beneficiary (QMB), the Specified Low-Income Medicare Beneficiary (SLMB), the Qualifying Individuals-1 (QI-1), and the Qualified Disabled and Working Individuals (QDWIs) programs. Medicare Savings Programs enrollees, together with Medicare beneficiaries who receive their State's full Medicaid benefits, are often referred to as "dual eligibles."

[3] See Indian Health Service, *Level of Need Funded (LNF) Study, Cost of an Equitable Health Benefits Package for Indian People*, (Rockville MD: IHS December, 1999).

of significant urban Indian populations. Data availability and methods for developing AI/AN eligibility and enrollment estimates at the State level were examined for each of these 15 States, and analyses were conducted to produce best estimates of AI/AN eligibility and enrollment in the programs of interest and to assess the feasibility and limitations of these estimates. This report presents the results of the examination of data availability, methodological issues, and exploration of the feasibility of developing reliable estimates of the number of AI/ANs eligible for and enrolled in Medicaid, SCHIP, and Medicare.

STUDY DESIGN ISSUES

There are significant issues that affect the reliability and usefulness of the estimates of AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare. These include:

- The definition of the AI/AN population is different in different data bases used to generate these estimates. The 2000 Census data used to generate eligibility estimates includes multiple-race responses that appear to include a significant number of people that may have some AI/AN heritage but who are not members of federally-recognized Tribes. In addition, some concerns have been expressed about the possibility that the Census disproportionately miscounts the AI/AN population. Data on AI/AN enrollment in Medicaid, SCHIP, and Medicare are based primarily on self-reported primary racial identification or, in some cases, on eligibility worker observational reports. Some evidence suggests that misidentification of race in enrollment data may be a significant problem. The differences in definition and identification of AI/AN race between the eligibility estimates and the enrollment estimates have a substantial impact on the reliability and usefulness of the comparison of these estimates and estimation of the extent to which under-enrollment may be present in each program.

- The available data sources for these estimates are for different periods. This required that some data sources be projected or interpolated to a standard year. Again, the reliance on projections and interpolations introduces some degree of uncertainty as to the reliability of the estimates.

- The administrative data used to estimate AI/AN enrollment in Medicaid required a number of assumptions to be made in order to generate estimates. Estimates vary depending on the specific assumptions made and, therefore, have some inherent uncertainty that may affect the stability and reliability of the estimates.

- In addition, during the project, it was determined that the timeframe of the available data for SCHIP programs for most States was concurrent with start-up marketing and enrollment into the SCHIP program. Because of the data limitations and the timeframe problems, CMS decided not to present results of the SCHIP eligibility and enrollment analyses. Similarly, based on our analysis, CMS determined that it was not feasible to conduct sub-State analyses of AI/AN eligibility and enrollment into these programs. Reasons for this decision included the data issues described above, combined with the fact that Census data are not available for areas with small populations due to privacy requirements and inability to link Census ZIP Code and County level data precisely to Reservation areas. Other program issues that arose included a lack of data to estimate

eligibility for Medicaid medically needy programs, and limited and inadequate data to develop reliable estimates of AI/AN eligibility for disabled persons enrolled in the Medicare program.

Results of the estimations of eligibility and enrollment, and of the ratio of estimated AI/AN enrollment to estimated AI/AN eligibility, illustrate the substantial data problems discussed above. Although estimates can be made of the number of AI/ANs who are eligible for Medicaid, SCHIP, and Medicare, and estimates can be made of the number of AI/ANs who are enrolled in these programs, the ratio of enrollment to eligibility varies widely across definitions of AI/AN population. This is primarily a result of using self-reported Census data for the estimation of eligibility and the issue of definition of the AI/AN population as AI/AN only or as AI/AN only or in combination with other race(s), while estimates of enrollment in these programs are based on data that reports only primary race of enrollees. All of the data issues together resulted in a high degree of uncertainty and a low level of confidence in the separate estimates of AI/AN eligibility and AI/AN enrollment in Medicaid, SCHIP, and Medicare. Combining the eligibility and enrollment estimates in order to examine the extent of under-enrollment in each program by State (i.e., the "take-up rate") was even more problematic, given the low level of confidence in the individual eligibility and enrollment estimates. Examination of the take-up rates in the illustrative analyses indicates wide variation in results, depending on definitions of the AI/AN population used to generate eligibility estimates and other varying assumptions.

ALTERNATIVE APPROACHES TO DEVELOPING ESTIMATES

Problems with existing data sets that could be used to estimate AI/AN eligibility for Medicaid, SCHIP, and Medicare include a lack of precise data to identify respondents as members of Federally recognized Tribes, members of non-Federally recognized Tribes, and those who have some AI/AN heritage and maintain cultural and social ties to AI/AN communities. It might be possible to develop standard survey questions that could be used in all Federally funded surveys that would permit more precise identification of AI/AN race and group identification. If so, then future estimations of AI/AN eligibility could be improved. The second significant problem with existing data sets, with the exception of Census data, is that sample sizes are generally not large enough to produce sufficient numbers of AI/AN respondents to permit analyses that focus on subgroups of the AI/AN population and urban, rural, and Reservation level analyses to be conducted. Substantial expansion of survey sample sizes would be necessary to obtain the larger AI/AN samples that would permit the estimation of AI/AN eligibility for Medicaid, SCHIP, and Medicare for alternative AI/AN subgroups and for State and sub-State geographic units.

Given these limitations and the small likelihood that existing surveys could easily be modified to permit the desired analyses to be conducted, we identified two alternative approaches that were discussed with CMS that could provide more reliable information as to whether there is AI/AN program under-enrollment: 1) new data collection, or 2) meta-analysis of existing survey data sources.

New Data Collection

First, if the definition of the AI/AN population were narrowed to include only members of Federally-recognized Tribes, it might be feasible to undertake new data collection based on Tribal enrollment lists obtained from either individual Tribes or from the Bureau of Indian Affairs. This survey could be limited to a sample of those who live on or near Reservations, using methods similar to those employed to conduct the 1989 National Medical Expenditure Survey (NMES) Survey of American Indians and Alaska Natives (SAIAN). If Tribes were willing to provide the survey sample frame from Tribal enrollment lists, which include addresses of all enrolled members, it might be feasible to survey members of Federally-recognized Tribes living both on or near and off-Reservations in urban or non-urban areas. A similar approach could be used to survey members of Tribes who are not Federally Recognized, to the extent that these Tribes maintain Tribal enrollment lists with names and addresses. However, any approach that relies on Tribal agreement to provide sample frames from Tribal enrollment lists would likely require extensive negotiation to obtain approval of the survey participation with each Tribe – a potentially lengthy and resource-intensive process. Other approaches to a survey of members of federally-recognized or non-federally-recognized Tribes that included non-Reservation areas would be substantially more expensive because of the small size of the target population, although there might be some approaches that would be less resource intensive that would build on on-going data collection efforts.

Meta-Analysis of Existing Survey Data

A more feasible and less costly approach would be a meta-analysis of existing survey data. Such an analysis could provide aggregate estimates for the 15 study states of the enrollment/eligibility ratio (or take-up rate). There are at least three national survey databases that would be useful in such an endeavor – the Current Population Survey (CPS), the Survey of Income and Program Participation (SIPP), and the National Health Interview Survey (NHIS).[4] One of the advantages of using these survey data over Census or administrative program data is that the race coding relies on self-reports in the context of an in-person interview so that it is less likely to be "missing" or coded as "other." In addition, most of the national health surveys obtain data on program enrollment, as well as a wide array of data on income and assets, family structure, and work history that is needed to estimate eligibility for the three programs in which CMS is interested.

The most obvious limitation of these survey data sets is their sample sizes for AI/ANs. Preliminary tabulations of the March 2001 CPS indicate there are 462 sample AI/AN children aged 17 and under in the 15 study States and 93 sample AI/ANs age 65 and over in these States. (This is without the expanded sample that has been fielded specifically to enable studies of SCHIP enrollment.) NHIS has the same approximate total sample sizes and the yield of AI/ANs should be roughly comparable, although it is difficult to predict this precisely given the different sample design used for the two surveys. SIPP sample sizes would be somewhat lower, but – given the availability of certain data items (e.g., assets) – it would be worth exploring. These numbers are sufficient for estimating the percentage of persons eligible for each of the three

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[4] One could also consider use of the National Survey of America's Families (NSAF), the Medical Expenditure Panel 0Survey (MEPS), the Survey of Program Dynamics (SPD), and the Health and Retirement Survey.

programs for the 15 study States as a group. While the numbers are not large, using three different data sets to conduct the analysis would allow increased confidence in the findings. Depending on sample sizes, some States might have to be combined for purposes of estimation.

CONCLUSIONS

The objectives, methodologies, and results reported in this study illustrate the complexity and difficulties associated with estimating AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare. Lack of data sources that are comparable and consistent for estimating eligibility and enrollment are a major deterrent to producing reliable and valid estimates. In addition, the issue of alternative definitions of the AI/AN population in available data sources compounds the difficulties of estimation. The alternative strategies that might be considered for future research efforts include new data collection or attempts to use meta-analysis of existing survey data that potentially provide more consistent and comparable measures of program eligibility measures and program enrollment. However, designing and conducting a new survey would be a lengthy and costly process. Alternatively, conducting meta-analyses of data available from existing surveys might improve estimates, but would likely only be able to produce estimates for multi-State areas or at a national level, due to the small AI/AN population. This aggregation would limit the usefulness of the results and would not permit identification of States or sub-State areas where under-enrollment may be a substantial issue.

However, the analysis could provide more reliable estimates of AI/AN eligibility, enrollment, and the ratio of enrollment to eligibility at the national level that could be useful in assessing the extent to which under-enrollment exists, by program, and the characteristics of AI/ANs who are eligible but not enrolled. This information could provide a better foundation for designing programs that target specific segments of the AI/AN population for outreach and assistance.

OVERVIEW AND OBJECTIVES

OVERVIEW

In September 2001, the Centers for Medicare & Medicaid Services (CMS) funded a two-year study to examine the extent to which American Indians and Alaska Natives (AI/ANs) are enrolling in Medicaid, State Children's Health Insurance Programs (SCHIP), and Medicare. In addition, CMS was interested in identifying the factors that may create barriers to enrollment and strategies that could be effective in reducing barriers and facilitating AI/AN enrollment into these programs.

Historically, the primary source of health care services for AI/ANs has been the Indian Health Service (IHS). Established in 1955, the IHS provides services to AI/ANs within a three-part "I/T/U" health delivery system, through direct IHS facilities (I), Tribally-operated facilities (T), and Urban Indian facilities (U). Additional funding is available through Medicare, Medicaid, and SCHIP programs when enrolled members obtain health services through IHS facilities. These programs constitute an important source of additional revenues for the IHS, which is funded at around 60 percent of the level needed to provide comprehensive services to AI/AN

people.[5] It has been estimated that Medicaid and SCHIP programs account for as much as 40 percent of the annual budgets for some I/T/U clinics and hospitals.[6]

Some limited studies have been conducted that suggest that under-enrollment in these programs may be a significant issue. One recent study found, for example, that up to 78 percent of AI/AN elders were eligible for, but not enrolled in one or more public programs.[7] Available research on AI/AN enrollment in public programs, however, is limited and the existing research does not provide the information that is necessary to identify whether, and to what extent, under-enrollment is a significant problem.

OBJECTIVES OF THE STUDY

The primary objectives of the project – conducted jointly by BearingPoint, Project HOPE's Center for Health Affairs,[8] and Social and Scientific Systems, with assistance from six American Indian consultants and a nine-member Technical Expert Panel (TEP)[9] – were to:

1. Estimate eligibility for, and enrollment of, AI/ANs in the Medicaid, SCHIP, and Medicare programs in 15 selected States.

2. Conduct in-depth case studies in 10 of the 15 States to identify both barriers to enrollment and effective strategies for addressing these barriers in order to increase program enrollment among AI/ANs.

The original objective of the former, quantitative component of this project was to develop estimates of AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare and to estimate the ratio of enrollment to eligibility by State and sub-State areas. However, significant data limitations were identified during the project and, as a result, the analysis conducted was primarily methodological to illustrate the effects of data and other issues that affect the feasibility of estimating AI/AN eligibility and enrollment in these programs.

The assessment of the feasibility of producing reliable estimates of AI/AN eligibility and enrollment focused on 15 States: Alaska, Arizona, California, Michigan, Minnesota, Montana, North Dakota, New Mexico, New York, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wisconsin. These States were selected for study based on AI/AN population as measured by the 2000 Census, Bureau of Indian Affairs Tribal Enrollment data, Indian Health Service Patient Users data, geographic diversity, diversity of State Medicaid and SCHIP programs, and presence of significant urban Indian populations. Data availability and methods for developing AI/AN eligibility and enrollment estimates at the State level were examined for each of these 15 States, and analyses were conducted to produce best estimates of AI/AN eligibility and enrollment in the

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5 See Indian Health Service, Level of Need Funded (LNF) Study, Cost of an Equitable Health Benefits Package for Indian People, (Rockville MD: IHS December, 1999).

6 Covering Kids Communications Kit: Reaching American Indian and Alaska Native Kids, 2001.

7 R. Baca, Developing an Educational Outreach Strategy for Indian Communities: Final Report Albuquerque Service Unit Area, Indian Health Service, January 2001.

8 Kathryn Langwell, Project Director, was with Project HOPE when the contract began but is now employed at Westat.

9 Appendix A lists Technical Panel members and project consultants who contributed to the study.

programs of interest and to assess the feasibility and limitations of these estimates. This report presents the results of the examination of data availability, methodological issues, and exploration of the feasibility of developing reliable estimates of the number of AI/ANs eligible for and enrolled in Medicaid, SCHIP, and Medicare.

This project also collected qualitative data to identify barriers to enrollment in Medicaid, SCHIP, and Medicare, as well as to identify effective strategies to facilitate AI/AN enrollment in these programs. Site visits were conducted in 10 States: Alaska, Arizona, Michigan, Minnesota, Montana, North Dakota, Oklahoma, South Dakota, Utah, and Washington. In each State, interviews were conducted with Tribal leaders, Tribal health directors, IHS Area and Service Unit staff, State Medicaid and SCHIP officials, Urban Indian Health Center staff, State/County eligibility and outreach workers, and other organizations and individuals knowledgeable about AI/AN health care access issues. A separate Case Study Report has been prepared for CMS that summarizes the findings of the 10 State case studies that were developed based on the site visits and other information collected for that component of the project. [10]

PURPOSE AND STRUCTURE OF THIS REPORT

This report presents the results of the examination of data availability, methodological issues, and analyses conducted to explore the feasibility of developing reliable estimates of the number of AI/ANs eligible for and enrolled in Medicare, Medicaid and SCHIP.

Initially, the objective of this effort was to develop AI/AN eligibility and enrollment estimates for these three programs in the 15 states studied. [11] These estimates were to be at the State and sub-State areas (e.g., Reservations and/or counties). However, the serious data limitation and methodological issues that were identified during the study resulted in a determination that it was not feasible to develop reliable estimates of AI/AN eligibility and enrollment at any geographic area level. With agreement and input from CMS, the focus of this report was re-directed to describing and illustrating the data and methodological limitations that precluded the development of estimates of AI/AN eligibility, enrollment, and the extent to which under-enrollment may exist.

The remainder of this report is organized into three sections. In the next section, data and methodological issues for developing AI/AN eligibility and enrollment estimates are discussed. The following section presents illustrative estimates of eligibility, enrollment, and the difference between estimates of eligibility and enrollment, by State. The final section of the report discusses data and methodological strategies that might be pursued to improve the potential for developing reliable estimates of AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare.

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[10] *American Indian and Alaska Native Eligibility and Enrollment in Medicaid, SCHIP, and Medicare, Summary Case Study Report.* Prepared by BearingPoint for the Centers for Medicare & Medicaid Services under Contract no. 500-00-0037 (Task 5), December 5, 2003.

[11] See *Background, Issues, Data, and Key Informant Interview Findings for Selection of 15 States for CMS Study: American Indian/Alaska Native Eligibility and Enrollment in Medicaid, SCHIP, and Medicare.* Prepared by BearingPoint for the Centers for Medicare & Medicaid Services under Contract no. 500-00-0037 (Task 5), December 12, 2002.

DATA AND METHODOLOGICAL ISSUES

OVERVIEW

In this section, we describe study design issues that were identified early in the project and the approach that was developed to estimate AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare. Then, we discuss data limitations and methodological issues that were encountered and their implications for the feasibility of developing reliable estimates of eligibility, enrollment, and differences between these estimates.

STUDY DESIGN ISSUES

Three major issues were identified during the study design phase of the project that affected the analysis conducted, which are discussed below:

- The definition of AI/AN that would be used in the study.

- The time period that would be the basis for the analysis.

- The definition of sub-State areas for which estimates would be made.

Definition of the AI/AN Population to be Studied

Several alternative definitions of the AI/AN population could be used for this study and each alternative has implications for selection of databases that would be used and the methodological approach that would be selected for estimating eligibility and enrollment. These alternatives include:

- AI/ANs who are identified on IHS Patient User files (i.e., those who live on or near Reservations and/or who travel to IHS facilities to receive health services).

- AI/ANs who are members of Federally-recognized Tribes (reported on Bureau of Indian Affairs (BIA) data files), regardless of residence.

- AI/ANs who are members of Federally-recognized Tribes and who reside on or near Reservations (also reported on BIA data files).

- AI/ANs who self-identify race on Census 2000 files as American Indian or Alaska Native. This definition includes members of Federally-recognized Tribes, members of non-Federally-recognized Tribes, and others who report AI/AN race but are not affiliated with a Tribe.

Census 2000 also introduces an additional definitional complication. In previous Censuses, respondents were asked to self-identify as one primary race. Census 2000 offered respondents the option of indicating multiple racial backgrounds, if appropriate, and did not request that the respondent indicate primary racial identification. Thus, a decision to define AI/AN as only those who indicated AI/AN only would result in under-counting the AI/AN population by limiting the population only to those who are single-race. Alternatively, a decision

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to define the AI/AN population as all who indicated their race as either AI/AN only or AI/AN in combination with another race would likely over-count the population by including a number of people who may have had a distant ancestor who was AI/AN but who have little or no current identification with AI/AN culture or traditions. This issue was a substantial one since less than 2 million people reported AI/AN race on the 1990 Census, 2.5 million reported AI/AN race only on the 2000 Census, and over 4 million reported AI/AN race only or in combination with another race.

CMS indicated that it would prefer that the study offer the opportunity to examine, to the extent possible, each of these alternative (overlapping) AI/AN populations, without limiting the choice to one of these definitions. Consequently, a decision was made to develop eligibility estimates separately for those who reported AI/AN race only and for those who reported AI/AN race, either only or in combination with another race.

The definitional issue also affects the estimates of enrollment in Medicaid, SCHIP, and Medicare since the racial identifiers available on the source databases may be self-reported, or State or County eligibility workers may record their own assessment of an individual's race. While self-reported data may generally be assumed as accurate, racial data reported by an observer may have limitations. An IHS study regarding the accuracy of AI/AN race coding on death certificates found that, on average, about 11 percent of AI/AN deaths were miscoded as other races. Further, in some States, the miscode rate was as high as 47 percent.[12] However, the Medicaid, SCHIP, and Medicare data sources indicate only one race and do not include multiple racial identifications. As a result, it is more likely that the enrollment data sources represent primary AI/AN racial identification.

Timeframe

A central element of this project was amassing and analyzing multiple data sources for developing estimates of eligible and enrolled AI/ANs in Medicaid, SCHIP, and Medicare. A major issue for the design was identifying time periods for which all data sources were available and/or developing methodologies for controlling for variations in the time periods covered by different analytic files.

Ideally, all data sources for the estimates of AI/AN eligibility and enrollment would be available for the same time period. However, review of the many different sources of data found that this was not the case. For example, the key file for estimating the number of AI/ANs enrolled in Medicare is the linked 1999 IHS/Medicare enrollment database. In contrast, key data for estimating the Medicare-eligible AI/AN population come from both the 1990 and 2000 Census.

In order to develop the best possible estimates from this array of data, it was necessary to select a study year once the data sources had been finalized and initial estimates had been

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[12] See: Support Services International, Inc., *Methodology for Adjusting IHS Mortality Data for Inconsistent Classification of Race-Ethnicity of American Indians and Alaska Natives Between State Death Certificates and IHS Patient Registration Records.* Report prepared for the Indian Health Service: Rockville, MD: November 1996.

developed, and adjust all estimates to correspond to the study year. This decision was made in conjunction with the CMS Project Officer.

An additional issue related to the timeframe of available data affected the estimates of AI/AN eligibility and enrollment in SCHIP programs. The most current data sources available for SCHIP estimates were for 1999 and 2000. This period coincided with start-up of the SCHIP program in many States. As a result, these States reported very low overall enrollment in SCHIP and significant enrollment growth was observed over the 1999-2000 period, reflecting the impacts of small numerical increases in enrollment as the programs were introduced. This timing issue made it problematic to estimate reliable AI/AN enrollment numbers that would reflect the potential "steady State" enrollment of AI/AN children into SCHIP. With CMS agreement, a decision was made to forego estimates of SCHIP enrollment in any of the 15 study States.

Sub-State Areas

The original scope of work for this project included estimation of AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare for each of the study States and for sub-State regions within these States. Discussions with CMS about the sub-State estimates resulted in a decision to explore the feasibility of making estimates at the County level and at the Reservation level. However, as the estimation process went forward, it became apparent that credible County-level and Reservation-level estimates could not be produced. Most study States are predominately rural, with low population density. Individual County populations were very low in many cases and the number of AI/AN people who would be eligible and enrolled in the programs of interest was very small – sometimes in single digits. These very small numbers were problematic because of the necessity of ensuring individual privacy and the inherent instability of estimates based on small numbers.

Efforts to develop Reservation-level estimates were also unsuccessful. In part, this was because there is no unique mapping available from the U.S. Census between counties and Reservations. The Census Geography shows American Indian areas mapping only to blocks and to the Nation, but not to other geographic units.[13] Reservations may cross County and State borders and many Tribes have Trust Lands that are not on or adjacent to Reservations. Using the Census Bureau "Reservation" designation, many Reservations also have substantial non-AI/AN populations. For example, the Agua Caliente Reservation in California has 172 people who self-identify as AI/AN out of a total population of over 20,000. Other States do not have Reservations, even though they may have Trust Lands. For example, Oklahoma is a Tribal Designated Statistical Area with only one Reservation but with a substantial AI/AN population living throughout the State. Alaska also has only one designated Reservation but has 14 Alaska Native Regional Corporations and Alaska Natives reside in a large number of traditional villages throughout the State. These issues were discussed with CMS and a decision was made to limit the estimates of AI/AN eligibility and enrollment to the State-level.

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[13] U.S. Census Geography, accessed at http://factfinder.census.gov/home/ep/epss/census.geography.html.

STUDY METHODOLOGIES

The estimates of AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare that were to be developed, under the contract, included: (1) estimation of the number of AI/AN people eligible for each program, in each of the 15 States; (2) estimation of the number of AI/AN people enrolled in each of the programs, for each of the 15 States; and (3) comparison of the eligibility and enrollment estimates to assess whether under-enrollment was observed in each State. The methodology and data sources used for each of these analyses are described below.

Eligibility Estimates: Methods and Data Sources

The purpose of this analysis was to estimate eligibility of the AI/AN population for Medicaid, SCHIP, and Medicare at the State level for the 15 study States. In order to do this, data and methods were required to:

- Define the population of American Indians and Alaska Natives.

- Determine program eligibility.

- Construct estimates for each study State.

Each of these issues is described briefly, with a more detailed discussion of data sources and technical estimation approaches following the brief discussion.

Defining American Indians and Alaska Natives

As discussed above, the study population could be defined based on AI/AN self-identification or according to membership in a Federally-recognized Tribe. In addition, the 2000 Census data permit identification of those who indicated AI/AN as their only race and of those who indicated AI/AN race alone or in combination with another race. Our approach for the eligibility estimates was to use the number of people reporting AI/AN race only, who were estimated to be eligible for a program, as a lower bound estimate. The upper bound estimate was defined as the number of people reporting AI/AN race only or in combination with another race who were estimated to be eligible for a program.

Determining Program Eligibility

Each of the four programs[14] required a different set of data elements to model program eligibility criteria. To estimate eligibility for Medicaid and SCHIP, we gathered background information on program eligibility criteria and determination in each of the 15 States. This required collecting information on the income standards applied, methods used for measuring assets, rules concerning family composition and age, and any other pertinent program regulations. We also reviewed the substantial literature on estimating Medicaid and SCHIP eligibility using person-level survey data to gain insights on the general process of applying

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[14] For purposes of estimating program eligibility, we consider the Medicare aged and Medicare disabled as separate programs since the requirements are entirely distinct.

program eligibility criteria to large databases.[15] Because of the variability across States and between the two programs even within a given State, each State-program pair's eligibility rules were applied to the data in a separately constructed algorithm. Given data limitations, however, it was difficult to accurately reflect all eligibility requirements in these algorithms. As discussed below, we estimated upper and lower bounds where appropriate.

<u>Data Sources</u>

Because no single data source includes all of the required information, four different primary sources of data were used. Complete data from the 2000 U.S. Census were not available during the database development phase of this project. Aggregate population counts, however, from the 2000 Census were used as control totals. Each of the data sources used for the eligibility estimates is described in detail below.

Census 2000 Summary Data—100 Percent File

Certain types of population counts were available on the Census website. Specifically, we obtained population counts for the AI/AN population by sex and age (available in 1 to 5 year age increments) and poverty level for each County in the United States. Counties were aggregated to conform to the 1990 data (described below). Estimates were made separately based on "AI/AN only" responses and based on "AI/AN only or in combination with other races."

1990 Public Use Microdata Samples (PUMS)—5 Percent File

Person-level (micro-) data from the 1990 U.S. Census were purchased from the U.S. Census Bureau. The largest available data set is the 5 percent sample; the smallest geographic unit for which these data are available is the public use microdata area (PUMA)– a County or groups of contiguous counties with a population of at least 100,000 persons. The data set includes a wide variety of data items, including the following variables of interest:

- Age

- Family relationship variables

- Race

- Tribe

- Poverty status

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[15] See, for example, Davidoff AJ, Garrett AB, Makuc DM, Schirmer M. "Medicaid-eligible children who don't enroll: health status, access to care, and implications for Medicaid enrollment," *Inquiry* 2000 Summer; 37(2):203-18; Irvin C and Czajka J. *Simulation of Medicaid and SCHIP Eligibility: Implications of Findings From 10 States*. Final Report submitted to the Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services, August 16, 2000; Selden TM, Banthin JS, Cohen JW. "Medicaid's Problem Children: Eligible but Not Enrolled," *Health Affairs* 1998, 17(3):192-200; and Selden TM, Banthin JS, Cohen JW. "Waiting in the Wings: Eligibility and Enrollment in the State Children's Health Insurance Program," *Health Affairs*, 1999, 18(2):126-133.

- Disability indicator

- Employment status

- Social security income receipt

2000-2002 CPS

CPS data were obtained and used for benchmarking of the Medicare eligibility estimates and for estimating the number of elderly eligible for Medicaid in each State.

General Methodology

The basic approach to estimating program eligibility relied on the 1990 PUMS. Overall population counts were adjusted using published data available from the 2000 Census. For all data items, with the exception of income, the population and its characteristics were inflated to the 2000 population control totals. Thus, for example, we inflated the total number of elderly (65 years of age or older) AI/ANs according to 2000 counts assuming that the same proportion of elderly AI/ANs who reported receiving Social Security income in 1990 received such income in 2000. While this assumption may be somewhat crude, it was the only feasible approach without an undue use of resources. Estimates of the percent of persons at various poverty levels were updated using Census 2000 State and County estimates produced by the U.S. Census Bureau.

As discussed above, substantial differences in the count of AI/ANs occur depending on whether respondents were allowed to identify multiple races, as was done in the 2000 Census. Given these differences, we used the number of persons identifying as "AI/AN only" as a lower bound on all estimates of the size of the population and "any AI/AN" as an upper bound.

Basic Approach

The approach described here was used for most estimates described below. It involves no updating of the underlying parameter; rather, we applied 1990 parameter estimates to the 2000 population counts. The steps are as follows, using the percent of the elderly receiving Social Security income to illustrate:

1. Using 1990 data, create cells within each County or grouping of counties for AI/ANs defined by age*sex.

2. For age 65 or older cells, estimate percent receiving Social Security income for each cell (still using 1990 data).

3. Create identical age*sex cells for AI/ANs at the County level, using 2000 data.

4. Apply estimated percent to 2000 data cells – apply to each County within the 1990 groupings.

Updating Percent below Poverty Level

The method described here was used for updating the percent of persons living below the Federal poverty level. For each County or grouping of counties, the following was calculated by age group (<5 years; 5-17; 18+):

% in poverty (1998)

((% in poverty (1990)) X (% of AI/ANs in poverty (1990)) X (# AI/ANs (2000)))

An additional step was to derive estimates for the percent of persons living below different multiples of the Federal poverty level. Those used by States to determine Medicaid eligibility range from below 100 percent (for certain categorical eligibility) to as high as 300 percent of poverty.[16] Data from the 2000 Census were used to estimate relationships at the State level between 100, 125, and 200 percent of poverty.

Methodology for Estimating Medicare Eligibility

Aged

As discussed above, we derived upper and lower bound estimates for Medicare eligibility. The lower bound estimate uses 1990 Census micro-data to estimate the proportion of persons age 65 or older receiving Social Security income and applies that proportion to the 2000 counts of persons age 65 or older. The 1990 micro-data were used to estimate the proportion of persons receiving Social Security income because the 2000 micro-data were not yet available. We produced these estimates at the area level (i.e., areas are aggregations of counties and are the smallest geographic unit provided on the micro-data), as well as for each of the 15 states. We then tested the estimated percentages of the proportion of persons receiving Social Security income for each area (using a chi-square statistical test of significance at the 95 percent level of confidence) to see if variation across areas within a State was significant. If there was statistically significant variation, we used the area-level estimates where sample sizes allowed (defined as the number of observations being greater than 20). If sample sizes were too small to be reliable or there was no statistically significant variation across counties, the State-level proportion was used. Four of the 15 states had significant variation across areas in the estimated proportions (Montana, New Mexico, Oklahoma, and South Dakota). The upper bound estimate simply counts all persons age 65 or older using the 2000 Census data. Upper and lower bounds were estimated using, first, single and, then, multiple race reporting. Estimates were produced for persons reporting race as AI/AN only or as AI/AN only or in combination with other races.

Non-Aged Disabled

We used 1990 Census data to estimate the proportion of persons younger than 65 years old who were likely to be not working due to disability. This estimated proportion was applied to the 2000 population estimate for AI/ANs ages 21 to 64 years old. As with the Medicare elderly,

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[16] For example, the higher Federal poverty level used by Alaska in determining Medicaid eligibility was accounted for in this approach.

we used an area proportion where possible. We tested across areas within each State to see if the variation was statistically significant (again using a chi-square test). For the four States with no variation, we used the State average. For the other States, we used the area proportion unless there were fewer than 50 cases or the proportion was zero, in which cases we used the State proportion. Estimates were produced for persons reporting race as AI/AN alone or as AI/AN only or in combination with other races.

Modifications to Initial Approach to Estimating Medicare Eligibility

We conducted a number of tests to benchmark our estimates. With regard to the proportion of AI/ANs reporting receipt of Social Security income, we calculated for the 15 study States the percentage of the non-Hispanic White population reporting receipt of such income, for purposes of comparison. These proportions were uniformly higher for the non-Hispanic White population: the State averages among elderly AI/ANs were between 54 and 87 percent, compared to 85 to 92 percent among non-Hispanic Whites. It is not clear how much of these differences were due to actual differences versus differences in accuracy of reporting. In addition, during this phase of the analysis and, in particular, when examining initial program take-up rates, it became clear that estimates of the Medicare-eligible population (especially for the aged population) appeared to underestimate the true number of Medicare-eligible AI/ANs. Analysis of 2000-2002 CPS data for the 15 study states found that 91.9 percent of elderly AI/ANs were enrolled in Medicare, while only 82.7 percent were receiving Social Security, indicating that a proportion of AI/ANs were acquiring Medicare eligibility by other means than Social Security entitlement. In addition, in some instances, preliminary calculations yielded take-up rate estimates of several hundred percent, which also suggested that the Medicare eligibility estimates may be somewhat low. (Given the particularly low take-up rates we obtained for California, we analyzed the California Health Interview Survey data and estimated that 92.8 percent of elderly AI/ANs report being covered by Medicare.) In response to these findings, a decision was made to use Census population totals, rather than the estimates based on receipt of Social Security income, for calculating the take-up rate estimates.

Methodology for Estimating Medicaid and SCHIP Eligibility

Although the Federal government establishes general guidelines for the Medicaid program and for SCHIP, specific eligibility requirements are actually established by each State. Thus, eligibility information was gathered on a State-by-State basis and for a number of different eligibility groups. Within each State, Medicaid estimates were calculated separately for each of the following eligibility groups, while SCHIP estimates apply only to children:

- Children

- Pregnant women

- Parents

- Adults, not parents

- Aged (SSI)

We were unable to calculate estimates for medically needy individuals (individuals who have spent over a given percentage of their income on medical expenses) because there are no available data on medical expenditures for AI/ANs at the County level (or even the State level). SCHIP eligibility estimates were calculated separately in States that had a separate program, and are included in Medicaid estimates where the SCHIP program is a Medicaid expansion. For combined SCHIP/Medicaid programs (California, Michigan, New York, North Dakota and South Dakota), individuals are allocated to Medicaid or SCHIP depending on their specific eligibility.

Children

We obtained information on State Eligibility criteria for children for both Medicaid and SCHIP.[17] While there are relatively limited data available to make eligibility estimates, we based our calculations on population counts by age and relative to the Federal poverty level.

We used State and County level data from the 2000 Census to count the number of AI/AN children below the poverty level.[18] Separate estimates were made for the following age categories: 0-5, 6-15, and 16-17.

Two issues arose with respect to the poverty status data. First, since income (poverty status) data is only available from the Census long form, this information is based on a sample of persons rather then the population universe. The result is that there were many counties in which we had to work with small sample sizes. Depending on the sample size in a given County, we calculated weighted State/County poverty proportions for each of the age categories. If the population was small, the State portion of the proportion was weighted more heavily and if the population was large the County portion of the proportion was weighted more heavily.

The second issue with respect to the poverty status data is that, as of the time of our analysis, the Census Bureau had only released poverty status by race for below 100 percent of the Federal poverty level and greater than 100 percent of the Federal poverty level (rather than, for example, the number of persons between 100 and 125 percent of the Federal poverty level). Thus, we had to interpolate estimates of the number of children below other specific poverty levels (e.g., 200 percent of the poverty line). We developed an interpolation chart that allowed us to estimate the proportion of children in a given age for each of the specific Medicaid thresholds for each of the 15 States.

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[17] Medicaid figures were from Table 1: State Income Eligibility Guidelines from a study entitled "Making It Simple: Medicaid for Children and CHIP Income Eligibility Guidelines and Enrollment Procedures; Findings for a 50-State Survey." Center on Budget and Policy Priorities, The Kaiser Commission on Medicaid and the Uninsured, October 2000: http://www.kff.org/content/2000/2166/hjksmall.pdf. The SCHIP eligibility guidelines come from the Centers for Medicare & Medicaid Services website detailing the different states' children health insurance updated program information in their SCHIP Annual Reports: http://cms.hhs.gov/schip/charST99.pdf (ST: AK, AZ, CA, MI, WA, MT, SD, MN, ND, NM, NY, OK, WI, OR, and UT).

[18] Counts by sex, age, and poverty status were obtained from http://factfinder.census.gov at the County level. The downloaded table's name is listed as PCT75C. Poverty Status in 1999 by Sex and Age (AI/AN Alone) on the website.

The interpolation chart was based on our estimation of the continuous income or poverty status distribution for three groups: children less than 18 years of age; parents; and the age 65 or older population. We used the 2000 Census Supplementary Survey; the public use file contains approximately 300,000 observations, with the ratio of total family income to the Federal poverty level as a continuous variable. Because the number of observations for AI/ANs was limited, we pooled states into two groups: predominantly Reservation States (Arizona, Montana, New Mexico, North Dakota, South Dakota and Utah) and all other study States. Based on the estimated continuous distribution, we could estimate the proportion of the particular group falling between any two poverty status levels.

As an example of how the interpolation was used, we can look at Santa Cruz County, Arizona. In this County, the Census Bureau indicates that 45 percent of children age 0 to 5 are estimated to be under 100 percent of the poverty line. However, in Arizona children age 0 to 5 are eligible for Medicaid if they are under 140 percent of the poverty guideline. Based on our interpolation chart, the proportion of eligible children in the 0 to 5-age category is 54.9 percent. The proportions of children in each age category eligible for Medicaid are calculated using this methodology for each County. This same approach was also used to estimate the SCHIP proportions for the 0-17 age category.

We applied these new proportions to the Census 2000 population counts for the 0 to 18 age population data.[19] This results in the estimated number of AI/AN children in each specific age category eligible for Medicaid for each County in the 15 states. For the number of SCHIP eligible children we applied the proportion calculated above to the total population of children ages 0 to 18 and then subtracted the total number of children eligible for Medicaid. If the State did not have a separate SCHIP program, then the number of children eligible for SCHIP was left as 0 for counties in these States (i.e., the number was included with the Medicaid estimates).

Pregnant Women

Because there are no available data on the number of pregnant women, we used the 0-5 age category proportion to approximate the birth rate among AI/ANs. Instead of simply using 1/5 of children ages 0-5 under 100 percent of the Federal poverty level to estimate the proportion of pregnant women under 100 percent of the Federal poverty level, we used a slightly higher proportion (0.3) to account for miscarriages and abortions. After interpolating the proportion of pregnant women eligible for Medicaid in each State (based on the eligibility rules for each State), we applied the new proportion to the population of 0-5 year-olds.

Parents

We obtained information on State eligibility criteria for parents.[20] We used State and County level poverty estimates from the Census 2000 data[21] to calculate separate poverty

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[19] We used Summary File 1, PCT12C. Sex by Age for the AI/AN Alone population,

[20] Table 3: Countable Income-eligibility Thresholds and Earnings Disregards Policies, All Applicable Eligibility Categories from a study "Expanding Family Coverage: States' Medicaid Eligibility Policies for Working Families in the Year 2000." Center on Budget and Policy Priorities, February 2002: http://www.cbpp.org/1-2-02health.pdf,

[21] Summary File 3, PCT160C. Poverty Status in 1999 of Families by Family Type by Presence of Related Children under 18 Years by Age of Related Children for the AI/AN Alone Householder

estimates for married and single parents. The same methodology described above was used to overcome small sample sizes for certain counties. Depending on the size of the County population from this sample data, we calculated weighted State/County poverty proportions for single and married parents. If the population was small, the State portion of the proportion was weighted more heavily and if the population was large, the County portion of the proportion was weighted more heavily.

As described above, since the proportions calculated are based on 100 percent of the Federal poverty level, we used the interpolation chart described above to estimate the proportions based on the specific Medicaid thresholds for each of the 15 states. For instance, in Minnesota, married parents under 275 percent of the poverty guideline are eligible for Medicaid. Thus, using Wilkin County, Minnesota, as an example in which 11 percent of married parents are estimated to be under 100 percent of the poverty line, according to our interpolation method, 42.3 percent of married parents are under 275 percent of poverty and thus eligible for Medicaid. The proportions of single and married parents eligible for Medicaid are calculated using this methodology for each County.

We applied these new proportions to the Census 2000 counts of married and single parents.[22] This derives the estimated number of AI/AN race alone married and single parents for each County in the 15 States. Married parents in North Dakota, Utah, and Wisconsin were not covered in 2000 so the number of married parents eligible was left at 0 for counties in these States.

Adults, Not Parents

In 2000, Oregon was the only study State in which adults who are not parents were eligible for Medicaid. We used Oregon State and County level poverty estimates for the 18-64 age category from the long form (sample) Census 2000 data.[23] The same approach as described above was used to deal with small sample sizes in some counties. We based our estimates on the number of adults eligible, subtracting the estimated number of pregnant women and parents eligible in each Oregon County.

Aged

There are several ways in which the aged population can be eligible for Medicaid. Institutionalized elderly are eligible based on income, and some community-based elderly are eligible through State home and community-based waivers. For community-based elderly, other routes to eligibility are based on State-specific income standards and/or eligibility for Supplemental Security Income (SSI). Because of limited availability of the specific data items needed and small aged sample sizes, we used as a proxy for eligibility the proportion of AI/AN elderly receiving SSI. Estimates were based on the March 2000 Supplement to the CPS and the estimated proportion was then applied to the Census 2000 age 65 or older population data to derive the estimated number of AI/AN race alone elderly eligible for Medicaid for each County in the 15 states.

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[22] Summary File 1, P35C. Family Type by Presence and Age of Related Children for the AI/AN Alone Householder
[23] Summary File 3, PCT75C. Poverty Status in 1999 by Sex by Age for the AI/AN Alone

As with the Medicare estimates, two sets of Medicaid estimates were prepared: one for single AI/AN race identification and one for multiple race identification.

Enrollment Estimates: Methods and Data Sources

Upper and lower bound enrollment estimates were calculated for each of the programs of interest. Lower bound estimates were based on the result of direct individual-level comparisons of race/ethnicity codes reported in various administrative data files. In contrast, upper bound estimates attempted to account for additional AI/ANs that would have been identified if it were possible to directly verify the race/ethnicity of all Medicare, Medicaid, and SCHIP beneficiaries.

<u>Data Sources</u>

Multiple data sources were used to develop the enrollment estimates, described next.

Medicare EDB

The Medicare Enrollment Data Base (EDB) contains individual-level information on individuals enrolled in the Medicare program, including unique identification information (e.g., Social Security Number (SSN), name, address), demographics (e.g., age, sex, race/ethnicity, date of death), and program administrative information (e.g., reason for program entitlement, Part A/Part B enrollment, Medicare+Choice plan enrollment). We used the latest monthly unloaded EDB as of November 1, 2002. This file contains information on anyone ever enrolled in Medicare and historical information since they enrolled. From this file we extracted information for persons enrolled in Medicare on December 31, 1999, and living in one of the 15 study States.

Medicaid MSIS

The Medicaid Statistical Information System (MSIS) enrollment files for 1999 were used for developing estimates for Medicare, Medicaid, and SCHIP. The MSIS data files consist of four quarterly data files for each State. For each quarter, Medicaid enrollment is recorded on a monthly basis. Further, race/ethnicity and address are reported.

IHS Patient Registry File

The IHS Patient Registry File was a primary source for directly identifying AI/ANs enrolled in the three programs. This data file contains the cumulative set of records for individuals receiving IHS services. Individuals can (and often do) have multiple records in this file. The initial file provided by the IHS contained 4,594,589 records. This initial file was reduced to 2,640,132 records by eliminating duplicate/dummy records and records without SSNs.

SCHIP

There are three types of SCHIP programs: (1) expansions of existing Medicaid programs (five of the study States), (2) new stand-alone State programs (five of the study States), or (3) combinations of Medicaid expansion and stand-alone programs (five of the study States). Administrative data on expansion program enrollments were contained in the MSIS data files.

However, data on stand-alone SCHIP program enrollments were not centrally available through CMS. Instead, we obtained the SCHIP data directly from the 10 study States that had either a new stand-alone State program or a stand-alone program in combination with a Medicaid expansion. As indicated by the summary information in Table 1 for these 10 States, the data varied considerably in terms of level of detail across the States. As discussed in the following sub-sections, estimates of lower and upper bound SCHIP program enrollments were driven in part by the level of detail contained in these data.

Table 1. Summary of SCHIP AI/AN Data Available for Analysis for Study States with Stand-Alone SCHIP Programs

State	SCHIP Program Type	Years	Unit of Analysis	All State or AI/AN Only	SSNs
Arizona	Separate	Enrolled as of 12/1/02	Person	State	No
California	Combination	1999 and 2000	County	AI/AN only	No
Michigan	Combination	1999 and 2000	Person	State	No
Montana	Separate	1999-2002	Person	State	No
New York	Combination	Enrolled as of 12/02 and 04/03	Person	AI/AN only	Yes
North Dakota	Combination	1999 and 2000	Person	State	Yes
Oregon	Separate	1999 and 2000	Person	State	Yes
South Dakota	Combination	1999 and 2000	Person	State	Yes-2000, No-1999
Utah	Separate	1999 and 2000	Person	State	Yes
Washington	Separate	2000	Person	State	Yes

Notes: Arizona data include children enrolled in the SCHIP program as of 12/01/99; enrollment dates range from 1998 to 2002. New York data include children enrolled in the SCHIP program as of 12/2002 and as of 04/2003.

Lower Bound Estimates

Medicare

For Medicare, lower bound estimates were obtained based on the results of direct matches between the Medicare EDB, the IHS Patient Registry File, and Medicaid MSIS files. The EDB and IHS data were merged as part of an effort that was separate from this project. Beneficiaries in this file were coded as AI/AN if they were either coded as such in the original EDB or were recoded as AI/AN as a result of a match to the IHS data. Unfortunately, the race code from the IHS data was not added to the EDB, but instead the existing race code on the EDB

was overwritten. Therefore, it is not possible to determine the prevalence of race code discrepancies between the EDB and IHS data files.[24]

The second stage in creating these lower bound estimates consisted of matching Medicaid MSIS data to the merged EDB/IHS file by SSN. This was done to validate the race/ethnicity codes of dual eligible Medicare beneficiaries.[25] This match increased the number of Medicare beneficiaries identified as AI/ANs in the EDB by about 4 percent for the 15 study States.

Medicaid

In order to develop geographic-specific estimates of AI/ANs in Medicaid, it was necessary to make several decisions on place of residency, MSIS race/ethnicity coding, and definition of Medicaid enrollment, as follows:

- Place of Residence. We decided to use individuals' fourth quarter addresses from the MSIS files as their full year addresses. As noted above, up to four different possible residences could be reported in the MSIS for a given year. Therefore, in order to avoid counting individuals multiple times during a calendar year, it was necessary to uniquely fix the person to one place of residence.

- MSIS Race/Ethnicity Coding. We decided to use information from the MSIS fourth quarter (i.e., Q4) to set the baseline race/ethnicity of Medicaid enrollees. Race/ethnicity coding varied by about one to two percent across the quarterly MSIS files. Further, this variation did not appear to be systematic (e.g., going from unknown race in Q1 to Black in Q2). The selection of Q4 was consistent with our decision on place of residence information.

- Medicaid Enrollment. We defined Medicaid enrollees to include all individuals enrolled during December 1999. Medicaid enrollment status is reported on a monthly basis within the MSIS data. Because individuals changed status (in some instances multiple times) during a calendar year, it was necessary to determine a decision rule for what constitutes a 1999 Medicaid enrollment.

The lower bound Medicaid enrollment estimates were calculated using the same basic approach as was used for generating the Medicare lower bound estimates, except that the base file was comprised of the MSIS quarterly files instead of the EDB. The MSIS was supplemented with race codes from the IHS patient registry file and the EDB. Both the MSIS-to-IHS and the MSIS-to-EDB match were conducted in this study. All Medicaid beneficiaries (enrolled in December 1999 and not enrolled in Medicaid-SCHIP expansion programs) that were identified as AI/AN in either the MSIS, IHS, or EDB data files were considered to be AI/AN for the lower bound estimates.

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[24] A binary variable indicating whether a beneficiary was found in the IHS data this file was added to the EDB file. This field allowed us to calculate an EDB/IHS match rate, which was important for making upper bound estimates.
[25] An enrollee was considered an AI/AN if coded as such on either the Medicare EDB or Medicaid MSIS data files.

SCHIP

For SCHIP, the lower bound estimates were calculated based on SCHIP program type. For States with only Medicaid expansion programs, the same process as Medicaid was used for beneficiaries on the MSIS enrolled in the expansion program as of December 1999. For States with separate programs, the lower bound estimate calculation varied by State. For States not providing SSNs, the lower bound estimates were a direct count from the State-provided data. For States providing SSN, the lower bound estimate includes any person on the State file identified as AI/AN on the State file, the IHS patient registry, or the MSIS files. For States with combined programs (Medicaid expansion and separate State programs), two separate lower bound estimates were calculated – one for the Medicaid expansion using the same methods as States with only Medicaid expansion programs and one for the separate State program using the same method as States with only separate programs.

Upper Bound Estimates

Upper bound estimates were created by estimating the additional number of AI/AN beneficiaries that would have been identified if all AI/ANs within the study States had been confirmed by direct matching with other data files. For example, because only a portion of Medicare-enrolled AI/ANs use IHS services and are in the IHS files, the lower bound estimates were based on a partial validation of race/ethnicity coding contained in the EDB. As such, several approaches were explored for obtaining estimates of the number of additional beneficiaries that would have been identified as AI/AN.

Medicare

The upper bound Medicare estimates consist of three components: (1) the number of beneficiaries coded as AI/AN on the EDB (after the IHS Match), (2) the number of beneficiaries coded as non-AI/AN on the EDB, but matched to the MSIS with a race code of AI/AN (miscodes), and (3) estimates of the number of additional miscodes that would have been detected if all of the beneficiaries on the EDB were matched to an external data source. Or:

(1) $\text{AI/AN}_{\text{Lower Bound}} = \text{AI/AN}_{\text{EDB/IHS}} + \text{AI/AN}_{\text{MSIS miscodes}}$

(2) $\text{AI/AN}_{\text{Upper Bound}} = \text{AI/AN}_{\text{Lower Bound}} + (\text{est})\text{AI/AN}_{\text{Add miscodes}}.$

The first two components are identical to those in the lower bound estimates. The third component was calculated by using the results of the EDB-to-MSIS match to identify (a) the number of beneficiaries coded as AI/AN on the EDB that matched the MSIS (confirmed), (b) the number of beneficiaries coded as non-AI/AN on the EDB that matched an MSIS record coded as AI/AN (miscodes), and (c) the number of beneficiaries coded as AI/AN on the EDB that did not match the IHS and MSIS files (unconfirmed).

This information was used to calculate a Confirmed to Miscode Rate (CMR), which consisted of data element (a) divided by data element (b). For example, if the CMR was equal to 5, then that implies that five beneficiaries would be confirmed as being AI/AN for every one record that was found to be miscoded as non-AI/AN. The CMR was divided into the number of unconfirmed records to estimate the number of additional AI/ANs that would have been found if

these records were confirmed by direct matching to either the IHS or MSIS data files. More rigorously stated, estimates of additional AI/AN miscodes were calculated as:

(3) $(est)AI/AN_{Add\ miscodes} = (number\ of\ unconfirmed\ AI/AN)/CMR,$

where

(4) $CMR = (AI/AN_{MSIS\ confirmed})/(AI/AN_{MSIS\ miscodes}).$

As an illustration of this approach, consider Aged Medicare AI/ANs for Alaska.[26] As presented in the next section, the number of beneficiaries coded as AI/AN on the EDB (after the IHS match) for Alaska is 5,746 and the number of additional AI/ANs identified after the MSIS match (miscodes) is 68, which gives the lower bound estimate of 5,814. Of these reported AI/ANs, (a) 2,355 were successfully matched to the MSIS (confirmed), (b) 68 additional beneficiaries were identified as AI/AN by the MSIS match (miscodes), and (c) 53 were unconfirmed by the initial IHS-to-EDB match. The CMR is 34.63 (=2,355/68), and the estimated number of additional miscodes that would have been detected if all AI/ANs were confirmed is 2 (=53/34.63).[27] The upper bound estimate for Alaska, therefore, is equal to 5,816 (=5,814+2).

Medicaid

For Medicaid, a similar approach is used. Confirmed AI/ANs included those in the MSIS that matched IHS or EDB records as AI/ANs, miscodes included MSIS non-AI/ANs that were coded as AI/ANs in either the IHS or EDB data, and unconfirmed AI/ANs in the MSIS included those that did not match either the IHS or EDB data. Estimates of the number of additional miscodes were obtained through the same CMR calculation.

SCHIP

For SCHIP Medicaid expansion programs, the same method as for Medicaid was used. For separate State programs not providing SSNs, the upper bound estimate is the same as the lower bound estimate as the data did not support an estimate of additional AI/ANs. For separate State programs, a similar approach to Medicaid and Medicare was used. The number of confirmed cases (AI/AN on State and AI/AN on IHS or MSIS), the number of unconfirmed cases (AI/AN on State and not on IHS or MSIS), and the number of additional AI/ANs (non-AI/AN on State and AI/AN on either IHS or MSIS) were estimated. A CMR was calculated and applied to the unconfirmed cases count. For States with combined programs, an upper bound was calculated for each part of the combined program and added together.

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[26] These data are reported in Tables 2 through 4 below.
[27] Estimates are rounded to the nearest whole number.

ILLUSTRATIVE ESTIMATES

OVERVIEW

There are significant issues, described above, that affect the reliability and usefulness of the estimates of AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare. These include:

- The definition of the AI/AN population is different in different databases used to generate these estimates. The 2000 Census data used to generate eligibility estimates includes multiple-race responses that appear to include a significant number of people who may have some AI/AN heritage but who are not members of Federally-recognized Tribes. In addition, some concerns have been expressed about the possibility that the Census disproportionately under-counts the AI/AN population. Data on AI/AN enrollment in Medicaid, SCHIP, and Medicare are based primarily on self-reported primary racial identification or, in some cases, on eligibility worker observational reports. Some evidence suggests that misidentification of race in enrollment data may be a significant problem. The differences in definition and identification of AI/AN race between the eligibility estimates and the enrollment estimates have a substantial impact on the reliability and usefulness of the comparison of these estimates and estimation of the extent to which under-enrollment may be present in each program.

- The available data sources for these estimates are for different time periods. This required that some data sources be projected or interpolated to a standard year. Again, the reliance on projections and interpolations introduces some degree of uncertainty about the reliability of the estimates.

- The administrative data are used to estimate AI/AN enrollment in Medicaid required a number of assumptions to be made in order to generate estimates. The results of these estimates may well vary depending on the specific assumptions made and, therefore, have some inherent uncertainty that may affect the stability and reliability of the estimates.

In addition, during the project's activities, it was determined that the timeframe of the available SCHIP program data was concurrent with start-up marketing and enrollment into SCHIP for most States. As a result, CMS decided not to complete or present preliminary results of the SCHIP eligibility and enrollment analyses.

Similarly, CMS determined that it was not feasible to conduct sub-State analyses of AI/AN eligibility and enrollment into these programs. Small population and privacy issues were the major reasons for this decision.

Other program issues that arose were a lack of data to estimate eligibility for Medicaid medically needy programs, and limited and inadequate data to develop reliable estimates of AI/AN eligibility for the Medicare Disabled program.

All of these issues, together, result in a high degree of uncertainty and a low level of confidence in the separate estimates of AI/AN eligibility and AI/AN enrollment in Medicaid,

SCHIP, and Medicare. Combining the eligibility and enrollment estimates in order to examine the extent of under-enrollment in each program by State is even more problematic, given the low level of confidence in the individual estimates.

In this section, the results of the separate eligibility and enrollment analyses, and the ratio of enrollment-to-eligibility estimates, are shown for each State to illustrate the impact of these issues on the confidence with which these estimates should be viewed.

MEDICARE ESTIMATES

Medicare eligibility, enrollment, and take up rate estimates for Aged AI/ANs are presented in Tables 2 to 4. Variation in the lower bound direct match eligibility and enrollment estimates (Table 2) is best evidenced by the AI/AN only and AI/AN multiple race take-up rates, which range from 22 percent (California and New York, multiple race) to 114 percent (Oklahoma, AI/AN only). As indicated by Columns (a) and (b) in Table 2, a primary source of this variation is the difference in the number of individuals reporting themselves as AI/AN only compared to AI/AN as one of several races. Overall, the number of multiple race AI/ANs exceeds the number of AI/ANs by about 52 percent. For some States, such as New Mexico, Alaska, South Dakota, and North Dakota, these counts differ only by about 10 percent. In contrast, for California, Michigan, New York, and Oregon, there is about twice as many multiple race AI/ANs as single race AI/ANs.

This variation in eligibility estimates and take-up rates illustrates clearly the issue of definitional comparability between the Census and Medicare administrative data files. Although the Census gives individuals the option of self-identifying multiple races (starting in 2000), the Medicare EDB does not. Therefore, the important question that is raised by this variation in the single versus multiple race estimates concerns how many of these respondents would answer AI/AN only, if not given the option to report other races as well. Although the answer most likely resides somewhere between the single and multiple race estimates, it is not possible to pinpoint the appropriate population number.

Further, it should be noted that these eligibility estimates are based on counts of AI/ANs age 65 or older. These simple population counts of elderly AI/AN will over-count Medicare eligibles, as some elderly people do not have sufficient work history to qualify for Medicare. Given reported high unemployment rates and the rural/frontier locations of many Reservations, it is plausible to expect that the AI/AN population may have a higher rate of ineligibility for Medicare due to limited work history than is the case for the general U.S. population.

Variation in take-up rates also exists across States for a given definition of the eligible population (i.e., AI/AN only, or multiple race AI/ANs). For example, the take-up rates based on the AI/AN only eligible population vary from between 42 percent (California) to 114 percent (Oklahoma).

The upper bound estimates are reported in Table 3. As discussed in the methods section, these estimates were constructed by augmenting the lower bound estimates with estimates of the additional number of AI/ANs that would have be found to have been miscoded, if the race/ethnicity of all beneficiaries coded as AI/AN in the Medicare EDB could have been verified

by direct matching with either IHS or MSIS data. The upper bound estimates are reported in Column (g) of this table. Columns (a) through (f) are reported to illustrate the steps taken in generating these upper bound estimates.

As shown in Column (f), those States with the lowest confirmation rates had the largest number of estimated additional miscodes. Compared to the lower bound estimates reported in Table 2, the indirect estimates increased by about 12 percent on average, and increased the most for California (42 percent) and New York (210 percent). These increases were driven both by the relatively low confirmation rates for these States and their very high miscode rates (about 150 percent for California and about 390 percent for New York).[28]

Table 4 summarizes the information provided in Tables 2 and 3. These estimates indicate that, depending on choice of enrollment and eligibility estimate, the Medicare take up rates will vary by as much as 72 percent (overall) or up to 610 percent for one State, California.

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[28] Calculated as Column ((d)/Column (b)) in Table 3.

Table 2. Direct Lower Bound Estimates of AI/AN Aged Population Estimated in Medicare

State	AI/AN Population (CENSUS) (AI/AN Only) (a)	AI/AN Population (CENSUS) (AI/AN Multiple Race) (b)	Count of AI/ANs from Matched EDB/IHS Data (c)	Lower Bound Estimate of Enrollment (including IHS/MSIS Matches) (d)	AI/AN Multiple Race Take up Rate (e)	AI/AN Only Take up Rate (f)
Alaska	5,728	6,361	5,746	5,814	0.91	1.02
Arizona	14,199	16,348	11,706	11,809	0.72	0.83
California	20,238	38,449	8,058	8,516	0.22	0.42
Michigan	3,158	7,136	1,957	2,044	0.29	0.65
Minnesota	2,276	3,312	2,156	2,331	0.70	1.02
Montana	2,711	3,257	2,723	2,810	0.86	1.04
New Mexico	10,413	11,401	8,830	8,993	0.79	0.86
New York	5,895	11,655	2,064	2,567	0.22	0.44
North Dakota	1,339	1,497	1,345	1,375	0.92	1.03
Oklahoma	18,845	29,001	21,114	21,565	0.74	1.14
Oregon	2,302	4,853	1,836	1,943	0.40	0.84
South Dakota	2,775	3,057	2,669	2,754	0.90	0.99
Utah	1,098	1,432	767	816	0.57	0.74
Washington	4,637	8,057	3,719	3,919	0.49	0.85
Wisconsin	2,320	3,394	2,085	2,117	0.62	0.91
Total	**97,934**	**149,210**	**76,775**	**79,373**	**0.53**	**0.81**

Notes: Col a.   Number of 65+ individuals reported as AI/AN only on 2000 Census.
　　　　　Col b.   Number of 65+ individuals reported as AI/AN in addition to another race/ethnicity on the 2000 Census.
　　　　　Col c.   Number of Aged Medicare beneficiaries coded as AI/AN after EDB/IHS match.
　　　　　Col d.   Number of Aged Medicare beneficiaries coded as AI/AN after EDB/IHS/MSIS match.
　　　　　Col e.   Equals Col (d)/Col (b).
　　　　　Col f.   Equals Col (d)/Col (a).

Table 3. Indirect Upper Bound Estimates of AI/AN Aged Population Estimated in Medicare

State	Count of AI/ANs from Matched EDB/IHS Data (a)	Confirmed AI/AN by MSIS Match (b)	Confirmed AI/AN by MSIS or IHS Match (c)	Miscoded Identified by MSIS Match (d)	Confirmed Miscode Ratio by MSIS Match (e)	Estimate of Additional Miscodes (f)	Upper Bound Estimate of Enrollment 1999 (g)	AI/AN Multiple Race Take up Rate (h)	AI/AN Only Take up Rate (I)
Alaska	5,746	2,355	5,693	68	34.63	2	5,816	0.91	1.02
Arizona	11,706	4,753	11,365	103	46.15	7	11,816	0.72	0.83
California	8,058	307	5,659	458	0.67	3,579	12,095	0.31	0.60
Michigan	1,957	165	1,521	87	1.90	230	2,274	0.32	0.72
Minnesota	2,156	692	1,990	175	3.95	42	2,373	0.72	1.04
Montana	2,723	685	2,621	87	7.87	13	2,823	0.87	1.04
New Mexico	8,830	2,114	8,624	163	12.97	16	9,009	0.79	0.87
New York	2,064	128	692	503	0.25	5,392	7,959	0.68	1.35
North Dakota	1,345	468	1,319	30	15.60	2	1,377	0.92	1.03
Oklahoma	21,114	3,486	20,538	451	7.73	75	21,640	0.75	1.15
Oregon	1,836	196	1,597	107	1.83	130	2,073	0.43	0.90
South Dakota	2,669	1,001	2,595	85	11.78	6	2,760	0.90	0.99
Utah	767	394	700	49	8.04	8	824	0.58	0.75
Washington	3,719	614	3,289	200	3.07	140	4,059	0.50	0.88
Wisconsin	2,085	121	1,874	32	3.78	56	2,173	0.64	0.94
Total	**76,775**	**17,479**	**70,077**	**2,598**	**6.73**	**9,698**	**89,071**	**0.60**	**0.91**

Notes: Col a. Number of Aged Medicare beneficiaries coded as AI/AN after EDB/IHS match.
Col b. Number of Aged Medicare beneficiaries confirmed as AI/AN by matching with MSIS data.
Col c. Number of Aged Medicare beneficiaries confirmed as AI/AN by matching with either the MSIS or IHS data.
Col d. Number of Aged AI/AN Medicare beneficiaries identified as being miscoded in the EDB by matching with the MSIS data.
Col e. Calculated as Col (b)/Col (d).
Col f. Calculated as (number of unconfirmed AI/ANs) x Col (e), where unconfirmed AI/ANs equals Col (a) – Col (c).
Col g. Equals lower bound estimate (Table 2, Col (d)) + Col (f).
Col h. Equals Col (g)/(Table 2, Col (b)).
Col i. Equals Col (g)/(Table 2, Col (a)).

Table 4. Summary of Direct and Indirect Eligibility and Enrollment Estimates of the AI/AN Aged Population in Medicare

State	AI/AN Aged Population		Enrollment		Take Up Rates			
	AI/AN Only	AI/AN (Multiple Race)	Lower Bound: EDB with IHS/MSIS	Upper Bound: Indirect Estimate	Direct Estimate (Multiple Race)	Indirect Estimate (Multiple Race)	Direct Estimate (AI/AN Only)	Indirect Estimate (AI/AN Only)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Alaska	5,728	6,361	5,814	5,816	0.91	0.91	1.02	1.02
Arizona	14,199	16,348	11,809	11,816	0.72	0.72	0.83	0.83
California	20,238	38,449	8,516	12,095	0.22	0.31	0.42	0.60
Michigan	3,158	7,136	2,044	2,274	0.29	0.32	0.65	0.72
Minnesota	2,276	3,312	2,331	2,373	0.70	0.72	1.02	1.04
Montana	2,711	3,257	2,810	2,823	0.86	0.87	1.04	1.04
New Mexico	10,413	11,401	8,993	9,009	0.79	0.79	0.86	0.87
New York	5,895	11,655	2,567	7,959	0.22	0.68	0.44	1.35
North Dakota	1,339	1,497	1,375	1,377	0.92	0.92	1.03	1.03
Oklahoma	18,845	29,001	21,565	21,640	0.74	0.75	1.14	1.15
Oregon	2,302	4,853	1,943	2,073	0.40	0.43	0.84	0.90
South Dakota	2,775	3,057	2,754	2,760	0.90	0.90	0.99	0.99
Utah	1,098	1,432	816	824	0.57	0.58	0.74	0.75
Washington	4,637	8,057	3,919	4,059	0.49	0.50	0.85	0.88
Wisconsin	2,320	3,394	2,117	2,173	0.62	0.64	0.91	0.94
Total	**97,934**	**149,210**	**79,373**	**89,071**	**0.53**	**0.60**	**0.81**	**0.91**

Notes: Col a. Number of 65+ individuals reported as AI/AN only on 2000 Census.
Col b. Number of 65+ individuals reported as AI/AN in addition to anther race/ethnicity on the 2000 Census.
Col c. From Table 2, Col (d).
Col d. From Table 3, Col (g).
Col e. Equals Col (c)/Col (b).
Col f. Equals Col (e)/Col (b).
Col g. Equals Col (c)/Col (a).
Col h. Equals Col (e)/Col (a).

MEDICAID ESTIMATES

The Medicaid estimates are reported in Tables 5 through 7. It should be noted that these estimates exclude medically needy AI/ANs. Although the medically needy are easily identifiable in the Medicaid administrative data, it was not possible to identify the AI/AN medically needy eligible population using the Census data. Also, estimates were not generated for Oklahoma because we were not able to develop separate estimates for AI/ANs eligible for Medicaid and SCHIP.

The direct estimates (Table 5) were calculated in much the same fashion as were the direct estimates for Medicare. The variation in the AI/AN only and multiple race estimates of Medicaid eligible AI/ANs is somewhat greater than that reported for Medicare (Table 2). This tends to suggest that individual self-identification as AI/AN may be more reliable for the Medicare enrolled AI/AN population.

In some instances, matching the MSIS data with the IHS and EDB data resulted in significant increases in the number of Medicaid enrollees identified as AI/AN. The most dramatic examples of this are California and Wisconsin, which experienced a nearly two-fold increase in AI/AN enrollees due to cross-file matching (93 percent and 79 percent, respectively). In contrast, for some States, the incremental increase in AI/AN identified due to matching was reasonably minor. For example, matching increased the estimated AI/AN enrolled population for Alaska, Michigan, and North Dakota by about 3 percent, 2 percent, and 1 percent, respectively.

The indirect estimates are reported in Table 6. Unlike the situation for Medicare, we were able to directly estimate the miscode rates resulting from the IHS- and EDB-to-MSIS match. As such, it was not necessary to calculate miscode rates based solely on the EDB-to-MSIS match.

The indirect estimates are in a certain sense consistent with the Medicare indirect estimates. The proportionate increases in enrollment estimates for California and Oregon are significantly above the overall average for the study States. In contrast, other States that exhibited proportionately smaller increases in the Medicare beneficiary population (i.e., Alaska, Arizona, and North Dakota) had similarly smaller increases in the estimated Medicaid enrolled population.

Table 5. Direct Lower Bound Estimates of AI/AN Population in Medicaid

State	AI/AN Eligibility Estimate (AI/AN Only) (a)	AI/AN Eligibility Estimate (Multiple Race) (b)	AI/ANs in Medicaid (MSIS Only) (c)	AI/ANs in Medicaid (MSIS with IHS/EDB Match) (d)	Multiple Race Take up Rate (e)	AI/AN Only Take up Rate (f)
Alaska	22,493	27,313	23,643	24,320	0.89	1.08
Arizona	63,121	71,365	68,309	72,083	1.01	1.14
California	62,305	117,404	17,246	33,330	0.28	0.53
Michigan	8,080	18,230	4,647	4,716	0.26	0.58
Minnesota	18,119	26,818	21,618	23,768	0.89	1.31
Montana	14,634	17,359	15,948	16,698	0.96	1.14
New Mexico	54,769	60,569	48,034	52,879	0.87	0.97
New York	17,772	35,350	6,579	7,779	0.22	0.43
North Dakota	8,399	9,608	9,745	9,814	1.02	1.17
Oklahoma	n/a	n/a	44,718	59,646	n/a	n/a
Oregon	10,811	20,147	7,486	10,507	0.52	0.97
South Dakota	25,347	27,791	25,532	26,637	0.96	1.05
Utah	6,215	8,580	6,933	7,321	0.85	1.18
Washington	28,312	48,642	19,355	26,206	0.54	0.93
Wisconsin	9,688	14,438	4,540	8,115	0.56	0.84
Total[*]	**350,065**	**503,614**	**279,615**	**324,073**	**0.64**	**0.93**

Notes: * Totals exclude Oklahoma.
Col a.   Estimated number of non-medically needy Medicaid eligible individuals reported as AI/AN only on 2000 Census.
Col b.   Estimated number of non-medically needy Medicaid eligible individuals reported as AI/AN in addition to another race/ethnicity on the 2000 Census.
Col c.   Number of non-medically needy AI/ANs enrolled in Medicaid as of December 1999.
Col d.   Number of non-medically needy AI/ANs enrolled in Medicaid as of December 1999 after match to IHS and EDB data files.
Col e.   Equals Col (d)/Col (b).
Col f.   Equals Col (d)/Col (a).

Table 6. Indirect Upper Bound Estimates of AI/AN Population in Medicaid

State	AI/ANs in Medicaid (MSIS Only)	Confirmed AI/ANs by IHS/EDB Match	Miscodes Identified by IHS/EDB Match	Confirmed to Miscode Ratio by IHS/EDB Match	Estimate of Additional Miscodes	Estimate of Enrollment 1999	Multiple Race Take up Rate	AI/AN Only Take up Rate
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Alaska	23,643	22,313	677	32.96	38	24,358	0.89	1.08
Arizona	68,309	60,314	3,774	15.98	414	72,497	1.02	1.15
California	17,246	8,148	16,084	0.51	17,775	51,105	0.44	0.82
Michigan	4,647	2,212	69	32.06	2,421	7,137	0.39	0.88
Minnesota	21,618	13,749	2,150	6.39	1,254	25,022	0.93	1.38
Montana	15,948	9,120	750	12.16	573	17,271	0.99	1.18
New Mexico	48,034	40,871	4,845	8.44	733	53,612	0.89	0.98
New York	6,579	409	1,100	0.37	16,594	24,273	0.69	1.37
North Dakota	9,745	8,675	69	125.72	59	9,873	1.03	1.18
Oklahoma	44,718	35,385	14,928	2.37	3,934	63,580	n/a	n/a
Oregon	7,486	4,952	3,021	1.64	1,546	12,053	0.60	1.11
South Dakota	25,532	21,719	1,105	19.66	182	26,819	0.97	1.06
Utah	6,933	5,206	388	13.42	126	7,447	0.87	1.20
Washington	19,355	12,948	6,851	1.89	3,459	29,665	0.61	1.05
Wisconsin	4,540	3,172	3,575	0.89	1,397	9,512	0.66	0.98
Total*	**279,615**	**213,808**	**44,458**	**4.81**	**46,571**	**370,644**	**0.74**	**1.06**

Notes: * Totals exclude Oklahoma.
Col a.   Number of non-medically needy AI/ANs enrolled in Medicaid as of December 1999.
Col b.   Number of non-medically needy Medicaid enrollees confirmed as AI/AN by matching with IHS and EDB data.
Col c.   Number of non-medically needy AI/AN Medicaid enrollees identified as being miscoded in the MSIS by matching with IHS and EDB data.
Col d.   Calculated as col (b)/col (c).
Col e.   Calculated as (number of unconfirmed AI/ANs) x col (d), where unconfirmed AI/ANs equals col (a) - col (b).
Col f.   Equals lower bound estimate (Table 5, col (d)) + col (e).
Col g.   Equals col (f)/(Table 5, col (b)).
Col h.   Equals col (f)/(Table 5, col (a)).

Table 7. Summary of Direct and Indirect Eligibility and Enrollment Estimates of the AI/AN Population in Medicaid

State	AI/AN Medicaid Eligible Population		Enrollment		Take Up Rates			
	AI/AN Only	Multiple Races	Lower Bound: MSIS IHS/EDB	Upper Bound: Indirect Estimate	Direct Estimate (Multiple Race)	Indirect Estimate (Multiple Race)	Direct Estimate (AI/AN Only)	Indirect Estimate (AI/AN Only)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Alaska	22,493	27,313	24,320	24,358	0.89	0.89	1.08	1.08
Arizona	63,121	71,365	72,083	72,497	1.01	1.02	1.14	1.15
California	62,305	117,404	33,330	51,105	0.28	0.44	0.54	0.82
Michigan	8,080	18,230	4,716	7,137	0.26	0.39	0.58	0.88
Minnesota	18,119	26,818	23,768	25,022	0.89	0.93	1.31	1.38
Montana	14,634	17,359	16,698	17,271	0.96	1.00	1.14	1.18
New Mexico	54,769	60,569	52,879	53,612	0.87	0.89	0.97	0.98
New York	17,772	35,350	7,679	24,273	0.22	0.69	0.43	1.37
North Dakota	8,399	9,608	9,814	9,873	1.02	1.03	1.17	1.18
Oklahoma	n/a	n/a	59,646	63,580	n/a	n/a	n/a	n/a
Oregon	10,811	20,147	10,507	12,053	0.52	0.60	0.97	1.12
South Dakota	25,347	27,791	26,637	26,819	0.96	0.97	1.05	1.06
Utah	6,215	8,580	7,321	7,447	0.85	0.87	1.18	1.20
Washington	28,312	48,642	26,206	29,665	0.54	0.61	0.93	1.05
Wisconsin	9,688	14,438	8,115	9,512	0.56	0.66	0.84	0.98
Total[*]	350,065	503,614	324,073	370,644	0.64	0.74	0.93	1.06

Notes: * Totals exclude Oklahoma.
Col a.   Estimated number of non-medically needy Medicaid eligible individuals reported as AI/AN only on 2000 Census.
Col b.   Estimated number of non-medically needy Medicaid eligible individuals reported as AI/AN in addition to another race/ethnicity on the 2000 Census.
Col c.   From Table 5, col (d).
Col d.   From Table 6, col (f).
Col e.   Equals col (c)/col (b).
Col f.   Equals col (e)/col (b).
Col g.   Equals col (c)/col (a).
Col h.   Equals col (d)/col (a).

SUMMARY AND DISCUSSION OF ALTERNATIVE STRATEGIES

SUMMARY

The objective of this component of the study was to estimate the extent to which AI/ANs may be under-enrolled in Medicaid, SCHIP, and Medicare, by using available data to estimate the number of AI/ANs that are eligible for and enrolled in each of these programs in 15 States. During the study, a number of issues were identified that significantly affect the degree of confidence that should be placed in these estimates.

The primary issues raised by this exploration were associated with substantial data limitations and with difficulties in defining consistently the population of interest. The available data sources – particularly for estimating eligibility – do not offer all the data that are required to determine whether individuals are eligible for enrollment in each program. As a result, estimation of the number of AI/ANs who are eligible is subject to some degree of uncertainty.

The definition of who is an American Indian or Alaska Native varies and results in considerable uncertainty in the estimates. First, because the 2000 Census allowed respondents to identify multiple races, there are substantial differences in the count of AI/ANs depending on whether one includes persons who reported being "only AI/AN" or persons who reported being AI/AN as one of multiple race designations.

An additional complication arises due to the different determinations of AI/AN race in the data used to estimate AI/AN eligibility and AI/AN enrollment in these programs. Using two different sources of data for the numerator and denominator of the take-up rate is problematic. The numerator data – used to calculate enrollment – is largely based on self-reported or observational reports of race. Validation of these data by comparing IHS patient user data files to program enrollment data on race is useful, but has some limitations. IHS data include primarily persons living on or near Reservation areas. While this is a substantial proportion of the AI/AN population, it does not include all of the population of interest. In addition, the definition of who is an American Indian or Alaska Native using IHS data is determined by rules related to IHS eligibility and relies primarily on membership in a Federally recognized Tribe. In contrast, the denominator data by definition employ a much broader definition of who is AI/AN. Using these two different sources together results in take-up rates that are unreliable.

One additional issue is that the time periods for the data sources differ. Population counts from the Census data used for the eligibility estimates are for April 1, 2000, while the administrative databases used for the enrollment estimates cover a number of different time

periods, including the end of 1999 for Medicare, last quarter 1999 for Medicaid, and 1999 to 2000 for SCHIP.[29]

County-level estimates introduce another source of error particularly in using the 1990 Census micro-data (a 5 percent sample). Because not all data elements and required cross-tabulations were available from the 2000 Census, we relied on the 1990 public use micro-data for some estimates (e.g., the proportion of persons receiving Social Security income). In many counties, the number of elderly AI/ANs and non-elderly disabled AI/ANs was quite small, leading to unstable estimates. In addition, cross-County movements – either in terms of changes in residence or obtaining health care in a different County than the County of residence – contribute to the instability of estimates.

Finally, Census data may undercount the AI/AN population. There was a severe undercount of American Indians in the 1990 Census; while a great deal of effort was made in the 2000 Census to improve methods and it is generally felt that the count was more accurate, there remains some uncertainty about the completeness of the count of the number of AI/ANs in the 2000 Census.

All of these issues contribute to the inability to generate reliable and valid estimates of the number of AI/ANs who are eligible for and enrolled in Medicaid, SCHIP, and Medicare. The results of the analyses that were conducted, presented through illustrative estimates, indicate the significant limitations of current data sources and the lack of confidence that should be placed in the estimates that were generated.

ALTERNATIVE APPROACHES

Problems with existing data sets that could be used to estimate AI/AN eligibility for Medicaid, SCHIP, and Medicare include a lack of precise data to identify respondents as members of Federally recognized Tribes, members of non-Federally recognized Tribes, and those who have some AI/AN heritage and maintain cultural and social ties to AI/AN communities. It might be possible to develop standard survey questions that could be used in all Federally funded surveys that would permit more precise identification of AI/AN race and group identification. If so, then future estimations of AI/AN eligibility could be improved. The second

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[29] We considered using data from the BIA for this study, but rejected this source as it was deemed incompatible. The BIA annually produces a report providing estimates of Tribal service populations and labor market information for the nation's Federally-recognized Tribes. This information is collected from the individual tribes via a survey form and pertains to the population eligible for services from the BIA – enrolled members and members from other Tribes who were eligible to use the Tribe's BIA-funded services. There are three particular data items that could be of interest: (1) BIA Tribal Enrollment; (2) BIA Total Indian Reservation Service Population; and (3) BIA percent of the AI/AN population that is unemployed and/or employed but with incomes below the Federal poverty level. Data from BIA are not comparable to other sources for several reasons. In terms of defining the AI/AN population, BIA data use Tribal enrollment data that are generally based on blood quantum. Total Indian Reservation Service Population includes those enrolled in Federally-recognized Tribes living on or near the Reservation as well as children of enrolled members who may not themselves be eligible and members of a Federally-recognized Tribe living on a different Reservation than the one through which they are eligible. Thus, at a local level, the BIA data are not likely to correspond to other sources based on use of services (IHS) or residence (Census). BIA data on poverty tend to fluctuate seasonally and are subject to change when AI/ANs working off-Reservation lose their jobs and return home. Thus, it is not likely to be comparable to Census figures.

significant problem with existing data sets, with the exception of Census data, is that sample sizes are generally not large enough to produce sufficient numbers of AI/AN respondents to permit analyses that focus on subgroups of the AI/AN population and urban, rural, and Reservation level analyses to be conducted. Substantial expansion of survey sample sizes would be necessary to obtain the larger AI/AN samples that would permit the estimation of AI/AN eligibility for Medicaid, SCHIP, and Medicare for alternative AI/AN subgroups and for State and sub-State geographic units.

Given these limitations and the small likelihood that existing surveys could easily be modified to permit the desired analyses to be conducted, we identified two alternative approaches that were discussed with CMS that could provide more reliable information as to whether there is AI/AN program under-enrollment: 1) new data collection, or 2) meta-analysis of existing survey data sources.

New Data Collection

If the definition of the AI/AN population were narrowed to include only members of federally-recognized Tribes, it would be feasible to undertake new data collection based on Tribal enrollment lists obtained from either individual Tribes or from the Bureau of Indian Affairs. This survey could be limited to a sample of those who live on or near Reservations, using methods similar to those employed to conduct the 1989 NMES of American Indians and Alaska Natives. If Tribes were willing to provide the survey sample frame from Tribal enrollment lists, which include addresses of all enrolled members, then it might be feasible to survey members of federally-recognized Tribes who live both on/near and off-Reservations in urban or non-urban areas. A similar approach could be used to survey members of Tribes that are not Federally Recognized, to the extent that these Tribes maintain Tribal enrollment lists with names and addresses. However, any approach that relies on Tribal agreement to provide sample frames from Tribal enrollment lists would likely require extensive negotiation to obtain approval of the survey participation with each Tribe – a potentially lengthy and resource-intensive process. Other approaches to a survey of members of federally-recognized or non-federally-recognized Tribes that included non-Reservation areas would be substantially more expensive because of the small size of the target population, although there might be some approaches that would be less resource intensive that would build on on-going data collection efforts.

Meta-Analysis of Existing Survey Data

A more feasible and less costly approach would be a meta-analysis of existing survey data. Such an analysis could provide aggregate estimates for the 15 study states of the enrollment/eligibility ratio (or take-up rate). There are at least three national survey databases that would be useful in such an endeavor – the CPS, the SIPP, and the NHIS.[30] One of the advantages of using these survey data over Census or administrative program data is that the race coding relies on self-report in the context of an in-person interview so it is less likely to be "missing" or coded as "other." In addition, most of the national health surveys obtain data on

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[30] One could also consider use of the National Survey of America's Families (NSAF), the Medical Expenditure Panel Survey (MEPS), the Survey of Program Dynamics (SPD), and the Health and Retirement Survey.

program enrollment, as well as a wide array of data on income and assets, family structure, and work history needed to estimate eligibility for the three programs in which CMS is interested.

The most obvious limitation of these survey data sets is their sample sizes for AI/ANs. Preliminary tabulations of the March 2001 CPS indicate that there are 462 AI/AN children aged 17 and younger in the 15 study states and 93 AI/ANs aged 65 and older in these states. (This is without the expanded sample that has been fielded specifically to enable studies of SCHIP enrollment.) NHIS has the same approximate total sample size and the yield of AI/ANs should be roughly comparable, although it is difficult to predict precisely given the different sample design used for the two surveys. SIPP sample sizes will be somewhat lower, but – given the availability of certain data items (e.g., assets) – it would likely be worth exploring. These numbers are sufficient for estimating the percentage of persons eligible for each of the three programs for the 15 study States as a group. While the numbers are not large, using three different data sets to conduct the analysis would allow increased confidence in the findings. Depending on sample sizes, some States might have to be combined for purposes of estimation.

The degree of confidence in the results depends largely on whether the results reinforce each other. If the surveys produce contradictory or inconsistent findings, then estimated uncertainty is not reduced. However, if analysis of the different surveys produces similar findings, confidence in these findings increases considerably.

Medicaid/SCHIP

The basic approach that would draw on analysis of existing survey data has been used previously for overall estimates of Medicaid and SCHIP eligibility.[31] In order to simulate eligibility for each of the two programs, one of the first steps is to gather background information on program eligibility determination in each of the 15 States. This requires collecting information on the income standards applied, methods used for measuring assets, rules concerning family composition, and any other pertinent regulations, as was done for this study. Because of the variability across States and between the two programs within a given State, each State-program pair's eligibility rules must be simulated in a separately constructed computer algorithm. Each survey varies in the types of information collected, but all can be used to approximate eligibility.[32] The level of intricacy in modeling of eligibility could vary according to time, resource, and sample size constraints.

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[31] See, for example, Davidoff AJ, Garrett AB, Makuc DM, Schirmer M. "Medicaid-eligible children who don't enroll: health status, access to care, and implications for Medicaid enrollment," Inquiry 2000 Summer; 37(2):203-18; Irvin C and Czajka J. Simulation of Medicaid and SCHIP Eligibility: Implications of Findings From 10 States. Final Report submitted to the Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services, August 16, 2000; Selden TM, Banthin JS, Cohen JW. "Medicaid's Problem Children: Eligible but Not Enrolled," Health Affairs 1998, 17(3):192-200; and Selden TM, Banthin JS, Cohen JW. "Waiting in the Wings: Eligibility and Enrollment in the State Children's Health Insurance Program," Health Affairs, 1999, 18(2):126-133.

[32] Neither CPS nor NHIS have data on assets; due to confidentiality issues, NHIS must be used in the NCHS Research Data Center, presenting some logistical problems; NSAF may have less reliable data for Native Americans because it is a telephone survey and this population (at least those living on or near Reservations) has extremely high rates of noncoverage by telephones.

The results from this process would provide an estimate of the number of AI/AN persons eligible for each Medicaid and SCHIP program across the 15 States. Calculation of the number of AI/ANs enrolled in the programs is more straightforward. For the CPS, data about program enrollment is obtained once during administration of the March supplement. For the NHIS, program enrollment is also asked only once during the interview. SIPP, in contrast, collects data on a monthly basis during interviews that take place every four months; because Medicaid and SCHIP status may change over time, rules would be required to define the relevant time period for being enrolled.

Medicare

Estimating eligibility for Medicare, at least with respect to the elderly population, is more straightforward. For persons 65 years old or older, eligibility for Part A of Medicare (health insurance or HI) is primarily based on having paid in to Social Security for 40 quarters. Using survey data, it would be possible to define the eligible population as those persons who are 65 or older and who receive Social Security benefits (or Railroad Retirement benefits). As described above for Medicaid/SCHIP, program enrollment is reported on each of the surveys.

CONCLUSION

The objectives, methodologies, and results reported in this study illustrate the complexity and difficulties associated with estimating AI/AN eligibility and enrollment in Medicaid, SCHIP, and Medicare. Lack of data sources that are comparable and consistent for estimating eligibility and enrollment are a major deterrent to producing reliable and valid estimates. In addition, the issue of alternative definitions of the AI/AN population in available data sources compounds the difficulties of estimation. The alternative strategies that might be considered for future research efforts include new data collection or attempts to use meta-analysis of existing survey data that potentially provide more consistent and comparable measures of program eligibility measures and program enrollment. However, designing and conducting a new survey would be a lengthy and costly process. Alternatively, conducting meta-analyses of data available from existing surveys could improve estimates but would likely only be able to produce estimates for multi-State areas or at a national level, due to the small AI/AN population. This aggregation would limit the usefulness of the results and would not permit identification of States or sub-State areas where under-enrollment may be a substantial issue. However, the analysis could provide more reliable estimates of AI/AN eligibility, enrollment, and the ratio of enrollment to eligibility at the national level that could be useful in assessing the extent to which under-enrollment exists, by program, and the characteristics of AI/ANs who are eligible but not enrolled. This information could provide a better foundation for designing programs that target specific segments of the AI/AN population for outreach and assistance.

APPENDIX A: TECHNICAL EXPERT PANEL MEMBERS AND PROJECT CONSULTANTS

Technical Expert Panel (TEP) Members		
Name	Organization	State
Jim Crouch	California Rural Indian Health Board	California
Mim Dixon	Mim Dixon & Associates	Colorado
Pamela Iron	National Indian Women's Health Resource Center	Oklahoma
Spero Manson	Division of American Indian and Alaska Native Programs, University of Colorado Health Sciences Center	Colorado
Beverly Russell	National Council of Urban Indian Health	Washington, DC
Nancy Weller	National Association of State Medicaid Directors Tribal Work Group; Alaska Dept. of Health and Social Services	Alaska
Laura Williams	Association of American Indian Physicians	California
Jonathan Windy Boy	Montana/Wyoming Tribal Leaders Council	Montana
Julia Ysaguirre	Native American Program Coordinator, Arizona Health Care Cost Containment System/KidsCare	Arizona

Project Consultants		
Name	Organization	State
Rebecca Baca	Elder Voices	New Mexico
David Baldridge	National Indian Project Center (formerly with the National Indian Council on Aging)	New Mexico
Ralph Forquera	Seattle Indian Health Board	Washington
Carole Anne Heart	Aberdeen Area Tribal Chairmen's Health Board	South Dakota
Jo Ann Kauffman	Kauffman & Associates	Washington
Frank Ryan	I&M Technologies	Maryland