

Valuing the Invaluable: The Economic Value of Family Caregiving, 2008 Update

Detailed Methodology, Data Year 2007

This document provides a technical description of the methodology used to estimate the number of caregivers and economic value of family caregiving at the state and national levels in the AARP Public Policy Institute Insight on the Issues, *Valuing the Invaluable: The Economic Value of Family Caregiving, 2008 Update*.

Within each state i , the estimate of the number of caregivers n_{ij} caring for a person in age group j at any given time is given by

$$n_{ij} = \alpha_j \beta_i \gamma N_{ij}$$

where β_i is a state factor (reflecting the relative prevalence of caregiving in the state relative to the nation as a whole), α_j is the number of caregivers currently providing care per person in age group j in the country, as calculated by analysis of the Caregiving in the U.S. survey data, γ is a scaling factor (reflecting the relative prevalence of the average of all five estimates of the number of caregivers relative to the Caregiving in the U.S. estimate), and N_{ij} is the July 1, 2007 population estimate for age group j in state. We use four age groups: 18-59, 60-74, 75-84, and 85+, in this analysis.

The total number of caregivers in the state at any given time is then given by

$$n_i = \sum_j \alpha_j \beta_i \gamma N_{ij}$$

and the total economic value is given by

$$V_i = n_i v_i h$$

where v_i is the estimated economic value per hour in the state and h is the number of hours of care per caregiver per year (1,080 hour per year, or about 21 hours per week). The estimators for v_i and h are described later in this document.

The total number of caregivers n and total economic value V in the country are then given by

$$n = \sum_i n_i = \sum_{i,j} \alpha_j \beta_i \gamma N_{ij}$$

and

$$V = \sum_i V_i = \sum_{i,j} \alpha_j \beta_i \gamma N_{ij} v_i h$$

and the economic value per hour v is given by

$$v = V/n$$

The total number of people n'_i in each state providing care at any time during the year is given by

$$n'_i = \sum_j \alpha'_j \beta_i \gamma N_{ij}$$

where α'_j is the number of caregivers who provided care within the last year per person in age group j in the country, as calculated by analysis of the Caregiving in the U.S. survey data. All

other values are the same as above. The total number of people in the country providing care at any time during the year is given by

$$n' = \sum_i n'_i = \sum_{i,j} \alpha'_j \beta_i \gamma N_{ij}$$

The values α_j and α'_j were estimated by the weighted proportion of all caregivers in the Caregiving in U.S. survey sample who were caring for people of each age group, either currently or in the last year, times the survey's estimate of the total number of caregivers (44.4 million), divided by the Census third quarter 2003 population estimate for that age group.

The values of α_j and α'_j obtained are shown in table 1.

Table 1: Values of α_j and α'_j

Care Recipient Age Group	α_j	α'_j
18-59	0.047	0.080
60-74	0.24	0.38
75-84	0.62	0.84
85+	1.41	1.94

The scaling factor γ was obtained by averaging the ratio of the predicted number of caregivers from each data source k to the predicted number using the definition and survey year from source k and the Caregiving in the U.S. survey data. That is,

$$\gamma = \frac{1}{5} \sum_k \gamma_k$$

where γ_k is the ratio for each of the 5 data sources. The five data sources used for the estimate of caregiving prevalence are shown in table 2.

Table 2: Prevalence Data Sources

Publication (publication year)	Data Year & Source Data
<i>Estimated Prevalence and Economic Value of Family Caregiving, by State (2004)</i> , Peter S. Arno, National Family Caregivers Association & Family Caregiver Alliance (2006)	Estimates for 2004, from 1986 SIPP
	Estimates for 2004, from 1987–88 NSFH
<i>Many Older Americans Engage in Caregiving Activities</i> , Richard W. Johnson & Simone G. Schaner, Urban Institute (2005)	2002 HRS
<i>Caregiving: A National Profile and Assessment of Caregiver Services and Needs</i> , Sarah L. McKune et al., Rosalynn Carter Institute (2006)	2000 BFRSS
<i>Caregiving in the U.S.</i> , National Alliance for Caregiving & AARP (2004)	2003, survey designed for publication

For Caregiving the U.S., it is clear that the value of γ_k is equal to 1. For Arno's two estimates and Johnson & Schaner,

$$\gamma_k = n_k / \sum_j \alpha_{jk} N_{jk}$$

where n_k is source k 's estimate of the number of caregivers, α_{jk} is the number of caregivers (using the definition of caregiving in data source k) per person in age group j in the country, as calculated by analysis of the Caregiving in the U.S. survey data in the manner as α_j and α'_j ,¹ and N_{jk} is the population estimate for age group j for the estimate year of source k .

For the state-level data source, McKune et al., γ_k and the state factors β_i were calculated together.² First the scaling factor γ_k was found by

$$\gamma_k = \sum_i n_{ik} / \sum_{i,j} \alpha_{jk} N_{ijk}$$

where n_{ik} is the McKune et al. estimate of the number of caregivers in state i and N_{ijk} is the population estimate for age group j in state i in 2000.

The individual state factors β_i were then calculated as

$$\beta_i = n_{ik} / \sum_j \alpha_{jk} \gamma_k N_{ijk}$$

All together, table 3 shows the values of γ and γ_k for each data source.

Table 3: Values of γ and γ_k

Data Source	γ_k
SIPP (Arno)	0.848
NSFH (Arno)	0.938
HRS (Johnson & Schaner)	1.401
BFRSS (McKune et al.)	1.115
Caregiving in the U.S.	1
Scale Factor (γ)	1.061

The state economic values per hour were estimated as the weighted average of the state minimum wage w_i , state home health aide median wage x_i , and the average private pay hourly rate for hiring a home health aide y_i . Thus,

$$v_i = \frac{w_i + x_i + 0.5y_i}{2.5}$$

No data were available to estimate the hours of care h per caregiver per year at the state level. The number of hours per caregiver was therefore assumed to be constant across states.

Four data sources were used for the national estimate, and these show a remarkable converge at about 1,080 hours per year, or about 21 hours per week (see table 4).

Table 4: Estimating Caregiving Hours

Source	Weekly Hours	Annual Hours
Caregiving in the U.S.	21	1,092
Arno (2004)	20.6*	1,071*
Johnson & Schaner	16.6**	860**
<i>A Profile of Frail Older Americans and Their Caregivers</i> , Richard W. Johnson & Joshua M. Wiener, Urban Institute (2006)	25	1,300
2002 HRS average***	20.8	1,080
<i>Consensus estimate</i>	21	1,080

*Arno's reported estimate of care hours is an average of four sources from the 1990s, which individually range from 18 to 24 hours of care per week.

**AARP Public Policy Institute calculations based on data in Johnson & Schaner; hours estimate is for spousal and parent/in-law care only.

***Average of Johnson & Schaner and Johnson & Weiner, which look at two subpopulations of caregivers using the same data source.

¹ The Caregiving in the U.S. definition of caregiving is generally more inclusive than the other definitions, which makes it easy think of α_{jk} as a proportion. In some cases, however, the other sources include caregivers not in Caregiving in the U.S.. In these cases, the number of such caregivers is estimated based on the number of similar caregivers who are in the Caregiving in the U.S. definition.

² Arno projects numbers for individual states for the average of the SIPP- and NSFH-based estimates, using the varying age structure of the states and assuming constant age-adjusted prevalence across states. Only the BRFSS data in McKune et al allow us to estimate the β_i , which represent the differences in age-adjusted prevalence between states.

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