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## Aging in the Eighties, People Living Alone—Two Years Later

### Data from the 1984 and 1986 Longitudinal Study of Aging Interviews

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#### Introduction

There is evidence that older people who live alone are more likely to become institutionalized than people who live with others (Branch and Jette, 1982), and that the risk is greater at older ages (Cohen, Tell, and Wallack, 1986). There is also evidence that people with strong social networks are more likely to survive and remain healthy than those without such social interaction (Berkman and Syme, 1979; House, Robins, and Metzner, 1982; Berkman, 1985; Seeman, Kaplan, Knudson et al, 1987). Data from the Supplement on Aging to the National Health Interview Survey showed that many of the people living alone in 1984 did have living children or siblings, had had recent contact with family or friends, or lived in housing without major barriers to movement (NCHS, 1986). If such factors do make it possible for people to remain in the community rather than becoming residents of nursing homes, identifying those factors will furnish guidelines for supporting the positive aspects and for identifying people at high risk of institutionalization and, perhaps, postponing or averting their institutionalization.

The Supplement on Aging had advantages over many other data sources in that there were many measures of functional health status in addition to measures of barriers in housing, contact with children, and recent social contacts. It also had a large national sample. The disadvantage was that there was no information about how these people fared as they grew older. That disadvantage has been partly overcome with the first reinterview of the oldest people 2 years later as part of the Longitudinal Study of Aging.

#### The data

In 1984 information on 16,148 people age 55 years and over was obtained through the Supplement on Aging to the

National Health Interview Survey (NCHS, 1987a). This supplement was designed to be the basis for a family of longitudinal studies that are known collectively as the Longitudinal Study of Aging.

The Longitudinal Study of Aging is a long-term collaborative project with the National Institute on Aging that involves matches with existing records, such as death certificates, for all of the people in the Supplement on Aging, and reinterviews with samples of people who were in the 1984 study (Fitti and Kovar, 1987; NCHS, 1987b). One part of the Longitudinal Study of Aging involved selecting a sample of 5,151 people who were age 70 years and over in 1984 to be reinterviewed in 1986.

There were 5,151 people selected for reinterview in 1986. The status of 92 percent was ascertained through the reinterview; 4,130 were still living, and 604 were deceased. Another 20 persons were identified as deceased through matching with the National Death Index for 1984 and 1985.

Information about the 1,921 people in the 1986 Longitudinal Study of Aging reinterview sample who had been living alone in 1984 is the basis of this report. The status of 91 percent, 1,743 persons, was ascertained in 1986 through the reinterview or the match with the National Death Index.

All estimates are national estimates for the population age 70 years and over who were living in the United States outside of institutions in 1984. A brief description of the study and the analytic methods are in the Technical notes; a full description of the study has been published (NCHS, 1987b).

#### Living alone or with others

In 1984 there were about 17 million people age 70 years and over living in the community in the United States—6 million were living alone and 11 million were living with

at least one other person (table A). Of the latter, 7 million were living with a spouse only and 4 million lived with other people. A sizable proportion of the last group was living with other people because of their health (Kovar and Harris, 1987). They were already having health problems and at high risk of death or institutionalization.

**Table A. Status in 1986 of people age 70 years and over living in communities in 1984, according to living arrangements in 1984: United States**

Status in 1986	Living arrangement in 1984				
	Total	Alone	With others		
			Total	Spouse only	All others
Population in thousands					
Total . . . . .	17,335	6,351	10,984	6,963	4,021
Percent distribution					
Total . . . . .	100.0	100.0	100.0	100.0	100.0
Alive . . . . .	88.2	89.8	87.3	89.0	84.3
In community . .	84.8	85.3	84.5	87.2	79.8
Alone . . . . .	34.0	77.8	9.2	8.1	11.1
With others. . . .	50.8	7.4	75.3	79.1	68.8
In institution . .	3.4	4.6	2.8	1.8	4.5
Dead . . . . .	11.8	10.2	12.7	11.0	15.7

Although the people who were living alone were, on the average, older than those living with others in 1984, they were not more likely to have died within the 2 years. This is partly because the majority of the people living alone were women, and women, on the average, live longer than men. However, people who had been living alone were more likely to be in nursing homes 2 years later than people who had been living with others. Again, this may be partly because of being women; older women are more likely to be in nursing homes than older men (NCHS, 1987c).

Most of the older people had the same living arrangements in 1986 that they had had 2 years earlier. Of the people who had been living alone in 1984, 78 percent were still living alone 2 years later; of those who had been living with others, 75 percent were living with others 2 years later.

The data from the 1986 Longitudinal Study of Aging reinterview confirm earlier research. Although few people were in nursing homes 2 years later, the percent of those who had been living alone who were in nursing homes was higher than the percent of those who had been living with others. Moreover, when only people who were not receiving help with one or more Activities of Daily Living in 1984 are considered, the percent remained higher (3.7 versus 1.6 percent), although the difference is not statistically significant.

**People living alone**

Of all the factors associated with entering a nursing home, age and functional status at the time of the original interview are the most powerful. The two are, of course, associated; people in their eighties are more likely to be in

poor health than people in their seventies. It is health status, however, not age per se, that leads to either death or institutionalization (Kovar, 1987).

People who are receiving help with one or more Activities of Daily Living (bathing, eating, dressing, transferring, walking, getting outside, using the toilet) are more likely to have died or become institutionalized 2 years later than those who were not receiving such help (Kovar, 1987). Only 7.5 percent of the people age 70 years and over living alone were receiving help with one or more Activities of Daily Living (ADL) in 1984 (table 1). Although only 10 percent of the people who had been living alone had died and only 5 percent had moved into nursing homes, 25 percent of the people living alone who had been receiving help with one or more ADL's had died and 16 percent were in nursing homes 2 years later (table B).

**Table B. Status in 1986 of people age 70 years and over living alone in 1984, according to help status in 1984: United States**

Status in 1986	Help status in 1984				
	Total	Help with—			No difficulty
		ADL <sup>1</sup>	IADL's <sup>2</sup>	Neither	
Population in thousands					
Total . . . . .	6,351	478	1,204	768	3,901
Percent distribution					
Total . . . . .	100.0	100.0	100.0	100.0	100.0
In community . . .	85.3	59.1	77.6	83.4	91.1
Alone . . . . .	77.8	52.0	67.4	80.5	83.7
With others. . . .	7.4	7.1	10.2	2.9	7.5
In institution. . .	4.6	15.9	7.9	5.9	1.9
Dead . . . . .	10.2	24.9	14.5	10.7	7.0

<sup>1</sup> ADL is Activity of Daily Living  
<sup>2</sup> IADL is Instrumental Activity of Daily Living.

Therefore, it is important to determine whether barrier-free housing, frequency of seeing children, and contacts with family and friends are associated with receiving such help. Some of these measures were associated with functional status. People who needed to have their major living components on one floor or who needed a walk-in shower were significantly more likely than others to be receiving help with one or more ADL's (table 1). People who had at least one child who could be with them within 10 minutes or who saw or talked with at least one child daily were more likely to be receiving help than people who saw or talked with their children less frequently (table 2). People who had not gotten together or talked on the telephone with friends or neighbors or who had not gone to religious or social events were significantly more likely than those who had to be receiving help with one or more ADL's (table 3). In contrast, neither the housing characteristics shown in table 1 nor having had recent contact with relatives was significantly associated with receiving such help.

Therefore, associations between the social and environmental characteristics and survival or remaining in the community should be evaluated for people who were not already receiving help at the beginning of the study.

The data on status in 1986 for people who were living alone and who were not receiving help with any Activities of Daily Living in 1984 are shown in tables 4-6. Their status 2 years later was better than that of the total group. Only 9.0 percent of these people (rather than 10.2 percent) had died and 3.7 percent (rather than 4.6 percent) were in nursing homes 2 years later.

It is obvious from table 4 that the need for appropriate housing measures something different from the receipt of help. People needing appropriate housing were significantly more likely to have died or to be institutionalized 2 years later than people who did not have such a need. Having major living areas on one floor is not sufficient; the difference between those with and without a need for such facilities is significant even for people who had them.

The association between seeing at least one child daily and living with someone else 2 years later is statistically significant. None of the other associations in table 5 is statistically significant, although there is a suggestion that people without children or who do not live very close to at least one child are more likely to be in institutions rather than living with others 2 years later.

All of the associations between recent nonfamilial social contacts in 1984 and death 2 years later shown in table 6 are statistically significant. People who had had no contact with friends or neighbors within 2 weeks and who were still in the community 2 years later were also more likely to be living with others. However, recent contacts with relatives were not significantly associated with the older person's status 2 years later, and there were no statistically significant associations with institutionalization.

## Summary

Older people who had been living alone were more likely than those living with others to be in a nursing home 2 years later. However, there is evidence of a progression; people live alone, then with other people if others are available, then they may become nursing home residents.

Older people who die or who become residents of nursing homes do so not because they are old or because they have no family to provide care but because they are sick people. Regardless of whether people had been living alone or with others, people who had been receiving help with any Activity of Daily Living were more likely to be in a nursing home or to have died 2 years later.

Even when only people who had not been receiving help with any Activity of Daily Living in 1984 are considered, the data from the Longitudinal Study of Aging 1986 reinterview show that people who had had recent contact with friends or neighbors are more likely to be alive, and people with children whom they see daily are more likely to live with others 2 years later. Although the data are not in this report, they also suggest that people who had living brothers and sisters were more likely to survive the 2-year period.

There are multiple confounders in studying aging and remaining independent. It is not sufficient to study only physical or functional health, barriers to movement, availability of family, or social contacts. All of these may function as protection against institutionalization or early death. Many may be associated with other things not measured or have interrelationships with one another that were not measured. The study included no question, for example, asking why people had no living children. It is possible that they never had children because of their ill health early in life or that their children died early. It is possible that those without living siblings had had siblings who died prematurely. The survivors may share a genetic predisposition that would leave them alive but in poor health.

Many of the relationships are only suggestive. Most of the people who were age 70 years and over and living alone in 1984, 78 percent of the people whose status in 1986 was confirmed, were still living alone 2 years later. The major reason people were not still living alone was death. The second reason was that they were now living with others, usually children. Although people who had been living alone were more likely to be in nursing homes 2 years later than those who had been living with others, only 4.6 percent were in nursing homes in contrast with 85 percent who were still living in the community outside of nursing homes. More people who had been living alone were living with others 2 years later than were in nursing homes.

Two years is a very short period in which to observe change. Older people who are not already dependent are not highly likely to die or become institutionalized in that time. Most of the people had had no change in their living arrangements; they had been living alone in 1984 and were still living alone 2 years later. It will take a longer time period, with more opportunity for change to occur, to confirm relationships that these data suggest.

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**Table 1. People who were 70 years and over and living alone by housing characteristics and whether they were receiving help with one or more Activities of Daily Living in 1984: United States**

Housing characteristics	Sample	Whether receiving help			
		Total	No	Yes	Percent
	Number	Population in thousands			
All people . . . . .	1,921	6,351	5,873	478	7.5
Steps to outside					
No . . . . .	408	1,365	1,265	99	7.3
Yes . . . . .	1,513	4,986	4,607	379	7.6
Levels inside					
One . . . . .	1,188	3,928	3,631	297	7.6
More than one . . . . .	733	2,423	2,242	181	7.5
Need bedroom, bathroom, kitchen on same floor					
Yes . . . . .	653	2,008	1,590	418	20.8
No . . . . .	1,268	4,343	4,282	60	1.4
Have bedroom, bathroom, kitchen on same floor					
Yes . . . . .	1,762	5,816	5,359	456	7.8
Needed . . . . .					
Needed <sup>1</sup> . . . . .	627	1,911	1,502	409	21.4
Not needed . . . . .	1,135	3,905	3,858	47	1.2
No . . . . .	159	535	513	22	4.1
Needed <sup>1</sup> . . . . .					
Needed . . . . .	26	97	89	9	8.8
Not needed . . . . .	133	438	425	13	3.1
Need walk-in shower					
Yes . . . . .	321	954	729	225	23.6
No . . . . .	1,600	5,397	5,144	253	4.7
Have walk-in shower					
Yes . . . . .	325	1,102	1,041	61	5.5
Needed <sup>1</sup> . . . . .					
Needed . . . . .	79	242	208	34	14.1
Not needed . . . . .	246	859	832	27	3.1
No . . . . .	1,596	5,249	4,832	417	7.9
Needed . . . . .					
Needed . . . . .	242	712	520	191	26.9
Not needed . . . . .	1,354	4,537	4,312	226	5.0

<sup>1</sup>Fewer than 100 sample persons

**Table 2. People who were 70 years and over and living alone by contacts with children and whether they were receiving help with one or more Activities of Daily Living in 1984: United States**

Contact with children	Sample	Whether receiving help			
		Total	No	Yes	Percent
	Number	Population in thousands			
All people . . . . .	1,921	6,351	5,873	478	7.5
No living children . . . . .	530	1,744	1,665	79	4.5
WITH LIVING CHILDREN					
Sex of children					
Sons only . . . . .	362	1,166	1,101	64	5.5
Daughters only . . . . .	326	1,112	1,017	95	8.5
Both . . . . .	702	2,327	2,087	241	10.3
Time for nearest child to get here					
Within 10 minutes . . . . .	406	1,338	1,159	179	13.4
10 minutes or more . . . . .	985	3,269	3,049	221	6.7
Frequency of seeing a child					
Daily . . . . .	376	1,209	1,041	167	13.8
2-6 times a week . . . . .	285	927	838	88	9.5
Weekly . . . . .	280	948	869	80	8.4
Less than weekly . . . . .	450	1,524	1,459	64	4.2
Frequency of talking with a child					
Daily . . . . .	564	1,832	1,594	237	13.0
2-6 times a week . . . . .	267	903	854	49	5.4
Weekly . . . . .	254	866	826	40	4.6
Less than weekly . . . . .	306	1,007	934	73	7.3
Frequency of seeing or talking with a child					
Daily . . . . .	680	2,188	1,917	271	12.4
2-6 times a week . . . . .	276	930	873	57	6.2
Weekly . . . . .	236	821	786	35	4.2
Less than weekly . . . . .	199	668	632	36	5.4

**Table 3. People who were 70 years and over and living alone by recent social contacts and whether they were receiving help with one or more Activities of Daily Living in 1984: United States**

Contacts within 2 weeks	Sample	Total	Whether receiving help		Percent
			No	Yes	
	Number	Population in thousands			
All people . . . . .	1,921	6,351	5,873	478	7.5
Got together with friends or neighbors					
Yes . . . . .	1,366	4,609	4,358	251	5.4
No . . . . .	555	1,742	1,515	227	13.0
Talked on telephone with friends or neighbors					
Yes . . . . .	1,606	5,323	4,984	339	6.4
No . . . . .	315	1,027	888	139	13.5
Got together with relatives					
Yes . . . . .	1,466	4,897	4,514	383	7.8
No . . . . .	455	1,454	1,358	95	6.6
Talked on telephone with relatives					
Yes . . . . .	1,650	5,462	5,060	402	7.4
No . . . . .	271	889	813	76	8.6
Went to church or synagogue					
Yes . . . . .	982	3,300	3,189	111	3.4
No . . . . .	939	3,051	2,684	367	12.0
Went to other group event					
Yes . . . . .	488	1,724	1,688	36	2.1
No . . . . .	1,433	4,627	4,185	442	9.6

**Table 4. Status in 1986 of people who were 70 years and over, living alone and not receiving help with Activities of Daily Living in 1984, according to housing characteristics in 1984: United States**

Housing characteristics in 1984	Status in 1986					
	Total	In community				
		Total	Alone	With others	Institution	Dead
	Percent distribution					
All people . . . . .	100.0	87.3	79.9	7.5	3.7	9.0
Steps to outside						
No . . . . .	100.0	85.8	79.3	6.5	4.9	9.3
Yes . . . . .	100.0	87.8	80.0	7.7	3.3	8.9
Levels inside						
One . . . . .	100.0	87.3	80.0	7.3	3.4	9.3
More than one . . . . .	100.0	87.4	79.7	7.7	4.1	8.5
Need bedroom, bathroom, kitchen on same floor						
Yes . . . . .	100.0	78.2	70.0	8.2	6.7	15.1
No . . . . .	100.0	90.6	83.5	7.2	2.6	6.8
Have bedroom, bathroom, kitchen on same floor						
Yes . . . . .	100.0	86.7	79.5	7.3	3.8	9.4
Needed . . . . .	100.0	77.2	70.1	7.1	7.1	15.7
Not needed . . . . .	100.0	90.4	83.0	7.3	2.6	7.1
No . . . . .	100.0	93.6	84.2	9.4	1.8	4.6
Needed <sup>1</sup> . . . . .	100.0	94.9	68.8	26.0	0.0	5.1
Not needed . . . . .	100.0	93.3	87.6	5.7	2.2	4.5
Need walk-in shower						
Yes . . . . .	100.0	75.2	65.3	9.9	6.3	18.6
No . . . . .	100.0	89.0	81.9	7.1	3.3	7.7
Have walk-in shower						
Yes . . . . .	100.0	86.9	76.4	10.4	4.0	9.1
Needed <sup>1</sup> . . . . .	100.0	69.4	58.9	10.4	6.7	24.0
Not needed . . . . .	100.0	91.2	80.7	10.4	3.4	5.5
No . . . . .	100.0	87.4	80.6	6.8	3.6	9.0
Needed . . . . .	100.0	77.5	67.9	9.6	6.1	16.4
Not needed . . . . .	100.0	88.6	82.1	6.5	3.3	8.1

<sup>1</sup>Based on fewer than 100 persons in the sample.

**Table 5. Status in 1986 of people who were 70 years and over, living alone, and not receiving help with Activities of Daily Living in 1984, according to contacts with children in 1984: United States**

Contacts with children in 1984	Status in 1986						
	Total	In community				Institution	Dead
		Total	Alone	With others			
	Percent distribution						
All people . . . . .	100.0	87.3	79.9	7.5	3.7	9.0	
No living children . . . . .	100.0	87.2	81.6	5.6	4.0	8.8	
<b>WITH LIVING CHILDREN</b>							
Sex of children							
Sons only . . . . .	100.0	89.6	83.6	6.0	3.6	6.9	
Daughters only . . . . .	100.0	88.8	82.8	6.0	2.9	8.3	
Both . . . . .	100.0	85.5	75.0	10.4	3.8	10.7	
Time for nearest child to get here							
Within 10 minutes . . . . .	100.0	88.3	78.6	9.7	2.7	9.0	
10 minutes or more . . . . .	100.0	87.0	79.4	7.6	3.8	9.2	
Frequency of seeing a child							
Daily . . . . .	100.0	87.9	76.8	11.1	2.8	9.3	
2-6 times a week . . . . .	100.0	86.2	78.5	7.7	5.4	8.4	
Weekly . . . . .	100.0	83.5	74.9	8.7	3.7	12.7	
Less than weekly . . . . .	100.0	89.9	83.7	6.2	2.9	7.2	
Frequency of talking with a child							
Daily . . . . .	100.0	84.4	74.8	9.6	3.9	11.7	
2-6 times a week . . . . .	100.0	91.0	85.2	5.8	3.9	5.1	
Weekly . . . . .	100.0	91.6	83.5	8.0	2.3	6.1	
Less than weekly . . . . .	100.0	85.3	77.2	8.1	3.7	11.1	
Frequency of seeing or talking with a child							
Daily . . . . .	100.0	85.2	75.3	9.9	4.2	10.7	
6 times a week . . . . .	100.0	90.2	82.2	8.0	3.5	6.3	
Weekly . . . . .	100.0	89.4	82.5	6.9	3.3	7.3	
Less than weekly . . . . .	100.0	87.4	82.3	5.1	2.1	10.5	

**Table 6. Status in 1986 of people who were 70 years and over, living alone and not receiving help with Activities of Daily Living in 1984, according to recent social contacts in 1984: United States**

Contacts within 2 weeks in 1984	Status in 1986						
	Total	In community				Institution	Dead
		Total	Alone	With others			
	Percent distribution						
All people . . . . .	100.0	87.3	79.9	7.5	3.7	9.0	
Got together with friends or neighbors							
Yes . . . . .	100.0	89.3	82.9	6.5	3.2	7.5	
No . . . . .	100.0	81.5	71.2	10.3	5.1	13.4	
Talked on telephone with friends or neighbors							
Yes . . . . .	100.0	88.7	82.0	6.7	3.3	7.9	
No . . . . .	100.0	78.8	67.0	11.8	5.5	15.6	
Got together with relatives							
Yes . . . . .	100.0	88.0	79.8	8.2	3.4	8.6	
No . . . . .	100.0	85.0	80.1	5.0	4.6	10.4	
Talked on telephone with relatives							
Yes . . . . .	100.0	87.9	80.3	7.6	3.5	8.6	
No . . . . .	100.0	83.2	76.6	6.6	4.8	12.0	
Went to church or synagogue							
Yes . . . . .	100.0	91.9	84.2	7.6	3.1	5.1	
No . . . . .	100.0	81.9	74.6	7.2	4.4	13.8	
Went to other group event							
Yes . . . . .	100.0	93.6	87.4	6.2	1.7	4.7	
No . . . . .	100.0	84.7	76.7	8.0	4.5	10.8	

## Technical notes

The National Health Interview Survey is the large continuing survey of the National Center for Health Statistics that is used to collect information about the health status of people living outside of institutions in the United States. Each year through 1984 (the sample size and design were changed in 1985) people in about 42,000 households were interviewed in the household by U.S. Bureau of the Census Interviewers (NCHS, 1985).

The National Health Interview Survey uses a basic questionnaire to collect information about everyone living in the households selected in the sample and supplements, which are usually added for 1 year, to collect information on special topics or about special populations.

In 1984 the supplement was designed to obtain information about people age 55 years and over living in households. This supplement, the Supplement on Aging, has been described and the questionnaire has been published (NCHS, 1987a). Its importance in the present context is that it was also designed to be the basis for longitudinal studies. The name, address, and telephone number of someone not living in the household was obtained along with permission to link information from the survey with other existing files of data. The longitudinal studies based on the Supplement on Aging are known collectively as the Longitudinal Study of Aging (LSOA).

The first Longitudinal Study of Aging sample was selected to be reinterviewed in 1986. The focus was on the oldest-old and their changes in functional status and living arrangements. Therefore, only people who had been age 70 years and over in 1984 were selected for this reinterview sample (table I).

**Table I. Selection of the 1986 Longitudinal Study of Aging interview sample from the Supplement on Aging sample**

Age and race	SOA		LSOA	
	Number	Number	Number	Percent
Total . . . . .	7,541	5,151		68.3
Age in 1984				
70-79 years . . . . .	5,446	3,061		56.2
80 years and over . . . . .	2,095	2,090		99.8
Race				
White . . . . .	6,891	4,535		65.8
All other . . . . .	650	616		94.8
Black . . . . .	563	560		99.5
Other . . . . .	87	56		64.4

Selection was in three stages. First, all households with a person age 80 and over were selected. Everyone age 80 years and over in these households and their relatives age 70 years and over were included. Second, all households with a black person age 70 years and over were selected. All black persons and their relatives age 70 years and older in

these households were included. Finally, the remaining households with a person age 70-79 years were randomly sorted and one-half the households were selected. If there was more than one person age 70-79 in a household that was selected, all were included. Because the sample was selected from the Supplement on Aging file before final editing, five people who would have been selected from the final edited file were not included in the 1986 Longitudinal Study of Aging reinterview sample.

The 1986 Longitudinal Study of Aging reinterviews were also conducted by the U.S. Bureau of the Census. However, data were collected by Computer Assisted Telephone Interviewing (CATI) rather than personal interviews in the household. If there was no telephone number for either the sample person or a contact person, or if there was no response to repeated telephone calls, a questionnaire with a postage-paid return envelope addressed to the U.S. Bureau of the Census was mailed.

Of the 5,151 people selected for reinterview, the status of 92.3 percent was ascertained through the 1986 reinterview (table II). Almost all of the 7.7 percent of the people whose status was not ascertained were not located by the U.S. Bureau of the Census interviewers. A few were located but could not be interviewed because they were unable to speak on the telephone due to illness or hearing or language difficulties.

**Table II. Interview status of people in the Longitudinal Study of Aging 1986 interview sample, according to living arrangements in 1984**

Interview status in 1986	Status in 1984		
	Total	Alone	With others
Number in sample			
Total sample . . . . .	5,151	1,921	3,230
Percent distribution			
Total . . . . .	100.0	100.0	100.0
Ascertained			
In community . . . . .	76.5	75.6	76.9
Alone . . . . .	31.0	68.3	8.8
With others . . . . .	45.4	7.3	68.1
In institution . . . . .	3.7	4.9	3.0
Dead . . . . .	12.1	10.1	13.3
Not ascertained			
Not located . . . . .	7.5	9.1	6.5
Other reason . . . . .	0.2	0.2	0.2

Three-quarters of the people who were in the 1984 sample and who were still alive in 1986 answered the questions for themselves (table III). Of the people still living in the community in 1986, 79 percent answered all questions for themselves. Almost all the other respondents were residents of the sample person's household when they answered the questions. Except for people who were residents of nursing homes in 1986, very little information was obtained from contact persons.

NOTE: A list of references follows the text.

Table III. Respondents to the 1986 Longitudinal Study of Aging interviews

Status in 1986	With interview	Total	Respondent		
			Self	Proxy	
				In same house	Contact person
Number	Percent distribution				
Total . . . . .	4,718	100.0	65.7	30.4	3.9
Alive . . . . .	4,114	100.0	75.4	20.2	4.4
In community . . . . .	3,938	100.0	78.7	18.4	2.9
Alone . . . . .	1,597	100.0	88.4	8.3	3.3
With others . . . . .	2,341	100.0	72.1	25.3	2.6
In institution . . . . .	176	100.0	0	60.8	39.2
Dead . . . . .	604	100.0	0	100.0	0

NOTE: An additional 20 persons were located through matching with the National Death Index. They are not included in this table.

The Longitudinal Study of Aging has been described (Fitti and Kovar, 1987) and a description of the study, which includes a written version of the Computer Assisted Telephone Interviewing questionnaire, is available from the National Center for Health Statistics and the Government Printing Office (NCHS, 1987b).

### Analytic methods

The Longitudinal Study of Aging 1986 reinterview is designed to produce national estimates for people who were age 70 years and over and living in the community in 1984. The weights were recalculated to take the subsampling into account. All data in this report are national estimates for people who were age 70 years and over and living in households in the United States in 1984.

The percent distributions that show the individual's status in 1986 (tables 4-6) are based only on people whose status was ascertained in 1986. This is equivalent to assum-

ing that the people who were not located were the same as those who were. That assumption is not valid for many purposes. People who were not located in 1986 were more likely to be living alone (46 versus 37 percent) and less likely to have a telephone (87 versus 99 percent) than those whose status was ascertained. However, because the purpose of this report is to describe people who had been living alone, the first difference does not bias the data. The second one could, but there were so few people who did not have telephones themselves or give the name of a contact person with a telephone that the difference should not have much effect on the estimates.

Because the sample of people living alone is relatively small, 1,921 persons, differences that appear to be large may not be statistically significant. The average weight for the Longitudinal Study of Aging sample is 3,365. For example, the population estimate of 1.7 million people who had not gotten together with friends or neighbors within 2 weeks of the 1984 interview is based on 555 people in the sample.

For general purposes, sampling errors for estimates shown in this report can be estimated by using the formula

$$\text{Variance} = pq/n$$

where  $p$  = proportion of people with the characteristic

$$q = (1-p)$$

= proportion of people without the characteristic

$n$  = number of people in the sample

and then taking the square root of the variance. The sample numbers are given in tables 1-3.

This approximation can be used for data in this report because the impact of the clustering due to the complex sample design is negligible for older people living alone. The approximation is not necessarily appropriate for other data from the Longitudinal Study of Aging. It may not be appropriate for people living with others because the subsampling procedure was designed to collect information about all persons age 70 years and over in every household that was selected for the Longitudinal Study of Aging 1986 reinterview sample.

NOTE: A list of references follows the text.

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