(≥0.70) was similar to the national rate in 1985 (0.58).

The QAS evaluation was relatively low-cost because the sample size was small. One interviewer was required for the survey and the evaluation was completed in two days. The QAS method is useful for evaluation of local oral rehydration programs in Haiti. □

Acknowledgments

I express my appreciation to Jean-Jacques Lamour for his assistance in the training and supervision of the Freres health workers. This research was supported by a USAID grant to the *Institut Haitien de l'Enfance* and the Haitian Arab Center, Port-au-Prince, Haiti.

References

1. Cash RA: Oral rehydration in the treatment of diarrhea. In: Chen LC, Scrimshaw NS (eds): Diarrhea and Malnutrition: Interaction, Mechanisms and Interventions. New York: Plenum Press, 1983; 203–221.
2. Institut Haitien de l'Enfance: Action pour la survie de l'enfant Haiti. *Port-au-Prince: Editions de l'Enfance,* 1987.
3. Lemeshow S: Sampling techniques for evaluating health parameters in developing countries. Board on Science and Technology for International Development, National Research Council Working Paper. Washington, DC: National Academy Press, 1988.
4. Tulloch J, Burton P: Global access to oral rehydration salts and use of oral rehydration therapy. World Health Stat Q 1987; 40:110–115.
5. Chowdhury AM: Evaluating community ORT programmes: Indicators for use and safety. Health Pol Plann 1986; 1:214–221.
6. Lemeshow S, Hosmer DW, Klar J, Lwanga SK: Adequacy of Sample Size in Health Studies. New York: John Wiley & Sons, 1990; 24–28, 213–214.
7. Ministry of Public Health and Population: Rapport final d'evaluation du program national de controle de la diarrhee et de promotion de l'allaitement maternel. Port-au-Prince: Ministry of Public Health and Population, 1985.

APPENDIX

Survey Questionnaire, Quality Assurance Sampling Survey, Freres, Haiti, 1987.

1. Did (name of the child) have diarrhea in the past two weeks? (If not, pass to question 3).
   Yes No
2. What did you give (name of the child)?
(Circle all spontaneous responses of the mother. Do not mention alternatives.)
   Home Remedy Doctor's Medicine Packet Solution
   Salt and Sugar Solution Nothing
3. Do you recognize this packet? (Show the ORS packet.)
What is it called? _____
4. How do you prepare the packet ORS solution? (Circle all spontaneous responses of the mother. Do not mention alternatives.)
   3 Kola Bottles of Water 1 Rum Bottle of Water 1 ORS Packet
   Solution Boiled Other _____ Doesn't Know
5. How do you prepare the salt and sugar ORS solution? (Circle all spontaneous responses of the mother. Do not mention alternatives.)
   2 Large Spoons of Sugar 1 Small Spoon of Salt
   1 Rum Bottle of Water 3 Kola Bottles of Water
   2 Small Spoons of Sugar 1 Pinch of Salt
   1 Kola Bottle of Water Solution Boiled
   Other _____ Doesn't Know

A B S T R A C T

A nine-year representative, longitudinal study of 1,598 urban elderly shows that two to eight times as many impaired or disabled are cared for in the community as in institutions. Younger age, male gender, better income, and living with others, especially children, favor continuing care in the home. (*Am J Public Health.* 1991; 81:1207–1209)

Impaired and Disabled Elderly in the Community

Amasa B. Ford, MD, Ann W. Roy, PhD, Marie R. Haug, PhD, Steven J. Folmar, PhD, and Paul K. Jones, PhD

Introduction

The purpose of the present study is to report information about the distribution between community and long-term institutional care of a representative sample of urban elderly over a nine-year period. We identify supporting factors that have enabled from two to eight times as many of the most impaired and disabled to remain in the community as were admitted to long-term nursing home care.

Methods

In 1975 a random sample of 1,598 noninstitutionalized persons age 65 years and older, living in the City of Cleveland, Ohio, were interviewed in their homes using the Duke OARS instrument.[1,2]

Nine years later, in 1984, the vital status of all but 13 individuals (0.8 percent) was ascertained. Among the 805 who were known to have survived, 647 (80.4 percent) were reinterviewed, using the same instrument. Information sufficient to determine institutionalization was ob-

From the Department of Epidemiology and Biostatistics, School of Medicine, and the Center on Aging and Health, Case Western Reserve University; and the Carolina Population Center, University of North Carolina, Chapel Hill.

Address reprint requests to Amasa B. Ford, MD, Department of Epidemiology and Biostatistics, School of Medicine, Case Western University, Cleveland, OH 44106. This paper, submitted to the Journal May 29, 1990, was revised and accepted for publication January 24, 1991.

TABLE 1—Survivors (n = 589) Remaining in the Community or Institutionalized Long-term, 1975–84, According to Health Impairment and Disability in 1984

	Remaining in Community (n)	Institutionalized Long-term (n)	Percent of Impaired or Disabled Remaining in Community
Survivors	526	63	
Physical health			
4+ chronic conditions	124	16	88.6
<4 chronic conditions	402	47	
Cognitive impairment			
4+ errors	63	26	70.8*
<4 errors	443	10	
Psychological distress			
7+ symptoms	95	42	69.3*
<7 symptoms	431	21	
Functional disability			
dependent 1+ ADL	111	60	64.9*
not ADL dependent	415	3	

*p < .001 by chi square

TABLE 2—Logistic Regression of Demographic and Independent Variables, Measured in 1975, on Dependent Variable: Remaining in Community 1975–84, for Survivors (n = 589) and Deceased (n = 632)*

Variables	Odds Ratio	95% CL
Age (continuous, by year)	.93	.90–.96
Gender (M = 1)	2.70	1.72–4.16
Race (B = 1)	1.38	.87–2.17
Education (>8 yr. = 1)	.73	.50–1.07
Income ($5000+ = 1)	2.28	1.46–3.54
Lives with child(ren) only (= 1)	3.45	1.85–6.43
Physical health impairment (4+ chronic conditions = 1)	1.11	.68–1.82
Cognitive impairment (4+ errors = 1)	.85	.46–1.56
Psychological distress (>7 of 15 symptoms)	1.53	.87–2.70
Functional disability (help with 1+ ADL = 1)	.79	.52–1.20
Died between 1975 and 1984 (= 1)	.56	.38–.83

*82 cases omitted from analysis because of missing data.

tained for 589 of the living respondents (91 percent). By 1984, 780 individuals were known to have died. Telephone interviews with next of kin or other informants were obtained for 639 deceased, with data about institutionalization secured for 632 (81 percent).

Demographic information was collected according to the OARS instrument. Impaired physical health was indicated by the presence of four or more self-reported chronic conditions from a list of the 12 most prevalent conditions.[3] Impaired cognitive function was measured by a score of four or more errors on a 10-item test of cognitive function.[4] "Psychological distress" was measured as seven or more symptoms of a list of 15 on a Short Psychiatric Evaluation Schedule.[5] Functional disability was measured by need for help with one or more of six activities of daily living: walking, going outside, bathing, dressing, transfer (i.e. getting in or out of bed or chair), or eating.[6]

The definition of long-term institutionalization was one or more institutional admissions totaling 30 days or more during the nine-year observation period, or prior to death. The rest of the subjects were characterized as "remaining in the community," even though they may have experienced short-term admissions. The object was to distinguish those who continued to receive care mainly outside of institutions from those who entered long-term or indefinite institutional care.

Results

Comparison of the 1984 survivors with figures extrapolated from the 1980 census of Cleveland shows that the subjects, now aged 74 years and older, remained representative of the city population aged 75 and over.[7]

By 1984, 76 of the 647 responding survivors (11.8 percent) were living in an institution at the time of the interview, and a total of 63 (10.7 percent) of all respondents, including institutionalized and non-institutionalized, had been admitted to a long-term care institution for 30 days or more. Of 731 persons who died during the nine-year observation period and for whom death certificates were available, 28.3 percent had a nursing home as their usual place of residence at the time of death.

Considering first the 589 survivors with complete data and their state of health impairment and functional disability at the time of reinterview in 1984, it appears that mental health impairment and functional disability were associated with institutionalization, but that the chances of remaining in the community were not affected by the presence of multiple chronic conditions. Expressed as a ratio of numbers of community residents to numbers of institutional residents, the figures are 7.8 for physical health impairment, 2.4 for cognitive impairment, 2.3 for psychological distress, and 1.8 for functional disability (Table 1).

The next stage of analysis was to ask whether it would have been possible to predict at the beginning of the study who would experience long-term institutionalization and who would remain in the community. A multivariate logistic regression was performed, using remaining in the community as the dependent variable, with independent variables as indicated in Table 2.

Factors significantly favoring continued care in the community include: younger age, male gender, income of greater than $5,000 (1975), and living with child(ren) only. Since previous analyses had pointed to living with others as favoring community care, three separate regressions were carried out, using different definitions of this variable. The odds ratio resulting were: lives with spouse, or children and spouse: 1.76 (95% CL = 1.08, 2.89), lives with others: 2.23 (95% CL = 1.54, 3.22), and lives with child(ren) only: 3.45 (95% CL = 1.85, 6.43).

Somewhat surprisingly, none of the four measures of impairment or disability served to distinguish between those who remained in the community and those who experienced long-term institutionalization. Those who died during the study period were less likely to have avoided long-term institutionalization.

Discussion

These results indicate that socioeconomic factors predominate as predictors of long-term care in the community. The way these factors operate is fairly clear. Relative youth implies better resources and coping skills. Males are more likely to have a surviving spouse. Better income allows for better housing and purchase of services, and children can be both care providers and income producers. In other recent longitudinal studies age, female gender, and living alone or absence of spouse have been shown to predict institutionalization.[8,9] Notably in the present study, when elders live with them, children appear to enhance the possibility of remaining in the community more than do living spouses or nonspecified "others."

Although, in this study, impairment and disability do not appear to predict whether community or institutional care will be used, it must be remembered that some part of nine years intervened between the measurement of dependent and independent variables. Observations closer to the decision-point might have shown that mental health impairment and functional disability were more difficult to care for at home than impairment of physical health alone, as suggested by the data in Table 1. □

Acknowledgments

Support for this project was provided by Grants P01 AG04391 and R01 AG07195 from the National Institute on Aging.

This report was presented in preliminary form at the World Congress of Gerontology, Acapulco, Mexico, June 22, 1989.

References

1. US General Accounting Office: The Well-Being of Older People in Cleveland, Ohio. HRD-77-70, Washington DC: US GAO, 1977.
2. Fillenbaum G: Multidimensional Functional Assessment of Older Adults: The Duke Older Americans Resources and Services Procedures. Hillsdale, NJ: Lawrence Erlbaum Associates, 1988.
3. Ford AB, Folmar SJ, Salmon RB, Medalie JH, Roy AW, Galazka SS: Health and function in the old and very old. J Am Geriatr Soc 1988; 36:187–197.
4. Pfeiffer E: A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. J Am Geriatr Soc 1975; 23:433–441.
5. Kincannon JC: Prediction of the standard MMPI scale scores from 71 items: The minimult. J Consult Clin Psychol 1968; 32:319–325. (Modified by Pfeiffer—see reference 2.)
6. Feller BA: Americans Needing Help to Function at Home. National Center for Health Statistics, Advance Data from Vital and Health Statistics, No. 92, Department of Health and Human Services Publ. No. (PHS) 83-1250. Hyattsville, MD: National Center for Health Statistics, 1983.
7. Ford AB, Haug MR, Jones PK, Roy AW, Folmar SJ: Race-related differences among elderly urban residents: A cohort study, 1975–1984. J Gerontol Soc Sci 1990; 45: 5163–5171.
8. Branch LG, Jette AM: A prospective study of long-term care institutionalization among the aged. Am J Public Health 1982; 72:1373–1378.
9. Shapiro E, Tate RB: Predictors of long-term care facility use among the elderly. Can J Aging 1985; 4:11–19.

Recent Trends in the Incidence of Toxic Shock Syndrome in Northern California

Diana B. Petitti, MD, MPH, and Arthur L. Reingold, MD

ABSTRACT

The incidence of toxic shock syndrome in women members of a large prepaid medical care program in Northern California was 1.5 cases per 100,000 in a period after removal of tampons containing polyacrylate rayon and reductions in tampon absorbency. This rate was lower, but not significantly lower, than the rate of 2.2 per 100,000 in the prior interval. It was higher, but not significantly higher, than the rate of 0.4 per 100,000 in the era before "superabsorbent" materials were introduced into tampons. The incidence in men has been stable at about 0.1 cases per 100,000 for the 15-year period from 1972 though 1987. (*Am J Public Health.* 1991;81:1209–1211)

Introduction

We previously reported the incidence of toxic shock syndrome (TSS) through 1985 in members of the Northern California Kaiser Permanente Medical Care Program ages 15–34 years.[1–3] Here, we present a final update on TSS in this population, presenting data for 1986 and 1987. The incidence of TSS in these latter two years is of particular interest, because polyacrylate rayon, a material included in tampons to increase their absorbency, was removed from tampons marketed in the United States in March 1985 and because there were further declines in the absorbency of tampons overall. Since high absorbency has been linked with an increase risk of TSS in tampon users,[4] one would expect the incidence of TSS to decline in women after reductions in the absorbency of tampons brought about, at least in part, by removal of polyacrylate rayon from tampons.

Methods

Our method of case ascertainment, in which medical records were reviewed to identify recognized and unrecognized cases of TSS, was described in detail in a

From the Division of Research, Kaiser Permanente Medical Care Program, Oakland, CA (Petitti) and the Department of Biomedical and Environmental Health Sciences, School of Public Health, University of California, Berkeley (Reingold).

Address reprint requests to Diana B. Petitti, MD, MPH, Department of Family and Community Medicine, AC-9, Box 0900, University of California at San Francisco, San Francisco, CA 94143. This paper, submitted to the Journal May 25, 1990, was revised and accepted for publication January 8, 1991.