CENTERS FOR DISEASE CONTROL

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Current Trends

Pilot Study of a Household Survey to Determine HIV Seroprevalence

A survey based on a probability sample of U.S. households was suggested as a method to determine the number of persons infected with human immunodeficiency virus (HIV) (*1*). To test the feasibility of such a survey, CDC's National Center for Health Statistics (NCHS) recently conducted a pilot study in two sites through a contract with the Research Triangle Institute. The first field test, conducted in January 1989, used a random sample of adults from households in Allegheny County (Pittsburgh), Pennsylvania (*2*); the response rate of 81% suggested that the majority of the sample population might participate in a carefully planned household HIV survey. This report summarizes the second field test, which was conducted in Dallas County, Texas, from September through December 1989.

The study in Dallas County was designed to resemble a national project. In both Allegheny County and Dallas County, to address public sensitivities and concerns about acquired immunodeficiency syndrome (AIDS)-related issues, planning and implementation activities included the establishment of policy advisory panels representing relevant constituencies and organizations. Procedures were developed to protect the privacy of all persons contacted in the survey.

Survey participants (adults aged 18–54 years) were randomly selected from a sample of 2528 households that were visited by teams of interviewers and phlebotomists. Persons selected were shown a videotape on the purpose and content of the survey; blood specimens obtained from those who consented were tested for antibodies to HIV and hepatitis B core antigen. Each participant provided basic demographic information and answered questions about risk behaviors on an anonymous self-administered questionnaire. The survey sample was geographically stratified and of adequate size to provide a reliable HIV prevalence estimate for the county.

Of the 1724 eligible persons identified, 1446 (84%) consented to participate in the survey. Primary reasons for refusal to participate were lack of interest in participating in surveys (48%) and fear of giving blood (22%).

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To assess and reduce potential nonresponse bias, a follow-up study was conducted using a random sample (n = 184) of those who initially declined to participate: 50% of these persons were asked only to complete the questionnaire and 50% to complete the questionnaire and provide a blood sample. In the follow-up study, a larger proportion of participants reported intravenous (IV)-drug use (7.0%) and male-to-male sex (16.8%) than those who consented to participate when first contacted (3.1% and 5.1%, respectively).

This evidence of nonresponse bias was used to adjust the overall HIV seroprevalence estimate among 18- to 54-year-old residents of households in Dallas County from 0.3% to 0.4%,* indicating that approximately 4000 persons among an estimated 950,000 persons aged 18–54 years would test positive for antibody to HIV (95% confidence interval = 2200–7500 HIV-positive persons) (Table 1). HIV seroprevalence was highest among males, persons aged 25–34 years, and persons who were unmarried. Antibody to hepatitis B core antigen was detected in 7.3% of participants who provided blood samples.

Overall, 20.2% reported having engaged in one or more risk behaviors for HIV infection (Table 2). An estimated 7.3% of males in Dallas County reported having had sex with another male since 1978 and no IV-drug use; 4.5% of males reported having had receptive anal intercourse. Of all adult household residents, an estimated 3.8% reported using IV drugs since 1978 and no male-to-male sex. In addition, 10.3% of respondents reported a history of gonorrhea; 2.4%, syphilis; and 2.3%, genital herpes.

The prevalence of HIV infection was highest among those who reported behavior previously associated with HIV transmission. Males who reported having had sex

*Based on 15 positive cases (13 males and two females).

TABLE 1. Percentage of persons aged 18–54 years with HIV antibody and hepatitis B core antigen (anti-HBc),* by sex, age, and marital status — Dallas County, Texas, 1989

Category	Sample size	HIV antibody %	HIV antibody SE†	Anti-HBc %	Anti-HBc SE
Sex					
Male	701	0.7	0.2	7.7	1.1
Female	745	0.1	0.1	6.9	1.7
Age (yrs)					
18–24	276	0.4	0.3	1.5	0.5
25–34	626	0.7	0.3	7.4	1.3
35–54	544	0.2	0.1	9.8	2.4
Marital status					
Married/Widowed	600	0.1	0.0§	7.1	1.8
Divorced/Separated	309	0.4	0.2	10.0	2.7
Never married	537	1.4	0.5	6.2	1.0
Total	**1446**	**0.4**	**0.1**	**7.3**	**1.2**

*Estimates based on sample data adjusted for nonresponse and nonresponse bias (*2*).
†Standard error.
§SE = 0.01.

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with another male (but not IV-drug use) since 1978 had an estimated HIV infection prevalence of 8.7%, which increased to 14.0% among those who reported having had receptive anal intercourse. The estimated HIV infection prevalence among those who reported IV-drug use (but no male-to-male sex) in the preceding year was 1.3% (Table 2). All HIV-infected persons in the Dallas survey reported having engaged in risk behavior for HIV infection.

To evaluate the survey estimate of HIV prevalence, several model estimates were prepared using back-calculation, a statistical method that uses observed AIDS incidence and estimated AIDS incubation period distribution (*3–7*). Comparison of the survey prevalence estimate with back-calculation models indicates that the point estimate (4000 infected persons) is lower than the range of estimates from these models; however, the upper boundary of the survey estimate is within the ranges obtained from two of the models (Table 3).

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Editorial Note: Findings in this feasibility study indicate that persons who engage in risk behaviors for HIV infection are likely to report those behaviors in a self-administered anonymous questionnaire. However, the extent of underreporting of these risk behaviors cannot be readily determined because there are no comparable studies for Dallas County and reporting in the survey could not be verified through comparison with other records because of ethical and privacy concerns. Nonetheless, the behavioral findings are consistent with previous reports (*8,9*), and the serologic and behavioral findings are consistent within this survey.

The follow-up study permitted adjustment to improve the estimate by compensating for nonresponse bias. Despite this adjustment, estimates derived using back-calculation models exceeded those based on the household survey. Although these

TABLE 2. Percentage of population reporting risk factors and percentage with HIV antibody,* by key risk factors — Dallas County, Texas, 1989

Reported risk factor	Population since 1978				Population in last 12 months			
	With risk factors		With HIV antibody		With risk factors		With HIV antibody	
	%	SE†	%	SE	%	SE	%	SE
Male-to-male sex, no IV-drug use	7.3	1.9	8.7	2.4	4.4	1.5	11.8	2.5
Male receptive anal intercourse	4.5	1.5	14.0	3.1	2.0	0.6	17.0	5.7
IV-drug use, no male-to-male sex	3.8	0.8	1.0	0.6	1.3	0.6	1.3	0.8
Global risk§	20.2	1.8	1.7	0.5	—	—	—	—

*Estimates based on sample data adjusted for nonresponse and nonresponse bias (*2*).
†Standard error.
§Includes all persons reporting any of the following risk factors since 1978: male-to-male sex, IV-drug use, payment for sex, or sex with an at-risk person.

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models are not a definitive standard for assessing the accuracy of the survey estimate, they suggest that the serologic survey point estimate for Dallas County is too low.

The feasibility study demonstrated that substantial resources are needed to implement such a household survey and that public concern requires intensive community preparation. This study confirmed that nonresponse bias is an important problem and that methods for measurement of nonresponse bias need to be field tested.

CDC is estimating national seroprevalence levels by using AIDS surveillance data and back-calculation models (*5*) and by using data from HIV serosurveys such as that of childbearing women (*10*). Based on the findings in this study and the availability of other methods for estimating HIV seroprevalence, CDC has recommended that a national household survey to estimate HIV seroprevalence not be done. However, applications of this methodology in the future could employ approaches for measuring nonresponse bias that 1) include persons for whom reliable independent records of HIV status and risk behaviors are available (this approach may not be feasible because of HIV research-related privacy concerns); and/or 2) employ a dual-frame survey design, including a sample of the general population and samples of special populations (i.e., clients of sexually transmitted diseases clinics, drug-treatment centers, and hospitals). The latter approach might produce more accurate HIV seroprevalence estimates by compensating for biases in each of the surveys.

Copies of the final report of the National Household Seroprevalence Survey Feasibility Study are available from the Office of Vital and Health Statistics, NCHS, CDC, Room 1120, 6525 Belcrest Road, Hyattsville, MD 20782.

References

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TABLE 3. Comparison of HIV prevalence estimate* with back-calculation model estimates — Dallas County, Texas, 1989

Estimation method	Assumed percentage of AIDS cases not reported†	Estimated range of no. of persons with HIV antibody
Dallas survey (*2*)	—	2,200–7,500
National Cancer Institute model (*3*)	10	7,100–13,800
CDC Weibull model (*6*)	10	10,900–15,200
CDC Weibull model	25	13,000–18,300
CDC Markov model§	10	6,800–9,600
CDC Markov model	25	8,100–11,600

*Estimates based on sample data adjusted for nonresponse and nonresponse bias (*2*).
†Plausible assumptions for Dallas County, based on national estimates (*5*).
§Similar to CDC Weibull model but with a Markov model for incubation period (*7*).

HIV Seroprevalence — Continued

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International Notes

Update: Dracunculiasis Eradication — Pakistan, 1990

Dracunculiasis (guinea worm disease) is a disabling infection that affects an estimated 10 million persons in 17 African countries and parts of India and Pakistan each year (*1,2*). In 1987, the Pakistan Dracunculiasis Eradication Program was established with the goal of eradicating dracunculiasis from Pakistan by 1990. This report summarizes progress toward that goal.

The program, which is assisted by Global 2000, Inc., and the Bank of Credit and Commerce International Foundation, conducted a national survey in 1987 for cases in Pakistan's estimated 48,000 villages to determine the location and incidence of the disease. In each village, surveyors used case recognition cards to ascertain whether cases had occurred during the previous 2 years and to determine the number of current cases (none, 1–9, or ≥10). The search indicated that the distribution of dracunculiasis was focal and involved <500 villages and approximately 2400 cases in the disease-endemic provinces of North-West Frontier, Punjab, and Sind (*3*) (Figure 1). The estimated population in these affected villages was 361,000.

In February 1988, active surveillance and control activities were implemented in all known affected villages (*4*). Village "implementors" were assigned to each disease-endemic village to conduct monthly searches for cases, record each case in village case registers, report these cases monthly to regional managers, implement hygiene education to promote filtration of unsafe drinking water through cloth filters, and distribute cloth filters and monitor use of the filters by villagers. During the transmission season (May–September), field health workers applied temephos (Abate®*) each month to unsafe sources of drinking water in each of the affected villages to reduce populations of the intermediate copepod hosts.

The coverage of intervention measures and the effectiveness of surveillance activities were evaluated in late 1988 and in 1989. Further epidemiologic investiga-

*Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

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tions of the disease-endemic areas in 1988 increased the total number of villages under surveillance to 530. Early in 1989, 40 sector supervisors were assigned to improve supervision of village implementors.

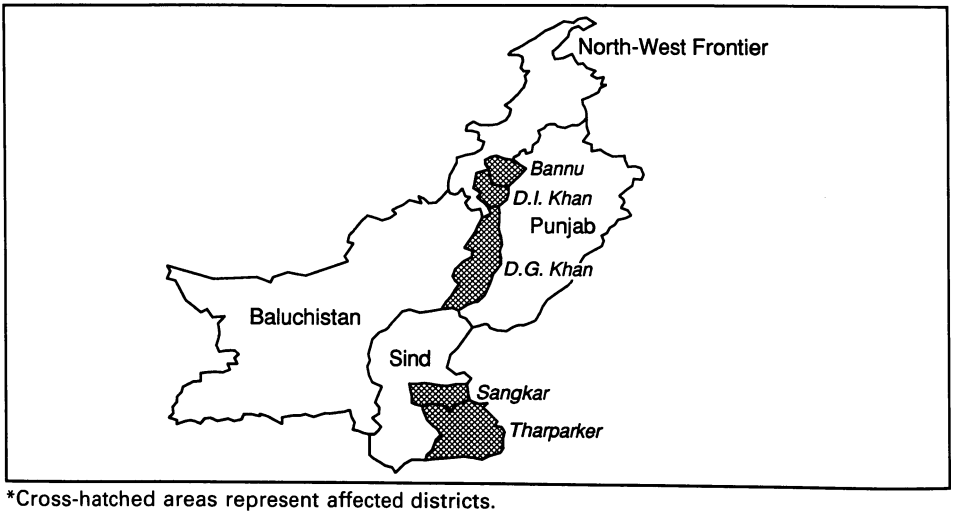
In January 1990, a case-containment strategy was implemented to prevent secondary transmission from cases occurring during the transmission season. Specific goals established for health workers were to 1) detect each new case of dracunculiasis within 24 hours and apply topical antiseptics and occlusive bandages to infected patients to reduce contamination of drinking water sources, 2) instruct each infected patient about dracunculiasis and the importance of not entering a drinking water source, 3) reinforce the importance of filtering drinking water and ensure that each household has cloth filters and knows how to use them properly, and 4) ensure treatment of local water source(s) with Abate®. In >86% of the cases that occurred through August 1990, control measures were initiated within 24 hours of emergence of the worm. Because of the 1-year incubation period of *Dracunculus medinensis*, however, the overall impact of the case-containment strategy cannot be assessed until the 1991 transmission season.

In 1990, a cumulative total of 160 cases in 56 villages were reported, compared with 534 cases in 146 villages in 1989 and 1110 cases in 156 villages in 1988 (Figure 2). Thus, the decline in the number of cases in 1990 from 1989 was 70%, compared with 52% for 1988 to 1989 and 54% for 1987 to 1988.

Reported by: National Institute of Health, Pakistan. WHO Collaborating Centre for Research, Training, and Eradication of Dracunculiasis. Global 2000, Inc., Carter Center of Emory Univ, Atlanta, Georgia. Div of Parasitic Diseases, Center for Infectious Diseases, CDC.

Editorial Note: The goal of a dracunculiasis eradication program is to reduce disease incidence to zero cases. Implicit in this goal is the need for active surveillance to 1) rapidly detect the location of all disease-endemic villages; 2) monitor operational campaign procedures to maximize efficiency, including the appropriate use of case-containment measures to prevent secondary transmission; and 3) adequately document the reduction in disease incidence resulting from control efforts. Substan-

FIGURE 1. National survey for cases of dracunculiasis – Pakistan,* July 1987



*Cross-hatched areas represent affected districts.

Dracunculiasis Eradication — Continued

tial reductions in the incidence of dracunculiasis since 1987 indicate the potential for Pakistan to become the first disease-endemic country to document the eradication of dracunculiasis and attain World Health Organization certification of eradication.

In areas where dracunculiasis is widespread and incidence is high, active surveillance can target village-based control interventions with maximum effectiveness to produce rapid and substantial reductions in disease incidence. However, in areas with relatively few cases, incidence can be reduced to zero more quickly and effectively if all cases are rapidly detected and investigated and stringent containment measures are implemented to prevent secondary transmission. To halt transmission of dracunculiasis by a specified target date, eradication programs should incorporate efficient case-containment measures into existing surveillance and control strategies. Case-containment measures are particularly appropriate for achieving zero case levels in areas where incidence levels of dracunculiasis are already low (e.g., Cameroon, India, and Pakistan).

References

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FIGURE 2. Dracunculiasis cases, by month — Pakistan, 1988–1990

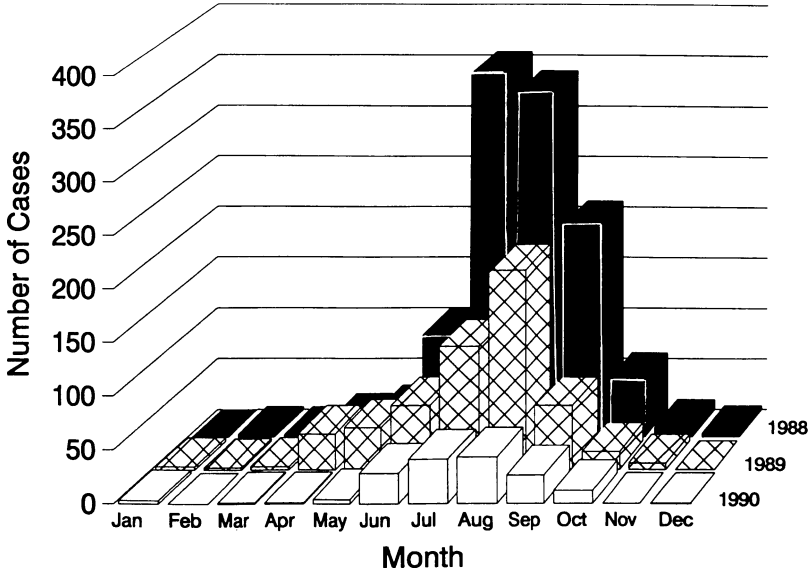
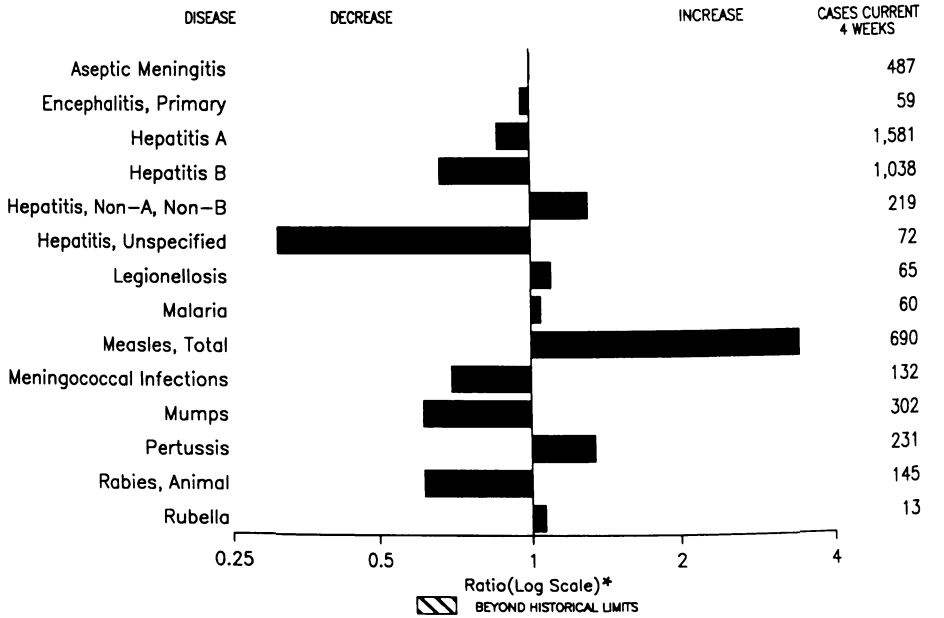


FIGURE I. Notifiable disease reports, comparison of 4-week totals ending January 5, 1991, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from comparable, previous, and subsequent 4-week periods for past 5 years).

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending January 5, 1991 (1st Week)

	Cum. 1991		Cum. 1991
AIDS	468	Plague	-
Anthrax	-	Poliomyelitis, Paralytic*	-
Botulism: Foodborne	-	Psittacosis	1
Infant	1	Rabies, human	-
Other	-	Syphilis: civilian	321
Brucellosis	-	military	-
Cholera	-	Syphilis, congenital, age < 1 year	-
Congenital rubella syndrome	-	Tetanus	-
Diphtheria	-	Toxic shock syndrome	6
Encephalitis, post-infectious	1	Trichinosis	-
Gonorrhea: civilian	5,848	Tuberculosis	116
military	50	Tularemia	1
Leprosy	-	Typhoid fever	2
Leptospirosis	-	Typhus fever, tickborne (RMSF)	3
Measles: imported	-		
indigenous	24		

*No cases of suspected poliomyelitis have been reported in 1991; none of the 6 suspected cases in 1990 have been confirmed to date. Five of the 13 suspected cases in 1989 were confirmed and all were vaccine associated.

TABLE II. Cases of specified notifiable diseases, United States, weeks ending January 5, 1991, and January 6, 1990 (1st Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	468	39	3	1	5,848	12,977	193	97	15	4	9	-
NEW ENGLAND	20	-	-	-	130	444	3	2	-	1	-	-
Maine	11	-	-	-	-	4	-	-	-	-	-	-
N.H.	-	-	-	-	-	8	-	-	-	-	-	-
Vt.	3	-	-	-	3	3	-	-	-	-	-	-
Mass.	-	-	-	-	113	91	-	-	-	-	-	-
R.I.	6	-	-	-	14	38	3	2	-	1	-	-
Conn.	-	-	-	-	-	300	-	-	-	-	-	-
MID. ATLANTIC	88	5	-	-	100	1,311	51	27	2	-	2	-
Upstate N.Y.	-	5	-	-	100	-	45	23	2	-	2	-
N.Y. City	-	-	-	-	-	824	-	-	-	-	-	-
N.J.	88	-	-	-	-	366	-	-	-	-	-	-
Pa.	-	-	-	-	-	121	6	4	-	-	-	-
E.N. CENTRAL	97	6	-	1	300	2,931	4	1	2	2	2	-
Ohio	-	6	-	1	-	1,019	4	1	-	2	2	-
Ind.	-	-	-	-	295	375	-	-	-	-	-	-
Ill.	97	-	-	-	-	909	-	-	-	-	-	-
Mich.	-	-	-	-	-	466	-	-	-	-	-	-
Wis.	-	-	-	-	5	162	-	-	2	-	-	-
W.N. CENTRAL	42	9	-	-	324	877	68	4	2	-	-	-
Minn.	28	2	-	-	14	89	-	-	-	-	-	-
Iowa	14	-	-	-	49	124	-	-	-	-	-	-
Mo.	-	-	-	-	179	347	-	-	-	-	-	-
N. Dak.	-	-	-	-	-	9	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	2	56	-	-	-	-	-
Nebr.	-	1	-	-	82	-	9	3	-	-	-	-
Kans.	-	6	-	-	-	306	3	1	2	-	-	-
S. ATLANTIC	63	10	1	-	3,506	4,117	9	33	5	1	1	-
Del.	-	1	-	-	23	34	2	2	-	-	-	-
Md.	-	3	1	-	237	182	4	7	2	-	-	-
D.C.	38	-	-	-	213	228	-	-	-	-	-	-
Va.	21	-	-	-	-	58	-	-	-	-	-	-
W. Va.	3	-	-	-	42	20	-	1	-	1	-	-
N.C.	-	4	-	-	578	403	2	11	3	-	-	-
S.C.	-	1	-	-	210	534	1	11	-	-	1	-
Ga.	1	-	-	-	811	897	-	1	-	-	-	-
Fla.	-	1	-	-	1,392	1,761	-	-	-	-	-	-
E.S. CENTRAL	11	4	-	-	822	618	7	12	2	-	-	-
Ky.	-	2	-	-	74	64	2	5	1	-	-	-
Tenn.	11	1	-	-	207	117	2	6	1	-	-	-
Ala.	-	1	-	-	287	238	3	1	-	-	-	-
Miss.	-	-	-	-	254	199	-	-	-	-	-	-
W.S. CENTRAL	58	2	2	-	511	793	12	11	-	-	-	-
Ark.	-	1	-	-	132	199	1	-	-	-	-	-
La.	-	-	-	-	125	150	2	4	-	-	-	-
Okla.	-	1	2	-	-	88	9	7	-	-	-	-
Tex.	58	-	-	-	254	356	-	-	-	-	-	-
MOUNTAIN	-	3	-	-	55	322	34	7	2	-	4	-
Mont.	-	-	-	-	-	3	1	1	-	-	-	-
Idaho	-	-	-	-	-	1	-	1	-	-	-	-
Wyo.	-	-	-	-	-	2	-	-	-	-	-	-
Colo.	-	-	-	-	-	96	-	-	-	-	-	-
N. Mex.	-	-	-	-	9	10	17	1	-	-	-	-
Ariz.	-	-	-	-	-	146	-	-	-	-	-	-
Utah	-	2	-	-	9	13	14	-	1	-	3	-
Nev.	-	1	-	-	37	51	2	4	1	-	1	-
PACIFIC	89	-	-	-	100	1,564	5	-	-	-	-	-
Wash.	-	-	-	-	-	96	-	-	-	-	-	-
Oreg.	-	-	-	-	21	57	4	-	-	-	-	-
Calif.	88	-	-	-	74	1,388	-	-	-	-	-	-
Alaska	1	-	-	-	-	23	-	-	-	-	-	-
Hawaii	-	-	-	-	5	-	1	-	-	-	-	-
Guam	-	-	-	-	-	2	-	-	-	-	-	-
P.R.	-	-	-	-	-	48	-	-	-	-	-	-
V.I.	-	-	-	-	-	6	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	1	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	2	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending January 5, 1991, and January 6, 1990 (1st Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	1991	Cum. 1991	Cum. 1990
UNITED STATES	3	24	24	-	-	233	11	25	25	20	20	63	2	2	13
NEW ENGLAND	1	-	-	-	-	3	2	-	-	5	5	-	-	-	-
Maine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N.H.	-	-	-	-	-	-	2	-	-	5	5	-	-	-	-
Vt.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R.I.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conn.	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
MID. ATLANTIC	1	-	-	-	-	20	2	5	5	2	2	6	-	-	-
Upstate N.Y.	1	-	-	-	-	-	1	5	5	2	2	-	-	-	-
N.Y. City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N.J.	-	-	-	-	-	5	-	-	-	-	-	4	-	-	-
Pa.	-	-	-	-	-	15	1	-	-	-	-	2	-	-	-
E.N. CENTRAL	-	-	-	-	-	123	-	-	-	6	6	39	-	-	2
Ohio	-	-	-	-	-	-	-	-	-	6	6	-	-	-	-
Ind.	-	-	-	-	-	3	-	-	-	-	-	26	-	-	-
Ill.	-	-	-	-	-	52	-	-	-	-	-	5	-	-	2
Mich.	-	U	-	U	-	-	-	U	-	U	-	1	U	-	-
Wis.	-	-	-	-	-	68	-	-	-	-	-	7	-	-	-
W.N. CENTRAL	-	-	-	-	-	13	-	3	3	-	-	-	-	-	-
Minn.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iowa	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-
Mo.	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nebr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kans.	-	-	-	-	-	-	-	3	3	-	-	-	-	-	-
S. ATLANTIC	-	-	-	-	-	4	-	8	8	-	-	1	2	2	-
Del.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Md.	-	-	-	-	-	3	-	5	5	-	-	-	2	2	-
D.C.	-	-	-	-	-	-	-	3	3	-	-	-	-	-	-
Va.	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-
W. Va.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N.C.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.C.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ga.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fla.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E.S. CENTRAL	1	-	-	-	-	11	3	-	-	1	1	3	-	-	-
Ky.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tenn.	-	-	-	-	-	8	1	-	-	1	1	-	-	-	-
Ala.	1	-	-	-	-	-	2	-	-	-	-	3	-	-	-
Miss.	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
W.S. CENTRAL	-	-	-	-	-	-	2	-	-	1	1	-	-	-	-
Ark.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La.	-	-	-	-	-	-	2	-	-	1	1	-	-	-	-
Okla.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tex.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOUNTAIN	-	2	2	-	-	-	-	-	-	-	-	2	-	-	-
Mont.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wyo.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
Colo.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N. Mex.	-	-	-	-	-	-	-	N	N	-	-	-	-	-	-
Ariz.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Utah	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Nev.	-	2	2	-	-	-	-	-	-	-	-	-	-	-	11
PACIFIC	-	22	22	-	-	59	2	9	9	5	5	12	-	-	-
Wash.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oreg.	-	-	-	-	-	-	2	N	N	-	-	4	-	-	11
Calif.	-	21	21	-	-	59	-	8	8	-	-	8	-	-	-
Alaska	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hawaii	-	1	1	-	-	-	-	1	1	5	5	-	-	-	-
Guam	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
P.R.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
V.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.
N: Not notifiable U: Unavailable †International §Out-of-state

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending January 5, 1991, and January 6, 1990 (1st Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	321	535	6	116	264	1	2	3	17
NEW ENGLAND	14	43	-	5	-	-	-	-	-
Maine	-	-	-	-	-	-	-	-	-
N.H.	-	23	-	-	-	-	-	-	-
Vt.	-	-	-	-	-	-	-	-	-
Mass.	14	6	-	-	-	-	-	-	-
R.I.	-	-	-	1	-	-	-	-	-
Conn.	-	14	-	4	-	-	-	-	-
MID. ATLANTIC	24	114	2	33	91	-	2	1	3
Upstate N.Y.	24	-	2	-	-	-	2	1	3
N.Y. City	-	74	-	33	77	-	-	-	-
N.J.	-	40	-	-	4	-	-	-	-
Pa.	-	-	-	-	10	-	-	-	-
E.N. CENTRAL	19	40	-	17	27	-	-	-	-
Ohio	-	12	-	-	-	-	-	-	-
Ind.	18	1	-	1	-	-	-	-	-
Ill.	-	16	-	16	22	-	-	-	-
Mich.	-	3	-	-	-	-	-	-	-
Wis.	1	8	-	-	5	-	-	-	-
W.N. CENTRAL	9	6	2	16	11	1	-	-	4
Minn.	2	1	1	-	4	-	-	-	4
Iowa	-	-	1	3	1	-	-	-	-
Mo.	7	4	-	13	-	-	-	-	-
N. Dak.	-	1	-	-	3	-	-	-	-
S. Dak.	-	-	-	-	1	-	-	-	-
Nebr.	-	-	-	-	2	-	-	-	-
Kans.	-	-	-	-	-	1	-	-	-
S. ATLANTIC	151	183	1	8	21	-	-	1	9
Del.	2	5	-	-	4	-	-	-	-
Md.	15	9	-	-	7	-	-	-	3
D.C.	24	-	-	3	-	-	-	-	-
Va.	-	28	-	-	-	-	-	-	2
W. Va.	-	-	-	2	2	-	-	-	2
N.C.	10	14	1	-	-	-	-	1	-
S.C.	6	27	-	3	8	-	-	-	-
Ga.	30	51	-	-	-	-	-	-	2
Fla.	64	49	-	-	-	-	-	-	-
E.S. CENTRAL	38	28	-	9	8	-	-	1	-
Ky.	-	-	-	-	4	-	-	-	-
Tenn.	-	-	-	-	-	-	-	-	-
Ala.	20	17	-	9	4	-	-	1	-
Miss.	18	11	-	-	-	-	-	-	-
W.S. CENTRAL	66	35	1	5	9	-	-	-	1
Ark.	6	4	-	-	9	-	-	-	1
La.	55	21	-	-	-	-	-	-	-
Okla.	-	-	1	5	-	-	-	-	-
Tex.	5	10	-	-	-	-	-	-	-
MOUNTAIN	-	7	-	22	1	-	-	-	-
Mont.	-	-	-	-	-	-	-	-	-
Idaho	-	1	-	-	-	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-
Colo.	-	2	-	-	-	-	-	-	-
N. Mex.	-	-	-	-	-	-	-	-	-
Ariz.	-	3	-	12	-	-	-	-	-
Utah	-	1	-	10	-	-	-	-	-
Nev.	-	-	-	-	1	-	-	-	-
PACIFIC	-	79	-	1	96	-	-	-	-
Wash.	-	9	-	-	3	-	-	-	-
Oreg.	-	1	-	-	2	-	-	-	-
Calif.	-	69	-	-	85	-	-	-	-
Alaska	-	-	-	-	1	-	-	-	-
Hawaii	-	-	-	1	5	-	-	-	-
Guam	-	-	-	-	1	-	-	-	-
P.R.	-	12	-	-	-	-	-	-	-
V.I.	-	-	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending January 5, 1991 (1st Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	546	390	91	38	19	8	47
Boston, Mass.	179	109	35	19	10	6	17
Bridgeport, Conn.	33	23	6	2	2	-	2
Cambridge, Mass.	22	18	4	-	-	-	3
Fall River, Mass.	13	10	2	1	-	-	-
Hartford, Conn.	33	20	9	3	1	-	1
Lowell, Mass.	29	24	2	2	-	1	1
Lynn, Mass.	16	14	-	1	1	-	-
New Bedford, Mass.	35	26	7	2	-	-	3
New Haven, Conn.	49	37	7	3	1	1	8
Providence, R.I.§	U	U	U	U	U	U	U
Somerville, Mass.	3	1	2	-	-	-	-
Springfield, Mass.	43	36	5	-	2	-	3
Waterbury, Conn.	31	27	4	-	-	-	7
Worcester, Mass.	60	45	8	5	2	-	2
MID. ATLANTIC	2,718	1,748	550	294	73	52	167
Albany, N.Y.	50	37	8	3	1	1	9
Allentown, Pa.	26	18	7	1	-	-	-
Buffalo, N.Y.§	U	U	U	U	U	U	U
Camden, N.J.	47	28	12	3	3	1	-
Elizabeth, N.J.	27	22	5	-	-	-	2
Erie, Pa.†	50	31	11	5	-	3	3
Jersey City, N.J.	94	52	18	16	4	4	-
N.Y. City, N.Y.	1,611	1,010	332	197	46	26	89
Newark, N.J.	89	39	27	14	2	6	14
Paterson, N.J.	27	17	5	3	1	1	5
Philadelphia, Pa.	209	129	46	27	4	3	16
Pittsburgh, Pa.†	74	51	16	4	2	1	5
Reading, Pa.	42	35	6	-	1	-	3
Rochester, N.Y.	131	99	18	8	3	3	9
Schenectady, N.Y.	24	22	1	1	-	-	-
Scranton, Pa.†	35	31	4	-	-	-	-
Syracuse, N.Y.	108	74	21	8	3	2	2
Trenton, N.J.	31	22	5	3	-	1	8
Utica, N.Y.	21	13	5	1	2	-	-
Yonkers, N.Y.	22	18	3	-	1	-	2
E.N. CENTRAL	1,616	1,134	309	111	27	35	100
Akron, Ohio	68	50	12	4	1	1	-
Canton, Ohio	36	23	9	2	-	2	4
Chicago, Ill.§	U	U	U	U	U	U	U
Cincinnati, Ohio	158	121	27	3	3	4	21
Cleveland, Ohio	157	104	32	10	3	8	3
Columbus, Ohio	128	87	18	14	5	4	4
Dayton, Ohio	104	73	23	6	1	1	9
Detroit, Mich.	216	130	49	30	3	4	4
Evansville, Ind.	60	39	13	6	2	-	4
Fort Wayne, Ind.	45	33	10	1	1	-	1
Gary, Ind.	16	13	1	2	-	-	-
Grand Rapids, Mich.	48	35	8	4	-	1	6
Indianapolis, Ind.	143	101	29	6	4	3	11
Madison, Wis.	29	15	9	4	1	-	2
Milwaukee, Wis.	148	112	22	9	2	3	13
Peoria, Ill.§	U	U	U	U	U	U	U
Rockford, Ill.	44	36	6	2	-	-	7
South Bend, Ind.	61	48	11	1	-	1	3
Toledo, Ohio	91	64	20	4	1	2	5
Youngstown, Ohio	64	50	10	3	-	1	3
W.N. CENTRAL	605	430	123	28	8	16	34
Des Moines, Iowa	50	42	7	1	-	-	1
Duluth, Minn.	22	16	5	-	1	-	3
Kansas City, Kans.	17	10	3	1	-	3	-
Kansas City, Mo.	101	69	24	6	-	2	5
Lincoln, Nebr.	24	15	7	1	1	-	1
Minneapolis, Minn.	130	86	27	10	5	2	11
Omaha, Nebr.	86	62	16	2	1	5	3
St. Louis, Mo.	115	86	23	3	-	3	9
St. Paul, Minn.	40	29	7	3	-	1	1
Wichita, Kans.	20	15	4	1	-	-	-
S. ATLANTIC	1,184	760	244	107	40	32	65
Atlanta, Ga.	179	99	42	24	5	9	4
Baltimore, Md.	190	114	43	19	9	5	15
Charlotte, N.C.	48	31	11	4	1	1	1
Jacksonville, Fla.	129	89	26	11	3	-	10
Miami, Fla.	112	64	22	15	6	5	-
Norfolk, Va.	50	36	8	1	1	3	4
Richmond, Va.	51	38	7	4	-	2	1
Savannah, Ga.	35	28	4	1	2	-	5
St. Petersburg, Fla.	79	62	9	4	1	3	7
Tampa, Fla.	173	116	43	12	1	1	11
Washington, D.C.	121	69	27	12	10	3	4
Wilmington, Del.	17	14	2	-	1	-	3
E.S. CENTRAL	582	391	112	36	18	25	55
Birmingham, Ala.	71	40	16	7	7	1	2
Chattanooga, Tenn.	30	23	4	2	-	1	2
Knoxville, Tenn.	85	63	15	5	2	-	13
Louisville, Ky.	70	52	13	2	1	2	9
Memphis, Tenn.	123	77	18	9	4	15	12
Mobile, Ala.	54	42	9	1	1	1	7
Montgomery, Ala.	41	27	8	3	1	2	4
Nashville, Tenn.	108	67	29	7	2	3	6
W.S. CENTRAL	1,053	700	203	92	28	30	61
Austin, Tex.	44	31	7	6	-	-	2
Baton Rouge, La.	49	34	10	3	-	2	1
Corpus Christi, Tex.	37	29	4	2	-	2	3
Dallas, Tex.	164	107	33	13	8	3	9
El Paso, Tex.	55	39	8	4	3	1	2
Fort Worth, Tex.	106	71	19	8	4	4	5
Houston, Tex.	201	124	47	17	5	8	19
Little Rock, Ark.	42	26	10	4	1	1	1
New Orleans, La.	105	70	19	11	2	3	-
San Antonio, Tex.§	162	107	34	19	-	2	3
Shreveport, La.	25	17	3	4	1	-	3
Tulsa, Okla.	63	45	9	1	4	4	13
MOUNTAIN	837	573	153	62	22	27	46
Albuquerque, N. Mex.	99	64	15	12	4	4	8
Colo. Springs, Colo.	47	38	8	1	-	-	4
Denver, Colo.	101	66	16	12	2	5	9
Las Vegas, Nev.	140	97	24	14	2	3	7
Ogden, Utah	17	15	2	-	-	-	1
Phoenix, Ariz.	215	143	43	13	7	9	11
Pueblo, Colo.	32	25	5	-	1	1	2
Salt Lake City, Utah	62	29	20	7	3	3	1
Tucson, Ariz.	124	96	20	3	3	2	3
PACIFIC	1,845	1,269	294	183	52	42	132
Berkeley, Calif.	17	14	1	1	-	1	-
Fresno, Calif.	75	54	11	6	2	2	7
Glendale, Calif.	18	13	4	-	-	1	1
Honolulu, Hawaii	84	56	17	6	2	3	4
Long Beach, Calif.	74	53	11	9	1	-	9
Los Angeles Calif.	400	250	69	52	16	8	18
Oakland, Calif.§	U	U	U	U	U	U	U
Pasadena, Calif.	43	34	6	1	-	2	4
Portland, Oreg.	113	88	13	9	2	1	8
Sacramento, Calif.	170	114	26	18	6	6	18
San Diego, Calif.	142	103	19	13	4	3	18
San Francisco, Calif.	159	102	27	26	2	2	8
San Jose, Calif.	191	126	44	13	6	2	8
Seattle, Wash.	194	142	21	15	8	8	5
Spokane, Wash.	76	55	16	4	-	1	8
Tacoma, Wash.	89	65	9	10	3	2	16
TOTAL	10,986††	7,395	2,079	951	287	267	707

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Report for this week is unavailable (U).

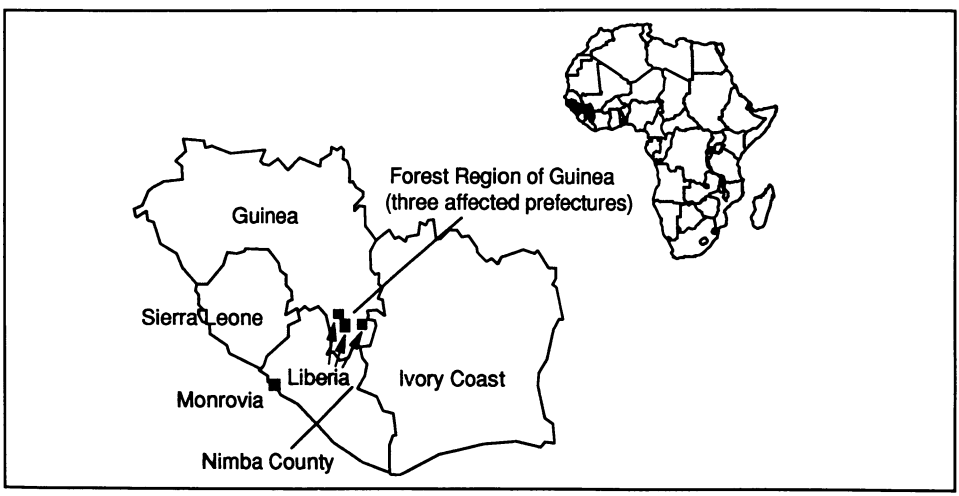
Health and Nutritional Status of Liberian Refugee Children — Guinea, 1990

Since December 1989, civil strife in Liberia has caused mass displacement of persons to neighboring Guinea and Ivory Coast (Figure 1). Liberian refugees initially settled in the Forest Region of Guinea and shared food and shelter with members of the same ethnic groups (mainly Gio and Mano) already residing in the area. The number of refugees overwhelmed the capacity of affected villages to provide basic needs, and camp-like settlements were established that received substantial external relief. In May 1990, to determine appropriate priorities for relief assistance, the health and nutritional status of Liberian refugees in the Forest Region of Guinea was assessed by CDC for the U.S. Department of State's Bureau for Refugee Programs. In May, an estimated 80,000 refugees were in the area; by December, the number had increased to an estimated 400,000. This report summarizes findings of the health and nutritional assessment of Liberian refugee children.

Thirty clusters were selected from a list of villages and camps with refugee populations >50; the sampling probability was proportional to population size. In each cluster, one household was randomly chosen as the starting point, and adjacent houses were visited until 30 children aged 6 months to 5 years were identified. The survey included Liberian refugees and Guineans and assessed weight and height (recumbent length in children <85 cm), measles vaccination status (by history and vaccination card), presence of pretibial edema (indicative of kwashiorkor), and the occurrence of diarrheal episodes and other diseases. Clinical signs of avitaminosis A (Bitot spots and/or xerophthalmia) were assessed in a nonrandomly selected subsample of 200 children.

Anthropometric results were determined using z-scores and percentages of the median of the National Center for Health Statistics/World Health Organization/CDC reference population (*1,2*); acute malnutrition was defined as weight-for-height z-score <–2 or weight-for-height <80% of the median of the reference population. Based on both measures, the prevalence of malnutrition was similar in both Guinean

FIGURE 1. Settlements for Liberian refugees — western Africa, 1990



Liberian Refugee Children — Continued

residents and Liberian refugees (Table 1). Severe malnutrition (weight-for-height <70% of the median of the reference population) was present in 0.3% and 0.5% of Guinean and Liberian children, respectively. Pretibial edema was detected in 1% of children. None of the children in the subsample had clinical signs of avitaminosis A.

In March 1990, an assessment by Médecins Sans Frontières Belgium (MSF) determined that 3.1% of children were acutely malnourished (defined as weight-for-height <80% of the median of the reference population) (J. Van der Heyden, MSF, unpublished data, 1990) compared with 5.3% in the CDC survey (confidence intervals for the two surveys overlap).

Distribution of dry food rations to refugees began in April, coinciding with the rainy season in the Forest Region of Guinea—a period when local food stocks normally diminish rapidly. The influx of Liberian refugees accelerated depletion of local food supplies, affecting food availability for both refugees and resident Guineans. However, rations were not provided to the resident Guineans.

Based on responses from mothers, measles vaccination coverage rates were 27% and 47% in Guinean and Liberian children, respectively. However, the coverage rates based on vaccination record cards were 9% for Guineans and 14% for Liberians. Sixty-five percent of the mothers reported that their children had had an episode of diarrhea during the 2-week period before the survey; 11%, an acute respiratory illness; and 40%, a febrile episode.

Consistent with current recommendations for refugee populations, beginning in February, MSF and local health authorities began to immunize all children aged 6 months to 5 years against measles; in July, MSF reported a measles vaccination coverage level of 70%, indicating substantial improvement over previous levels (N. Keitha, Regional Ministry of Health, unpublished data, 1990).

Recommendations of the assessment team included the need to accelerate food distribution; strengthen surveillance systems for food availability, nutritional status, morbidity, and mortality; improve the existing primary health-care structure (i.e., provide ready access to health workers); intensify promotion of oral rehydration therapy; and improve the water supply.

TABLE 1. Percentage of sampled children with malnutrition*, by nationality — Forest Region of Guinea, May 1990

Weight-for-height	Guineans (n=314)	Liberians (n=590)	Total (n=904)
Reference median†			
<70%	0.3	0.5	0.4
<80%	5.4	5.3	5.3
80%–85%	6.7	11.4	9.7
z-score <–2§	7.3	8.4	8.0

*Acute malnutrition: <80% of median weight-for-height or z-score <–2 of mean weight-for-height. Severe malnutrition: <70% of median weight-for-height.

†Percentage of the study population below the indicated cut-off point of the median weight-for-height of the National Center for Health Statistics (NCHS)/World Health Organization (WHO)/CDC reference population.

§Percentage of the study population below two standard deviations of the mean weight-for-height of the NCHS/WHO/CDC reference population.

Liberian Refugee Children — Continued

Reported by: Bur for Refugee Programs, US Department of State. Médecins Sans Frontières, Belgium. Technical Support Div, International Health Program Office, CDC.

Editorial Note: Media coverage of the situation in Liberia had emphasized the civil strife but did not address the public health problems of refugees in Guinea and Ivory Coast. The response by the international donor community was probably delayed by limited awareness and lack of reliable data on the extent of problems.

Despite these delays in international aid, the prevalence of acute malnutrition in both Liberian refugees and local Guineans is similar to rates reported for African populations in noncrisis situations (*3*). However, as food availability declines while the refugee influx continues, the affected population will become more dependent on external relief. The most recent harvest began in December but did not provide sufficient quantities of food. Moreover, the establishment of a reliable food distribution system is still hampered by logistic constraints (e.g., lack of coordination between donor agencies and inadequate roads and bridges). Deterioration in the nutritional status and associated mortality in Guineans and Liberian refugees can be prevented only through regular distribution of adequate food rations (*4*). Ongoing surveillance of the nutritional status of these groups is essential to allow immediate detection of changes.

The risk for measles outbreaks is high in refugee settings because of overcrowding and the constant influx of susceptible persons (*5*). Thus, further efforts are needed to increase measles vaccination coverage to prevent outbreaks. The high incidence of reported diarrheal disease probably reflects poor sanitation and unsafe water sources.

Early access to information by host countries and international donors should facilitate planning and effective coordination of relief assistance to refugee populations. The problems described in this report underscore the importance of early assessment of refugee situations (*6*).

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Perspectives in Disease Prevention and Health Promotion

Residential Arrangements for Adults with Cerebral Palsy — California, 1988

In the United States, an estimated 274,000 persons have cerebral palsy (CP) (*1*), a neurologic condition defined as a group of nonprogressive disorders in which an abnormality of the central nervous system can result in motor dysfunction (e.g., paresis, involuntary movement, and incoordination). CP is the third leading cause of the need for assistance with basic life activities and the fifth leading cause of activity limitation (*1*). An adult with CP may require adaptive housing to improve accessibility (e.g., to entrances and toilet facilities), attendant care to assist with activities of daily living, and/or nursing care to meet specific health-care needs. These needs can be met through a variety of residential accommodations. However, because the residential environment has a considerable impact on well-being and quality of life (*2*), the accommodations should be in the least restrictive environment* and, when possible, community-based. This report summarizes an assessment of characteristics of adults with CP to determine which factors are associated with placement in a more restrictive environment.

This study used data from the 1988 annual Client Development Evaluation Reports (CDER) to compare health characteristics with the residential arrangements of 11,050 adults aged ≥20 years with CP enrolled with the California Department of Developmental Services (CDDS). The CDDS contracts with regional centers to provide statewide case management for persons with developmental disabilities, including CP, regardless of economic need. Each year, the CDER obtains for each of these persons demographic data and diagnosable conditions and provides an assessment of the person's functional abilities. Living accommodations were classified into four categories, ranging from the most to the least restrictive: 1) developmental centers (DCs) (large state-run residential facilities); 2) group quarters, ranging from four to >50 residents per facility; 3) residence with a parent or guardian; and 4) independent or semi-independent residence. Characteristics compared with residential placement were 1) the severity of CP, as indicated by use of a wheelchair; 2) mental retardation (MR); and 3) seizure disorder. Based on the presence (or absence) of these characteristics, eight combinations could be compared with residential placement. Information on bowel and bladder control and psychological problems† also was reviewed.

The analysis indicated that 24% of persons in the study group resided in DCs; 38%, in group quarters; 32%, with a parent or guardian; and 7%, independently or semi-independently. Persons living with a parent or guardian were younger and were more likely to be racial/ethnic minorities than persons living elsewhere (Table 1). Of those who resided independently or semi-independently, 92% had complete bowel and bladder control, compared with 9% of adults in DCs. Among persons living in DCs and group quarters, the relative frequency of psychological problems was more than twice that of persons living elsewhere.

*The least restrictive environment is the setting that provides basic health and safety while offering the fewest restrictions on a person's independence and the greatest opportunities to further a person's independence (*3*).

†Psychological problems were defined by a *Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition, Revised* diagnosis other than MR or related conditions, or by a current prescription for a behavior-modifying drug.

Cerebral Palsy — Continued

Of adults who did not have MR or seizures and did not use a wheelchair, 29% lived independently or semi-independently (Table 2). With the presence of MR, the proportion of persons living independently or semi-independently decreased appreciably. Conversely, the proportion of persons living in DCs increased markedly with the presence of MR and seizures and with the use of a wheelchair.

Reported by: Developmental Disabilities Br, Div of Birth Defects and Developmental Disabilities, Center for Environmental Health and Injury Control, CDC.

Editorial Note: The National Council on Disability's report *Toward Independence* emphasized that all persons with disabilities should be able to live in settings that promote their independence and dignity (*4*). Placement of persons with substantial disabilities into less restrictive environments is an important goal that has permitted gains in developmental growth, cognitive improvement, and social skills (*5–7*).

The persons evaluated in this report may not represent all adults with CP in California. Although the CDDS has no economic criteria for enrollment as a client, not all California residents with CP have been registered with a regional center. Those who were registered may be more cognitively impaired than unregistered persons with CP. In this study group, 86% had MR, compared with 62% in a recent population-based study of 10-year-old children with CP (*8*).

Based on the findings in this report, the low proportion of adults with CP who live independently suggests the need to examine whether specific factors are associated

TABLE 1. Characteristics of adults with cerebral palsy, by type of residential arrangement — California, 1988

Characteristic	Independent/ Semi-independent (n=781)		Parent/ Guardian (n=3519)		Group quarters (n=4153)		Development center (n=2597)	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Ethnicity								
Other than white	149	(19)	1458	(41)	955	(23)	579	(22)
Mental retardation*								
None	410	(53)	718	(21)	350	(9)	14	(1)
Mild	322	(42)	1087	(32)	828	(20)	49	(2)
Moderate	35	(5)	772	(23)	815	(20)	81	(3)
Severe/Profound	6	(1)	816	(24)	2088	(51)	2447	(94)
Wheelchair use	316	(40)	1431	(41)	2125	(51)	2034	(78)
Seizure disorder	205	(26)	1355	(39)	2008	(48)	1687	(65)
Bowel and bladder control†								
Control	721	(92)	2699	(77)	1992	(48)	241	(9)
Limited control	42	(5)	449	(13)	1249	(30)	690	(27)
No control	18	(2)	369	(10)	909	(22)	1665	(64)
Psychological problem§	57	(7)	235	(7)	711	(17)	417	(16)
Median age (yrs)	33		28		32		33	

*Two hundred twelve persons with undetermined mental retardation were omitted.
†Status unknown for six persons.
§Psychological problems were defined by a *Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition, Revised* diagnosis other than mental retardation or related conditions or by a current prescription for a behavior-modifying drug.

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with residence in more restrictive environments. This assessment did not indicate the extent to which the severity of CP and associated conditions or the presence of secondary health conditions influenced residential placement. Other factors, such as lack of accessible housing, deficiency of training, and inadequacy of support programs for independent living, may affect residential arrangements for adults with CP. Further efforts are required to clarify these issues and identify potential factors that may prevent persons with CP and other developmental disabilities from living in the least restrictive environment.

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TABLE 2. Percentage of adults with cerebral palsy in selected residential arrangements, by mental retardation (MR), use of wheelchair (W/C), and seizure status — California, 1988

Characteristic	No.	Independent/ Semi-independent		Parent/ Guardian		Group quarters		Development center	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)
No MR, W/C, or seizures	415	122	(29)	229	(55)	63	(15)	1	(<1)
Seizures only	219	61	(28)	108	(49)	47	(21)	3	(1)
W/C only	717	201	(28)	319	(44)	191	(27)	6	(1)
W/C and seizures	141	26	(18)	62	(44)	49	(35)	4	(3)
MR only	2,453	178	(7)	1,034	(42)	982	(40)	259	(11)
MR and seizures	1,977	99	(5)	674	(34)	906	(46)	298	(15)
MR and W/C	2,084	71	(3)	501	(24)	871	(42)	641	(30)
MR, W/C, and seizures	2,832	15	(1)	466	(16)	972	(34)	1,379	(49)
Total	**11,050***	**773**	**(7)**	**3,393**	**(32)**	**4,081**	**(38)**	**2,591**	**(24)**

*Two hundred twelve persons with undetermined MR were included in the total.

Notices to Readers

Changes in Table III: Deaths in 121 U.S. Cities

Beginning with *MMWR* volume 40, number 1, the totals for deaths from all causes and the total pneumonia and influenza deaths no longer include estimated numbers. This may cause the totals to be lower than usual. Reports from cities that are unable to report for the current week are now shown as unavailable ("U").

CDC Voice Information System

CDC's Hospital Infections Program, Center for Infectious Diseases, has a new automated telephone system that can provide callers with information on hospital-acquired infections, including the guidelines for prevention and control of nosocomial infections, disinfection or sterilization procedures, nosocomial infection rates, and training courses on infection control. Information on these topics is available from the CDC Voice Information System, telephone (404) 332-4555. The system is available 24 hours a day, 365 days a year.

Cerebral Palsy — Continued

The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. Accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials, as well as matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Mailstop C-08, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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