CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

May 19, 1995 / Vol. 44 / No. 19

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

World No-Tobacco Day, 1995

The increase in cigarette smoking worldwide since 1950 has been particularly dramatic in developing countries and has been associated with substantial morbidity, mortality, and economic costs (*1,2*). Each year, tobacco use accounts for at least 3 million deaths worldwide (*1–3*). Based on current smoking trends, in 30–40 years, tobacco use is projected to cause 10 million deaths annually, of which 70% will occur among persons in developing countries (*1*). The global health-care costs resulting from tobacco use exceed $200 billion per year—more than twice the current health budgets of all developing countries combined (*4*).

To increase global awareness of tobacco-attributable morbidity, mortality, and economic costs, the theme of the eighth World No-Tobacco Day, to be held May 31, 1995, is "Tobacco Costs More Than You Think." Additional information about World No-Tobacco Day 1995 is available from the Regional Office for the Americas, World Health Organization (telephone [202] 861-3200), or from CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion (telephone [404] 488-5705).

References

1. Peto R, Lopez AD, Boreham J, Thun M, Heath C. Mortality from smoking in developed countries, 1950–2000. Oxford, England: Oxford University Press, 1994.
2. World Health Organization. World No-Tobacco Day, 31 May 1995 [Advisory kit]. Geneva: World Health Organization, 1995.
3. World Health Organization. World No-Tobacco Day, 31 May 1995 [Press kit]. Geneva: World Health Organization, 1995.
4. Barnum H. The economic burden of the global trade in tobacco. Tobacco Control 1994;3: 358–61.

Assessment of the Impact of a 100% Smoke-Free Ordinance on Restaurant Sales — West Lake Hills, Texas, 1992–1994

Exposure to environmental tobacco smoke (ETS), which is associated with adverse health effects among nonsmokers (*1*), is a health hazard of particular concern for patrons and employees in restaurants (*2*). To protect nonsmokers, many local governments have enacted ordinances requiring restaurants to be smoke-free. However, the potential economic impact of these laws on restaurants is an important concern for restaurant owners. On June 1, 1993, the city of West Lake Hills (a suburb of Austin), Texas (1995 population: 3000), implemented an ordinance requiring a 100% smoke-free environment in all commercial establishments to which the public has access, including all restaurants and restaurants with bar areas. This report summarizes an assessment of sales in restaurants during June 1993–December 1994 compared with January 1992–May 1993.

Restaurants in West Lake Hills had a variety of menus and food-pricing scales. Restaurant sales data for West Lake Hills were obtained from the Texas State Comptroller's office. Aggregate monthly sales data* from January 1992 through December 1994 were obtained for the eight restaurants in West Lake Hills that had indoor dining areas and were in operation during all of 1992 and until the ordinance went into effect in June 1993 (one of these restaurants closed in April 1994 because its lease expired). These sales data included the 17-month period preceding implementation of the ordinance (January 1992–May 1993) and the 19-month period following implementation (June 1993–December 1994). Restaurants that opened during the assessment period were not included in the analysis because the purpose of the study was to assess the impact of the ordinance on a consistent panel of restaurants (five restaurants opened during September 1992–July 1994).

Data were analyzed using a linear regression model (*3*) that examined the relation between total restaurant sales and the presence of a smoke-free ordinance and that incorporated seasonal variations in sales and temporal economic trends. For each factor examined (i.e., time [year and month], quarter of the year, and presence of the implemented ordinance), a corresponding regression coefficient was calculated to measure the effect of that factor on total restaurant sales. A positive regression coefficient suggests that the factor was associated with increased total restaurant sales, and a negative value suggests that the factor was associated with decreased total restaurant sales. To test for multicollinearity, variance inflation factors were computed for each independent variable in the model. The Durbin-Watson statistic was computed (*4*) to test for first-order autocorrelation (correlation of the residuals [error terms] for adjacent observations over time).

Total monthly sales for the restaurants during 1992–1994 varied by season. Sales peaked during the second quarter of each year.

In the initial regression model, the variance inflation factors for the ordinance variable and the year variable were above four, indicating multicollinear involvement between these variables. To address the multicollinearity, the time variable was removed: although reanalysis did not change the regression coefficient for the ordinance variable, the standard error was substantially decreased. The variance inflation

*To protect confidentiality, individual restaurant sales data are not released by the Comptroller's office .

Smoke-Free Ordinance — Continued

factors for this final model indicated that multicollinearity was no longer present, and the Durbin-Watson statistic indicated that significant first-order autocorrelation was not present (Table 1).

The regression coefficient for the second quarter of the year was positive, suggesting that restaurant sales were greater in the second quarter of each year than in the first quarter (Table 1). The regression coefficient for the ordinance variable was positive, suggesting that the total sales of the restaurants did not decrease after implementation of the ordinance.

Reported by: P Huang, MD, Bur of Chronic Disease Prevention and Control; S Tobias, S Kohout, M Harris, D Satterwhite, Office of Smoking and Health; DM Simpson, MD, State Epidemiologist, Texas Dept of Health; L Winn, City of West Lake Hills; J Foehner, L Pedro, Office of the Texas Comptroller of Public Accounts. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report are consistent with assessments using similar methods in other locations that have reported that the implementation of smoke-free ordinances has not been associated with adverse economic effects on restaurants (*3,5,6*).

Previous reports of decreases in restaurant sales following the enactment of clean indoor air ordinances have been based on anecdotal information (*7–10*), on studies that used restaurant owners' self-reports of the impact on their business instead of validated sales data (*7,8*), and on studies that used tax data to measure restaurant sales but collected data for only one or two quarters following implementation of ordinances (*9,10*). In comparison, the assessment in West Lake Hills was based on sales data that were validated by tax revenue reported by the State Comptroller's office, included data for periods of time sufficient for statistical analysis, and employed multiple linear regression techniques to account for temporal trends and seasonal variations in sales.

The findings in this assessment are subject to at least three limitations. First, because of limitations in data, an ordinary least squares regression model—which assumes no autocorrelation—was used in place of a more specific time series model; however, the Durbin-Watson statistic indicated that significant autocorrelation was

TABLE 1. Results of multiple linear regression analysis of the effects of a 100% smoke-free ordinance implemented June 1, 1993, on sales in eight restaurants — West Lake Hills, Texas, 1992–1994

Variable	Regression coefficient	(SE*)	Variance inflation factor†
Second quarter§	21,085	(8806)	1.5
Third quarter§	–4,199	(9040)	1.6
Fourth quarter§	757	(9040)	1.6
Ordinance	23,539	(6493)	1.1
Adjusted R^2 for model: 0.33			
Durbin-Watson statistic¶: 2.64			

*Standard error.
†Values above 2 suggest that multicollinearity may be a problem in the model.
§Indicates the effect of the variable on monthly restaurant sales (in dollars). The first quarter is the reference for the quarterly sales coefficients.
¶In a model with four independent variables and 36 observations, a Durbin-Watson statistic below 1.24 indicates significant positive autocorrelation and a value above 2.76 indicates significant negative autocorrelation.

Smoke-Free Ordinance — Continued

not present. Second, the model only explained 33% of the variation in total restaurant sales; future studies may benefit from the inclusion of other variables that can affect restaurant sales. Third, because the assessment focused on a consistent panel of restaurants and excluded restaurants that opened during the assessment period, the findings cannot be generalized to all restaurants in West Lake Hills.

The economic impact of smoke-free ordinances is an important consideration for policymakers concerned about the ETS exposure of nonsmokers; assessment of the potential economic impact of these laws should be based on the most objective, scientific evidence available. The findings from the assessment in West Lake Hills has provided policymakers in that community with a scientific appraisal of the impact of public health measures to reduce exposure to tobacco smoke. In addition, the assessment in West Lake Hills provides a model for other local and state public agencies to consider when evaluating tobacco-control programs.

References

1. US Environmental Protection Agency. Respiratory health effects of passive smoking: lung cancer and other disorders. Washington, DC: US Environmental Protection Agency, Office of Health and Environmental Assessment, Office of Atmospheric and Indoor Air Programs, 1992; publication no. EPA-600/6-90/006F.
2. Siegel M. Involuntary smoking in the restaurant workplace: a review of employee exposure and health effects. JAMA 1993;270:490–3.
3. Glantz SA, Smith LR. The effect of ordinances requiring smoke-free restaurants on restaurant sales. Am J Public Health 1994;84:1081–5.
4. Durbin J, Watson GS. Testing for serial correlation in least squares regression. Biometrika 1951;37:409–28.
5. Maroney N, Sherwood D, Stubblebine WC. The impact of tobacco control ordinances on restaurant revenues in California. Claremont, California: The Claremont Graduate School, The Claremont Institute for Economic Policy Studies, 1994.
6. Taylor Consulting Group. The San Luis Obispo ordinance: a study of the economic impacts on San Luis Obispo restaurants and bars. San Luis Obispo, California: Taylor Consulting Group, 1993.
7. Gambee P. Economic impacts of smoking ban in Bellflower, California: analysis of survey data, February–May, 1991. Bellflower, California: California Business and Restaurant Alliance, 1991.
8. Charlton Research Company. Pacific Dining Car Restaurant and Southern California Business Association, December 11, 1993–January 15, 1994. San Francisco, California: Charlton Research Company, 1994.
9. Laventhol & Horwath, Certified Public Accountants. Preliminary analysis of the impact of the proposed Los Angeles ban on smoking in restaurants. Los Angeles, California: Laventhol & Horwath, Certified Public Accountants, 1990.
10. Masotti LH, Creticos PA. The effects of a ban on smoking in public places in San Luis Obispo, California. Evanston, Illinois: Creticos & Associates, Inc, 1992.

Smoking-Attributable Mortality — Mexico, 1992

Cigarette smoking causes neoplastic, respiratory, and cardiovascular diseases that contribute substantially to disability, death, and medical-care expenditures (*1*). In the United States, cigarette smoking is the leading preventable cause of premature death (*1*). Although the prevalence of cigarette smoking in Mexico (26% in 1993 [*2*]) is similar to that in the United States, smoking-attributable mortality has not been recently estimated for Mexico or most other developing countries that are experiencing

Smoking-Attributable Mortality — Continued

increases in chronic diseases. To assist in the development of programs for preventing tobacco use, the Ministry of Health of Mexico used a modified version of the software program Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) to estimate smoking-related mortality (*3*). This report summarizes trends in the occurrence of smoking-related diseases in Mexico and estimates smoking-attributable mortality and years of potential life lost before age 65 years (YPLL-65) in 1992.

Data from the Ministry of Health for 1970, 1980, and 1990 were used to calculate age-adjusted death rates per 100,000 persons for lung cancer, coronary heart disease, cerebrovascular disease, chronic obstructive pulmonary disease, and other smoking-related cancers (e.g., mouth, esophagus, larynx, cervix, bladder, and kidney) (*4*); rates were directly adjusted to the 1992 population (*5*). SAMMEC uses smoking prevalence and relative risks for smoking-related diseases to calculate smoking-attributable fractions (the proportions of deaths attributable to cigarette smoking). Because relative risks for smoking-related diseases were unavailable for Mexico, smoking-attributable fractions were estimated (*5,6*) by using an index based on lung cancer death rates in the United States and Mexico (cigarette smoking accounts for most lung cancer deaths [*6*]; therefore, the lung cancer death rate in Mexico was used as an overall measure of risk for disease).

The lung cancer index was calculated separately for men and women. For men, the lung cancer rate among women was used as the baseline because the prevalence of smoking among women in Mexico has been low until recently, and the prevalence of other risk factors for lung cancer has been similar among men and women in Mexico. For women, the lung cancer rate among U.S. never smokers was used as the baseline (*6,7*). The index was multiplied by SAMMEC disease-specific smoking-attributable fractions to obtain adjusted disease-specific smoking-attributable fractions for Mexico. The number of deaths from each smoking-related disease in 1992 was multiplied by the respective adjusted smoking-attributable fraction to estimate the smoking-attributable mortality for Mexico and was used to estimate YPLL-65 associated with cigarette smoking.

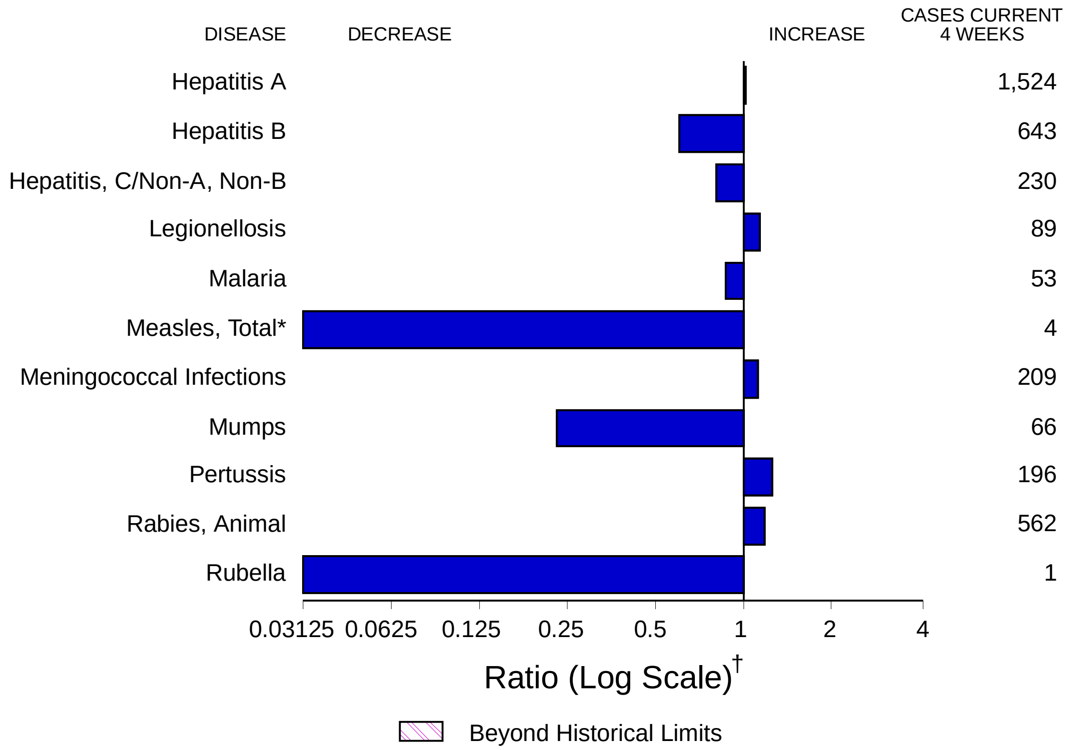
During 1970–1990, death rates for all major smoking-related diseases in Mexico increased substantially, ranging from a 60% increase in the death rate for cerebrovascular disease to a 220% increase in the death rate for lung cancer (Table 1, page 379).

When the lung cancer rate among women was used to estimate the baseline risk for men, the numbers of smoking-attributable deaths and YPLL-65 among men in 1992 were 6875 and 25,172, respectively (Table 2, page 379). When the lung cancer rate among U.S. never smokers was used to estimate the baseline risk among women in Mexico, the numbers of smoking-attributable deaths and YPLL-65 among women in Mexico in 1992 were 3378 and 14,996, respectively. The total numbers of smoking-attributable deaths and YPLL-65 in Mexico in 1992 were 10,253 and 40,168, respectively. Most smoking-attributable deaths and YPLL-65 among men and women were associated with cardiovascular diseases, chronic obstructive pulmonary disease, and lung cancer.

Reported by: R Tapia Conyer, MD, P Kuri Morales, MD, F Meneses Gonzáles, MD, Ministry of Health, Mexico City, Mexico. Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Data for Decision Making Project, Epidemiology Program Office, CDC.

(Continued on page 379)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending May 13, 1995, with historical data — United States



*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.

†Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending May 13, 1995 (19th Week)

	Cum. 1995		Cum. 1995
Anthrax	-	Psittacosis	22
Brucellosis	21	Rabies, human	1
Cholera	8	Rocky Mountain Spotted Fever	43
Congenital rubella syndrome	3	Syphilis, congenital, age < 1 year†	-
Diphtheria	1	Tetanus	8
*Haemophilus influenzae**	490	Toxic shock syndrome	76
Hansen Disease	44	Trichinosis	18
Plague	2	Typhoid fever	107
Poliomyelitis, Paralytic	-		

*Of 477 cases of known age, 115 (24%) were reported among children less than 5 years of age.
†Updated quarterly from reports to the Division of Sexually Transmitted Diseases and HIV Prevention, National Center for Prevention Services. First quarter data not yet available.
-: no reported cases

TABLE II. Cases of selected notifiable diseases, United States, weeks ending May 13, 1995, and May 14, 1994 (19th Week)

Reporting Area	AIDS*	Gonorrhea		Hepatitis (Viral), by type A		B		C/NA,NB		Legionellosis	
	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	19,652	131,817	133,303	8,747	7,904	3,221	4,413	1,411	1,607	470	516
NEW ENGLAND	842	1,720	2,906	61	125	63	157	34	53	4	8
Maine	23	30	33	13	11	2	7	-	-	-	-
N.H.	38	36	27	3	4	8	10	2	5	-	-
Vt.	7	18	11	3	1	1	5	-	6	-	-
Mass.	457	1,082	1,070	24	58	26	105	32	31	4	4
R.I.	59	9	165	1	12	-	3	-	11	-	4
Conn.	258	545	1,600	17	39	26	27	-	-	N	N
MID. ATLANTIC	4,550	13,048	15,881	460	544	385	540	125	197	49	55
Upstate N.Y.	521	2,640	3,437	120	175	127	135	64	89	12	14
N.Y. City	2,342	3,932	6,289	224	190	104	113	1	1	-	-
N.J.	1,112	1,312	1,891	54	117	90	142	49	92	10	10
Pa.	575	5,164	4,264	62	62	64	150	11	15	27	31
E.N. CENTRAL	1,622	28,078	25,986	1,131	729	347	436	97	141	131	182
Ohio	409	9,233	8,792	698	216	35	69	5	7	68	69
Ind.	106	2,480	2,865	54	126	83	79	-	3	26	58
Ill.	737	7,893	5,683	175	230	68	127	18	40	10	11
Mich.	278	6,837	6,142	145	92	148	127	74	91	14	29
Wis.	92	1,635	2,504	59	65	13	34	-	-	13	15
W.N. CENTRAL	427	6,996	7,586	442	351	193	234	35	28	42	35
Minn.	93	1,104	1,185	52	71	17	23	1	6	-	-
Iowa	20	565	437	26	11	13	12	3	7	8	20
Mo.	148	4,188	4,052	296	167	134	172	21	5	27	7
N. Dak.	1	10	15	11	1	2	-	1	-	3	3
S. Dak.	1	70	67	11	15	1	-	1	-	-	-
Nebr.	43	-	393	9	42	8	13	3	4	2	3
Kans.	121	1,059	1,437	37	44	18	14	5	6	2	2
S. ATLANTIC	5,708	39,074	36,642	403	454	470	958	113	285	76	134
Del.	113	726	666	6	13	2	7	1	1	-	-
Md.	978	4,479	6,763	71	59	79	137	3	13	16	29
D.C.	373	1,776	2,414	2	10	9	16	-	-	3	4
Va.	374	4,193	4,550	72	46	34	41	3	15	4	3
W. Va.	21	224	276	10	4	21	9	20	12	3	1
N.C.	248	9,067	8,989	50	37	116	113	25	24	14	8
S.C.	280	4,236	4,485	12	11	19	14	3	2	14	3
Ga.	594	6,729	U	41	21	49	378	11	146	9	64
Fla.	2,727	7,644	8,499	139	253	141	243	47	72	13	22
E.S. CENTRAL	612	17,845	12,278	469	157	259	452	390	303	11	23
Ky.	63	2,991	1,634	17	81	30	44	6	12	1	4
Tenn.	269	4,858	4,833	380	53	183	380	382	286	6	13
Ala.	159	6,964	5,811	48	23	46	28	2	5	3	6
Miss.	121	3,032	U	24	U	-	U	-	U	1	U
W.S. CENTRAL	1,404	12,289	15,719	973	983	467	444	193	139	5	11
Ark.	64	1,483	2,406	69	20	11	8	1	3	-	4
La.	299	4,330	4,489	32	49	64	66	45	36	2	-
Okla.	84	809	1,364	173	87	138	119	135	74	2	7
Tex.	957	5,667	7,460	699	827	254	251	12	26	1	-
MOUNTAIN	637	2,868	3,519	1,605	1,517	270	220	168	152	94	38
Mont.	8	30	38	23	11	9	7	7	2	2	13
Idaho	17	48	30	166	128	36	31	21	41	1	-
Wyo.	4	19	33	64	6	7	7	70	36	2	2
Colo.	214	1,102	1,208	216	183	50	39	29	26	27	5
N. Mex.	69	311	385	286	392	87	77	19	29	3	1
Ariz.	133	1,063	1,096	451	571	43	24	14	5	44	1
Utah	37	83	116	349	145	27	13	3	9	5	2
Nev.	155	212	613	50	81	11	22	5	4	10	14
PACIFIC	3,850	9,899	12,786	3,203	3,044	767	972	256	309	58	30
Wash.	360	927	1,092	215	434	60	93	73	106	5	7
Oreg.	122	18	354	571	284	34	55	17	12	-	-
Calif.	3,261	8,430	10,759	2,342	2,229	663	799	156	187	48	21
Alaska	29	302	309	15	82	4	5	1	-	-	-
Hawaii	78	222	272	60	15	6	20	9	4	5	2
Guam	-	23	51	1	8	-	-	-	-	-	2
P.R.	649	202	192	33	35	272	131	181	59	-	-
V.I.	14	4	10	-	-	1	1	-	-	-	-
Amer. Samoa	-	8	14	5	4	-	-	-	-	-	-
C.N.M.I.	-	10	21	11	2	6	-	-	-	-	-

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands
*Updated monthly to the Division of HIV/AIDS, National Center for Infectious Diseases; last update March 30, 1995.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending May 13, 1995, and May 14, 1994 (19th Week)

Reporting Area	Lyme Disease		Malaria		Measles (Rubeola)						Meningococcal Infections		Mumps	
					Indigenous		Imported*		Total					
	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	1995	Cum. 1995	1995	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	1,488	1,599	316	347	-	147	-	5	152	550	1,267	1,265	295	574
NEW ENGLAND	154	163	14	24	-	1	-	1	2	16	66	55	3	10
Maine	1	-	1	1	-	-	-	-	-	2	3	11	2	3
N.H.	9	5	1	3	-	-	-	-	-	-	13	4	-	4
Vt.	2	1	-	1	-	-	-	-	-	1	6	1	-	-
Mass.	41	25	4	9	-	1	-	1	2	5	24	23	-	-
R.I.	26	22	-	4	-	-	-	-	-	5	-	-	-	1
Conn.	75	110	8	6	-	-	-	-	-	3	20	16	1	2
MID. ATLANTIC	1,109	1,152	75	52	-	1	-	-	1	156	134	119	39	51
Upstate N.Y.	698	951	18	15	-	-	-	-	-	13	48	40	13	12
N.Y. City	10	1	30	12	-	1	-	-	1	2	15	15	5	-
N.J.	87	119	17	15	-	-	-	-	-	138	30	30	-	10
Pa.	314	81	10	10	-	-	-	-	-	3	41	34	21	29
E.N. CENTRAL	18	17	32	41	-	2	-	-	2	59	157	190	54	146
Ohio	14	6	2	5	-	-	-	-	-	10	55	47	18	22
Ind.	3	3	2	10	-	-	-	-	-	1	25	37	1	6
Ill.	-	7	21	15	-	-	-	-	-	39	42	65	17	92
Mich.	1	1	6	10	-	-	-	-	-	6	31	21	18	23
Wis.	-	-	1	1	-	2	-	-	2	3	4	20	-	3
W.N. CENTRAL	18	26	7	18	-	1	-	-	1	144	72	84	18	28
Minn.	-	-	3	5	-	-	-	-	-	-	14	8	2	4
Iowa	1	1	-	3	-	-	-	-	-	-	15	10	4	7
Mo.	4	22	3	7	-	1	-	-	1	143	24	40	10	15
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	1	-	1
S. Dak.	-	-	-	-	-	-	-	-	-	-	3	6	-	-
Nebr.	-	-	1	2	U	-	U	-	-	1	6	8	2	1
Kans.	13	3	-	1	-	-	-	-	-	-	10	11	-	-
S. ATLANTIC	133	175	77	74	-	1	-	-	1	7	229	196	41	86
Del.	7	22	1	3	-	-	-	-	-	-	2	2	-	-
Md.	90	53	19	30	-	-	-	-	-	2	12	12	-	21
D.C.	-	1	8	7	-	-	-	-	-	-	1	1	-	-
Va.	8	19	14	8	-	-	-	-	-	1	27	29	13	23
W. Va.	7	5	1	-	-	-	-	-	-	-	4	8	-	3
N.C.	11	22	6	2	-	-	-	-	-	-	41	31	16	24
S.C.	5	-	-	2	-	-	-	-	-	-	30	6	5	5
Ga.	4	48	11	10	-	-	-	-	-	1	54	44	-	6
Fla.	1	5	17	12	-	1	-	-	1	3	58	63	7	4
E.S. CENTRAL	7	14	6	7	-	-	-	-	-	28	78	77	14	1
Ky.	1	10	-	2	-	-	-	-	-	-	33	20	-	-
Tenn.	3	3	1	4	-	-	-	-	-	28	12	21	4	1
Ala.	1	1	5	1	-	-	-	-	-	-	18	36	4	-
Miss.	2	U	-	U	U	-	U	-	-	U	15	U	6	U
W.S. CENTRAL	26	26	6	7	-	2	-	-	2	11	148	146	17	126
Ark.	2	-	2	-	-	2	-	-	2	-	16	20	2	4
La.	-	-	1	-	-	-	-	-	-	1	20	20	6	11
Okla.	12	16	-	2	-	-	-	-	-	-	14	12	-	21
Tex.	12	10	3	5	-	-	-	-	-	10	98	94	9	90
MOUNTAIN	2	1	22	16	-	39	-	1	40	102	103	95	16	16
Mont.	-	-	2	-	-	-	-	-	-	-	2	2	1	-
Idaho	-	1	1	2	-	-	-	-	-	-	4	12	2	3
Wyo.	-	-	-	-	-	-	-	-	-	-	5	2	-	-
Colo.	1	-	12	6	-	-	-	-	-	17	21	14	1	1
N. Mex.	-	-	3	2	-	28	-	-	28	-	22	10	N	N
Ariz.	-	-	2	1	-	10	-	-	10	-	38	37	4	2
Utah	-	-	1	4	-	-	-	1	1	85	4	14	1	5
Nev.	1	-	1	1	-	1	-	-	1	-	7	4	6	4
PACIFIC	21	25	77	108	-	100	-	3	103	27	280	303	93	110
Wash.	1	-	8	11	-	13	-	1	14	-	49	45	6	7
Oreg.	1	2	4	9	-	1	-	-	1	-	47	63	N	N
Calif.	19	23	57	80	-	86	-	1	87	26	178	190	78	93
Alaska	-	-	1	-	-	-	-	-	-	-	4	1	8	2
Hawaii	-	-	7	8	-	-	-	1	1	1	2	4	1	8
Guam	-	-	-	-	U	-	U	-	-	181	1	-	2	3
P.R.	-	-	-	-	-	3	-	-	3	22	12	5	-	2
V.I.	-	-	-	-	U	-	U	-	-	-	-	-	1	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	1
C.N.M.I.	-	-	-	1	-	-	-	-	-	26	-	-	-	-

*For imported measles, cases include only those resulting from importation from other countries.

N: Not notifiable U: Unavailable -: no reported cases

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending May 13, 1995, and May 14, 1994 (19th Week)

Reporting Area	Pertussis			Rubella			Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	1995	Cum. 1995	Cum. 1994	1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	35	1,110	1,344	-	28	143	6,010	6,906	5,994	6,579	2,293	2,596
NEW ENGLAND	6	138	134	-	2	97	73	75	102	131	564	692
Maine	-	17	2	-	-	-	2	4	-	-	-	-
N.H.	1	9	31	-	1	-	1	1	4	6	78	78
Vt.	-	2	15	-	-	-	-	-	1	1	85	66
Mass.	5	104	76	-	1	97	29	24	66	63	245	266
R.I.	-	-	3	-	-	-	-	6	1	11	11	5
Conn.	-	6	7	-	-	-	41	40	30	50	145	277
MID. ATLANTIC	5	85	247	-	2	5	336	505	1,246	1,272	565	625
Upstate N.Y.	4	50	91	-	1	5	24	63	118	178	224	456
N.Y. City	-	18	39	-	1	-	170	260	672	764	-	-
N.J.	-	-	9	-	-	-	73	87	238	234	135	122
Pa.	1	17	108	-	-	-	69	95	218	96	206	47
E.N. CENTRAL	4	110	273	-	-	11	997	985	640	710	2	12
Ohio	-	37	62	-	-	-	343	407	105	87	1	-
Ind.	-	5	31	-	-	-	86	93	21	69	-	2
Ill.	3	23	96	-	-	6	397	258	358	387	1	3
Mich.	1	33	21	-	-	5	116	120	137	150	-	4
Wis.	-	12	63	-	-	-	55	107	19	17	-	3
W.N. CENTRAL	4	56	44	-	-	-	288	475	214	167	109	70
Minn.	3	25	16	-	-	-	17	19	37	38	2	8
Iowa	-	1	4	-	-	-	26	16	31	14	40	25
Mo.	-	5	12	-	-	-	236	404	83	71	12	8
N. Dak.	-	5	3	-	-	-	-	1	1	2	9	2
S. Dak.	1	7	-	-	-	-	-	-	16	9	22	11
Nebr.	U	3	3	U	-	-	-	5	6	7	-	-
Kans.	-	10	6	-	-	-	9	30	40	26	24	16
S. ATLANTIC	1	105	146	-	5	5	1,368	2,094	1,116	881	796	703
Del.	-	5	-	-	-	-	7	9	-	9	33	16
Md.	-	10	51	-	-	-	24	92	169	119	161	218
D.C.	-	2	3	-	-	-	46	101	38	40	5	2
Va.	-	7	15	-	-	-	266	276	61	119	143	153
W. Va.	-	-	2	-	-	-	1	8	38	35	35	30
N.C.	-	49	41	-	-	-	427	675	99	146	156	71
S.C.	-	11	8	-	-	-	258	273	111	155	47	64
Ga.	-	1	10	-	-	-	181	324	216	258	114	144
Fla.	1	20	16	-	5	5	158	336	384	U	102	5
E.S. CENTRAL	1	22	73	-	-	-	1,825	721	430	399	69	78
Ky.	-	-	52	-	-	-	153	91	54	117	7	5
Tenn.	-	2	13	-	-	-	336	364	162	137	11	33
Ala.	1	20	8	-	-	-	241	266	149	145	51	40
Miss.	U	-	U	U	-	U	1,095	U	65	U	-	U
W.S. CENTRAL	-	46	36	-	2	7	837	1,534	666	795	40	261
Ark.	-	-	4	-	-	-	180	206	62	67	11	13
La.	-	1	5	-	-	-	406	702	-	-	9	41
Okla.	-	9	20	-	-	4	21	51	1	89	20	17
Tex.	-	36	7	-	2	3	230	575	603	639	-	190
MOUNTAIN	5	389	117	-	3	2	91	119	193	174	40	41
Mont.	-	3	3	-	-	-	3	-	3	9	17	7
Idaho	-	70	22	-	-	-	-	1	6	6	-	-
Wyo.	-	-	-	-	-	-	2	-	1	1	13	6
Colo.	-	1	70	-	-	-	59	57	4	13	-	-
N. Mex.	2	18	6	-	-	-	2	5	22	26	-	-
Ariz.	-	286	11	-	3	-	15	30	87	78	9	27
Utah	2	7	5	-	-	2	3	5	10	-	-	-
Nev.	1	4	-	-	-	-	7	21	60	41	1	1
PACIFIC	9	159	274	-	14	16	195	398	1,387	2,050	108	114
Wash.	3	30	36	-	1	-	6	17	92	85	-	-
Oreg.	-	6	42	-	1	-	-	12	3	45	-	-
Calif.	6	114	192	-	11	15	188	367	1,202	1,809	104	84
Alaska	-	-	-	-	-	-	1	1	28	28	4	30
Hawaii	-	9	4	-	1	1	-	1	62	83	-	-
Guam	U	-	-	U	-	1	1	1	4	18	-	-
P.R.	-	5	3	-	-	-	107	121	23	71	18	34
V.I.	U	-	-	U	-	-	1	19	-	-	-	-
Amer. Samoa	-	-	1	-	-	-	-	-	2	2	-	-
C.N.M.I.	-	-	-	-	-	-	-	1	7	14	-	-

U: Unavailable -: no reported cases

TABLE III. Deaths in 121 U.S. cities,* week ending May 13, 1995 (19th Week)

Reporting Area	All Causes, By Age (Years)						P&I[†] Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	589	411	97	59	10	11	39
Boston, Mass.	135	79	27	19	6	3	5
Bridgeport, Conn.	35	23	9	1	1	1	6
Cambridge, Mass.	18	13	5	-	-	-	3
Fall River, Mass.	26	23	2	1	-	-	-
Hartford, Conn.	82	45	23	9	2	3	2
Lowell, Mass.	24	18	3	3	-	-	3
Lynn, Mass.	18	12	5	1	-	-	-
New Bedford, Mass.	21	16	2	3	-	-	2
New Haven, Conn.	33	22	4	6	-	1	3
Providence, R.I.	62	57	2	2	-	1	6
Somerville, Mass.	3	2	-	1	-	-	-
Springfield, Mass.	44	31	6	6	1	-	3
Waterbury, Conn.	32	24	4	3	-	1	-
Worcester, Mass.	56	46	5	4	-	1	6
MID. ATLANTIC	2,037	1,346	372	238	45	32	73
Albany, N.Y.	57	42	9	3	1	2	1
Allentown, Pa.	13	8	2	1	2	-	-
Buffalo, N.Y.	99	73	13	12	-	1	-
Camden, N.J.	31	22	6	2	-	1	1
Elizabeth, N.J.	24	13	7	3	1	-	2
Erie, Pa.§	45	36	6	3	-	-	2
Jersey City, N.J.	36	20	6	8	2	-	-
New York City, N.Y.	1,300	805	261	179	32	23	34
Newark, N.J.	U	U	U	U	U	U	U
Paterson, N.J.	30	16	6	4	-	-	1
Philadelphia, Pa.	U	U	U	U	U	U	U
Pittsburgh, Pa.§	66	48	12	2	1	3	2
Reading, Pa.	22	16	4	2	-	-	2
Rochester, N.Y.	125	96	17	6	5	1	9
Schenectady, N.Y.	27	24	3	-	-	-	2
Scranton, Pa.§	32	30	1	1	-	-	6
Syracuse, N.Y.	86	67	14	3	1	1	10
Trenton, N.J.	32	18	5	9	-	-	1
Utica, N.Y.	12	12	-	-	-	-	-
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,054	1,272	367	242	112	61	124
Akron, Ohio	73	57	9	5	1	1	-
Canton, Ohio	42	34	5	1	-	2	6
Chicago, Ill.	498	224	83	105	74	12	22
Cincinnati, Ohio	102	73	19	6	2	2	6
Cleveland, Ohio	145	90	33	15	6	1	4
Columbus, Ohio	202	127	45	21	1	8	15
Dayton, Ohio	99	72	20	5	1	1	11
Detroit, Mich.	202	112	39	30	9	12	5
Evansville, Ind.	47	36	8	2	-	1	2
Fort Wayne, Ind.	43	29	7	4	1	2	2
Gary, Ind.	14	5	6	3	-	-	-
Grand Rapids, Mich.	55	39	9	4	1	2	12
Indianapolis, Ind.	146	85	23	21	8	9	3
Madison, Wis.	70	51	10	7	-	2	8
Milwaukee, Wis.	132	100	26	4	1	1	10
Peoria, Ill.	35	24	8	2	-	1	4
Rockford, Ill.	42	33	6	3	-	-	7
South Bend, Ind.	38	26	4	2	3	3	4
Toledo, Ohio	U	U	U	U	U	U	U
Youngstown, Ohio	69	55	7	2	4	1	3
W.N. CENTRAL	688	514	90	43	16	14	55
Des Moines, Iowa	68	54	9	-	2	3	7
Duluth, Minn.	21	19	1	1	-	-	-
Kansas City, Kans.	U	U	U	U	U	U	U
Kansas City, Mo.	81	59	7	4	-	-	3
Lincoln, Nebr.	46	40	2	4	-	-	5
Minneapolis, Minn.	212	155	32	15	5	5	18
Omaha, Nebr.	76	59	10	5	1	1	5
St. Louis, Mo.	115	82	18	7	4	4	12
St. Paul, Minn.	69	46	11	7	4	1	5
Wichita, Kans.	U	U	U	U	U	U	U
S. ATLANTIC	1,246	748	272	162	37	27	62
Atlanta, Ga.	186	98	45	33	3	7	6
Baltimore, Md.	261	158	55	35	9	4	16
Charlotte, N.C.	U	U	U	U	U	U	U
Jacksonville, Fla.	125	84	26	13	2	-	9
Miami, Fla.	122	76	27	18	1	-	-
Norfolk, Va.	45	23	11	5	2	4	2
Richmond, Va.	78	46	20	6	5	1	1
Savannah, Ga.	40	26	10	2	2	-	6
St. Petersburg, Fla.	43	34	3	4	-	2	5
Tampa, Fla.	158	98	40	17	2	1	11
Washington, D.C.	176	95	35	29	9	8	6
Wilmington, Del.	12	10	-	-	2	-	-
E.S. CENTRAL	819	540	168	71	24	15	61
Birmingham, Ala.	107	58	27	12	5	4	2
Chattanooga, Tenn.	72	55	12	3	-	2	5
Knoxville, Tenn.	85	59	15	8	2	1	4
Lexington, Ky.	95	69	14	8	3	1	8
Memphis, Tenn.	188	127	33	21	4	3	17
Mobile, Ala.	102	73	18	4	5	2	11
Montgomery, Ala.	39	24	10	3	2	-	4
Nashville, Tenn.	131	75	39	12	3	2	10
W.S. CENTRAL	1,124	746	206	100	47	15	55
Austin, Tex.	78	56	10	11	-	1	5
Baton Rouge, La.	50	27	15	7	1	-	-
Corpus Christi, Tex.	45	32	8	3	2	-	3
Dallas, Tex.	201	122	39	24	15	1	4
El Paso, Tex.	88	59	16	6	4	3	8
Ft. Worth, Tex.	104	65	21	11	5	2	7
Houston, Tex.	U	U	U	U	U	U	U
Little Rock, Ark.	80	57	11	7	4	1	2
New Orleans, La.	98	57	21	8	2	-	-
San Antonio, Tex.	218	156	35	12	8	7	14
Shreveport, La.	60	39	15	3	3	-	7
Tulsa, Okla.	102	76	15	8	3	-	5
MOUNTAIN	925	616	163	97	25	23	63
Albuquerque, N.M.	108	74	15	16	3	-	3
Colo. Springs, Colo.	52	28	13	7	3	1	1
Denver, Colo.	109	72	22	12	1	2	14
Las Vegas, Nev.	173	111	30	22	3	7	12
Ogden, Utah	28	21	4	1	2	-	6
Phoenix, Ariz.	169	111	29	13	10	5	11
Pueblo, Colo.	20	14	5	-	1	-	1
Salt Lake City, Utah	115	81	17	12	2	3	9
Tucson, Ariz.	151	104	28	14	-	5	6
PACIFIC	1,565	1,036	290	161	53	20	105
Berkeley, Calif.	14	9	4	1	-	-	1
Fresno, Calif.	68	45	13	7	3	-	7
Glendale, Calif.	34	22	7	3	1	-	1
Honolulu, Hawaii	46	34	7	3	1	1	2
Long Beach, Calif.	78	54	16	5	-	3	9
Los Angeles, Calif.	503	311	99	63	23	4	18
Pasadena, Calif.	29	21	3	1	2	2	3
Portland, Oreg.	165	122	21	16	5	1	11
Sacramento, Calif.	U	U	U	U	U	U	U
San Diego, Calif.	147	94	26	13	7	6	22
San Francisco, Calif.	U	U	U	U	U	U	U
San Jose, Calif.	173	116	37	15	4	1	15
Santa Cruz, Calif.	34	25	5	3	1	-	3
Seattle, Wash.	143	92	28	19	3	1	5
Spokane, Wash.	43	30	7	4	2	-	6
Tacoma, Wash.	88	61	17	8	1	1	2
TOTAL	11,047[¶]	7,229	2,025	1,173	369	218	637

*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.
U: Unavailable -: no reported cases

Smoking-Attributable Mortality — Continued

TABLE 1. Annual death rates* for leading causes of smoking-related deaths — Mexico, 1970, 1980, and 1990

Disease (ICD-9† code)	1970	1980	1990
Lung cancer (162)	1.8	3.3	5.8
Coronary heart disease (410–414)	11.9	18.6	34.3
Cerebrovascular disease (430–438)	14.0	17.5	22.8
Chronic obstructive pulmonary disease (491–492 and 496)	§	0.9	6.3
Other smoking-related cancers¶	3.4	4.8	7.8

*Per 100,000 population, directly adjusted to the age distribution of the 1992 population of Mexico.
†*International Classification of Diseases, Ninth Revision*.
§ICD-9 group codes were not available.
¶Cancer of the mouth (ICD-9 codes 140–149), esophagus (150), larynx (161), cervix (180), bladder (188), and kidney (189).

Source: Vital Statistics Section, Ministry of Health, Mexico.

TABLE 2. Estimated smoking-attributable mortality (SAM) and smoking-attributable years of potential life lost before age 65 (YPLL–65), by sex — Mexico, 1992

	Men†		Women§	
Disease (ICD-9* code)	SAM	YPLL-65	SAM	YPLL-65
Neoplasms				
Lip, oral cavity, or pharynx (140–149)	111	380	30	127
Esophagus (150)	105	369	34	153
Pancreas (157)	67	349	77	350
Larynx (161)	152	463	27	86
Trachea, lung, or bronchus (162)	997	3,219	307	1,269
Cervix uteri (180)			325	3,093
Urinary bladder (188)	50	112	13	36
Kidney or other urinary (189)	67	342	8	44
Cardiovascular diseases				
Hypertension (401–404)	76	285	43	130
Ischemic heart disease (410–414)	1,522	8,515	620	2,509
Other heart disease (390–398, 415–417, and 420–429)	675	2,017	349	1,274
Cerebrovascular disease (430–438)	768	3,604	417	3,432
Atherosclerosis (440)	92	88	49	30
Aortic aneurysm (441)	26	81	6	19
Other arterial disease (442–448)	79	214	35	114
Respiratory diseases				
Pneumonia and influenza (480–487)	479	1,693	229	667
Bronchitis or emphysema (491–492)	346	349	219	256
Chronic airway obstruction (496)	919	1,007	454	514
Other respiratory diseases (010–012 and 493)	344	2,085	136	893
Total	**6,875**	**25,172**	**3,378**	**14,996**

**International Classification of Diseases, Ninth Revision*.
†Baseline for Mexican men based on lung cancer rates for Mexican women.
§Baseline for Mexican women based on lung cancer rates for U.S. never smokers.

Smoking-Attributable Mortality — Continued

Editorial Note: The findings in this report document the substantial impact of cigarette smoking on premature mortality in adults in Mexico. Death rates from the leading causes of smoking-related deaths have nearly tripled since 1970 in Mexico. Based on this analysis, the proportion of deaths attributable to smoking in Mexico is 9%, compared with 32% in the United States for the same categories of deaths considered in this report. These differences may be attributable to lower cigarette consumption in Mexico compared with the United States. However, as the population of Mexico ages and the average duration of smoking increases, the number of smoking-attributable deaths probably will increase.

The estimates of the total number of smoking-attributable deaths and YPLL-65 in Mexico during 1992 probably are low for at least three reasons. First, baseline lung cancer rates for U.S. never smokers probably reflect effects of occupational or environmental exposures and, therefore, may have produced lower estimates of excess risk in Mexico. Second, estimates of smoking-attributable mortality in Mexico do not include deaths from burns, stillbirths, and sudden infant death syndrome or deaths occurring during the perinatal period because these risks are unknown and could not be extrapolated from known risks in the United States. Third, smoking-attributable mortality estimates for 1992 reflect the lower prevalences of smoking in previous decades and may not fully capture increases in mortality resulting from recent changes in smoking patterns. In addition, because this study used adjusted smoking-attributable fractions, the association between smoking-related behaviors (i.e., duration and amount of smoking, depth of inhalation, or use of filtered-tip cigarettes) and smoking-related diseases could not be examined. Ongoing examination of the relation between smoking and disease in Mexico will improve the accuracy of future estimates.

In Mexico, because chronic diseases (including neoplasms and cardiovascular disease) are emerging as leading causes of death (*4*), the prevention of tobacco use is a major priority. The findings in this report will assist in refining policies to reduce the prevalence of cigarette smoking and risks for associated diseases and to counter the impact of increased tobacco advertising and other marketing strategies (*8*). Priority measures may include preventing the initiation of cigarette smoking among children and adolescents, increasing smoking cessation among adult smokers, developing health education programs, and establishing legislative policies (e.g., regulating and restricting the advertisement and promotion of tobacco products, restricting or banning tobacco sales to minors, and increasing tobacco taxes and prices [*9*]).

References

1. CDC. Reducing the health consequences of smoking: 25 years of progress—a report of the Surgeon General. Rockville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1989; DHHS publication no. (CDC)89-8411.
2. General Office for Epidemiology. National Addiction Survey, 1993 [Spanish]. Mexico DF: Ministry of Health, 1993.
3. Shultz JM, Novotny TE, Rice DP. Smoking-Attributable Mortality, Morbidity, and Economic Cost (SAMMEC) version 2.1 [Software and documentation]. Atlanta: US Department of Health and Human Services, Public Health Service, CDC, 1992.
4. National Institutes for Statistics, Geography, and Informatics. Total deaths by cause, sex, and age—United States of Mexico, 1970, 1980, 1990: population by age, 1992. Mexico DF: Ministry of Health, General Office for Statistics, National Institutes for Statistics, Geography, and Informatics, 1993; publication no. (IFDN)968-811-239-9.
5. Rothman KJ. Modern epidemiology. Boston: Little, Brown, and Company, 1986.

Smoking-Attributable Mortality — Continued

6. CDC. Smoking and health in the Americas: a 1992 report of the Surgeon General, in collaboration with the Pan American Health Organization. Atlanta: US Department of Health and Human Services, Public Health Service, CDC, 1992; DHHS publication no. (CDC)92-8419.
7. Peto R, Lopez AD, Boreham J, Thun M, Heath C Jr. Mortality from tobacco in developed countries: indirect estimation from national vital statistics. Lancet 1992;339:1268–78.
8. Stebbins R. Making a killing south of the border: transnational cigarette companies in Mexico and Guatemala. Soc Sci Med 1994;38:105–15.
9. Roemer R. Development and implementation of a policy on tobacco control. In: Legislative action to combat the world tobacco epidemic. 2nd ed. Geneva: World Health Organization 1993:155–80.

Outbreak of Ebola Viral Hemorrhagic Fever — Zaire, 1995

On May 6, 1995, CDC was notified by health authorities and the U.S. Embassy in Zaire of an outbreak of viral hemorrhagic fever (VHF)-like illness in Kikwit, Zaire (1995 population: 400,000), a city located 240 miles east of Kinshasa. The World Health Organization and CDC were invited by the Government of Zaire to participate in an investigation of the outbreak. This report summarizes preliminary findings from this ongoing investigation.

On April 4, a hospital laboratory technician in Kikwit had onset of fever and bloody diarrhea. On April 10 and 11, he underwent surgery for a suspected perforated bowel. Beginning April 14, medical personnel employed in the hospital to which he had been admitted in Kikwit developed similar symptoms. One of the ill persons was transferred to a hospital in Mosango (75 miles west of Kikwit). On approximately April 20, persons in Mosango who had provided care for this patient had onset of similar symptoms.

On May 9, blood samples from 14 acutely ill persons arrived at CDC and were processed in the biosafety level 4 laboratory; analyses included testing for Ebola antigen and Ebola antibody by enzyme-linked immunosorbent assay, and reverse transcription-polymerase chain reaction (RT-PCR) for viral RNA. Samples from all 14 persons were positive by at least one of these tests; 11 were positive for Ebola antigen, two were positive for antibodies, and 12 were positive by RT-PCR. Further sequencing of the virus glycoprotein gene revealed that the virus is closely related to the Ebola virus isolated during an outbreak of VHF in Zaire in 1976 (*1*).

As of May 17, the investigation has identified 93 suspected cases of VHF in Zaire, of which 86 (92%) have been fatal. Public health investigators are now actively seeking cases and contacts in Kikwit and the surrounding area. In addition, active surveillance for possible cases of VHF has been implemented at 13 clinics in Kikwit and 15 remote sites within a 150-mile radius of Kikwit. Educational and quarantine measures have been implemented to prevent further spread of disease.

Reported by: M Musong, MD, Minister of Health, Kinshasa, T Muyembe, MD, Univ of Kinshasa; Dr. Kibasa, MD, Kikwit General Hospital, Kikwit, Zaire. World Health Organization, Geneva. Div of Viral and Rickettsial Diseases, and Div of Quarantine, National Center for Infectious Diseases; International Health Program Office, CDC.

Editorial Note: Ebola virus and Marburg virus are the two known members of the filovirus family. Ebola viruses were first isolated from humans during concurrent

Ebola Viral Hemorrhagic Fever — Continued

outbreaks of VHF in northern Zaire (*1*) and southern Sudan (*2*) in 1976. An earlier outbreak of VHF caused by Marburg virus occurred in Marburg, Germany, in 1967 when laboratory workers were exposed to infected tissue from monkeys imported from Uganda (*3*). Two subtypes of Ebola virus—Ebola-Sudan and Ebola-Zaire—previously have been associated with disease in humans (*4*). In 1994, a single case of infection from a newly described Ebola virus occurred in a person in Côte d'Ivoire. In 1989, an outbreak among monkeys imported into the United States from the Philippines was caused by another Ebola virus (*5*) but was not associated with human disease.

Initial clinical manifestations of Ebola hemorrhagic fever include fever, headache, chills, myalgia, and malaise; subsequent manifestations include severe abdominal pain, vomiting, and diarrhea. Maculopapular rash may occur in some patients within 5–7 days of onset. Hemorrhagic manifestations with presumptive disseminated intravascular coagulation usually occur in fatal cases. In reported outbreaks, 50%–90% of cases have been fatal (*1–3,6*).

The natural reservoirs for these viruses are not known. Although nonhuman primates were involved in the 1967 Marburg outbreak, the 1989 U.S. outbreak, and the 1994 Côte d'Ivoire case, their role as virus reservoirs is unknown. Transmission of the virus to secondary cases occurs through close personal contact with infectious blood or other body fluids or tissue. In previous outbreaks, secondary cases occurred among persons who provided medical care for patients; secondary cases also occurred among patients exposed to reused needles (*2*). Although aerosol spread has not been documented among humans, this mode of transmission has been demonstrated among nonhuman primates. Based on this information, the high fatality rate, and lack of specific treatment or a vaccine, work with this virus in the laboratory setting requires biosafety level 4 containment (*3,7*).

CDC has established a hotline for public inquiries about Ebola virus infection and prevention ([800] 900-0681). CDC and the State Department have issued travel advisories for persons considering travel to Zaire. Information about travel advisories to Zaire and for air passengers returning from Zaire can be obtained from the CDC International Travelers' Hotline, (404) 332-4559.

References

1. World Health Organization. Ebola haemorrhagic fever in Zaire, 1976: report of an international commission. Bull WHO 1978;56:271–93.
2. Baron RC, McCormick JB, Zubeir OA. Ebola virus disease in southern Sudan: hospital dissemination and intrafamilial spread. Bull World Health Organ 1981;61:997–1003.
3. Peters CJ, Sanchez A, Rollin PE, Ksiazek TG, Murphy FA. Filoviridae: Marburg and Ebola viruses. In: Fields BN, Knipe DM, Howley PM, eds. Field's virology. 3rd ed. New York: Raven Press, Ltd, 1996 (in press).
4. McCormick JB, Bauer SP, Elliott LH, Webb PA, Johnson KM. Biologic differences between strains of Ebola virus from Zaire and Sudan. J Infect Dis 1983;147:264–7.
5. Jarling PB, Geisbert TW, Dalgard DW, et al. Preliminary report: isolation of Ebola virus from monkeys imported to USA. Lancet 1990;335:502–5.
6. CDC. Management of patients with suspected viral hemorrhagic fever. MMWR 1988;37(no. S-3).
7. Peters CJ, Sanchez A, Feldmann H, Rollin PE, Nichol S, Ksiazek TG. Filoviruses as emerging pathogens. Seminars in Virology 1994;5:147–54.

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format and on a paid subscription basis for paper copy. To receive an electronic copy on Friday of each week, send an e-mail message to *lists@list.cdc.gov*. The body content should read *subscribe mmwr-toc*. Electronic copy also is available from CDC's World-Wide Web server at *http://www.cdc.gov/* or from CDC's file transfer protocol server at *ftp.cdc.gov*. To subscribe for paper copy, contact Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 783-3238.

Data in the weekly *MMWR* 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 following Friday. Address inquiries about the *MMWR* Series, including material to be considered for publication, to: Editor, *MMWR* Series, Mailstop C-08, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333; telephone (404) 332-4555.

☆U.S. Government Printing Office: 1995-633-175/05072 Region IV