

TABLE VI.

Sub-Districts.	Population in 1851.	Deaths from Cholera in 1853.	Deaths by Cholera in each 100,000 living.	Water Supply.	
St. Saviour, Southwark	19,709	45	227	Southwark and Vauxhall Water Company only.	
St. Olave . . . . .	8,015	19	237		
St. John, Horsleydown	11,360	7	61		
St. James, Bermondsey	18,899	21	111		
St. Mary Magdalen . . . . .	13,934	27	193		
Leather Market . . . . .	15,295	23	153		
Rotherhithe* . . . . .	17,805	20	112		
Wandsworth . . . . .	9,611	3	31		
Battersea . . . . .	10,560	11	104		
Putney . . . . .	5,280	—	—		
Camberwell . . . . .	17,742	9	50		
Peckham . . . . .	19,444	7	36		
Christchurch, Southwk.	16,022	7	43		Lambeth Water Company, and Southwark and Vauxhall Company.
Kent Road . . . . .	18,126	37	204		
Borough Road . . . . .	15,862	26	163		
London Road . . . . .	17,836	9	50		
Trinity, Newington . . . . .	20,922	11	52		
St. Peter, Walworth . . . . .	29,861	23	77		
St. Mary, Newington . . . . .	14,033	5	35		
Waterloo (1st part) . . . . .	14,088	1	7		
Waterloo (2nd part) . . . . .	18,348	7	38		
Lambeth Church (1st part) . . . . .	18,409	9	48		
Lambeth Church (2nd part) . . . . .	26,784	11	41		
Kennington (1st part) . . . . .	24,261	12	49		
Kennington (2nd part) . . . . .	18,848	6	31		
Brixton . . . . .	14,610	2	13		
Clapham . . . . .	16,290	10	61		
St. George, Camberwell	15,849	6	37		
Norwood . . . . .	3,977	—	—	Lambeth Water Company only.	
Streatham . . . . .	9,023	—	—		
Dulwich . . . . .	1,632	—	—		
First 12 sub-districts . . . . .	167,654	192	114	Southwk. & Vaux.	
Next 16 sub-districts . . . . .	301,149	182	60	Both Companies.	
Last 3 sub-districts . . . . .	14,632	—	—	Lambeth Comp.	

Statistics for  
 A.C. & B. between 1853

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\* A part of Rotherhithe was supplied by the Kent Water Company ; but there was no cholera in this part.

this report. The tables number of subjects from obtained, the date of en- total number of deaths, The number of subjects 000 in the British doctors ciety study. The number

data on women, only the ican Cancer Society study ulations on women are as

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and the amount smoked at essitate an amount of detail sidered practicable in these moking habits varied from current amount and type of stionnaire. These amounts tes, cigars or pipes per day. ing previous to the date of ed data on the maximum y described as *non-smokers* moked an insignificant total

ars and pipes appear in all ed" categories are difficult to all numbers of subjects, the

been combined when the num- data for the separate types.

AGE DISTRIBUTION

markedly affected by their age re death rates of two groups of comparable. A standard meas- rate, in which the rate is com- within a relatively narrow span, y appropriate when it is desired o groups change with age.

TABLE 1.—Outline of prospective studies of smoking and mortality

Authors	Doll & Hill (5)	Hammond & Horn (10)	Dorn (6)	Dunn, London, Breslow (7)	Dunn, Buell, Hreslow (8)	Best, Josle, Walker (2)	Hammond (11)
Subjects	British doctors	White men in 9 States	U.S. veterans	California occu- pational groups	California Ameri- can Legion mem- bers	Canadian pensioners (veterans and de- pendents)	Men in 25 States
Number of usable replies	34,000	188,000	248,000	67,000	60,000	78,000	448,000
Date of enrollment	Oct. 1951	Jan.-Mar. 1952	Jan. 1954 and Jan. 1957.	Nov. 1953 and May 1957.	May-Nov. 1957	Sept. 1955-July, 1956	Oct. 1959- Feb. 1960.
Age range	35-75+	50-69	30-75+	35-69	35-75+	35-75+	35-89
Months followed	120	44	78	About 48	About 24	72	About 22
Number of deaths	4,534	11,870	24,519	1,714	1,704	9,070	11,612
Person-years of exposure	269,000	668,000	1,312,000	222,000	119,000	383,000	820,000

grandparents were short-lived. Included among these variables were religion, educational level, native or foreign birth, residence by size of town and occupational exposure, use of alcohol, use of fried food, amount of nervous tension, use of tranquilizers, and presence or absence of prior serious disease. For cigarette smokers who smoked more than a pack a day and inhaled moderately or deeply, the mortality ratio was computed within each subgroup. For example, the mortality ratio was 1.99 for men with long-lived parents and 2.30 for men with short-lived parents. In every subgroup the mortality ratio was well above unity, the lowest among 71 computed ratios being 1.57 (for men with a history of previous serious disease).

These data provide information on the association of the other variables with mortality as well as on the association of smoking with mortality. For six of the most relevant variables, Table 18 gives age-adjusted death rates, using the combined populations of non-smokers and cigarette smokers as the standard population. The death rates apply to a period of roughly 22-months follow-up. As already mentioned, the cigarette smokers (of more than a pack per day who inhaled moderately or deeply) have higher death rates than the non-smokers in every cell of Table 18. Since not all respondents answered these supplementary questions, the results may be subject to some additional non-response bias.

As would be expected, death rates are relatively high for men with previous serious disease and for men from short-lived families, and are somewhat

TABLE 18.—Age-adjusted death rates per 1,000 men (over approximately 22 months) for variables that may be related to mortality

Type of smoking	Long-lived parents and grandparents		Short-lived parents and grandparents		No previous serious disease		Previous serious disease			
	None.....	14.8		21.1		11.5		42.5		
Cigarettes <sup>1</sup> .....	27.1		44.8		22.3		65.0			
	Single		Married		Use tranquilizers		Do not use tranquilizers			
None.....	26.0		18.9		29.1		18.2			
Cigarettes <sup>1</sup> .....	50.1		33.0		52.4		31.8			
	Educational level									
	No high school		Some high school		High school graduate		Some college		College graduate	
None.....	22.7		20.0		16.9		18.3		15.8	
Cigarettes <sup>1</sup> .....	35.2		34.5		35.5		34.2		29.4	
	Degree of exercise <sup>2</sup>									
	None		Slight		Moderate		Heavy			
None.....	23.8		14.7		11.0		9.5			
Cigarettes <sup>1</sup> .....	34.1		25.5		20.8		19.7			

<sup>1</sup> Smokers of more than a pack per day who inhaled moderately or deeply.  
<sup>2</sup> Confined to men with no history of heart disease, stroke, high blood pressure or cancer (except skin) who were not sick at the time of entry.

higher for single than for users of tranquilizer surprising (29.1 against tranquilizers in question re this group are presumably users is small, comprising question. Death rates increases; this association death rates with socio-economic association with additional degrees of education show marked elevation only 2 percent of the respondents.

From the same data of seven variables that whether any of the variables did cigarette smoking, disease, none of the other mortality as smoking of other variables with correlation of cigarette the other variable.

In the analyses above arately. In addition, in which pairs of cigarette education, religion, drug exposure. The percentage smokers and 0.88 for

These informative studies. However with mortality should correlations of this variable both be higher than the

Except for the brief the analyses throw light differences in death rates, i.e., that regular cigarette higher death rates even point appears in the

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In all seven studies national Statistical Commission was abstracted from society studies, further evidence, was sought

ES TO EXCESS MORTALITY

n these studies have included  
hs of cigarette smokers over  
l causes of death. For each  
nd the expected number of  
: total excess for all causes,  
n a percentage basis. Table  
lies for 13 groups of causes.  
aces in the table, implies that  
re smaller than the expected

ss deaths of cigarette smokers  
es<sup>1</sup>

California occupational	California Legion	Canadian veterans	Men in 25 States
43.5	43.5	44.2	51.7
1.4	4.5	5.0	5.5
5.3	6.5	-1.8	3.3
1.7	0.2	5.6	4.4
20.2	16.8	18.3	13.6
0.2	3.0	2.2	2.2
6.3	2.2	7.2	7.6
1.3	5.8	8.2	3.8
2.4	1.5	1.5	1.5
-1.7	2.5	2.9	1.3
6.9	2.2	0.8	0.9
8.3	2.7	4.6	0.8
4.2	12.5	0.4	3.4
100.0	100.0	100.0	100.0

and men in 25 States studies; current

agree in showing coronary  
s mortality, with lung cancer  
stantial contribution in some  
d emphysema, cancers other  
isease other than coronary.

ven major prospective studies  
nd non-smokers.

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ly who were smoking at the  
hat for non-smokers.

TABLE 26.—Numbers of expected and observed deaths for smokers of cigarettes only, and mortality ratios, each prospective study and all studies

Cause of death	British doctors			Men in 9 States			U.S. veterans			California occupational		
	Deaths		Mortality ratio	Deaths		Mortality ratio	Deaths		Mortality ratio	Deaths		Mortality ratio
	Expected	Observed		Expected	Observed		Expected	Observed		Expected	Observed	
Cancer of lung.....	6.4	129	20.2	23.4	233	10.0	43.3	519	8.7	138	15.9	
Bronchitis, emphysema.....	4.2	53	12.5	12.8	30	2.3	14.4	141	2.6	11	4.3	
Cancer of larynx.....	0	7	0	1.3	17	13.1	2.4	14	0	3	0	
Cancer of oral cavity.....	0	0	0	7.8	22	2.8	6.1	64	7.2	7	1.0	
Cancer of esophagus.....	3.3	7	2.1	2.7	18	6.6	3.2	33	5.5	4	0.7	
Stomach and duodenal ulcers.....	0	14	0	12.2	61	5.0	21.5	57	23.1	12	1.5	
Other chronic diseases.....	17.2	27	1.6	19.7	49	2.7	31.2	228	14.7	18	1.6	
Cirrhosis of liver.....	0	12	0	23.5	41	1.7	31.4	55	2.2	13	6.0	
Cancer of bladder.....	13.9	15	0.9	17.2	41	2.4	31.4	55	2.2	13	6.0	
Coronary artery disease.....	369.9	535	1.5	927.7	1,734	1.9	1,893.5	3,037	273.9	561	2.0	
Other heart diseases.....	78.8	115	1.5	72.5	107	1.5	122.2	244	23.8	24	1.0	
Hypertensive heart disease.....	21.0	32	1.5	80.7	107	1.2	133.7	223	27.2	28	1.0	
General arteriosclerosis.....	21.2	21	1.0	0.1	18	2.0	97.0	163	0	6	0	
Cancer of kidney.....	81.7	8	0	14.0	21	1.5	23.1	34	0	10	0	
All other cancer.....	28.3	73	2.6	132.9	250	1.9	313.8	457	72.1	105	1.5	
Influenza, pneumonia.....	47.0	31	0.7	33.7	75	2.2	61.0	90	31.4	24	0.8	
All other causes.....	144.0	182	1.3	15.6	41	2.6	354.3	36	10.3	25	2.4	
Cerebral vascular lesions.....	161.1	192	1.2	208.8	279	1.3	309.1	360	68.9	101	1.5	
Cancer of prostate.....	29.0	15	0.5	32.4	51	1.6	53.7	106	42.2	76	1.8	
Accidents, suicides, violence.....	89.2	90	1.0	174.1	192	1.1	211.5	306	8.6	4	0.5	
Nephritis, suicides, violence.....	8.1	17	2.1	43.3	34	0.8	18.6	50	16.0	10	1.5	
Rheumatic heart disease.....	10.2	13	1.3	48.4	43	0.9	67.4	70	22.9	31	1.4	
Cancer of rectum.....	4.2	15	3.6	20.8	45	2.2	68.7	62	13.6	14	1.0	
Cancer of intestines.....	26.1	28	1.1	65.6	35	0.5	121.2	152	23.7	22	0.9	
All causes.....	1,161.8	1,672	1.44	2,227.7	3,781	1.70	4,043.1	7,226	818.5	1,456	1.79	

TABLE 26.—Numbers of expected and observed deaths for smokers of cigarettes only, and mortality ratios, each prospective study and all studies—Continued.

Cause of death	California Legion			Canadian veterans			Men in 25 States			Total, all studies			Median mortality ratio
	Deaths		Mortality ratio	Deaths		Mortality ratio	Deaths		Mortality ratio	Deaths		Mortality ratio	
	Expected	Observed		Expected	Observed		Expected	Observed		Expected	Observed		
Cancer of lung.....	19.9	98	4.9	27.1	317	11.7	41.5	399	170.3	1,833	10.8	11.7	
Bronchitis, emphysema.....	3.6	30	8.4	36.5	106	4.0	16.4	115	80.5	540	6.1	7.5	
Cancer of larynx.....	4.0	6	1.5	0	5	-----	0	23	14.0	75	5.4	5.8	
Cancer of oral cavity.....	6.2	10	1.9	5.1	20	3.9	3.0	33	37.0	152	4.1	3.9	
Cancer of esophagus.....	1.8	9	5.1	6.8	22	3.3	8.4	20	33.7	113	3.4	3.3	
Stomach and duodenal ulcers.....	1.8	12	6.8	7.9	54	6.0	38.0	74	105.1	294	2.8	5.0	
Other circulatory diseases.....	10.7	37	2.2	41.5	90	2.3	31.0	190	254.0	640	2.6	2.3	
Cirrhosis of liver.....	13.1	23	1.8	37.6	50	1.3	49.1	72	169.2	379	2.2	2.1	
Cancer of bladder.....	1.8	7	4.0	22.3	38	1.7	22.8	60	111.6	215	1.9	2.2	
Coronary artery disease.....	312.8	515	1.7	832.5	1,582	1.8	1,803.6	3,223	6,430.7	11,177	1.7	1.7	
Other heart diseases.....	420	26	2.0	75.3	98	2.1	140.3	195	620.0	868	1.7	1.6	
Hypertensive heart disease.....	(421-2, 430-4)	29	1.2	39.2	38	1.6	71.5	154	405.2	631	1.5	1.5	
General arteriosclerosis.....	(440-3)	24.9	20	14.7	48	3.3	25.6	35	210.7	310	1.7	1.7	
Cancer of kidney.....	(450)	30.1	20	14.7	48	3.3	25.6	35	210.7	310	1.7	1.7	
All other cancer.....	(180)	8.3	6	9.0	13	1.4	24.1	28	79.0	120	1.5	1.4	
Influenza, pneumonia.....	(151)	75.4	84	104.2	149	1.4	279.4	426	1,061.4	1,524	1.4	1.4	
All other causes.....	(480-93)	20.5	25	12.2	76	1.0	98.6	91	285.2	413	1.4	1.3	
Cerebral vascular lesions.....	(330-4)	39.1	64	2.4	159	1.2	38.0	97	303.2	415	1.4	1.6	
Cancer of prostate.....	(177)	57.1	57	294.1	390	1.0	330.9	416	1,508.7	1,946	1.3	1.3	
Accidents, suicides, violence.....	(890-909)	22.1	19	32.3	48	1.5	74.9	76	1,461.8	1,844	1.3	1.3	
Nephritis.....	(592-4)	45.0	62	1.4	101.3	174	1.7	303.7	1,083.2	1,310	1.2	1.3	
Rheumatic heart disease.....	(400-16)	14.2	16	1.3	11.0	17	1.5	68.8	62	173	1.1	1.5	
Cancer of rectum.....	(154)	12.2	13	41.3	39	0.8	79.4	88	290.6	309	1.1	1.1	
Cancer of intestines.....	(152-3)	38.2	13	46.6	64	1.4	106.2	81	207.8	213	1.0	0.9	
All causes.....	-----	799.4	1,204	1.58	2,420.1	4,001	1.65	4,183.3	6,813	15,653.9	1.68	1.65	

The death rates in smoking less than respectively, the death rates 120 percent higher than at the earlier ages increasing age. The rate of heavy smoke

In the studies the substantially higher men who started at as the number of increase was irregular

In two studies were for a given amount Cigarette smoke study had mortality smokers. Two studies stopped. In these years of cessation increased with the who stopped after (These results were

Taken as a whole of the type of mortality in America and Britain a random sample rates below those extent this is to under-recruited in death rates can

The data on smoking of measurement, once and some in study. For men judgment is that the observed mortality true mortality rate

The studies in the study population 32 percent in the information about ratios lying between for the complete biases can account for cigarette smoking

In three studies the mortality rate