

ROCKETDYNE WORKER HEALTH STUDY

Appendix C



Tobacco Use, Smoking Survey

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Appendix C. Tobacco Use, Smoking Survey

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Smoking Evaluation. To learn more about the smoking habits of hourly and salaried workers, a brief questionnaire survey was conducted in 2004. A sample of living workers was selected and approximately half of those mailed a questionnaire responded (68 hourly and 71 salaried workers). Compared to salaried workers, hourly workers were significantly more likely to have smoked cigarettes (61% vs 41%), to be current smokers (9% vs 0%), to have started smoking at a younger age, to have quit at an older age, to smoke for more years (31.4 yr vs 21.1 yr) and to have consumed more cigarettes during their lifetime as measured in terms of “pack-years”. The number of cigarettes smoked each day and the use of other tobacco products, such as cigars, did not differ significantly between the two groups. The survey is limited because only survivors are included and the response rate was low, only 50%. In addition, addresses could only be found for about 50% of those originally selected. Distinctions between SSFL workers and the workers at other facilities by pay type were not informative because of the small numbers, e.g., there were only 29 salaried workers overall who had smoked cigarettes. Nonetheless, these distributions are consistent with information obtained from a sample of over 120 medical records of test stand workers of whom smoking information was available on over 60 who had completed questionnaires in the 1960s which included queries on cigarette smoking habits, i.e., just over 60% of the hourly workers were current or former smokers. National surveys of smoking habits among hourly (blue collar) and salary (white collar) workers also indicate a significantly higher prevalence of smoking among hourly workers compared to salaried workers and hourly workers compared to the general population. These evaluations indicate that caution must be exercised when interpreting comparisons in cancer risk between hourly workers and salaried workers and between hourly workers and the general population because there is strong evidence that there are significant differences in smoking habits. This is seen in the SMR analyses in that hourly workers in general have higher rates of lung cancer and other smoking related causes of death such as heart disease and non-malignant respiratory diseases such as emphysema. It has been suggested that smoking preventive programs should be considered for blue collar workers (Howard 2004). While patterns of risk in the observed and expected ratios can be informative, the internal dose-response analyses comparing hourly workers to hourly workers and salaried workers to salaried workers over categories of exposure are the most informative with regard to investigating causal associations.

Additional discussion and references can be found in the Discussion section of the Chemical Paper. “The previous UCLA investigation had abstracted medical records of over 1000 workers to learn whether smoking information might be available and whether smoking status might vary over categories of estimated hydrazine exposure (essentially, among test stand workers). There was little evidence that smoking was a confounder, since smoking prevalences were quite similar among the test stand workers and other workers (Morgenstern and Ritz 2001). It might be noted, however, that the available medical records were limited, in that practically all medical records for workers who terminated employment prior to about 1970 (i.e., for over 66% of the test stand workers) had been destroyed, and were thus not available for review in the 1990s. In addition, most of the questionnaires available in existing medical records had been administered in the 1960s and changes in smoking habits over the years could not be evaluated. To obtain additional information on smoking histories and the possible association with pay code, a brief smoking survey was conducted of a random sample of 200 living workers who fell into one of four

categories: hourly and salaried workers at SSFL and hourly and salaried workers at the other Rocketdyne facilities where radiation work was performed. Just over 64% of the hourly workers reported being a current or former smokers, whereas the proportion among salaried workers was 40%, indicating the importance of controlling for pay code in the analyses as a surrogate measure of smoking. Even though survey methods differed, the prevalences of current smokers, in our survey are generally similar to recent national and California population estimates (CDC 2004a, CDC 2004b). We found 9 % of hourly workers reporting current smoking, and none of the salaried workers in our sample with a median age of 71 years. The national prevalence of smoking in 2002 (the latest year for which estimates are available) were 10% at ages 65+, and smoking prevalences in California were 24% lower than the national level. The smoking prevalence of California males over the age of 70 years is estimated to be below 7%. Thus our small survey was consistent with previous large-scale investigations indicating that hourly workers smoke more than salaried workers and more than the general population. Nonetheless, the study is limited in not having information on the smoking habits of the workers studied.”

Centers for Disease Control and Prevention (CDC). Cigarette smoking among adults – United States, 2002. MMWR Morb Mortal Wkly Rep 53:427-431, 2004a.

Centers for Disease Control and Prevention (CDC). State - specific prevalence of current cigarette smoking among adults – United States, 2002. MMWR Morb Mortal Wkly Rep 52:1277-1280, 2004b.

Howard J. Smoking is an occupational hazard. Am J Ind Med 46:161 169, 2004.

C1. Smoking Survey (2004) – Health Status

How would you describe your health?

Health Status	Hourly (%)		Salary (%)		Total (%)	
Excellent	7	(10)	16	(23)	23	(17)
Very Good	22	(32)	31	(44)	53	(38)
Good	16	(24)	12	(17)	28	(20)
Fair	12	(18)	8	(11)	20	(14)
Poor	9	(13)	3	(4)	12	(9)
Deceased	2	(3)	1	(1)	3	(2)
Total	68		71		139	
p-value from χ^2 test for association:				0.08		

C2. Smoking Survey (2004) - Ever Smoked

Have you smoked at least 100 cigarettes in your entire life?

Ever Smoked	Hourly (%)		Salary (%)		Total (%)	
Yes	40	(61)	29	(41)	69	(50)
No	26	(39)	42	(59)	68	(50)
Total	66		71		137	
p-value from χ^2 test for association:				0.02		

Note: Tabulations include (136) workers who returned a survey and (1) deceased worker whose survey was completed by next-of-kin.

C2a. Smoking Survey (2004) - Age Started Smoking

About how old were you when you first started smoking cigarettes regularly?

Age Started (yr)	Hourly (%)	Salary (%)	Total (%)
< 15	5 (13)	2 (7)	7 (10)
15-19	22 (56)	18 (62)	40 (59)
20-24	11 (28)	5 (17)	16 (24)
≥25	1 (3)	4 (14)	5 (7)
Total	39	29	68
Mean (Std dev) age	16.6 (3.1)	17.9 (3.7)	
p-value from t-test for equality of means:		0.05	

Note: (1) smoker did not answer this question

C2b. Smoking Survey (2004) - Current Smoker

If you answered 'Yes' to the question 'Have you smoked at least 100 cigarettes in your entire life,' do you smoke cigarettes now?

Current Smoker	Hourly (%)	Salary (%)	Total (%)
Yes	6 (15)	0 (0)	6 (9)
No	34 (85)	29 (100)	63 (91)
Total	40	29	69
p-value from Fisher's exact test ¹ for association:		0.04	

¹Because of small cell counts, Fisher's exact test was used instead of χ^2 test.

C2c. Smoking Survey (2004) - Age Quit Smoking

At what age did you quit?

Age Quit (yr)	Hourly (%)	Salary (%)	Total (%)
<30	2 (6)	7 (24)	9 (15)
30-39	11 (35)	8 (28)	19 (32)
40-49	4 (13)	6 (21)	10 (17)
≥50	14 (45)	8 (28)	22 (37)
Total	31	29	60
Mean (Std dev) age	46.3 (14.7)	40.0 (14.4)	
p-value from t-test for equality of means:		0.09	

Note: (3) former smokers did not answer this question

C2d. Smoking Survey (2004) – Intensity (Cigarettes per Day)

On average how many cigarettes a day did you smoke?

Cigarettes/Day	Hourly (%)	Salary (%)	Total (%)
<10	9 (23)	4 (14)	13 (19)
10-19	6 (15)	9 (31)	15 (22)
20-29	19 (48)	9 (31)	28 (41)
≥30	6 (15)	7 (24)	13 (19)
Total	40	29	69
Mean (Std dev)	17.8 (9.7)	21.5 (17.3)	
p-value from t-test for equality of means:		0.25	

C2f. Smoking Survey (2004) - Other Tobacco Use

Have you ever used any of the tobacco products listed below?

Tobacco Product	Hourly (%)		Salary (%)		Total (%)	
Chewing Tobacco						
Yes	3	(7)	1	(3)	4	(5)
No	41	(93)	32	(97)	73	(95)
p-value from Fisher's exact ¹ test:			0.63			
Snuff Tobacco						
Yes	2	(5)	2	(6)	4	(5)
No	42	(95)	31	(94)	73	(95)
p-value from Fisher's exact ¹ test:			0.99			
Pipes						
Yes	14	(32)	15	(45)	29	(38)
No	30	(68)	18	(55)	48	(62)
p-value from Fisher's exact ¹ test:			0.24			
Cigars						
Yes	9	(20)	11	(32)	20	(26)
No	35	(80)	23	(68)	58	(74)
p-value from Fisher's exact ¹ test:			0.30			

¹Because of small cell counts, Fisher's exact test was used instead of χ^2 test.

C2g. Smoking Survey (2004) – Duration of Smoking

Duration of smoking (derived as age quit minus age start or, if current smoker, current age minus age start)?

Duration (yr)	Hourly (%)		Salary (%)		Total (%)	
<10	2	(6)	4	(14)	6	(9)
10-19	9	(25)	10	(34)	19	(29)
20-29	7	(19)	6	(21)	13	(20)
30-39	7	(19)	6	(21)	13	(20)
≥40	11	(31)	3	(10)	14	(22)
Total	36		29		65	
Mean (Std dev)	31.4	(16.8)	21.1	(12.8)		
p-value from t-test for equality of means:					0.01	

Note: (4) of the 69 former and current smokers were missing information necessary to calculate this value.

C2h. Smoking Survey (2004) - Cumulative Amount of Tobacco Use

Cumulative amount (derived as the product of the average number of cigarettes per day times the duration of smoking in years divided by 20 (the number of cigarettes in a pack)).

Pack-years	Hourly (%)	Salary (%)	Total (%)
<5	5 (14)	5 (17)	10 (15)
5-9	2 (6)	4 (14)	6 (9)
10-19	7 (19)	7 (24)	14 (22)
20-29	6 (17)	3 (10)	9 (14)
30-39	5 (14)	5 (17)	10 (15)
40-59	7 (19)	3 (10)	10 (15)
≥60	4 (11)	2 (7)	6 (9)
Total	36	29	65
Mean (Std dev)	30.3 (23.4)	26.2 (29.6)	
p-value from t-test for equality of means:		0.54	

Note: (4) of the 69 former and current smokers were missing information necessary to calculate this value.

C3. Smoking Survey (2004) - Exercise

On how many of the past 7 days did you exercise or do sports for at least 20 minutes that made you sweat or breathe hard (e.g., dancing, jogging, basketball, etc.)?

Days Exercised Past Week	Hourly (%)		Salary (%)		Total (%)	
0	26	(40)	18	(26)	44	(33)
1	6	(9)	8	(11)	14	(10)
2	8	(12)	12	(17)	20	(15)
3	11	(17)	12	(17)	23	(17)
4	0	(0)	7	(10)	7	(5)
5	9	(14)	7	(10)	16	(12)
6	2	(3)	0	(0)	2	(1)
7	3	(5)	6	(9)	9	(7)
Total	65		70		135	
p-value from Fisher's exact test ¹ for association:			0.07			

Note: (3) deceased workers not included in tabulation. (1) worker did not answer this question

¹Because of small cell counts, Fisher's exact test was used instead of χ^2 test.

C4. Smoking Survey (2004) – Response Rate

Response Rate¹	Hourly (%)	Salary (%)	Total (%)
Number Selected	300(100)	300 (100)	600 (100)
Number Mailed Questionnaire	145 (46)	147 (46)	292 (49)
Number Responded	68 (23)	71 (24)	139 (23)

¹ 300 hourly and 300 salaried workers known to be alive 31 December 1999 were randomly selected. Current mailing addresses were sought and (292) were found. (292) questionnaires were mailed and tabulations are made as of 17 December 2004. (6) workers were found to have died. (3) surveys were returned by next-of-kin for deceased workers.

C5. Smoking Survey (2004) – Age distribution

Current age of respondents (as of date questionnaire was received):

Current Age	Hourly (%)		Salary (%)		Total (%)	
< 50	10	(15)	12	(17)	22	(16)
50 – 59	8	(12)	12	(17)	20	(14)
60 – 69	15	(22)	12	(17)	27	(19)
70 – 79	24	(35)	27	(38)	51	(37)
≥ 80	11	(16)	8	(11)	19	(14)
Total	68		71		139	
Mean age (std dev)	67.8	(12.6)	67.0	(12.8)	67.4	(12.7)
Median age (range)	71.1	(37.7-84.8)	69.8	(41.6-94.0)	70.0	(37.7-94.0)

Note: Tabulations include (136) workers who returned a survey and (3) deceased workers whose surveys were completed by next-of-kin.