A Classic Study – The Doll and Hill Study on Lung Cancer (1948)

During the 20th century there had been a remarkable increase in the incidence of lung cancer, both in the United Kingdom and in the US. As unbelievable as it sounds now, the cause was unknown. Richard Doll and Bradford Hill were British researchers who conducted a study to address this. They identified lung cancer patients in 20 London hospitals and enrolled a comparison group of non-cancer patients who had been admitted to the same hospitals. The cancer patients and non-cancer patients were matched by age, gender, and hospital. While in the hospital, all subjects were interviewed about their past smoking habits and other exposures using a 3-page questionnaire. The interviewers were aware of the diagnosis of the patients they interviewed. For part of the analysis the investigators classified "smokers" as anyone who smoked a one or more cigarettes per day for more than one year. The investigators also verified each patient's status with respect to lung cancer at the time of discharge or death by reviewing the final diagnosis, checking on surgical findings and biopsy results, and checking on autopsy findings when they were available.

It is also relevant to note that prior to the 1950s, smoking was socially less acceptable in females than in males.

The data was analyzed separately for males and females. Among the 1298 males in the study there were 649 with lung cancer and 647 of these were "smokers". Among the 649 males who did not have cancer, 622 were smokers, and 27 were not. There were 120 females in the study. There were 60 females with lung cancer, and 41 of these admitted to smoking. There were 60 females without cancer, and 28 of these admitted to smoking.

1) Using these data, set up two-by-two tables to perform a stratified analysis and calculate the crude and stratum-specific measures of association that focus on the strength of association. [4 pt.]

Crude Analysis

	Cases	**Controls**	
	688	650	1338
	21	59	80
	709	709	1418

Crude Odds Ratio= 2.97

Stratified Analysis

	Males			Females		
	Cases	**Controls**		**Cases**	**Controls**	
Exposed	647	622	1269	41	28	69
Non-exposed	2	27	29	19	32	51
	649	649	1298	60	60	120

Odds Ratio= 14.04

Odds Ratio= 2.47