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IS THE INCREASE IN ADENOCARCINOMA A RESULT OF CHANGES IN CIGARETTE DESIGN?

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Adenocarcinoma as a percentage of all lung cancer has increased over time and this increase has been attributed to changes in cigarette design. We use five-year birth cohort specific estimates of smoking behaviors and a model of lung cancer risk derived from the ACS CPS I data to estimate the expected rate of lung cancer by birth cohort and compare those estimates to actual US lung cancer mortality by birth cohort. Risk data from CPS I are based on cigarettes smoked prior to 1972, and these risk estimates progressively underestimate actual US lung cancer mortality between 1970 and 2000 culminating in a 50% underestimate. This underestimate can be eliminated by including a simple scaling term for the duration of smoking cigarettes manufactured after the mid 1960s. Birth cohort specific lung cancer incidence by tissue type was examined using the SEER data and the same risk models scaled to the percentage of all lung cancer represented by that type. Squamous cell carcinoma incidence rates by birth cohort were well predicted by the model without any adjustment for cigarettes smoked after the mid 1960s suggesting that there has been no increase in risk of smoking over time for squamous cell. Incidence rates for adenocarcinoma were progressively underestimated suggesting that the risk of smoking for adenocarcinoma has increased dramatically over time. These data suggest that up to one half of current lung cancer occurrence may be attributable to changes in cigarette design and correspondingly that current lung cancer rates might be reduced by up to 50% through regulatory control of cigarette design and composition.