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**Abstract**

Data collected during seven population health surveys over 18 years in Busselton, Western Australia, were examined to determine the effect of smoking on lung function and to investigate the development of chronic airflow limitation. Lung function was measured and details of respiratory illness and smoking histories were collected from subjects attending surveys at three year intervals from 1966 to 1984. Data from ex-smokers and asthmatic patients (diagnosis based on answer to questionnaire) were excluded. Regression of height adjusted forced expiratory volume in one second (FEV1) on age was calculated individually for 759 non-smokers and 225 regular smokers with four or more observations. Decline in height adjusted FEV1 was similar for men and women. In smokers the rate of decline in FEV1 was greater than in non-smokers and was related to the amount smoked, to the extent that a smoker could expect a 20-30% greater rate of decline than a non-smoker of the same age. Chronic airflow limitation (defined as FEV1/FEV less than 65% or FEV1 less than 65% predicted on at least two occasions) was common, occurring in 24% of men and 18% of women who were regular smokers and in 5% of male and 8% of female non-smokers. These figures are higher than those reported in other populations, especially for women and for non-smokers. Not all chronic airflow limitation was associated with respiratory symptoms, confirming that the condition may be unrecognised until it is advanced.