Abstract
Although from a societal point of view a modal shift from car to bicycle may have beneficial health effects due to decreased air pollution emissions and increased levels of physical activity, shifts in individual adverse health effects such as higher exposure to air pollution and risk of a traffic accident may prevail. We have summarized the literature for air pollution, traffic accidents, and physical activity using systematic reviews supplemented with recent key studies. We quantified the impact on all-cause mortality when 500,000 people would make a transition from car to bicycle for short trips on a daily basis in the Netherlands. We estimate that beneficial effects of increased physical activity are substantially larger (3-14 months gained) than the potential mortality effect of increased inhaled air pollution doses (0.8-40 days lost) and the increase in traffic accidents (5-9 days lost). Societal benefits are even larger because of a modest reduction in air pollution and traffic accidents. On average, the estimated health benefits of cycling were substantially larger than the risks relative to car driving for individuals shifting their mode of transport.

Keywords
Air pollution, Biking, Modal shift, Physical activity, Traffic accidents