

# **Epidemiology**      **Bulletin**

*REPUBLIC OF CHINA*

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## Trends in Motor Vehicle Accidents in the Taiwan Area

Since 1970, accidents have been the third leading cause of mortality in the Taiwan Area ranking only behind cancer and cerebrovascular disease in relative importance. However, accidents primarily affect young individuals and are the leading cause of mortality for all age groups under 45 years. Assuming all persons should live a productive life until age 65 years, we can compare the relative importance of diseases and conditions which result in "premature" mortality. This measure of premature mortality has been called "years of potential life lost before age 65", or YPLL<sup>1</sup>. For example, the death of a 35 year-old motor vehicle accident (MVA) victim would result in a loss of 30 years of potential life. In contrast, the death of a 64 year-old heart attack victim would result in the loss of only one year of potential life. Comparing the amount of premature mortality caused by diseases and conditions, accidents emerge as the leading cause of YPLL in the Taiwan Area (Figure 1).

In Taiwan, motor vehicle accidents (MVA's) account for approximately half of all accident mortality in persons >15 years of age. From 1966 to 1984, the crude mortality rate from MVA's increased almost 4-fold from 8 to 30 deaths per 100,000 population. During this period, the number of registered motor vehicles increased 46-fold, from about 150,000 to over 7 million<sup>2</sup>. Crude MVA mortality rates from 1975 to 1984 were 3-5 times higher for men than women. The MVA mortality rate by sex and age shows similar rates for males and females before 15 years of age, followed by a sharp increase in the rate for males in the 15-19 year age group (Figure 2). This increase is probably due to a greater frequency of driving among teenage males, many of whom drive motorcycles. Although MVA mortality data are not separated by vehicle type, Taipei City MVA morbidity data reveal a large proportion of accidents involve motorcycles; from 1975 to 1984, approximately 50% of all MVA's in Taipei City involved motorcycles<sup>3</sup>. After age 30, MVA mortality rates for both sexes increase with age, and the highest rates are found among older age groups. This may be due to higher fatality rates from trauma among older individuals despite their expected lower frequency of exposure as drivers or passengers in motor vehicles.

Figure 1. Ten leading causes of years of productive life lost (YPLL) in the Taiwan Area, 1984

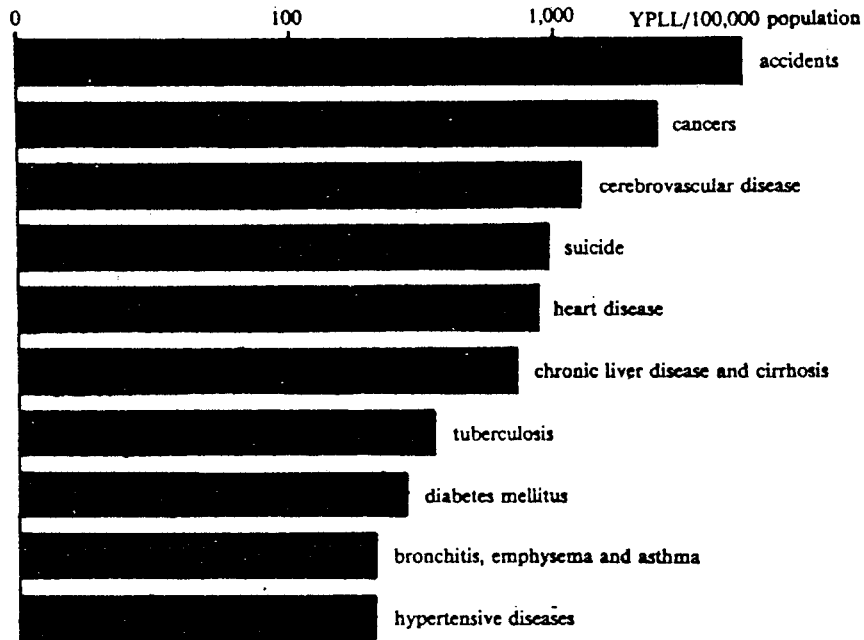
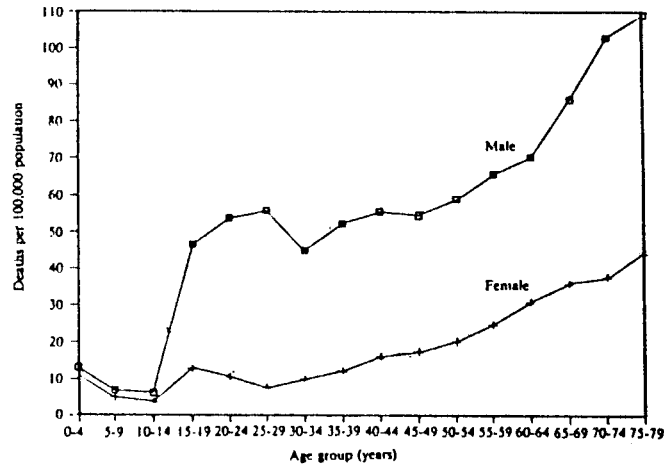


Figure 2. Motor vehicle accident mortality rates by age and sex, 1975 to 1984.



Areas in Taiwan with the highest MVA mortality rates are those with mountainous terrain. MVA's in these areas are more likely to result in fatalities due to the nature of accidents in such areas (head-on collisions around curves, vehicles plunging into ravines after loss of control) as well as the relative distance to the nearest emergency medical

facilities. One factor which may contribute to MVA's in mountainous areas are poor road conditions such as unpaved road surfaces. We have found a correlation between MVA mortality rates and the proportion of unpaved road surfaces in the Taiwan Area (Figure 3). According to these data, a reduction in MVA mortality rate of approximately 4 per 100,000 population could be expected for every 10% reduction in the proportion of unpaved roads.

Although MVA mortality data are reasonably complete in Taiwan, data on non-fatal MVA's and injuries are less reliable. The most accurate data of this kind are available from the National Highway Bureau which monitors traffic on Taiwan's north-south freeway. Data from this source reveal an increase in the injury, accident, and fatality rates (per million vehicle-kilometers) in the first few years after the freeway opened (Figure 4). All three rates declined, however, after the Traffic Safety Improvement Project was implemented in 1978. Among other things, this project increased the number of road signs, policemen, and emergency telephones. In March 1985, a mandatory seatbelt law went into effect for front seat passengers of all freeway vehicles. Since the implementation of this law, the MVA fatality rate has declined 37%<sup>4</sup>.

*Reported by the Field Epidemiology Training Program, Bureau of Disease Control, Department of Health, Executive Yuan; the Taiwan Area National Freeway Bureau, Ministry of Communications.*

Editorial note: Accidents are an extremely important public health problem in Taiwan resulting in the annual loss of more years of potential life than any other health condition. Motor vehicle accidents account for nearly half of all accident mortality, and this proportion can be expected to increase as the number of motor vehicles increases. The prevention of MVA morbidity and mortality will require better cooperation among diverse groups of professionals including epidemiologists, highway and vehicle safety engineers, and police authorities. Some examples of important questions unanswered by this review are: 1) What proportion of MVA's in Taiwan are alcohol-related? 2) Are current driver education programs effective in reducing MVA rates, or are there ways to improve such

Figure 3. Correlation between proportion of unpaved road surface and motor vehicle accident mortality rates for 19 administrative areas in Taiwan, 1984.

