

# Trends in childhood injury mortality in three South African population groups, 1968 - 1985

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## Summary

Trends in major causes of injury mortality and the proportion of total deaths attributable to injuries from 1968 to 1985 for white, coloured and Asian children < 15 years in the RSA were examined. There were 937 injury deaths in 1968 and 853 in 1985 but no clear trends in overall mortality rates were observed. There were, however, marked fluctuations in injury mortality rates from year to year with peaks in 1975 and 1981/1982. The impact of injury as a cause of death has increased relative to a decrease in other diseases, notably gastro-enteritis and malnutrition in children < 5 years. Patterns varied considerably between age, sex and population groups. Overall, road and burn death rates decreased while drowning and assault rates increased. Reasons for observed trends are discussed and the need for the collection of reliable national data for the total population is highlighted.

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World-wide, the impact of injury mortality in childhood has been increasing.<sup>1</sup> In part, this is a relative trend as infectious diseases and malnutrition are controlled, but increased exposure to technological hazards has also been responsible for increased rates.<sup>2</sup> In some countries, notably Mexico, rapid modernisation without adequate safety controls has resulted in adolescent motor vehicle accident deaths increasing by as much as 600% between 1955 and 1974.<sup>2</sup>

In South Africa, injuries are the leading cause of death in children and young people between the ages of 5 years and 34 years<sup>3</sup> and a detailed description of childhood injury deaths for 1981 - 1985 has been reported.<sup>4</sup> In children < 5 years, infectious diseases, respiratory disease and perinatal causes still play a major role and account for 72% of deaths.

Injury deaths are potentially preventable<sup>5</sup> and in many countries, such as Sweden, increasing public awareness and the introduction of safety legislation has resulted in decreasing injury mortality rates.<sup>1,6,7</sup> This study examines trends in injury mortality rates and the proportion of total deaths attributable to injuries from 1968 to 1985 for whites, coloureds and Asians\* in South Africa. Trends for the black population were not investigated, since data for this group have only been

collected nationally since 1978. Other reasons for not calculating rates for the black population together with a more detailed account of the methodology have been described.<sup>4</sup>

## Subjects and methods

Computerised data supplied by the Central Statistical Services (CSS) were analysed. These included all registered deaths in children < 15 years in the RSA (excluding Transkei, Bophuthatswana, Venda and Ciskei) from 1968 to 1985.

The term 'injury' was used for all external causes (E code) as defined in the *International Classification of Diseases*.<sup>8</sup> Causes of injury were grouped together in a way which has practical relevance. The five main groups were road deaths which included motor vehicle and pedestrian accidents (E810 - 829), drowning (E910), burns (E890 - 899, 924 - 926), assault (E960 - 978, 990 - 999) and undetermined whether accidental or purposefully inflicted injury (E980 - 989, 889).

The year in which the death occurred and not the registration date was used throughout the analysis. Population data were obtained from the 1970<sup>9</sup>, 1980<sup>10</sup> and 1985<sup>11</sup> population census reports of the CSS. The population size was estimated by linear interpolation from 1970 to 1985 and extrapolation before 1970. The census data for each age, sex and population group combination were used. The age groups were < 1 year, 1 - 4 years, 5 - 9 years and 10 - 14 years. No corrections were made for census undercount, since this was assumed to be small in the children of the three population groups investigated.<sup>11</sup>

Where appropriate, a 5-year moving average was used to smooth trends in the rates and proportions analysed, since the underlying data demonstrated fluctuations that made it difficult to observe overall trends. For the total number of deaths, fluctuations from a smooth trend were evaluated using the chi-square test to compare the observed frequency of death with that expected if the trend had been smooth.

All computations were undertaken on an IBM mainframe computer using the SAS package of programs.<sup>13</sup> Selected results are displayed graphically.

## Results

The total number of injury deaths in children < 15 years for the years 1968 to 1985 (unsmoothed) are shown in Fig. 1. There were 937 injury deaths in 1968 and 853 in 1985. The peaks in 1975 and 1981/1982 were found to be significantly higher (using the chi-square test) when compared with the smoothed number of deaths per year, except in the case of the Asians.

Fig. 2 shows the smoothed trends in the total number of injury deaths as a percentage of all deaths by age, sex and population group. In children < 5 years the percentage has increased in all groups, particularly in coloured children aged 1 - 4 years. In children > 5 years there was little change except in the 5 - 9-year group after 1978.

The unsmoothed trends in the total injury death rates demonstrated marked fluctuations from year to year. When these rates were smoothed, the only subgroups to show a clear

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\*White, coloured (mixed racial origin) and Asian are categories based on the South African Population Registration Act of 1950. These groups are associated with socio-economic differences<sup>12</sup> but data directly relating injury to social class are not available.



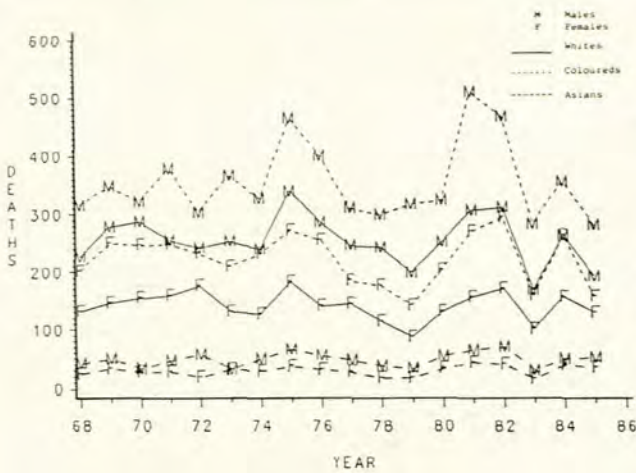


Fig. 1. Annual total RSA injury deaths in children < 15 years for three population groups by sex (1968 - 1985).

increase were coloured boys < 1 year old and Asian girls aged 5 - 9 years after 1978. The rates in the other subgroups remained fairly stable over this period.

Trends in mortality rates for road accidents, drowning, burns and assault are shown separately in Figs 3 to 6. Overall, road and burn deaths have decreased, while drowning and assault rates have increased.

In 14% of the injury deaths between 1981 and 1985, it was not determined whether the injury was accidental or purposefully inflicted (ICD codes 980 - 989 and CSS code 889).<sup>4</sup> There were very few deaths classified in this undetermined group before 1975. Since this date, the three population groups showed dramatic increases to rates of approximately 9/100 000/year.

### Discussion

This study was confined to registered deaths, which are regarded as an underestimate of the actual number of deaths. If it is assumed that the rate of registration has remained fairly constant since 1968, there has been little change in childhood injury mortality rates during the period under review. However, the impact of injury as a cause of death has increased relative to a decrease in other diseases, notably gastro-enteritis and malnutrition<sup>14</sup> (particularly in children < 5 years). The only subgroups to show an increasing trend in overall injury mortality rates were coloured infant boys and Asian girls aged 5 - 9 years — findings for which there is no clear explanation.

In all subgroups there was considerable fluctuation in mortality rates from year to year. This type of fluctuation has also been demonstrated by Taket<sup>1</sup> and has important implications when interpreting changes over a short period of time and evaluating the impact of intervention programmes. There were two distinct peaks around 1975 and 1981/1982 (Fig. 1). These

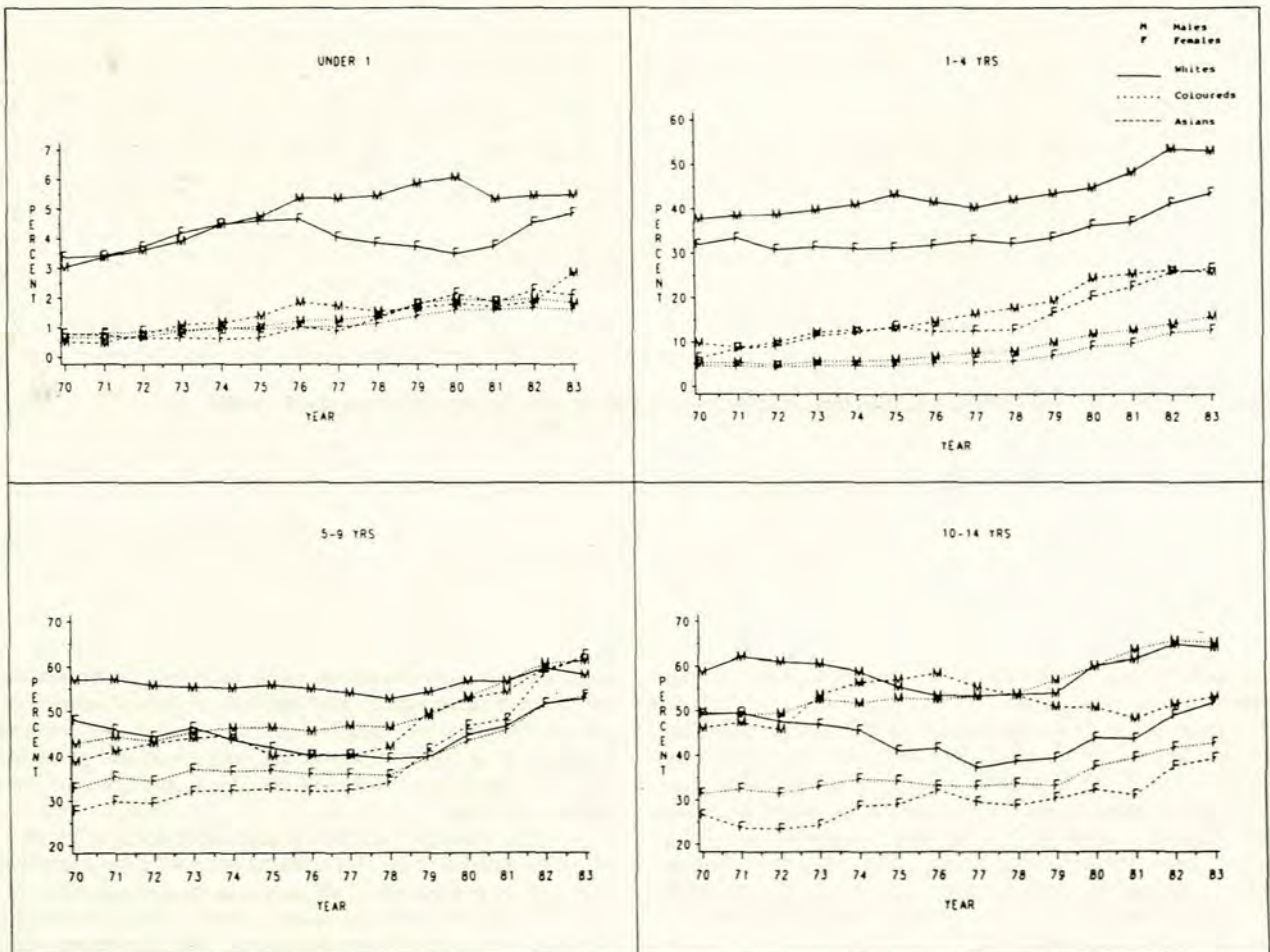


Fig. 2. Age-specific smoothed trend of injury deaths as a percentage of all deaths for three population groups by sex (1968 - 1985).



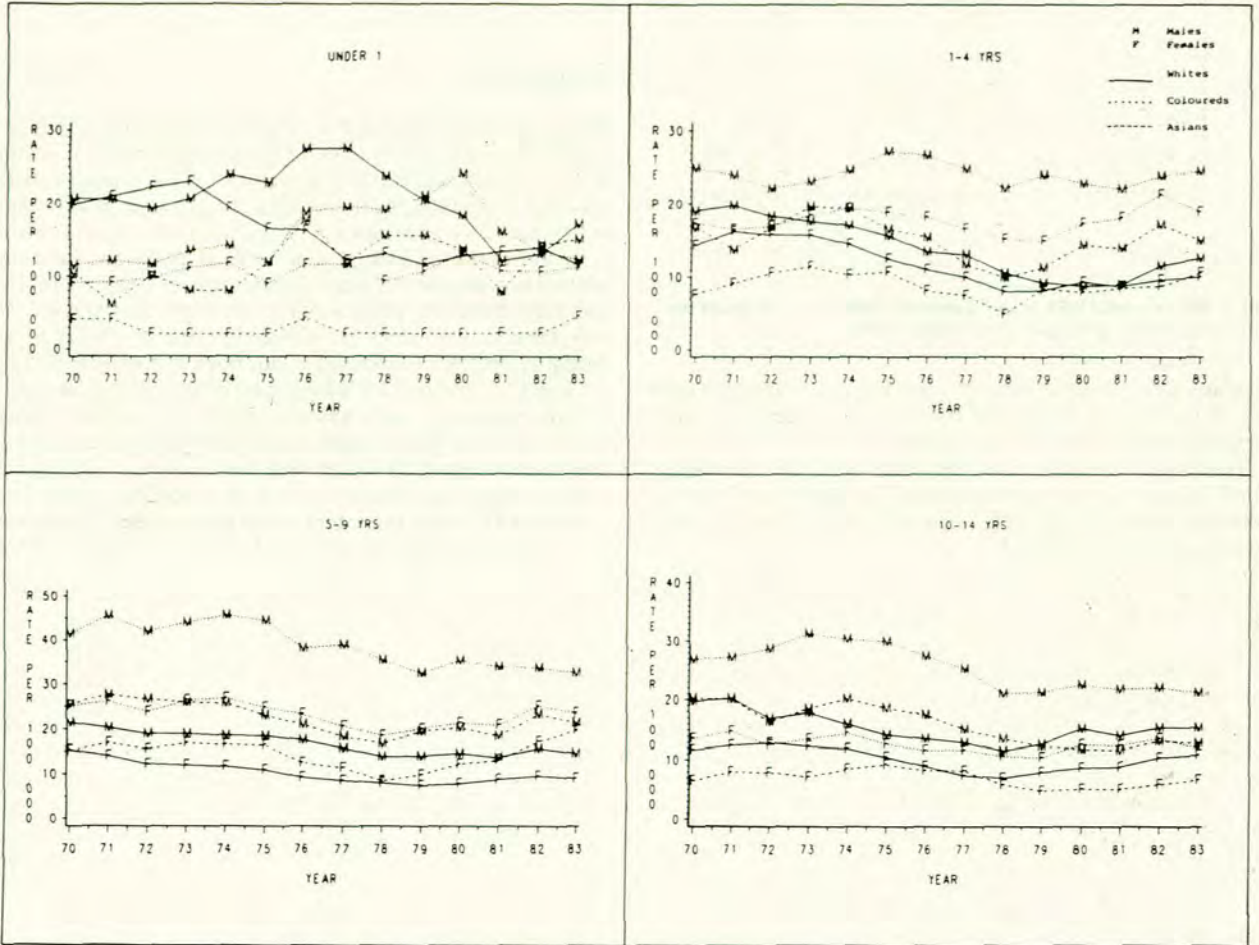


Fig. 3. Age-specific smoothed trend of road injury death rates for three population groups by sex (1968 - 1985).

peaks may coincide with periods of economic recession and warrant further investigation.

The increases in mortality rates since 1975 in the undetermined group (undetermined whether accidental or intentionally inflicted injury) are important and need to be taken into account when interpreting the trends in other causes of injury death. This increase is likely to be due to a change in coding practice, since the encoders at the CSS have been taking greater care since this date to establish the exact cause of death in doubtful cases (Mrs A. C. Jordaan, CSS, Pretoria — personal communication).

Childhood injury is the result of a complex interaction between factors in society, the child, the family, the environment and the agent of injury.<sup>1,5,15</sup> Trends in aggregated mor-

tality statistics are therefore often difficult to explain and further in-depth research into associated socio-economic and cultural factors is needed. Notable changes in cause-specific mortality were confined to certain subgroups and there was often no consistency between the boys and girls of each population group.

In most subgroups road deaths decreased slightly or remained constant (Fig. 3). Declining rates were most apparent in the white population at all ages and in coloured boys > 5 years. In contrast, rates for coloured male infants increased to a peak in 1980 but are now decreasing. The decreasing trends could be associated with increasing public awareness created by campaigns by organisations such as the National Road Safety Council. The increase in coloured infant death rates



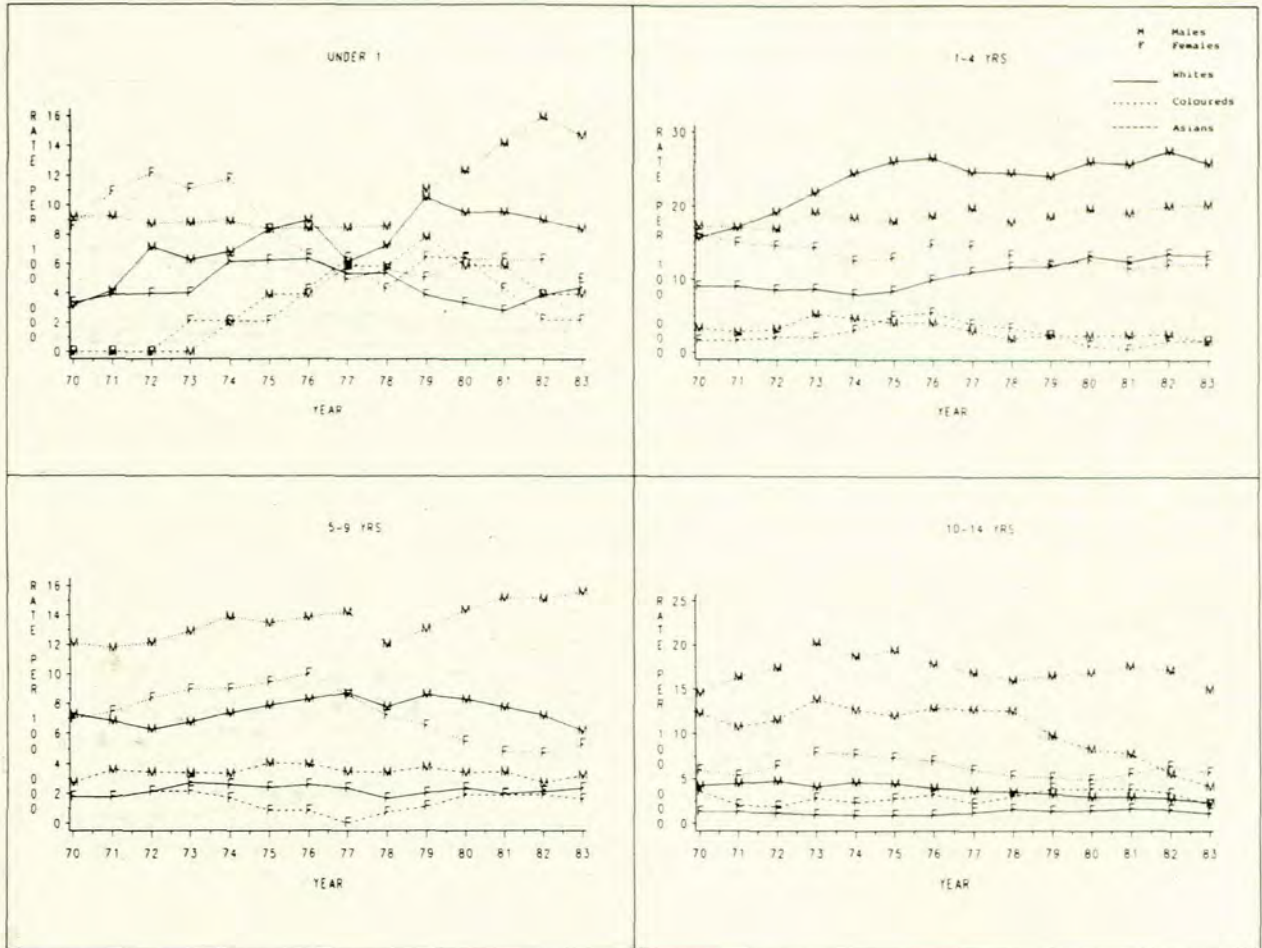


Fig. 4. Age-specific smoothed trend in drowning death rates for three population groups by sex (1968 - 1985).

(mostly passengers<sup>4</sup>) may be due to an increasing car ownership in this population group. Legislation compelling the fitting of safety belts in new cars (1964 for front belts and 1987 for rear belts) and their use (1977) do not appear to have had a significant effect on child road deaths but as yet there is no legislation requiring the use of child safety restraints. These restraints have proven efficacy<sup>16</sup> if used appropriately. Since 1973 there have been a number of changes in speed regulations.<sup>17</sup> Although some authors<sup>18,19</sup> have identified significant reductions in road accidents as a result of speed restrictions, the results of this study do not support this clearly.

The increase in drowning rates (Fig. 4) in white boys aged 1 - 4 years before 1976 may have coincided with an increase in the number of private swimming pools, since the majority of

these deaths occur in private pools (J. de Wet — An analysis of drownings in South African children 0 - 14 years for the year 1986 — unpublished data, Child Safety Centre, University of Cape Town). In contrast, the majority of coloured drownings occur in dams, rivers and canals and there is no clear explanation for the increase in deaths among coloured male infants < 1 year and > 5 years. There was a notable decrease in burn mortality rates (Fig. 5) in coloured children between 1968 and 1979, which may reflect improved housing conditions during the 1970s. Assault death rates (Fig. 6) have increased in coloured boys of all ages, Asian boys aged 5 - 9 years and white boys aged 1 - 4 years. Political violence has increased dramatically since 1976<sup>20</sup> and this may have contributed to the increase in deaths among older coloured children. Wyndham<sup>21</sup>



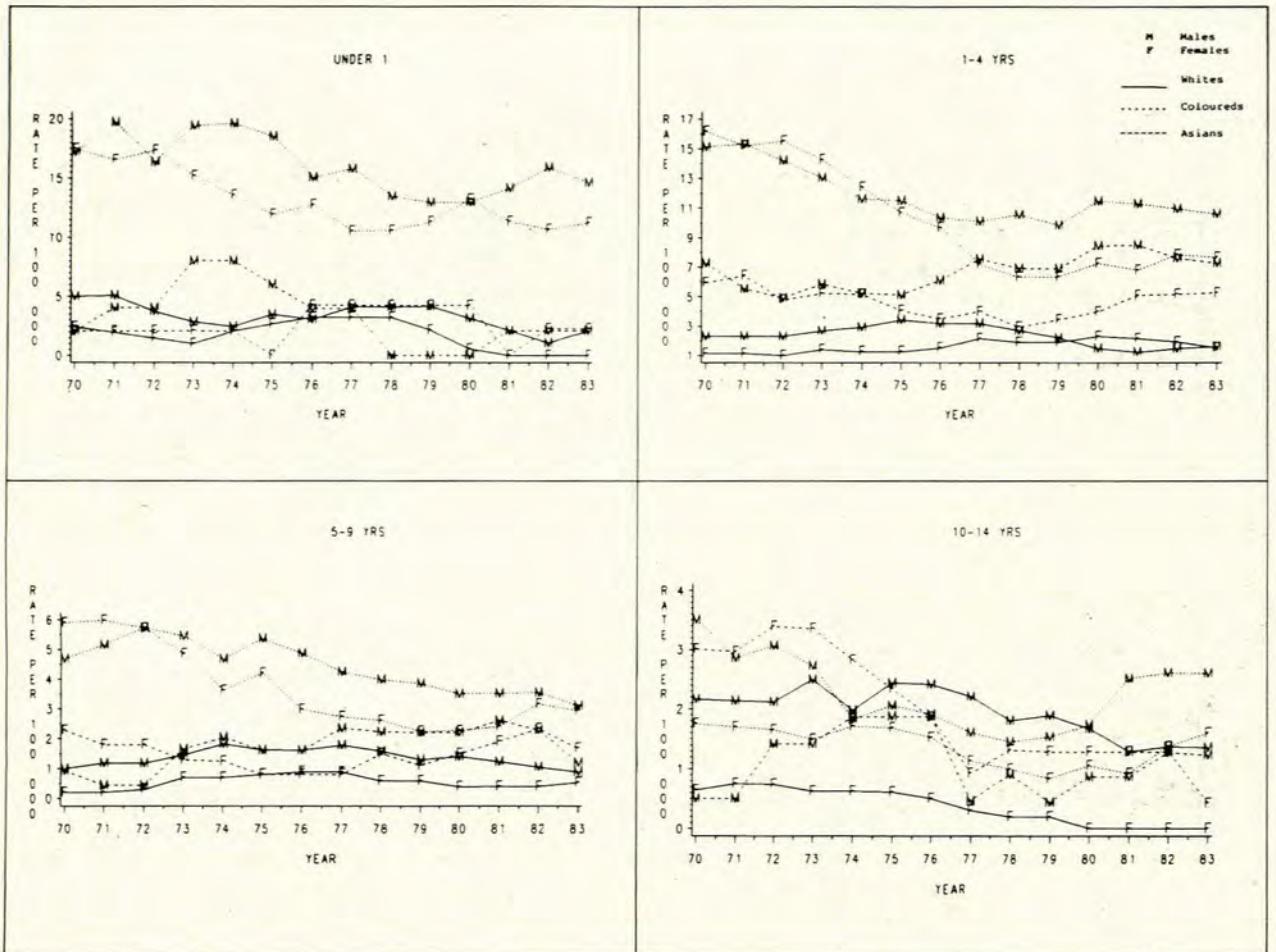


Fig. 5. Age-specific smoothed trend in burn death rates for three population groups by sex (1968 - 1985).

has described a steady increase in homicide rates in the coloured population as a whole before 1977, which he suggested was an 'indicator of stress in a population under various social strains'. Family suicide/murders may at least partially account for the increase in deaths among white children (although the absolute numbers are small).

Overall childhood injury mortality rates have not decreased substantially since 1968 for the three population groups studied. It is cause for concern that these rates are very high in comparison with other countries.<sup>4</sup> The black population (which constitutes 76% of the population of the RSA<sup>11</sup>) is at present undergoing a process of rapid urbanisation<sup>22</sup> and inherent in this process is the risk of exposure to technological hazards under stressful social and economic conditions. It is critical that reliable data for this group are collected. Under present conditions it is probable that injury deaths will increase rapidly

and appropriate intervention strategies should be implemented as a matter of urgency.

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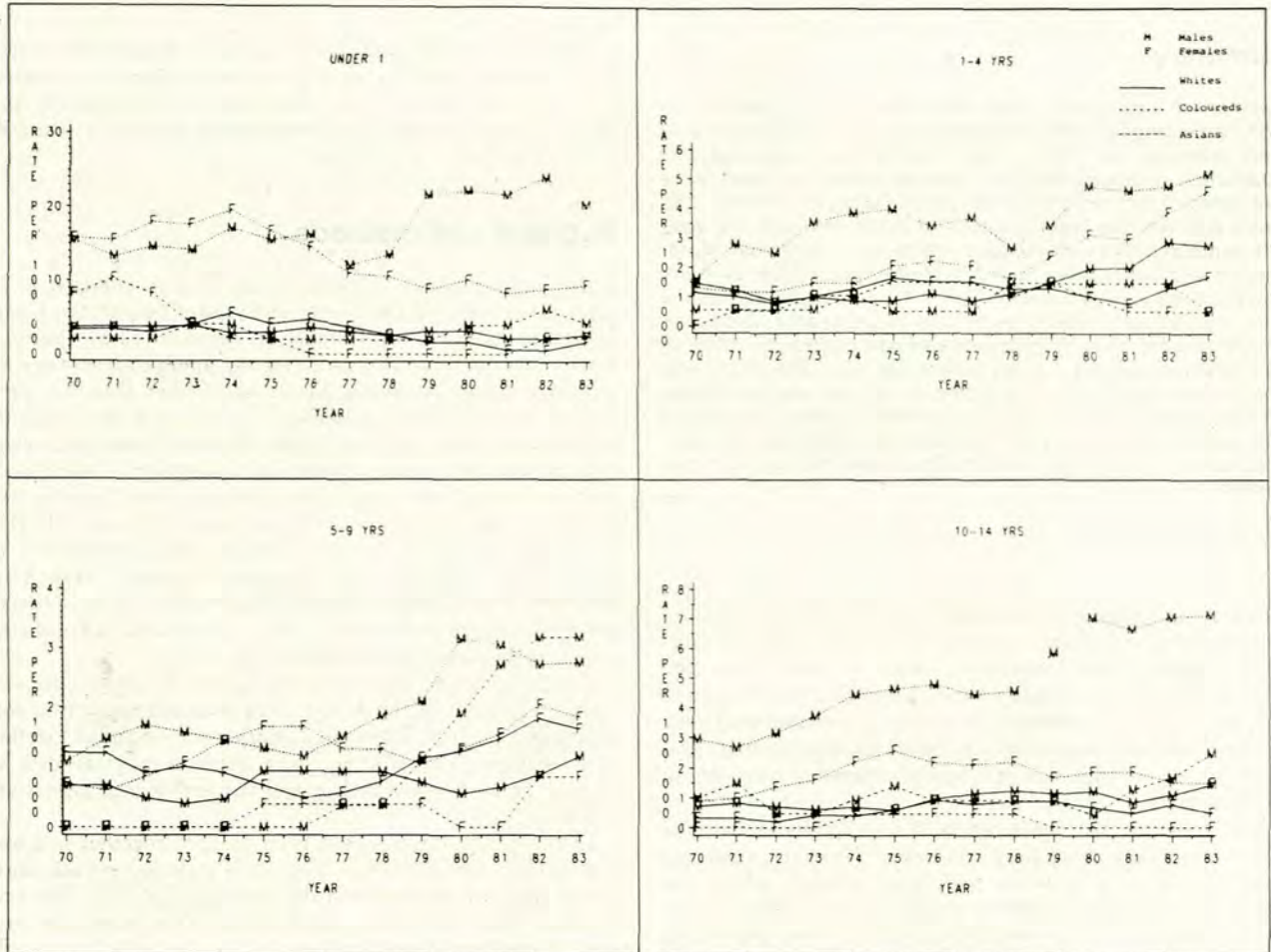


Fig. 6. Age-specific smoothed trend in assault death rates for three population groups by sex (1968 - 1985).

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