bolytic treatment in hospital at a median time of about four hours after start of symptoms, each hour's delay increased the mortality risk by 30 lives per 1000 within five weeks.[10] Thus the additional benefit of starting thrombolysis at the first opportunity in the community may exceed the absolute benefit of giving it later in hospital.

Resuscitation from cardiac arrest in hospital saves about 50 lives per 1000 patients with acute myocardial infarction; 10-30 per 1000 may be saved by prehospital resuscitation.[17] From every 1000 patients with acute myocardial infarction, as many lives may be lost by an hour's delay in giving thrombolytic treatment as would be lost by a similar delay in treating cardiac arrest.

CONCLUSIONS

Between 30 days and 30 months after acute myocardial infarction there was a substantial additional mortality benefit associated with prehospital thrombolysis. The magnitude of the benefit from earlier thrombolysis is such that giving thrombolytic treatment at the first opportunity is a matter of the utmost clinical importance; in terms of potential lives saved it is as urgent as the treatment of cardiac arrest.

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Benefit from earlier thrombolytic therapy is certain, but what is the magnitude of benefit?

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Abundant evidence exists to confirm that fibrinolytic treatment saves lives in patients with acute myocardial infarction and that the earlier the treatment the higher the benefit obtained.[1] There is also evidence to suggest that administration of fibrinolytic treatment, under certain conditions, before hospital admission may lead to further improvement in patients' prognosis with no significant additional risk.[2-4]

John Rawles attempts to quantify the benefit of earlier fibrinolytic treatment using the data from the 311 patients included in the GREAT trial, which evaluated the feasibility, safety, and efficacy of domiciliary fibrinolysis by general practitioners.[5] Such quantification is essential if providers of health care are to make an informed decision on whether to allocate resources to domiciliary fibrinolysis. The magnitude of the benefit is controversial, and the trial that could fully resolve this will never be performed for obvious ethical reasons. This trial would require randomising patients to, say, four or five groups, each group having a predetermined delay from diagnosis of acute myocardial infarction to fibrinolytic treatment. Thus, the only available way to assess the magnitude of benefit of earlier fibrinolytic treatment compared with later treatment is to retrospectively analyse data from fibrinolytic studies, performing indirect comparisons of the randomised groups or using an epidemiological approach.

In the systematic overview by the Fibrinolytic Therapy Trialists' Collaborative Group an unadjusted, indirect comparison showed that a one hour delay in the time to treatment would lead to an increased mortality of 1·6 (SD 0·6) lives per 1000 within 35 days.[1] The underlying assumption in this analysis was that the patients in the different subgroups defined by the time to treatment were comparable, which is, of course, not the case. Dr Rawles presents a classic epidemiological approach with a model using multivariate analysis of the effect of the time gained in the delay to treatment on mortality at 30 days and 30 months. The outcome of the analysis of data combined from both treatment groups is, not surprisingly, in favour of earlier fibrinolytic treatment, and the results are impressive: "In patients presenting two hours after start of symptoms each hour's delay in receiving thrombolysis led to the loss of 21 lives per 1000 within 30 days (95% confidence interval 1 to 94 lives per 1000) (P=0·03) and 69 lives per 1000 within 30 months (16 to 141 lives per 1000) (P=0·0004)."

However, these results, though significant, should be moderated by the considerable width of the 95% confidence intervals (1 to 94 for 30 day mortality and 16 to 141 for 30 month mortality), which make the results equally compatible with more favourable and less favourable results. Although the point estimator at 30 days is much greater than that reported by the Fibrinolytic Therapy Trialists' Collaborative Group

(21 *v* 1·6), the lower limit of the 95% confidence interval (equivalent to the loss of 1 life per 1000) means that the compatibility of the results cannot be excluded. However, in their meta-analysis of all randomised clinical trials of prehospital treatment versus hospital treatment, the European Myocardial Infarction Project Group's point estimate of the benefit of treatment given one hour earlier is similar to that reported by Dr Rawles (17% (95% confidence interval 2 to 29), P=0·03).[2] Furthermore, Dr Rawles' report is the first to show that time to treatment favourably influences the benefit of fibrinolytic treatment on long term mortality, and it would be worth confirming in other studies or in a meta-analysis.

The clinical implication from Dr Rawles' paper remains that patients with suspected acute myocardial infarction should be given fibrinolytic treatment as early as possible, but the precise magnitude of the benefit is still debatable.

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Outlook for survivors of childhood in sub-Saharan Africa: adult mortality in Tanzania

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Abstract

***Objective*—To measure age and sex specific mortality in adults (15-59 years) in one urban and two rural areas of Tanzania.**

***Design*—Reporting of all deaths occurring between 1 June 1992 and 31 May 1995.**

***Setting*—Eight branches in Dar es Salaam (Tanzania's largest city), 59 villages in Morogoro rural district (a poor rural area), and 47 villages in Hai district (a more prosperous rural area).**

***Subjects*—40 304 adults in Dar es Salaam, 69 964 in Hai, 50 465 in Morogoro rural.**

***Main outcome measures*—Mortality and probability of death between 15 and 59 years of age ($_{45}Q_{15}$).**

***Results*—During the three year observation period a total of 4929 deaths were recorded in adults aged 15-59 years in all areas. Crude mortalities ranged from 6·1/1000/year for women in Hai to 15·9/1000/year for men in Morogoro rural. Age specific mortalities were up to 43 times higher than rates in England and Wales. Rates were higher in men at all ages in the two rural areas except in the age group 25 to 29 years in Hai and 20 to 34 years in Morogoro rural. In Dar es Salaam rates in men were higher only in the 40 to 59 year age group. The probability of death before age 60 of a 15 year old man ($_{45}Q_{15}$) was 47% in Dar es Salaam, 37% in Hai, and 58% in Morogoro; for women these figures were 45%, 26%, and 48%, respectively. (The average $_{45}Q_{15}$s for men and women in established market economies are 15% and 7%, respectively.)**

***Conclusion*—Survivors of childhood in Tanzania continue to show high rates of mortality throughout adult life. As the health of adults is essential for the wellbeing of young and old there is an urgent need to develop policies that deal with the causes of adult mortality.**

Introduction

Since the late 1960s most public health programmes in the countries of sub-Saharan Africa have been directed towards reducing maternal, infant, and childhood mortality. Adult mortality has received much less attention, due partly to a widespread impression that mortality in adults is low.[1] Indeed, at a recent World Bank workshop on health care priorities in East Africa it was stated that once a child reaches the age of 2 he or she will "likely live almost as long in an African country as in an industrialised country."[2] Increasing evidence, however, suggests that this may not be true; even after surviving the early years of life people in low income countries continue to face high risks of death throughout their lives.[3]

No country in mainland sub-Saharan Africa, including Tanzania, has a vital registration system that captures a sufficient number of deaths to provide meaningful death rates.[4] Murray and Lopez have recently described probabilities of death specific for age and cause for adults aged 15 to 59 years in sub-Saharan Africa, but these were based solely on model estimates.[5] The adult morbidity and mortality project was established in 1992 to measure rates, causes, and consequences of morbidity and mortality in adults in Tanzania. We describe the mortality and probabilities of death between 1 June 1992 and 31 May 1995 for 160 733 adults living in one urban and two rural areas of Tanzania.

Subjects and methods

SELECTION OF THE STUDY AREAS

In planning the project we chose three contrasting areas for surveillance: eight branches (described below) in Dar es Salaam, 59 villages in Morogoro Rural District, and 47 villages in Hai District (figure 1). To have sufficient power to analyse age, sex, and cause specific mortality we aimed to include about 20 000 households in each area. Dar es Salaam is Tanzania's largest city with a population of 1·5 million. Administratively the city is divided into districts, branches, and 10 cell units. The 10 cell unit is the smallest administrative unit, containing 10 or more households. A branch is roughly equivalent to a large village, containing about 2000 subjects. We chose eight branches in two of the three districts of the city, containing 16 123 households (65 826 people on 30 November 1993). The median household size was three people. The branches were chosen to cover a wide range of socioeconomic conditions.

Hai District lies on the southwestern slopes of