SECTION C

Please summarise the main aims of your original application and to what extent you have been able to achieve them. If you have diverged from the original plan, please explain why this was necessary.

The Trust is interested in investigating the relation between aims specified in the original application and the actual outcome of research. Frequently, important unexpected findings are made; this section seeks to obtain information on this.

The project addressed patterns of mortality in London between 1860 and 1920. It has a bearing on crucial historical issues, including the causes of the 'modern rise of population' and the roles of public health intervention, investment in infrastructure, nutritional status, environment, and the autonomous evolution of disease as explanations of the major changes that took place. The project has made a fundamental contribution towards mapping and explaining the transition from a transitional pattern of urban mortality, in which infectious and water-borne diseases predominated, to the one of today when chronic disease and old age are major causes of death. It rests upon analysis of data concerning causes of death and age at death provided by the reports of the Registrar-General and other sources. The mode of explanation links that analysis to others of trends in wealth, living conditions and expenditure, both for London overall and for the numerous registration districts into which the metropolis was divided. The project set out to explore those relationships more fully in studies of selected districts. It also has a bearing on the political economy of health and the factors that influenced policy and expenditure. A major aim was to place London, which during the period studied was widely admired for its medical and environmental provision, in the context indicated by other investigations of mortality in Britain and elsewhere. The great size and complexity of London have caused those studies so far to focus on much smaller cities. Moreover, the availability of data for each of the London districts offered an opportunity not available elsewhere for interpreting mortality change in relation to contrasting social and environmental conditions.

The fundamental aims of assembling reliable computer datasets, of developing appropriate methodologies, and of gathering the material needed to define local conditions and policies have been fully accomplished. The research strategy on local studies was changed from the original plan: two, instead of three, districts were chosen for intensive study, and to them were added less detailed investigations of four others. In another unanticipated exercise, a dataset was compiled concerning Londoners who died during the cholera epidemic of 1866. Establishing the methodologies and the analysis of the datasets took longer than expected because of the complexity of the sources from which they were derived. Analysis was not completed during 1998-9, as had been hoped, and is still in progress. For this reason, the book planned to present the overall findings of the project is not yet complete, although two-thirds of it is in draft. Methodological and other findings, however, have been published in a series of essays. A longer-term aim, not anticipated at the outset and only to be addressed once the book is complete, is to produce an atlas of mortality in London during the period covered. This would be the most effective means of expressing the full complexity and richness of the material.

Two possible explanations of mortality change have not been explored, although the project's findings will provide a sound basis for future attempts to assess their significance. Autonomous changes in most diseases cannot be directly revealed by the sources and methods used, although in the case of scarlet fever McKeown's hypothesis seems to be confirmed. Anthropometric evidence on changes in nutritional status is inadequate for a study focusing on differences within London.

SECTION E

Please give a description of the research undertaken ***(up to 2 pages).***

A fundamental stage of the research was to construct datasets from the printed reports of the Registrar General. These supply a basis for comparison and explanation of changes in death rates across London. For each of the 25 to 30 registration districts of the metropolis, annual cause- and age-specific mortality rates, and decennial figures on causes of death by age groups can be calculated. The latter allow changes in mortality by district to be analysed with the life table. They can be compared with decadal figures for life expectation at birth and with crude annual death rates, allowing an overall assessment of the contribution of specific causes of death to improvements in life expectancy. In particular, these exercises reveal the importance of childhood diseases and phthisis (tuberculosis) for mortality decline across London as a whole. Additional datasets of a similar character were created for selected periods and districts from the Registrar General's weekly returns, from the annual reports of Medical Officers of Health, from London County Council statistics for notifiable diseases, and from a detailed record (including addresses, occupations, and causes of death) of 13,000 Londoners who died during the cholera epidemic of 1866.

Analysis of this material required elaborate methodological preparation. The number and boundaries of the registration districts changed almost from year to year, and so for the purposes of spatial analysis a geographical information system that took account of those changes was commissioned from the Geography Department of Queen Mary and Westfield College, University of London. The combinations of districts that would allow spatial comparison of units over the period as a whole were established. Likewise, an intensive study was undertaken of the stated causes of death to establish the nosologies employed and identify the most effective bases for comparison over time. After these initial explorations, it was decided to focus disease-specific analysis on four categories: infant mortality and diarrhoea; childhood diseases (scarlet fever, whooping cough, and measles); the adult diseases of phthisis, typhus, typhoid, heart disease and cancer; and a selection of epidemic crises (cholera 1866, smallpox 1860-85, and influenza 1918-19). Studies were undertaken of the epidemiological characteristics of these diseases as they are at present understood. Contemporary perceptions and responses -- by the public, medical professionals, institutions and public health bureaucracies - to epidemic crises were assessed.

For the period up to 1885 a major problem for the analysis of mortality in London is that deaths were counted by the district in which they took place rather than by the normal place of residence of the deceased. Thus, death-rates and causes of death could be severely distorted for districts that contained hospitals or other institutions where people died. After 1885 the Registrar's statistics attributed deaths to place of residence. To overcome this problem an intensive study was undertaken of the catchment areas of hospitals and Poor Law Institutions, using admissions registers and other records. By this means it was possible to calculate measures allowing deaths within districts to be 'redistributed' to district of residence. Apart from providing an essential analytical tool, this exercise yielded many insights into the role of the institutions within the community.

Early in the research an assessment was made of the detailed records available for the individual registration districts. Two contrasting districts, Hackney and Kensington, were chosen for intensive study. Subsequently, four more districts representing a range of social conditions (Greenwich, St George in the East, St Marylebone and St Pancras) were chosen for less detailed investigation. Sources for these studies included the

annual reports of medical officers of health (sometimes including detailed statistics and commentary on local conditions and epidemiological events) and of vestries, parliamentary papers, London Statistics, Charles Booth's investigations, local newspapers, directories, and rating valuations. These studies made an essential contribution towards explaining changes in mortality by throwing light on social and environmental conditions, policy and medical provision. They also serve as a foundation for assessing the political economy of public health in London over the period.

It would be impracticable to assess mortality change and its political context in detail for each registration district. Moreover, the available sources vary in quality. For the purposes of London-wide explanation and comparison between districts, however, consistent sets of data on wealth and on investment in public health and infrastructure in 19 sanitary districts have been compiled (not all sets of data are available for the entire period). The wealth of each district is measured by the incidence of domestic servants. Investment is measured by annual expenditure and outstanding loans per head at constant prices on street maintenance and construction, refuse removal, sewers and drains, and public baths and washhouses; by annual payments per head to the Metropolitan Board of Works and the Metropolitan Asylums Board; and by population per sanitary inspector and health visitor. Other statistics were collected but are less amenable to incorporation in explanatory models. Because of London's tangled administrative structures, the collecting and ordering of this material into usable form was a major research effort.

Potential explanations of mortality change include environmental and domestic conditions. Comparison on a district by district basis by all appropriate measures, including population and housing densities, would be excessively complicated and would be problematic with some categories of mortality data. Moreover, many districts contained neighbourhoods of extreme contrast in wealth, housing and the extent of open land, for which it is impossible to disaggregate the corresponding mortality statistics. The solution adopted has been to categorise each district by decade according to annual rates of growth in population and numbers of inhabited houses, and to relate population density at the end of the decade to the rate of housing growth. The latter exercise results in distinctive groupings of districts according to shared characteristics that indicate their status as 'declining city core', 'stable city core', 'established suburb' and 'emerging suburb'. District patterns of mortality change can thus be compared to the trajectory of the district within this grid, which provides a more useful framework for overall comparison than the rigid geographical sectors (west, north, east, south, and central) employed by the Registrar General.

At present the analysis of the mortality data is in progress, relating it to these broad characterisations of all metropolitan districts and to the more detailed information available on the areas chosen for intensive study. This exercise represents the core explanatory element in the project, on which chapters for the intended book have only been partially drafted. Nevertheless, it seems that late nineteenth-century London was a significantly healthier place than most European capitals and British provincial cities, and that investment in the poorer metropolitan districts, as well as falling densities in central areas, contributed to a diminution of mortality differentials across the metropolis. Drafts have been completed for those parts of the book which deal with methodology, the historiographical background, the administrative structures underlying investment and the production of statistics, broad trends in the epidemiology of London before 1860 and throughout the study period, and the framework for understanding the political economy of public health. The Cambridge University Press has expressed an interest in publishing the work.