The London School of Economics and Political Science

The Population Trajectories of Bangladesh and West Bengal During the Twentieth Century: A Comparative Study

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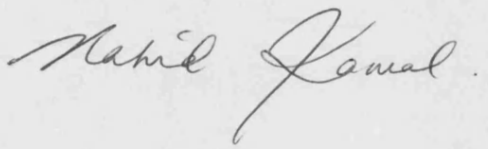

Abstract

This study traces the demographic evolution in present-day Bangladesh and West Bengal, which together comprised the former province of Bengal in British India. It presents time-trend analysis of vital rates and their proximate as well as indirect determinants using registration, census and survey data for pre and post-Partition Bengal. Evidence suggests that although the two wings were historically under the same provincial government, there were significant differences in their demographic profiles, arising from differences in occupational structure, ongoing ecological changes, religion, and in the extent of development efforts. These long-term historical disparities set the course of subsequent demography and explain the contemporary fertility and mortality differentials between Bangladesh and West Bengal. Statistical analysis of survey data suggests that a higher age at marriage in West Bengal coupled with greater levels of healthcare utilization in the state have contributed to a more favourable health situation relative to Bangladesh. The culture in West Bengal appears to be more conducive to utilization of healthcare which has been shaped by a long history of exposure to western influences and to social movements, among other considerations. It has also facilitated the process of fertility transition in West Bengal which plausibly initiated during the late 1950s. For Bangladesh, the study maintains that the synergy created by a host of factors contributed to the remarkably rapid decline in fertility during the 1980s. It is pointed out that the plateauing in the fertility rate in the country since the 1990s is testament to the fact that a strong family planning programme alone cannot complete a demographic transition. This study concludes that the culmination of ongoing socio-economic processes over the course of the twentieth century has provided the backdrop for the demographic transition in present-day Bangladesh and West Bengal.

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Abbreviations

ADP	Annual Development Programme
ANC	Ante-natal care
ANM	Auxiliary Nurse Midwife
ASFR	Age Specific Fertility Rates
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BRAC	Bangladesh Rural Advancement Committee
CBR	Crude Birth Rate
CDR	Crude Death Rate
CPI-M	Communist Party of India (Marxist)
CPR	Contraceptive Prevalence Rate
CWR	Child Woman Ratio
DPD	Development and Planning Department (West Bengal)
EB	East Bengal
EPI	Expanded Programme on Immunization
ECPR	Effective Couple Protection Rate
FPP	Family Planning Programme
FWA	Family Welfare Assistant
FWP	Family Welfare Programme
FYP	Five Year Plan
GFR	General Fertility Rate
GNP	Gross National Product
HCR	Head Count Ratio
HSPC	Health and Population Sector Programme
ICDDRB	International Centre for Diarrhoeal Diseases Research, Bangladesh
IMR	Infant Mortality Rate
HDI	Human Development Index
MMR	Maternal Mortality Ratio
MoHFW	Ministry of Health and Family Welfare
NFHS	National Family and Health Survey
NGO	Non-government Sector

NIS	National Impact Survey
NSS	National Sample Survey
ORG	Operations Research Group
ORS	Oral Rehydration Solution
PHC	Primary Health Centre/Primary Health Care
RH	Reproductive Health
SDP	State Domestic Product
SRS	Sample Registration System
SEI	Socio-economic index
SC	Schedule Caste
ST	Schedule Tribe
SES	Socio-economic status
TB	Tuberculosis
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate
THC	*Thana* Health Complex
TT	Tetanus Toxoid
VR	Vital Registration
WB	West Bengal

Table of Contents

List of tables

List of Figures

1 Chapter 1: INTRODUCTION AND HISTORICAL BACKGROUND

This dissertation traces the demographic evolution of present-day Bangladesh and West Bengal[1] which together comprised the former province of Bengal in British India. It aims to shed light on why and how the demographic profiles and their determinants in Bangladesh and West Bengal changed over the course of the twentieth century. It brings together relevant demographic material, including censuses, survey data and research studies, in order to study demographic trends and patterns over time. The dissertation seeks to examine how the present population characteristics have been shaped by past changes. In addition, it attempts to offer a new perspective on demographic transition in the two wings of Bengal.

Demographic transition refers to the change in population over time as pre-modern societies transform to industrial ones. Population change *per se* is a function of births and deaths and to some extent, of migration. In pre-modern societies, the rates of births and deaths are high and the net population growth is negligible. With industrialisation comes improvements in mortality resulting in a high rate of population growth. Further economic progress is accompanied by a fall in the birth rate. The fertility level then continues falling until the replacement level of 2.1 is reached which is a situation when children are just about replacing their parents and there is no net growth in population. In the final stage of the demographic transition, as is the case in post industrial societies like western Europe, both birth and death rates are once again low and the net difference between births and deaths, is minimal or none. This theory assumes that industrialisation and economic growth are pre-requisites for the demographic transition, in particular for the transition to low levels of fertility. It has been based on the experience of western Europe undergoing the transition during the nineteenth century. This theory is addressed in a more formal manner in Chapter 7. The study of the population trajectories and their determinants in Bangladesh and West Bengal reveal the unique and different circumstances under which the demographic transition took place in Bengal.

[1] West Bengal became a state of the Union of India after Partition of the Indian sub-continent in 1947.

The process of demographic transition may be described as a lagged change in fertility that comes about as a response to a preceding sustained change in mortality. It is a drawn-out process where the gap between fertility and mortality decline can range anywhere between five and forty-five years depending on whether, using Reher's classification, the population is a 'forerunner' or a 'latecomer' in the transition (Reher 2004:23). It is a lengthy process that is spread over a long period of time. Thus it is impossible to ascertain the pace and timing of the transition without considering long term trends in fertility and mortality. Given the paucity of reliable demographic data on Bangladesh, existing literature on the transition in the country has not taken historical trends into account. This study attempts to explain the transition in Bangladesh from a historical as well as a regional perspective. It brings together different sources of data in order to construct a time series of annual rates of vital rates for the entire twentieth century. This time series is integral in comparing the course of population trends in the two Bengals and especially in ascertaining the timing of the onset of the transition in fertility and mortality.

Variation in language, culture, religion and political history have been important conditioning factors in some of the historical as well as the more contemporary populations undergoing the transition. In particular, the "diffusion hypothesis" involves a common language and/or culture facilitating the adoption of new fertility regulation behaviour of the 'leaders' by the 'followers'. It has been postulated that the rapid fertility decline in Bangladesh observed during the 1980s and 1990s was a spill-over or lagged effect of the fertility transition in neighbouring West Bengal, with which the country has a common language and political history (Basu and Amin, 2000). This hypothesis asserts that West Bengal was the 'leader' and Bangladesh the 'follower' where a common language and history acted as the conditioning factor for the transition process. It is worthwhile to examine whether this diffusion hypothesis is the only explanation for fertility decline in Bangladesh. It may well be the case that the conditioning factors for the transition in the two Bengals are quite different despite the similarities in language, elements in culture and political history.

The experience of contemporary societies suggests that the determining factors for the demographic transition are both contextual and complex. Space and time have

played a central role in explaining the transition, the more so for contemporary cases, and yet, this concept has been largely marginalised in the existing literature on Bangladesh and West Bengal. The socio-political histories of the two wings of Bengal are crucial for an understanding of their demographic transitions. None of the existing studies has sufficiently recognized the importance of space and time in explaining how political divides can become demographic divides. Thus studies like Basu and Amin (2000) has attempted to offer explanations in terms of similarities between the two wings while largely discounting the important differences. Ramesh's work on Punjab suggests that there are more differences than similarities between the fertility levels in Pakistani Punjab and Indian Punjab, arising from differences in religion, government and levels of socio-economic development (Ramesh, 2001). Similarly, my own research in this thesis suggests that there are significant differences in the demographic transitions in Bangladesh and West Bengal which can be related to socio-political considerations, among other factors.

Even in historical transitions, factors like culture, language, government, religion and ethnicity had played a pivotal role. For example in nineteenth century Belgium, the decline in fertility came about earlier among the French speakers than among the Dutch speakers (Lesthaeghe and Surkyn, 1988). Again political and cultural considerations have been conditioning factors for the transition among the Malay population in Southeast Asia (Jones, 1990). Also, Muslims have generally been observed to be laggers in the transition, in particular in relation to fertility control. The transition is also known to have occurred earlier among the former British colonies than among French and Spanish ones (Kirk, 1996). In India, the earliest decline in fertility was recorded in the Dravidian south and in the coastal regions, before it gradually diffused inland (Rajan and Guilmoto, 2001).

The tempo of the transition has been much faster in contemporary societies – both with respect to mortality decline and with respect to fertility decline. Also, the lag between fertility decline and mortality decline has been longer, and this fact has contributed to the greater population growth associated with contemporary (as opposed to historical) transitions. Among the 'trailers' and 'latecomers' in the transition, which are the populations where the onset in fertility decline began after 1950, the pace has been much faster than that among the forerunners (Reher

2004:23). Bangladesh stands out in that the pace of fertility decline has been unprecedented. The fertility rate declined from seven children to a little over three in the country in the span of roughly fifteen years. Thus it is useful to re-examine the factors explaining this phenomenon.

The existing literature on demographic transition in Bangladesh has taken a rather short-sighted and ahistorical view, looking only at immediate causes. For example, some scholars have attributed the fertility decline to the family planning programme (Cleland at al, 1994), some to structural changes in the economy (Adnan,1993; Kabeer, 2001) while others to the diffusion hypothesis (Basu and Amin, 2000). These studies have sought explanations pertaining largely to the post-1971 period. They have identified isolated factors as explanations for the transition as opposed to taking an overall view of changes over time. In addition, no significant attempt has been made to date to ascertain the timing of the onset of decline in rates of births and deaths when demographic transition is a long drawn-out process. My research seeks to make its contribution to the literature in two main ways: (i) for the first time taking a long-term perspective in order to highlight the origin of events as well as the pace of their progress over time, and (ii) better addressing the importance of concepts of space and time within explanations for the transitions in Bangladesh and West Bengal.

My conjecture is that a comparison of West Bengal and Bangladesh should be complemented with historical demographic analysis, in order to fully understand the more recent demography of the region. The historical aspect of the study is designed to understand the origin of events while the comparison with West Bengal serves to validate findings. Demographic transition came about under unique circumstances in the two wings of Bengal, thus discrediting the framing of the classical theory of demographic transition. This study attempts to add to our limited understanding of the transition in the region by addressing the following specific research questions:

- ***What has been the course of population trends in Bangladesh and West Bengal and why?***
- ***To what extent has the demographic transition been similar in Bangladesh and West Bengal?***

There are two basic aspects to the dissertation - namely the comparison of two regions, Bangladesh and West Bengal, and analysis of their demographic trends over time. The study concludes that although the two wings of the province were historically under the same provincial government, there have been significant differences in their demographic rates, arising from differences in occupational structure, ecology, religion, and the extent of development efforts. These long-term historical disparities set the course of the subsequent demography and explain the differences in the timing and pace of the demographic transitions in Bangladesh and West Bengal.

1.1 Outline of existing comparative work on Bengal's demography

This study complements existing work available on Bangladesh and West Bengal by providing a much relevant but overlooked historical background. In addition, it explores if the present demographic situation in Bengal has historical roots.

Few studies have addressed the historical demography of Bengal in any detail. Some isolated attempts have been made focusing on specific issues - for example, the Bengal famine of 1943-44 or the causes of population change over a specific period of time. Among the studies, which have used a similar territorial approach to that used here are those of Chowdhury (1989) and Dyson (2001). Chowdhury analyzed data for undivided Bengal for the period 1921 to 1941 in terms of the east, west, north and central zones in order to explain the fast rate of population growth during the 1930s. He addressed primarily mortality in Bengal covering the period between 1921 and 1941. His work gives useful insights into regional variation in mortality in the province. He concluded that the areas of the province that comprise present-day West Bengal benefited significantly more during the 1920s and 1930s in relation to East Bengal. He ascribed the unprecedented rate of growth in population in parts of the province during the 1930s to improvements in malaria mortality.

Dyson contended that although the crude rate of birth (CBR) is influenced by changes in the population age composition and alteration in marriage patterns and levels of marital fertility, it directly influences the rate of population growth (Dyson, 2001:53). He brought together various sources of data for the period between 1920s and the 1990s in order to ascertain the timing of the initial decline in the birth rate in

West Bengal and Bangladesh. He concluded that the timing of the initial onset of birth rate decline was the same in the two Bengals, i.e., during the early 1960s or even the late 1950s.

Ramesh (2001) set out to explore if language and ethnicity were stronger determinants of fertility and contraceptive behaviour than religion or geographical location. He analysed survey data pertaining to the early 1990s for Indian and Pakistani Punjab and for West Bengal and Bangladesh. His conclusion was that the fertility behaviour was different among the different ethnic groups, that is Indian Punjab and West Bengal had lower fertility and use of family planning than Pakistani Punjab and Bangladesh. He accredited the observed fertility differentials between the two Bengals to differences in programmatic inputs and in levels of socio-economic development.

More recent comparison of East and West Bengal includes that of Basu and Amin (2000). They propose that a common colonial history, and a strong sense of linguistic identity, have facilitated the diffusion of modern ideas, including those relating to family planning, between West Bengal and Bangladesh. I have assessed the validity of this theory in detail in Chapters 7 and 8.

My approach differs from previous work in that, I have covered various aspects of fertility, mortality and migration together, and for the entire twentieth century. I have studied pre-Partition Bengal in detail, thus enabling a comparison of pre and post-1947 demography. Time trend analysis, not just of demographic rates but also of their determinants, is an integral component of this approach. I have constructed a time series of annual rates of births and deaths for each of the two Bengals for the entire twentieth century in order to ascertain the timing of the transition in fertility and mortality. In addition I have attempted to explain the reasons behind the demographic transition in Bengal in light of the time series. Finally I have complemented historical demography with statistical analysis of comparable survey data available for the two wings of Bengal for the last two decades.

This dissertation, however, only covers developments that were perceived to be relevant to an understanding of the demographic transition. And given that the

reference period is an entire century, it was only possible to give a bird's eye view rather than an in-depth analysis of some of the events covered. It may be argued that the comparison of Bangladesh and West Bengal is not appropriate given that one is an independent country and the other a state of the Union of India. Another limitation of the study is that some of the findings and arguments are rather speculative. This is partly because of non-availability of relevant data. The change in population over time and between two regions with different make-up in levels of development, religion, government, etc, is a complex process and it will take more than one dissertation to furnish with all the answers.

1.2 The importance of studying Bengal

Bengal, comprising present-day Bangladesh and West Bengal, was chosen as the area for study because it provides fertile ground for demographic research - given our less than satisfactory understanding of the region's population dynamics. West Bengal and Bangladesh, each on their own, merit detailed study given the unique circumstances under which the demographic transition took place during the last three decades of the twentieth century.

The two Bengals share a common language, political history and elements of culture. They used to be one administrative and political entity known as the province of Bengal until the Partition of the Indian sub-continent in 1947. With a common language, culture and political history, the comparison between the two populations serves to throw light on the validity of the diffusion hypothesis in explaining the demographic transition (Basu and Amin, 2000). This hypothesis postulates that West Bengal was the 'leader' and Bangladesh the 'follower' where a common language and history acted as the conditioning factor for the transition process. Today, both these regions remain economically disadvantaged, faring relatively low in development indicators like female status, level of education, life expectancy, and infant mortality. Yet, the demographic transition is most certainly underway in both regions, refuting the classical centrality of the transition theory - which asserts that economic development and modernization are pre-requisites for the initiation of the transition from high to low fertility. This phenomenon in Bengal perplexed demographers, the more so in the case of Bangladesh where the transition was

initiated amidst higher levels of mortality and lower levels of socio-economic progress than in West Bengal. Thus Bangladesh has been the subject of much scholarly debate. Explanations for the country's fertility decline have ranged from there being a successful family planning programme, to a poverty-induced decline, to the diffusion hypothesis. In contrast, the experience of West Bengal has gone relatively unnoticed - probably because it has not been an extreme case in terms of the Indian demographic spectrum. Current mortality and fertility rates in West Bengal are comparable to those in south Indian states, without having quite attained their level of social development.

In the Indian context, West Bengal today contains less than three percent of the land area of the country and roughly eight percent of the total Indian population (Census, 2001). The state is the mostly densely populated in India and borders with Bangladesh in the east and Bihar in the west. Despite widespread income poverty, the state has made considerable improvements in health and education relative to other Indian states, with the same level of per capita income. With a current total fertility rate of 2.3, the state has almost reached replacement fertility. Another unique feature of the state is the high proportion of non-Hindu population. Muslims constitute over 25 percent of the total population in West Bengal compared with an all-India average of roughly thirteen percent. Minority religious groups, Schedule Tribes and Schedule Castes together comprise almost half of the total population of West Bengal (Maharatna, 2003).

Bangladesh is a relatively new nation having gained independence from Pakistan in 1971. The 37 or so year-old history of the country has been marked by one misfortune after another. The country has a unique geographical location, being surrounded by India on three sides and Bay of Bengal in the south. There has been a succession of war, famines, political problems, not to mention natural disasters like floods and cyclones. The country continues to be the most densely populated and among the poorest countries in the world. With a per capita income of below $200 during the 1970s, the average family used to have around 6 children. The proposition that high fertility leads to high levels of poverty seemed to apply aptly to Bangladesh (Sinding, Kelly and Birdsall, 2001).

Poverty has been defined as a state of resource deprivation (Anand and Morduch 1999) when one's command over accessing the basic human needs like food, shelter, health and education is severely compromised. The proposition that high fertility and consequently high population growth goes hand in hand with high poverty levels has been rekindled in recent years (Merrick 2002). The causal relationship between poverty and high fertility is well documented (Livi-Bacci and Santis, 1998) where poverty can be the cause as well as the consequence of high fertility. On one hand high fertility perpetuates poverty - a large family size translates into lower levels of per capita income that is available for consumption, and for investment in human capital (health and education). On the other hand, couples often cope with poverty by having large families where children contribute to family income, or serve as security for parents during old age (Anand and Morduch 1999). High levels of infant mortality, a culturally determined preference for sons, and limited knowledge and access to family planning services, are among other factors responsible for high fertility among the poor.

Declining fertility is known to be associated with improvements in poverty (Sinding, Kelley and Birdsall, 2001). In the case of India, declining fertility is believed to have accounted for a third of the poverty reduction between 1987/88 and 1993/94 (Gupta and Dubey, 2003). Kerala experienced the greatest improvements in poverty among the Indian states between 1960 and 2000, where the linear annual rate of change in percentage points was –1.45 compared with the national average of -0.65. The corresponding figure for West Bengal was –0.87 (Datt and Ravallion 2002). Kerala also happens to be the state to experience the most rapid decline in fertility and consequently in mortality since the late 1960s (Zachariah and Rajan, 1997). In Bangladesh high fertility has been the cause as well as the consequence of high levels of poverty at different times. This study addresses the causes and the pathways for this phenomenon.

From an historical perspective, Bengal was of strategic importance in the Indian sub-continent. The province had two important features, namely easy access to the sea, thus supporting trade, and fertile lands where agriculture flourished. The Gangetic plain has been the Indian sub-continent's most densely populated part for about the

last 2500 years (Dyson, 2004:16).[2] Chand (1939) estimated the provincial growth in population density in India between 1881 and 1931. He concluded that Bengal was the most densely populated province in the country, and was becoming progressively more dense since 1881. He attributed the higher than average density in Bengal to the exceptionally high density of the eastern districts of the province – Mymensingh, in particular. In 1901, the population density of Bengal stood at over 200 persons per square kilometre compared with the Indian average of just 77. Many a ruler of India, including the *Moghals* and the British, ruled the country at times from Bengal. And the apparent differences in levels of socio-economic development between contemporary Bangladesh and West Bengal have been shaped by events that took place in the past. Another unique feature of Bengal is the confluence of three main religions, Buddhism, Hinduism and Islam, within the province. The influence of these religions may help to explain why the Muslims of Bangladesh are different from those of the Arab countries or Pakistan, and why the class structure is not as rigid in West Bengal as it is in other states of India (see Mallick, 1993).

Beyond demography, West Bengal has been a popular subject of academic study because of its importance in the context of culture, education, religious reform, politics and the growth of trade union movements (Ried, 1966; Sengupta 2002). Much has been written on the general state and people of Bengal during British rule when 'of all cities of the British empire, only London was greater than Calcutta at the opening of the 20th century. With one million people, it towered above the surrounding villages and puny district towns' (Bloomfield 1968:1). It was Job Charnock, the captain of a band of British traders, who is said to have founded the 'city of palaces,' Calcutta, in 1690 from what had previously been a 'flat rice swamp' (Chaudhuri1971:1).[3]

1.2.1 The significance of studying the twentieth century

My period of reference is the twentieth century. This is partly because of the relatively good data that are available for that period. 'It is always easier to search

[2] The Indian sub-continent is defined here as most of present-day India, Pakistan, Bangladesh and Sri Lanka.
[3] On the 16th of May 2003, the Kolkata High Court ruled Job Charnok out as the founder. However, an alternative founder of the city of Kolkata had not been proposed at the time of writing.

where the light is brighter' (Nicholas 1981:34). The other reason for choosing the last century is that some of the most significant events shaping the present demography of Bangladesh and West Bengal occurred then. Among the major crises that affected Bengal in the last hundred years are the 1918-1919 influenza pandemic that reportedly killed eighteen million people in India (Mills, 1989); the 1943-44 Bengal famine where there were between two and three million excess deaths (Sen, 1981; Dyson and Maharatna, 1991); the Partition of 1947, which entailed perhaps the largest migrations in history (Davis, 1951); and the 1973-74 famine in Bangladesh following independence from Pakistan in 1971. The repercussions that each of these crisis had on the two wings of the province are discussed Chapter 3.

1.3 History of Bengal

Some background on various aspects of population history is important for an understanding of significant concepts like nuptiality patterns, or socio-economic development in the two Bengals, which in turn have influenced the contemporary demography of both Bangladesh and West Bengal.

1.3.1 Religious history

The religious, geographical, political, and socio-economic history of Bengal makes it unique in the context of the Indian sub-continent. It was these features that made Bengal the most advanced province of British-governed India, and they explain why most of the rulers of India, including the Senas, Moguls and British, made Bengal their capital. In the words of a historian,

> 'Nor was it language and political independence alone that differentiated the region of Bengal from the rest of north India in this era, for even the form of Islam predominantly practiced there was peculiarly attuned to its cultural and ancient heritage. Sufism, Islam's mystic thread, which evolved primarily as a legacy of Persian influence upon Islamic orthodoxy, struck a responsive chord in the mass of Bengal's population especially among the lowest class of Hindu outcastes and former Buddhists, who were left without a priesthood to turn to for spiritual guidance after 1202, it appealed as well to many Muslims, for whom it revitalized the message of Islam.'
>
> Wolpert (2004:117)

Table 1-1: Timeline of Bengal's Historical Landmarks

Pre Eighth Century	Trantic age
Buddhist era	
750-1161	Buddhist Pala kings in Bengal
Hindu era	
1095-1260	Hindu Sena kings
Muslim era	
1576	Bengal was brought under *Moghal* rule
1704	The *Moghal* capital was shifted from Dacca to Murshidabad
1716	*Farman*[4] was granted, absolving British traders from payment of inland taxes in Bengal, a measure designed to give the British an edge over other European traders
British era	
1757	Battle of Plassey following which the Company gained a foothold in Bengal
1765	British gained *Diwani** of Bengal which gave them rights to collect revenue in Bengal , Bihar, and Orissa
1769-70	Famine in Bengal
1793	Permanent Settlement Act passed
1828	*Brahmo Samaj** established in Bengal
1829	Act passed prohibiting the practice of *Sati**
1835	English education and other reform in Bengal
1836	Assam was added to Bengal Presidency
1850s onwards	Rapid industrialization in Bengal; growth in jute, cotton and coal production
1857	The Sepoy Mutiny after which the rule of India was put under the British Crown
1881	Railway construction completed in Bengal
Late 1800s	Malaria insurgence in Bengal
1872	The *Brahmo Marriage* Act passed lifting ban on widow remarriage
1874	Assam is separated from Bengal
1885	Bengal Tenancy Act
1900	Famine in Bengal, Bihar and Orissa
1905	First Partition of Bengal; spearheading the 'Quit India' Movement
1911	Annulment of Bengal Partition
1912	Imperial capital shifted from Calcutta to Delhi
WWI (1914-19)	Fall in jute prices affects the Bengal economy
1917	Influence of Bolshevism in Bengal intelligentsia
1918-19	Influenza epidemic
1919	1919 Act of India – greater Indian representation in administration
1920s onward	Non-cooperation movement against colonial rulers; civil disobedience, and Quit India movement led by Gandhi
1939-early 1940s	Second World War affected India
1943-44	The Bengal Famine
1947	Partition of India and independence from British rule

*Note:** Explained in later discussions
Source: Compiled by author using various sources, including Sengupta (2001)

[4] Loosely translated to 'wish' or 'prayer' in Urdu.

Bengal has been home to three major religions of the world, namely, Buddhism, Hinduism and Islam. The historical influence of Buddhism, Hinduism and Islam explains some of the observed similarities in culture and tradition in Muslim dominated Bangladesh and Hindu majority West Bengal. The history of Bengal was marked by 'cultural and physical invasions' (Roy 1981:28). Before the spread of Buddhism in the region, the indigenous population was known to practice a distinct socio-religious tradition called *Tranticism* whose central ideology is the human body. Thus the kind of Buddhism practised there under the *Pala* kings for about four centuries was not in its pure form, but *Trantric* Buddhism. During the Buddhist era, the universality of marriage plausibly was not that prevalent in Bengal given that Buddhism advocated monasticism and epitomizes devotion to the Buddha (Avasthi 1979). Following the Buddhist era, Bengal was subjected to two centuries of Hindu rule under the *Sena* dynasty. The *Sena* kings preached *Brahmanic* Hinduism[5] emphasizing austerity in moral conduct and strict social laws, and had little tolerance for followers of Buddhism. As a result, there was substantial emigration of the Buddhist population from Bengal to Burma and Thailand (Elahi 1997).

Various practices of female oppression - namely early age at marriage, a large age gap between husband and wife, female infanticide and *sati (*self-immolation of a Hindu widow on the funeral pyre of her deceased husband) were plausibly introduced in India during the *Brahmanic* age (Avasthi 1979) which intensified during the Muslim rule. [6] The roots of female subordination in *Brahmanism* may be traced to *Vedic*[7] scriptures formulated by the *Aryan* conquerors and later re-enforced by Manu, the much revered Hindu reformist (Sen, 2005). Incidentally, the strict traditions of *Brahmanism*, which included the practice of child marriage, were not dominant in the eastern-most districts of Bengal, namely, Chittagong, Sylhet and

[5] Unlike Buddhism, Christianity and Islam, Hinduism was not established by an individual but evolved over time. *Brahmanism* was the first phase of Hinduism initiated by nomadic hunter-gatherer Aryan tribes to maintain their supremacy over the local Dravidian population of the Indian sub-continent. The two main tenets of *Brahmanism* are the caste system and belief in the sacred *Vedic* scriptures. In order to maintain their elite identity, the Aryans called themselves the *Brahmin* caste (the highest class comprising of priests and intellectuals) and categorizing the subordinate indigenous population into three lower castes, namely, *Khastriyas, Vaishyas* and *Sudras*, based mainly on occupation. See, for example, Sen (2005) and Vivekananda (1897).

[6] The practices of female oppression like *Sati* and female infanticide were most extreme among the Rajputs of northern India who would die rather than be captured by Muslims (see for example, Agarwal 1999). According to Avasthi (1979), Muslim rule and the practice of *Sati* were established around the same time in India.

[7] The *Vedas* were the primary and sacred texts of the Aryans.

eastern Mymensingh (Roy 1981), the reason being that eastern Bengal was inaccessible terrain with heavy forests, and was without a direct river connection to northern India until about the sixteenth century (Eaton 2001:32). In Sylhet, the Hindu king was overthrown by Muslim troops from Yemen led by *Shah Jalal* during the mid fourteenth century (Gardner, 1990; Sengupta, 2001). The district of Chittagong was under *Arrakanese* rule (i.e. part of Burma) during the second half of the sixteenth century (Subramanyam, 1987). The insulation of Syhlet and Chittagong against *Brahmanic* influences like early marriage may at least partly explain why the average age at marriage has consistently been higher in these divisions of Bangladesh in relation to the average age for the rest of the country.[8]

Muslim conquest of Bengal took place during the thirteenth century, but the province had been subjected to frequent Muslim invasions since the eighth century (Elahi 1997; Ahmed 2001). The practice of *purdah* (female seclusion) is believed to have been initiated during the Muslim invasions when Hindu women would be kept in seclusion, in fear of falling prey to the lustful eyes of foreign invaders (Sur 1963).[9] Forcible abduction of Hindu girls continued even after Muslim conquest of India heralding the age of practices of extreme female oppression like *sati*. The economic impoverishment of the Hindu population under Muslim rule was a factor contributing to the tradition of early marriage for girls (Avasthi 1979) when daughters were perceived to be an economic burden.

The native Buddhist and low-caste Hindus of Bengal were possibly attracted by the tenet of Islam promoting equality, while others were coerced into adopting the faith. Conversions that took place were often motivated by privileges like tax exemptions reserved only for Muslims, or to avoid persecution. Whatever the reason for conversion, there is general agreement on the fact that there were mass conversions, both voluntary and coercive, in Bengal from both Buddhism and Hinduism to Islam during the Muslim reign, and especially between the thirteenth and fifteenth centuries (Ahmed 1981, Murshid 1995). The *Moghal* emperors, with the exception

[8] According to BDHS 2004, the median age at first marriage among women aged 20-49 was 15.9 in Sylhet and 15.6 in Chittagong compared with 14.8 for the whole country. Even Dhaka division recorded a lower median age of 14.9 years.

[9] The purported reason for the Muslim invaders' preference for unmarried over married women is that unmarried girls were assumed to be virgins and therefore not polluted by Hindu men.

of Aurangzeb, were generally known to be more tolerant of other religions than their Muslim predecessors (Eaton 2001).

There were a number of reasons behind the Hindu conversion to Muslims. While some Hindu conversions were forcible under Muslim rulers, many lower caste Hindus were attracted by a faith (Islam) that treated everyone equally (Panandikar 1926). Some may have also converted in order to avail themselves of economic benefits offered by Muslim rulers. The majority of the conversions date from the time of the Muslim ruler Jalaluddin (1414-1430) who oppressed the Hindus of his day. The *Moghal* emperors were known to be more secular.

The western half of Bengal (i.e. present-day West Bengal) was possibly developed earlier than the eastern half, (i.e. present-day Bangladesh), as there is no mention of East Bengal in the sacred Hindu scriptures like the Ramayana and the Mahabharata (Obaidullah 1966:39). Eaton's (2001) postulation is convincing that East Bengal had been heavily forested and only became heavily inhabited from the sixteenth century onwards when the Muslim *Moghal* rulers granted tax-free tenures of forest-land to men to clear and cultivate, which may have acted as an incentive for non-Muslims to convert to Islam. Eaton also points out that the merging of the two rivers the *Ganges* and the *Brahmaputra*, which is responsible for making the deltaic plain fertile, occurred during the *Moghal* reign. Subsequently the capital of the *Moghal* empire was shifted to Dhaka (formerly known as Dacca) during the early seventeenth century. Cotton and rice cultivation flourished during this period thus attracting European traders. In present-day Bangladesh, Islam and agriculture were introduced around the same time and advanced together (Eaton 2001:35).

Islam was foreign to Bengal until the first contact with Turkish invaders during the eighth century and subsequently with Afghan, Arab, and Central Asian conquests. The invaders all had their own languages and cultures, while the natives spoke Bengali, a language that flourished under the Buddhist Pala and Hindu Sena kings, preceding the Muslim conquerors. This is how the *Ashraf* and *Atraf* distinction arose where the former was of noble-descent or originating abroad, speaking Arabic, Persian or Urdu, and maintaining a sense of aristocracy and distance from the low-born Bengali speaking *Atraf* class, the majority of whom were Buddhist and low-

caste Hindu converts to Islam (Sarkar 1991). These two broad categories of Muslims in Bengal tended to be in distinctly different occupations; the A*shrafs* were based in West Bengal whereas the A*traf* cultivators were mainly in the east (Murshid, 1995). The former class kept their women in strict seclusion or 'purdah' in order to disassociate them from the looked down upon local, Bengali speaking A*trafs*. The practice may have diffused among non-A*shraf* populations through the process of *Sanskritization.*[10] Thus *'purdah'* was consolidated in Bengal during the Muslim reign by the upper class Muslims.

1.3.2 Background on pre-nineteenth century Bengal

Trade with European traders became an important feature of the Bengal economy from the time of the *Moghals*. The Portuguese were among the earliest foreign traders in Bengal, but by the eighteenth century, the East India Company had gained a strong foothold in the region. In fact the British territorial empire in South Asia really began in Bengal, Bihar and Orissa. It was in 1765 that the British East India Company took over the *Diwani*[11] of the region and in 1874 Bengal became a separate unit of administration for the first time. What attracted foreign traders to Bengal were the rich prospects for trade which the region offered and the comparative autonomy that the province enjoyed as a result of its distance from Delhi. Since the reign of the fifth *Mogha*l emperor, Shah Jahan, the British were allowed to trade freely in Bengal in return for a fixed annual tax or tribute known as *peshkash.* Soon the economy became heavily dependent on the trade royalties earned from the East India Company. Bengal itself was considered by European traders to be a 'storehouse where a resourceful trader was almost sure of making a fortune' (Bhattacharya 1954:12).

The province was endowed with innumerable rivers, rich deltaic soil, and abundant rainfall, and all these features contributed to the region's international fame as a

[10] The term was coined by Srinivas (1956) to describe the process by which members of lower classes emulate practices of upper classes.

[11] The British East India Company was entrusted with the responsibility of revenue collection on behalf of the Muslim rulers of India at the time. The *Mogha*l provinces were ruled by a Governor or *Nazim*. In addition, a *Diwan* was appointed by the *Moghal* emperor as a check on the *Nazim*. In certain cases, these two offices were combined. For example, this was done by Alivardi Khan in 1740 when he became the Governor of Bengal, Bihar and Orissa. For further details see (Marshall 1987:49).

producer of rice, jute and cotton. Until the 1940s, Bengal was producing a third of India's total rice requirements (Uppal 1984:61). The most popular agricultural products for the British were *Muslin*, a fabric made from a special type of cotton grown along the banks of the river *Meghna* in eastern Bengal, and silk, which was a product of Calcutta and Patna in Bihar. Indigo, tea, sugar cane and oil seeds were some of the other cash crops grown in the region which had promising trade prospects.

Agriculture, comprising both food and cash crops, formed the backbone of the Bengal economy. Two policies of British administrators were largely responsible for the decline of this sector in Bengal over time. The first was the Permanent Settlement Act of 1793, and second was 'commercialization of Bengali agriculture' when rice was replaced by jute, cotton and indigo (Schendel and Faraizi, 1981:29). The Permanent Settlement Act of 1793 implemented by the colonial rulers, became synonymous with the *zamindari* system as it protected the interests of the landlords or *Zamindars* at the cost of the vast majority of the peasant class known as *raiyats.* It was the cause of much unrest in the agrarian sector which is when the 1885 Bengal Tenancy Act had to be passed in order to define the rights of landlords and tenants in clearer terms (see, for example, Bose 1982). The switching of land from cultivation of food crops to commercial ones can often be more labour-intensive, as was the case for jute, or can leave land unsuitable for future use, for example indigo (Islam 1978). The shifting of the main river system *Ganges*, to the east, the rise in industrialization, poor local government at the village level, lack of rural credit facilities to enable farmers to avail themselves of Green technology were other factors contributing to the decline of agriculture in Bengal over time (Boyce, 1987).

By the time the British became a strong presence in Bengal during the mid eighteenth century, the history of religious tension between the conquered and the conqueror had largely subsided. Hindus and Muslims were living side by side. The communal harmony between the Hindus and Muslims of Bengal was however short-lived, as later chapters will show. Both the communities had let go of specific beliefs

and rituals unique to each religion, and had embraced new customs and traditions common to them both (Murshid 1995).[12]

In 1770, only five years after the East India Company was granted the *Diwani* of Bengal, the province was engulfed by what may have been the worst famine in its history, when a third of the population is believed to have perished. This famine is often cited as the first sign of the inability of the East India Company to run the Bengal economy (Obaidullah 1966). The Permanent Settlement Act was passed in 1793 with the intention of reviving the Bengal agricultural sector that was left in a state of disarray by the famine of 1770 (Visaria and Visaria, 1983). In practice it only served to augment the polarization between the landowning *zamindars,* who were mainly Hindus, and the peasant class comprising Muslims (Chattopadhyay, 2004; Bose, 1982). Unlike Muslims, many of the Hindus of Bengal had been trade partners with British traders working as middlemen and brokers, who had managed to accumulate sufficient wealth to invest in land and thus benefited from this Act (Murshid 1995). As eastern Bengal was more dependent on rural agriculture than the west, the east suffered more as a result of the Act. This marked the beginning of a gradual decline in the Bengal economy.

1.3.3 Background on post-nineteenth century Bengal

Landmark developments took place in Bengal during the nineteenth century. The early decades were marked by a series of peasant uprisings, for example, *Faraizi* movement, in protest of growing poverty and food scarcities under British rule. It originated in Faridpur in East Bengal where the Muslim peasantry protested against the oppression by *zamindars* (landlords) by putting forward the Islamic doctrine of equality (Sengupta, 2001). With the introduction of English education in 1817, a middle class Hindu intelligentsia was created which demanded social and religious reform, and in particular, the emancipation of women. Hence the *Brahmo Samaj*[13] was born. Subsequently Acts were passed to ban *Sati*, lift the ban on widow

[12] The Muslims of Bengal revered the *tulsi* plant, generally considered sacred by Hindus. Rituals at weddings and at childbirth were also similar. See Murshid (1995:34) for further examples.

[13] It was a Hindu reform movement founded by Debendranath Tagore, the Nobel laureate Rabindranath Tagore's father. In particular, *Brahmo Samaj* sought to stop oppression of women in society and caste discrimination in Hinduism. See, for example, (Sengupta, 2001) for further details.

remarriage and most importantly, to increase the legal minimum age at marriage to 12 and 14 for girls and boys respectively (Avasthi 1979, Dutta 2002).

The mid nineteenth century ushered in the beginning of industrialization in British Bengal. Calcutta, Hooghly and Howrah in western Bengal were the main centres of the coal and jute industries (Sinha 1998, Haan 1995). The completion of the railway network in 1881 expanded economic opportunities. Under the British Raj, there was a shift away from food to cash crops, mainly to jute and indigo. The cotton industry used to be a major cash crop in Bengal, which experienced a decline under British Raj. It was perceived to pose a threat to the cotton industry in Britain. The growth of coal and steel industries in Bengal also altered the patterns of migration in the province. Historically migration was from rural districts of western Bengal to the rice producing regions in the east during harvest seasons. Following the expansion in industry from the mid nineteenth century, migration tended to be from rural districts to urban centres offering jobs in coal and jute factories (Schendel and Faraizi, 1984; Haan 1995).

The demographics of Bengal from the eighteenth century onwards were much influenced by British policies. The British government took over the administration of India in 1857. The fact that Calcutta, the capital of Bengal was the seat of government of the British Raj, meant that the province enjoyed certain exclusive advantages in terms of education, urbanization and infrastructure building, and public health measures.[14] In the short run, trade and industry flourished under the British, bringing socio-economic prosperity and political stability when population started increasing. In the long run, their development projects exacerbated ongoing ecological changes in addition to being responsible for an upsurge in malaria mortality (Harrison, 1994).

The province of Bengal encompassed the deltas of the *Ganges* and *Brahmaputra* rivers and it was bounded by the Himalayas in the north and the Bay of Bengal in

[14]Bengal was the capital province of India for the greater part of colonial history. Nadia, currently a district of West Bengal, was the capital under the hindu Sena kings. After the muslims conquered Bengal in the thirteenth century, the capital was moved to Gaur. With the shifting of the river Ganges eastward, Mughal rulers made Dhaka the capital, followed by Murshdabad, before finally settling on Calcutta (Obaidullah 1966).

the south. Agriculture has always been the most salient feature of Bengali society; the vast majority of the people cultivated land and paid tax on it. Growing rice required a good supply of water and therefore the physical properties of the region provided the perfect conditions for rice cultivation. Most of Bengal receives higher annual rainfall than the rest of the sub-continent and much of the Province's soil was made exceptionally fertile by the flooding of the extensive network of rivers, which left behind rich deposits of silt. The Bengali population relied on the rich deltaic soil for their livelihood. Paddy rice has not only been the staple diet of the Bengalis, but has shaped the societal norms and very culture of the people.[15]

However by the middle of the nineteenth century an imbalance in the relative agrarian prosperity of eastern and western Bengal became apparent. This stemmed mainly from the distinct topographical differences between the two sides of the province. The eastern part of Bengal, now Bangladesh, comprised the hydrologically more active portions of the *Ganges,* and *Brahmaputra* rivers, all of which allowed natural drainage into the Bay of Bengal. Those parts of the *Ganges* and *Brahmaputra* rivers which are in Eastern Bengal are known as the *Padma* and *Jamuna,* respectively. These two rivers merge to form the *Meghna* which flows into the Bay of Bengal. The map of the river network in Bengal shows the dried up state of the Hooghly or *Bhagirathi* (meaning 'life-line' in Bengali) river, which is the branch of the Ganges running through West Bengal.

[15] An interesting account of the importance of rice and the central concept of *annadata* ('provider of food' in Bengali) in the Bengali culture is given in Greenough (1982:37-8).

Figure 1-1: Map of Bengal

Thus the eastern half of the province remained hydrologically 'active' while the western part, that is present-day West Bengal, gradually became 'moribund' as the water brought down by the *Ganges* could no longer find outlets to the sea and hence started to silt up.[16] Increasingly, the low-lying lands of the east, which were fertilized annually by the rich alluvial deposits brought down by the great rivers, became the leading home for rice production. Dhaka, Sylhet and Bakarganj districts were described as the 'granaries of this part of Bengal' (Marshall, 1987:22). On the other hand, the stagnant rivers of the west, including the *Bhagirati,* slowly decayed and became the breeding grounds for malaria-bearing mosquitoes. This led to

[16]The distinction between 'active' and 'moribund' rivers is made in Broomfield (1968:14), Greenough (1982:5), and Marshall (1987:4).

devastating bouts of malaria (known as Burdwan Fever) in the western and central parts of Bengal from the second half of the nineteenth century onwards (Sarkar 1987:4). As a result of the decaying river system, growing rice became increasingly difficult in the west. During the eighteenth century it was believed that Calcutta would be reduced to 'the greatest necessity and misery' if the rice market at Bakarganj (a district of East Bengal) were to close down (Marshall 1987:22). According to some, the long-term ecological factors that gathered pace during the nineteenth century were only partly responsible for the shift in the river system from the west to the east. In particular, it was believed that the natural processes were made worse by human interference during colonial rule. Some writers contend that the situation was greatly aggravated by 'unimaginatively constructed railway embankments' (Sarkar 1987:4).

Distinctly different demographic patterns historically observed in the east and the west of Bengal can be attributed to the processes outlined above. As the ecological changes progressed, so there arose a distinction between the patterns of economic activities or 'occupations' undertaken in the east and the west of Bengal. The rich soil and active rivers of the east were conducive to agriculture, while the west progressively became the centre for trade and industry. In Bengal, the rural Muslims (who were mainly converts from Hinduism and Buddhism) were traditionally the cultivators while Hindus were often traders (Murshid, 1995). She points out that the Urdu speaking A*shraf* class of Muslims in Bengal looked down upon agriculture which they associated with the Bengali speaking *Atrafs*. Thus they tended to be concentrated in urban centres. The British view was that 'most Bengali Muslims were poor artisans or small cultivators and were predominantly in the countryside' (Marshall 1987) . The majority of Hindus, on the other hand, were thought of as townspeople. In fact 60 percent of the townspeople of Bengal were Hindus at the beginning of the twentieth century (Broomfield 1987:5). However, according to Kingsley Davis (1951:201), taking the sub-continent as a whole, Muslims were more urban than Hindus; in 1931, 13 percent of the Muslims lived in urban areas compared to only 10.4 percent of Hindus. It was predominantly the A*shraf* class of non-Bengali speaking Muslims who resided in urban Bengal (Murshid, 1995).

The relatively fast rate of population growth among Muslims in the Indian subcontinent has usually been attributed to religious differences. In particular, the so-called ban on widow remarriage and advocacy of sexual abstinence operate to control Hindu fertility, while polygamy and pro-natalist Islamic teachings, it is said, result in higher fertility among Muslims. Using census data for the period from 1891 to 1941, Davis (1951) showed that Muslims consistently had a higher child-woman ratio than did Hindus. This he attributed partly to a higher birth rate among Muslims than among Hindus and partly to conversions. The lower incidence of malaria, attributable to an active river system, may also explain the higher observed fertility levels in the east of the province relative to the west. Reasons for Hindu-Muslim fertility differentials are taken up in detail in Chapter 3.

Population statistics pertaining to the post-Partition period have been increasingly influenced by medical, social and economic interventions. With the advances in medical technology following the Second World War, the historically killer diseases like malaria and smallpox, among other communicable diseases, were greatly reduced. As malaria was the single most important cause of death in Bengal since the mid nineteenth century, the dramatic reduction in malaria deaths coupled with greater availability of modern drugs, in the period following the Second World War, was a turning point in the population history of that region. The second half of the twentieth century was also marked by interventions to control fertility when modern contraceptives became widely available. The first ever, national program aimed at reducing the rate of population growth was introduced in India in 1952. Bangladesh had a similar programme since the Pakistan times, which was strengthened in the late 1970s.

1.4 The Structure of the dissertation

The history presented thus far provides the backdrop for an understanding of the historical as well as present-day demography of Bangladesh and West Bengal. Higher levels of population density and birth rate observed in Bangladesh in 1901 (in Table 1-2) are explained by a number of the factors outlined in preceding discussions – namely, a higher proportion of Muslim population, and general 'healthiness' of the region as a result of the river system shifting towards the east. Demography of pre-Partition Bengal is taken up in detail in Chapter 3.

This dissertation explores why the birth and death rates declined faster in West Bengal relative to East over the course of the last century. It also touches upon the reasons behind the changes in religious composition and rates of urbanization, among other things, which in turn may have influenced the change in population.

Table 1-2: Selected Demographic Indicators, 1901 and 2001

	1901	2001	Percentage change
Land Area (sq/km)			
Bangladesh	109,950	144,000	
West Bengal	75,034	88,752	
Population (million)			
Bangladesh	24.7	129.2	+423 (5.2 times)
West Bengal	15.2	84.2	+454 (5.5 times)
Population density (sq/km)			
Bangladesh	224	895	+3.9
West Bengal	202	946*	+4.7
Crude Birth Rate/1000 population@			
Bangladesh	38.2	30.0	-21.5
West Bengal	33.6	20.6	-38.7
Crude Death Rate/1000 population@			
Bangladesh	31.9	8.4	-73.7
West Bengal	32.3	7.0	-78.3
Infant Mortality Rate/1000 livebirths@			
Bangladesh	192.9	63	-67.3
West Bengal	214.2	51	-76.2
Religion			
Bangladesh (Hindus)	33.8	16	-52.6
West Bengal (Muslim)	25.9	25.2	-2.3
Percent Urban			
Bangladesh	2.3	23.4	+ 21.1
West Bengal	12.9	28.5	+ 15.6

Notes: The rates for 1901 and 2001 are not strictly comparable as the territorial boundaries of the two regions changed during the twentieth century. The territorial definition of Bangladesh in 1901 excludes Chittagong Hill Tracts and Sylhet, while that of West Bengal excludes Cooch Behar, and Purulia. Details on the territorial boundaries of pre-Partition Bangladesh and West Bengal used in this dissertation may be found in Chapter 2. @ Registered rates for 1901. * The Indian average for 2001 was about a third, or 324 per square kilometres.

Source: Rates for 1901 were calculated by author (details in Chapter 2 and 3); for 2001, census estimates were used.

I address the historical as well as the more recent demography of Bangladesh and West Bengal. The first three chapters focus primarily on the pre-Partition period.

Fertility and mortality have direct and indirect determinants. The chapters on fertility and mortality mainly compare proximate or direct determinants while that on post-Partition Bengal (Chapter 4) discusses the indirect factors. The chapters in the dissertation also include a review of the literature available on these topics, where applicable. What follows is a brief outline of the contents of each of the chapters.

Chapter 2: Data, Methods and Analysis

In order to study trends in the rates of births and deaths, one needs a reliable time series. These are not available for either Bangladesh or West Bengal. I had to construct a time series for the twentieth century using the scanty demographic data available. Chapter 2 discusses the strengths and weaknesses of the data that are available for Bengal. It then attempts to construct a time series of annual rates of births and deaths for Bangladesh and West Bengal for the entire twentieth century. Its purpose is to ascertain the timing of the onset of the initial decline in birth and death rates in the two regions. In addition, the chapter employs indirect techniques like Growth Balance and Reverse Survival methods in order to provide estimates of decadal rates of births and deaths for pre-Partition Bangladesh and West Bengal. The second section discusses the comparability of the survey data used for the statistical analysis in Chapters 5 and 6.

Chapter 3: Demography of pre-Partition Bengal

This chapter discusses time-trend analysis of demographic rates and their determinants during the first half of the twentieth century. It makes use of registration and census data for undivided Bengal in order to compare demographic rates (such as births, deaths, infant mortality, age structural measures of fertility), and their macro-level determinants like urbanization, literacy rates, and religious composition for East and West Bengal separately. It highlights that although East and West Bengal were under the same British administration, their demographics were very different - arising from differences in occupational and economic structure, disease patterns, religion, public health interventions and ecology. It describes the long-term ecological processes as well as interventions of the British administration which to a large extent influenced the virulence of malaria in the west of the province in relation to the east, decline of Bengali agriculture over time, as well as the direction of migration flows in the province.

Ch 4: Overview of post-Partition Bengal

The impact of Partition in 1947 on the political, economic and religious structure of the two wings of Bengal is discussed, drawing heavily on census data. It discusses the different forms of government, among other factors, that set the course of the subsequent trends in economic growth, agriculture, and social development which in turn influenced the demographics of post-Partition West Bengal and Bangladesh. Levels of education and urbanization in contemporary Bengal are discussed in some detail.

Ch 5: Trends and determinants of mortality

Mortality played a major role in population change in pre-Partition Bengal. This chapter compares the trends in indicators of mortality, for example, life expectancy and infant mortality, in addition to crude death rates, in an attempt to explain why mortality improved at a faster rate in West Bengal. It also discusses differences in maternal and infant health in great detail, using statistical analysis. The chapter seeks to explain why Bangladesh achieved a life expectancy of 50 years in 1983 (Caldwell 1999) when West Bengal achieved the same at least ten years earlier. The chapter identifies a greater level of female healthcare utilization as a determining factor for the relatively better female health status in West Bengal. West Bengal has many of the attributes that characterize superior health achievers. For example, there is an absence of a rigid class structure, a history of radical and leftist politics, and of attaching importance to education (Caldwell 1986).

Ch 6: Trends and determinants of fertility

Fertility has been the primary determinant of population change during the latter half of the twentieth century. This chapter compares the trends and patterns in fertility between the two Bengal. Since the 1990s comparable surveys are available for Bangladesh and West Bengal to enable the study of the proximate determinants of fertility. Using various demographic methods, for example, Bongaarts decomposition analysis, this chapter identifies marriage and contraceptive use as the two main proximate determinants in both the regions during the last three decades of the twentieth century.

Nuptiality is discussed in detail – the founding principles of Bengali marriage along with its evolution over time in order to accommodate changing socio-economic and demographic profiles of the province. The chapter also analyses the decadal progression of the age distribution by sex for the last century in order to show how age structural changes over time at least partly influenced marital age and the flow of wealth in marriage (dowry/brideprice). Finally, results of a linear regression are presented to show how education, socio-economic status, and religion influence age at marriage in Bangladesh and West Bengal.

The various dimensions of the two family planning programmes are discussed. A unique feature of contemporary West Bengal is the continuing high use of traditional methods of contraception. The state recorded the highest use of these methods among all states of India (1998-99 NFHS), plausibly reflecting a high level of unmet need for spacing methods. A multinomial regression is undertaken in order to study how background characteristics like levels of education, urbanization and socio-economic status influence choice and use of contraceptive use.

Ch 7: Demographic transition in Bengal

The aim of this chapter is to highlight the timing of the onset of the decline in the birth and death rates in the two Bengals. In addition, it examines the validity of the various explanations that have been put forward in order to explain the transition in Bangladesh, in light of the time series. The earlier onset of transition in West Bengal is ascribed to greater mortality improvements during the inter-war period in relation to Bangladesh, as well as to the state's history of leftist politics.

Ch 8: Summary and implications

A summary of the main findings is presented in this final chapter along with the policy implications for Bangladesh and West Bengal. Regarding the first research question on why the population trajectories have been different in the two wings of Bengal, I conclude that the answer lies in the history of Bengal. A few of the elements of Bengal's history that explain the demographic differences between the two Bengals are the river system shifting to the east and thus making West Bengal more malaria prone; health interventions and modern influence in West Bengal from an early age; uniqueness of the Bengali Muslims; and differences in occupational

structure and religion. For the second research question, my answer is that the timing of the initial decline in fertility and mortality has been similar in the two parts of Bengal, based on the analysis of time trends in vital rates. However the facilitating factors for the decline in fertility have been somewhat different. The final conclusion is that the contemporary demography of Bangladesh and West Bengal can be explained to a large extent, in light of the past.

2 Chapter 2: DATA, METHODS AND ANALYSIS

> "If the only tool you have is a hammer, you tend to see every problem as a nail."
>
> Abraham Maslow

In order to compare the population trajectories of fertility and mortality in the two Bengals, one needs at least a time series of annual rates of births and deaths. The time series is essential in order to identify the timing of the transition in the birth and death rates. Such a time series does not exist for the entire period in study for either of the two Bengals. This chapter discusses the problems with constructing such a time series for the entire twentieth century and how they were overcome. Statistical analysis has been undertaken for chapters 5 and 6 on the determinants of mortality and fertility. The second section of this chapter discusses the survey data, and choice of regression models and presents frequency tables.

Registration data forms the basis of this kind of time-trend analysis. However, a consistent or complete source of this type of longitudinal demographic data is unavailable for most developing countries, including Bangladesh and West Bengal. Indian registration data is known to suffer from under-registration and incomplete coverage (Bhat, Preston and Dyson; 1984). Even under the British Raj who introduced the system of registration, it was not as sound as the censuses (Davis, 1951). And it deteriorated even further during the post- Partition period for reasons that are discussed in later sections. Time trend analysis of vital rates of East and West Bengal, using registration data, is more comparable for the pre-Partition period. This is so because the same data source, namely the annual provincial public health reports for undivided Bengal may be used to estimate the rates for East and West Bengal. However the registration system for that period is known to have been far from perfect thus requiring the use of indirect techniques in order to account for

incompleteness of the data (see, for example, Mills, 1989; Chowdhury, 1989; Dyson, 1991; and Maharatna, 1996).

Civil registration data deteriorated further after Partition. This makes the study of time- trends during the second half of the last century almost impossible (Bhat, Preston and Dyson; 1984). Thus alternative methods had to be devised in order to study demographic rates. There are multiple sources of registration and survey data available for both post-Partition Bangladesh and West Bengal, but each with its own inherent deficiency. Longitudinal registration data, for example the Matlab Demographic Surveillance System (DSS) in Bangladesh, and the Sample Registration System (SRS) in West Bengal have their shortcomings.[17] Although the Matlab (DSS) data, available since 1966, provide a goldmine of demographic data, it is not representative of Bangladesh in the strictest sense. The SRS for West Bengal on the other hand, was exceptionally deficient until 1979 (ibid). The use of multiple sources of data to compile the time series for each Bengal may introduce inconsistencies in both the comparison of cross-country data, as well as the analysis of trends over time.

Regardless of these limitations, an attempt was made to construct a time series of annual rates of births, deaths and infant mortality for Bangladesh and West Bengal for the entire twentieth century. One of the objectives of studying the time series is to compare the levels and trends in vital rates. The time series of annual rates of vital events enables the study of short-term fluctuations as well as long-term trends (Dyson 2001). It serves as an essential tool for studying the timing of the onset of decline in these rates.

[17] The DSS in Matlab is a demographic longitudinal study covering a population of around 200,000 in the south-east of Bangladesh. In the current method of data collection in this surveillance system, Community Health Visitors (CHV) visit each household in the study area in order to record events like births, deaths, marital unions, migration and socio-economic background. While Matlab DSS data may not be representative of the country, SRS is representative of India at the national and state levels. Data collection in the Indian Sample Registration System involves longitudinal enumeration of births and deaths in a sample village or urban block by a resident enumerator, followed by an independent six-monthly retrospective survey by a supervisor. The objective of this dual record-keeping system is to ensure that events are not missed. See Srivastava (1989); or Bhat (2002) for further details. A list of the various sources of demographic data available for East and West Bengal may be found in later discussions.

This chapter discusses the limitations of demographic data pertaining to pre and post-Partition Bengal, and how these were surmounted in order to construct a reasonably reliable and comparable time series of vital rates for Bangladesh and West Bengal for the twentieth century. I will first discuss data for pre-Partition Bengal and the adjustments made to account for incompleteness before examining the quality and sources of data for the second half of the last century. The final section includes discussion of the Bangladesh DHS and the West Bengal NHFS.

2.1 Data on pre-Partition Bengal:

The two main sources of demographic data that are available for pre-Partition Bengal are the decennial census reports and annual reports of the registration records of vital events. In addition, there were specific survey reports which were conducted for assessing the magnitude of certain events, for example, the Famine Enquiry Commission's report on the 1943-44 Bengal famine. The year 1872 marked the beginning of decennial censuses in British India. Yet the first complete and comprehensive census report that is available at the national and provincial levels is for the following census year of 1881 (Census of India, 1951).

Registration of mortality has been effective in the Indian sub-continent since the early nineteenth century. The initial purpose of recording deaths was to study the levels and causes of mortality in jails, army, or during epidemics. Registration of both births and deaths was introduced in Bengal in1864, and achieved nationwide coverage of British India by 1875 (Davis, 1951; Census of India 1951). These reports were published annually, providing statistics on age and cause-specific mortality, in addition to vital rates at the district and provincial levels.[18] Data on age and causes of deaths are especially questionable considering that *chowkidars* (village watchmen), who often had no formal education, were in charge of recording these details (Bhat, Preston and Dyson, 1984; Davis, 1951).

[18] Since it inception in 1864 until 1919, this annual provincial report was known as the Sanitary Commissioner's Report. From 1920 onwards, the report came to be known as Public Health Report. These annual reports on vital rates continued to be published in West Bengal and East Pakistan after 1947. However their quality deteriorated considerably when the SRS was commissioned.

An understanding of the system of registration of vital events in British Bengal is helpful in explaining the differences in registration coverage and completeness in the two Bengals. The village watchmen were the sole agents for registering vital events in rural Bengal. In the urban areas, which were mainly concentrated in the west of the province, residents themselves had to report events within eight days of their occurrence. The system of employing *chowkidars* to record births and deaths, who were often illiterate and ill-paid, may explain the poor quality of registration data, especially those related to age and cause-specific mortality (Davis, 1951). Moreover, recording vital statistics was often one of the many tasks they had to perform (Chand, 1939). The general contention is that the quality of registration in the province deteriorated over the course of the last century because *chowkidars* found it increasingly difficult to cope with the larger and larger population increases that Bengal experienced since early twentieth century (Bhat, Preston and Dyson; 1984).

Estimation of vital rates for East and West Bengal using data for undivided Bengal is complicated by two factors. The first problem lies in accounting for the many boundary changes which the province underwent throughout history, and the second in adjusting for incompleteness of data.

2.1.1 Territorial changes

For the purpose of this study, it was necessary to lay out physical boundaries for pre-Partition East and West Bengal in a way that would serve two purposes. Firstly, it would have to withstand the intermittent territorial changes that the province underwent. Secondly, it would have to resemble present-day Bangladesh and West Bengal as closely as possible so that time-trend analysis could be consistent and comparable.

Between 1765 and 1905, the province of Bengal in British India largely comprised the three contemporary Indian states of West Bengal, Bihar and Orissa, along with present-day Bangladesh. In 1905, the British Raj divided up Bengal, keeping West Bengal, Bihar and Orissa in tact in the province, and carving out a new one called Eastern Bengal and Assam, comprising Bangladesh and Assam. However this partition was annulled in 1912.

The 1947 Partition came at a time when the long-standing tension between Hindus and Muslims in Bengal had almost culminated in civil war and the most logical partition of the province seemed to be on some sort of territorial and religious basis. Lord Mountbatten's decision on Partition of Bengal caused much discontent because the homeland created for the Hindu population of the province, West Bengal, got only 39 percent of the total land area rather than the anticipated 45 percent. During Partition, most of the Hindu-majority western districts of Bengal under Burdwan and Presidency Divisions, were made West Bengal. As much as 60 percent of the land area in the east of the province, comprising the present-day Divisions of Rajshahi, Dhaka and Chittagong, became East Pakistan, which was a new home created for the Muslims of India.

Subsequent to the Partition of 1947, the geographical boundaries of both regions, West and East Bengal, have undergone further changes. For example, Cooch Behar (a Princely or Native State)[19] was merged with West Bengal in 1950. The other regions annexed to West Bengal were Chandernagore (a French Settlement) in 1954, and Purulia and Purnea (previously belonging to Bihar) in 1956. Purulia shortly thereafter went back to Bihar. During the early decades of the last century, two of the contemporary north-eastern Indian states of Tippera (present–day Tripura) and Sikkim, along with the Chittagong Hill Tracts, were recorded as part of the province of Assam in one census report and that of Bengal in another. Similarly, Sylhet, a district of present day Bangladesh, was a part of Assam for the greater part of the colonial era. It was annexed to East Bengal only after Partition of 1947. However, Sylhet did briefly fall under the same administration as East Bengal between 1905 and 1912.

Thus, as illustrated above, Bengal changed its territorial boundaries a number of times, either by adding or subtracting districts. For the purpose of this study, pre-Partition East and West Bengal were defined in terms of the core districts, which continued to be a part of each of the two wings even after 1947. As a result, Sylhet and the Chittagong Hill Tracts were excluded from my definition of East Bengal.

[19] These were sovereign entities of British India ruled by monarchs who were not directly under British control. The rulers of these states had to accede their political independence after Partition of 1947 and opt for either Pakistan or India. See, for example, Devi (1985) for an all-embracing account of Princely States of British India.

The inclusion of the districts of Sylhet and Chittagong Hill Tracts would have increased the land area of East Bengal by 3,490 and 13,295 square kilometers, respectively. However I still left them out as they were not under the same jurisdiction as the province of Bengal. Moreover, the Chittagong Hill Tracts were not covered by the registration system (Chowdhury, 1989). Similarly Cooch Behar and Purulia were not included in my definition of West Bengal. For the purpose of this study, pre- Partition East and West Bengal have been defined to constitute a total land area of 111,318 and 72,735 squared kilometres, respectively. All the demographic and other estimates presented for pre-Partition East and West Bengal were calculated by the author from data for undivided Bengal based on the following territorial definition.

Table 2-1: Author's territorial definition of pre-Partition East and West Bengal (in square km)

West Bengal		East Bengal	
Burdwan (Bardhhaman)	2689	Jessore	2925
Birbhum	1752	Khulna	4765
Bankura	2621	Rajshahi	2618
Midnapore (Medinipur)	5186	Dinajpur	2762
Hooghly	1191	Jalpaiguri	876
Howrah (Haora)	510	Rangpur	3479
24 Parganas (North and South 24 Parganas)	4844	Bogra	1359
Calcutta (Kolkata)	32	Pabna	1851
Nadia	1395	Malda	570
Murshidabad	2143	Dacca (Dhaka)	2777
Dinajpur (Uttar Dinajpur)	1184	Mymensingh	6249
Jalpaiguri	2043	Faidpur	2576
Darjeeling (Darjiling)	1164	Bakarganj (Barisal)	4642
Malda (Maldah)	1329	Noakhali	1644
		Chittagong	2492
		Nadia (Kushtia)	1395
Total in Squared Miles	28083		42980
Total in Squared Kilometres	***72,735***		***111,318***

Note: The contemporary names and spellings of these districts are provided in parenthesis. The current land area of West Bengal is 88,752 squared kilometers, including Purulia and Cooch Behar (2001 census). In 2001, the total land area of Bangladesh was recorded to be 144,000 squared kilometres inclusive of Sylhet and the Chittagong Hill Tracts. During Partition in 1947, four of the central districts of the province, namely Nadia, Dinajpur, Malda and Jalpaiguri were divided between West and East Bengal in the ratio of 1:1, 0.7:0.3, 0.3:0.7, and 0.3:0.7, respectively. The portions of Jalpaiguri and Malda that were given to East Bengal during Partition were integrated with Rangpur, and Dinajpur, respectively.

Principal Sources: Census reports of Bengal 1901 and 1951; Obaidullah (1966).

2.1.2 Under-registration of vital rates in pre-Partition Bengal

Davis (1951:34) estimated the extent of birth and death registration in British India to have been between 30 and 50 percent deficient. According to this study, the registration of deaths was relatively more complete than of births. Chowdhury (1989), and Maharatna (1996) are among studies, beside Indian census actuaries, that have provided estimates for the extent of incompleteness of registration in Bengal for the early decades of the last century. Their estimates of the correction factors for Bengal are more or less similar to those put forward by Davis for British India.[20] According to my calculations, the average level of completeness of birth and death registration in West and East Bengal between 1900 and 1940 may have been roughly 67 and 64 percent, respectively.

Growth Balance method to correct for under-registration of deaths

This is perhaps the first attempt to estimate the level of under-registration for both Bangladesh and West Bengal, using census and registration data for undivided Bengal. The correction factors (c.f.) for death registration were calculated using the growth balance method developed by Brass (1975).[21] The two data input are age-specific registered deaths and the census age distribution. The method involves manipulation of age-specific deaths, under certain assumptions (details in Appendix A). The work of Mills (1989) and Maharatna (1996) go to show that this method does not give full-proof results. Nevertheless it is useful to ascertain, although not to the highest degree of accuracy, the extent of under-registration of deaths.

[20] For a list of the correction factors for birth and death under-registration in the whole of the province or in West Bengal for the period 1921-50, see Dyson and Maharatna (1991:290). For estimates pertaining to earlier decades, see Chowdhury (1989).

[21] Details on application of the method may be found in United Nations (1983).

Table 2-2: Registered & adjusted death rates in West Bengal and East Bengal

	West Bengal		East Bengal	
	Registered 1	Adjusted 2	Registered 3	Adjusted 4
1900-1902	30.7	(1.55) 47.5	29.3	(1.58) 46.3
1911-1913	30.9	(1.48) 45.7	29.2	(1.57) 45.8
1920-1922	28.1	(1.46) 41.0	26.9	(1.47) 39.6
1930-1932	22.5	(1.48) 33.3	21.0	(1.41) 29.6
1938-1940	19.7	(1.32) 26.0	21.1	(1.47) 31.0
Average c.f.1900-40		(1.46)		(1.55)

Note: The registered death rates are not the decadal rates but refer to the three years around the census years. Column 2 is the product of Column 1 and the correction factors (in parenthesis). Similarly Column 4 is column 3 multiplied by the correction factors for East Bengal.

Source: Census reports and Sanitary Commissioner's Reports for relevant years.

The estimates presented in Table 2.2 cannot be regarded as robust because the populations concerned did not strictly comply with the underlying assumptions of the technique outlined by Brass. Bengal's population was certainly not closed to migration during the period; age misreporting, especially at young and older ages, is a continuing problem in the Indian sub-continent. Finally, completeness of registration data almost certainly varied at different ages (see, for example, Bhat et al, 1984).

Nevertheless, a few points can be made about Table 2.2. First, death registration was definitely incomplete in both the wings of the province. The level of registration coverage may have been slightly better in West Bengal which was relatively more urban and developed than the East (details in Chapter 3). The death rate has been declining over the course of the last century in both the wings. Finally, the death rate was improving at a much faster rate in West Bengal from the 1920s. This is taken up in detail in later discussions.

Reverse Survival method to correct for under-registration of births

Rates of under-ten mortality enable the estimation of the number of births in the preceding decade by 'reverse-surviving' the children enumerated in the census by suitable survival rates. Thus accuracy of the birth rates obtained using this method

depends upon completeness of census enumeration, and accuracy of the rates of under-ten mortality. Dyson (1989) points out that the two major problems with using Indian census age distributions are gross age distortions, and unreliable information on infant and child mortality. The Indian censuses generally under-record children in the age group 0-5 and over-report those at ages five to nine (Adlakha and Kirk 1974:384). In my calculations, it was assumed that the levels of under and over count of age-specific groups were similar in successive censuses and as such no adjustment was made to the census age distributions.

Table 2-3: Registered and Adjusted Crude Birth Rates for 1900-1941

	West Bengal		Bangladesh		
	Reg.	R S	Reg.	R S	BBS
1901-10	33.6	(1.61) 54	38.2	(1.59) 61	54
1911-20	30.9	(1.55) 48	33.9	(1.42) 48	53
1921-30	28.8	(1.39) 40	27.7	(1.62) 45	50
1931-40	27.9	(1.58) 44	29.1	(1.78) 52	53
Average c.f.		1.53		1.60	

Note: RS is abbreviation for Reverse Survival; BBS is abbreviation for Bangladesh Bureau of Statistics

Source: Relevant census and Sanitary Commissioners' reports.

It is evident from Table 2.3 that registration of deaths may have been relatively better than that of births in both the wings of Bengal, as in the rest of British India (Davis, 1951). The birth rate was generally higher in the east for ecological as well as socio-economic reasons as outlined in the next chapter.

Two completely different techniques, that is, the Growth Balance and Reverse Survival methods, have provided similar levels of under-registration of births and deaths in West and East Bengal. Thus it may be reasonable to shift up the registered vital rates for the pre-Partition period by the average of the correction factors estimated using the Growth Balance and Reverse Survival methods for each of the two wings of the province. These are 1.49 and 1.55 for West and East Bengal, respectively. The corrected annual vital rates are included in Appendix A.

2.2 Data for post-Partition East and West Bengal

Regular demographic surveys became operational in Bangladesh since the 1950s but the earlier ones may have been fraught with flaws (National Academy of Sciences, 1981). Robust and reliable estimates of fertility exist for Bangladesh only from the mid 1970s onwards with the introduction of regular contraceptive surveys to be followed by demographic and health surveys. For West Bengal, the sample registration system has provided reasonably reliable fertility estimates since the 1980s (Visaria, 2004).[22] In addition, the Indian National Family Health Surveys reports are available at the state level since the early 1990s. Thus multiple sources of data were used for both the Bengals. The non-availability of a uniform source of data can possibly compromise the study of trends over time.

Post enumeration surveys revealed that the extent of undercount for the 1951, 1961, 1974, 1981 and 1991 Bangladesh censuses were 5.0 percent, 8.6 percent, 6.8 percent, 3.1 percent and 4.6 percent, respectively (Bangladesh Bureau of Statistics 1991) . The published population estimates for Bangladesh are generally adjusted for undercount.

Among the studies on the historical mortality patterns in India, Bhat et al (1984), using SRS data adjusted for under-registration, concluded that West Bengal was among the low mortality states during 1968-78 along with Punjab, Kerala, Karnataka and Maharashtra and their estimates of the CDR for West Bengal for 1968-78 are similar to my estimates.

The insufficiency of registration data is particularly acute for the 1950s when the responsibility of registering vital rates in India was shifted from *chowkidars* to the *Panchayat,* which is the village level administrative unit. The quality of registration data suffered even further under this new system when a lack of suitable personnel as well as of political commitment were deterring factors (Dyson, 1991).

[22] West Bengal along with Bihar, were excluded from the national estimates of demographic rates derived from Sample Registration data pertaining to the 1970s as the system was especially deficient in these two states (Bhat, Preston and Dyson, 1984). Indirect estimates are available for most of these decades.

Multiple sources of data had to be used to complete the time series for the post partition period. I did not calculate the correction factors myself but relied on existing estimates in order to shift up vital registration data available for post-Partition East and West Bengal.

2.2.1 Data sources for post-1947 West Bengal

The Indian Civil Registration system was described as being 'ridiculously low' and giving 'meaningless birth and death rates' (Srivastava 1989:17). Among the reasons he cited for the poor quality of registration data were low levels of education amongst the masses and low priority accorded to record keeping of such events. As the population of India grew at the high rate that it did since Independence, it became increasingly difficult to record vital events. At the same time accurate estimates of birth and death rates became absolutely necessary for population planning and government policies. At various points in time, demographers have estimated birth and death rates for India using indirect methods. Beside Indian census actuaries, Davis (1951) is a noteworthy study that provides decadal estimates of vital rates. The limited estimates available for West Bengal are presented in Table 2.4.

In the absence of reliable civil registration data in India, the National Sample Survey (NSS) was introduced during the mid 1950s. The NSS is an ongoing series of socio-economic surveys which collect limited information on vital rates. Two major national surveys were also conducted during the 1970s, the first being the 1972 Fertility survey and the second, the 1979 survey on infant and child mortality. The former survey was conducted in the SRS villages enabling the estimation of infant and child mortality rates through indirect methods. Bhat et al (1984:67) analyzed this survey data only to conclude 'there is evidence to reject the 1972 Fertility Survey for West Bengal.'

The Sample Registration System (SRS), was introduced during the mid 1960s with the objective of providing reliable demographic estimates at the national and state levels. The Model Registration System (MRS) was implemented simultaneously as the SRS. Despite its limitations, it serves as one of the few sources providing

information on age and cause specific mortality. Though far from perfect, and more so in certain states of India than in others, the SRS provides consistent and reliable longitudinal data on Indian vital rates. The quality of pre-1980 SRS data has been well below the all-India average in Bihar and West Bengal, so much so that these two states were excluded from the aggregate birth and death rates for India until 1979 (Bhat, Preston and Dyson 1984; Jain and Adlakha, 1982). The system was revamped in 1980 - the average undercount in the SRS in West Bengal post 1980 is three percent compared with the Indian average of 1.2 percent (Bhat 2002).

Beside the two rounds of National Family Health Survey (NFHS) during the 1990s, which is the Indian equivalent of Demographic and Health Surveys (DHS), the Ministry of Health in West Bengal has been publishing a comprehensive annual report called 'Health on the March' which monitors progress in health and demographic indicators.

For the period from Independence until reliable SRS data became available for West Bengal in 1980, I have used Vital Registration data for the time series. The rates were adjusted upwards using suitable correction factors.

Table 2-4: Available estimates of vital rates for West Bengal: 1900-2001

Author	Period	Method of Estimation	CBR	CDR
1. Present Author	1901-10	Growth Balance and Reverse Survival	50	48.1
2. Ghosh	"	Direct estimation	44.9	
3. Roy	1911-20	Census age distribution	42.8	39.0
4.Present Author	"	Growth Balance and Reverse Survival	46	51
5. Nag	"	(Not known)	NA	50.0
6. Ghosh			41.8	
7. Nag	1921-30	(Not known)	NA	42.0
8. Roy	"	Differencing Method	42.6	34.9
9. 1931 Census	"	Differencing Method	41.9	34.9
10. Present Author	"	Growth Balance and Reverse Survival	42.9	38.7
11. Ghosh			38.2	
12. Roy	1931-40	Census age distribution	43.7	30.5
13. Present Author	"	Growth Balance and Reverse Survival	41.6	31.6
14. Ghosh			40	
15. Roy	1941-50	Census age distribution	37.3	23.0
16. RG	"	Differencing & Reverse Survival Method	35.0 (39.9)	NA
17. 1951 Census	"	(Not known)	41-42	NA
18. Nag	"	(Not known)	NA	29.0
19. Present Author		Growth Balance and Reverse Survival	31.7	29
20. Ghosh			34.8	
21. Roy	1951-60	Census age distribution	44.0	13.9
22. Nag	"	(Not known)	NA	21.0 (23.0)
23. Srikantan	"	"	47.5 (41.3)	NA
24. RG	"	Differencing Method	42.9 (41-42)	NA
25. Roy	1961-70	Census age distribution	44.3	18.5
26. Srikantan	"	(Not known)	42.9	NA
27. RG	"	Differencing Method	44.7 (40-41)	NA
28. 1981 Census	"	Births by Reverse Survival and Deaths by Growth Balance	44.3 (41.2)	18.5(19.2)
29. Nag	"	(Not known)	NA	19.0
30. Roy	1971-79	Census age distribution	34.6	13.5
31. 1981 Census	1971-81	Births by Reverse Survival and Deaths by Growth Balance	34.5 (37.2)	14.5 (15)
32. SRS	*1980-90*	*Registration Data*	*30.2*	*9.6*
33. SRS	*1991-2001*	*Registration Data*	*23.1*	*7.6*

Notes: Roy did not make it clear if he did the calculations himself or quoted estimates made by others; c.f. is abbreviation for correction factor; RG is abbreviation for Registrar General; figures in parenthesis are rates for India.

Sources: Srikantan (1979); Roy (1993); SRS bulletins of various years; Ghosh (1956); Nag (1983); my estimates were derived by multiplying the registered decadal rates of birth and death by the correction factor of 1.49.

Given the paucity of reliable demographic data, Indian census actuaries have had to devise alternative methods to provide estimates of birth and death rates by applying various techniques to smooth the age distributions in two consecutive censuses. They have then applied methods like reverse survival or the differencing technique on the smoothed census age data.[23] The problem with using unsmoothed census data is that census age reporting is more often than not defective in the Indian sub-continent attributable to poor knowledge of dates and recall errors (i.e., digit preference) among other reasons.

Depending upon whether smoothed or unsmoothed data are used, and which techniques are applied to the age distribution to calculate birth and death rates, it is possible to get a number of demographic estimates pertaining to the same period (as seen in Table 2.4). When a different method is used for each decade, one needs to approach trends in vital rates with caution - a fall or a rise in the rate could be because of the application of multiple methods. Each method of calculating vital rates indirectly has its advantages and disadvantages.

2.2.2 Data sources for post –1947 East Bengal

The vital registration system was introduced in Bangladesh, as in the rest of Bengal, through the Bengal Births and Deaths Registration Act of 1873. However the system has not been enforced strictly since Partition. The quality of vital registration data deteriorated in East Bengal post 1947 for the same reasons that it did in West Bengal. Unlike West Bengal, Bangladesh has a long history of retrospective surveys. Retrospective surveys provide the advantage of collecting detailed data to enable the estimation of refined measures of fertility and mortality. However Bangladesh survey data are often defective, suffering from severe underreporting of recent births and age-misreporting thus giving distorted results (Cleland et al, 1994). One of the earlier demographic sample surveys to be conducted in Bangladesh (then East Pakistan) was the Population Growth Estimation Experiment (1962-65), which estimated the registered birth and death rates for that period to have been below 50 percent complete. The primary objective of the surveys conducted in erstwhile Pakistan, the main ones being the Demographic Survey in East Pakistan (1961), National Impact

[23] See, for example, Srikantan and Raychaudhuri (1972), Adlakha and Kirk (1974), or Dyson (1979).

Survey (1962), and Population Growth Experiment (1962-65), was to ascertain the rates of demographic statistics in the absence of reliable vital registration data. On the other hand, the surveys conducted in independent Bangladesh, post-1971, namely the series of Fertility and Contraceptive Prevalence surveys to be replaced by the Demographic and Health Surveys, have primarily monitored progress of the family planning programme.

Bangladesh Bureau of Statistics (BBS) provides demographic data on a sample basis under the dual record system. In terms of the method of data collection, it is comparable to the SRS in India but not quite as reliable or complete as SRS data (Begum, 1990). BBS has provided decadal birth and death rates for Bangladesh for the last century but it is not clear how these rates were derived. According to one report, the vital rates provided by the BBS for the earlier part of the twentieth century were estimated from various sources and are of 'varying reliability'(ESCAP 1981:64). A sample registration system has been maintained by the BBS since 1980. But these BBS estimates of vital rates are lower than those for the Matlab comparison area. It is almost certainly indicative of poor completeness of BBS data.

Begum (1990) estimated intercensal vital rates by applying the South Asian pattern of Model Life Table on unsmoothed sex and age distributions of the 1951, 1961, 1974, and 1981 censuses of Bangladesh. She used four different indirect techniques to show that BBS's estimates of vital rates for earlier decades had been overstated.

Kabir (1977) is another study that has attempted to estimate the birth rates for Bangladesh for the period 1952-1974 by applying the reverse survival method to unsmoothed census age data. Some of his estimates seem rather high - probably reflecting age misreporting in the census data.

Table 2-5: Available estimates of vital rates for Bangladesh: 1900-2004

Author	Period	Method of Estimation	CBR	CDR
1. BBS	1901-10	Not known	53.8	45.6
2. Present author	"	Reverse Survival and Growth Balance	54.2	49.5
3. BBS	1911-20	Not known	52.9	47.3
2. Present author	"	Reverse Survival and Growth Balance	52.5	46.5
4. BBS	1921-30	Not known	50.4	41.7
5. Present author	"	Reverse Survival and Growth Balance	42.9	38.3
7. BBS	1931-40	Not known	52.9	37.8
8. Present Author	"	Reverse Survival and Growth Balance	45.1	34.1
9. BBS	1941-50	Not known	49.4	40.7
10. Present Author	"	Reverse Survival and Growth Balance	37.4	38.8
11. BBS	1951-60	Not known	51.3	29.7
12. Begum	"	Multiple indirect techniques	43	18
13. Kabir	"	Reverse Survival (RS)	57.6	
14. BBS	1961-70	Not known	50.0	18.5
15. Begum	1961-74	Multiple indirect techniques	45	16
16. Kabir	"	RS	48.9	
17. Matlab	1966-71	DSS	45.1	15.3
18. DSEP	1961	Retrospective survey	47	
19. PGE	1962-5	"	53	
18. BBS	1971-80	Not known	47.4*	Na
19. Begum	1974-81	Multiple indirect techniques	44	15
20. Matlab	"	DSS	42.8	15.9
21. NIS	1974	Retrospective survey	48.3	
22. BFS	1976	"	46.9	
22. BBS	1981-90	Not known	33.8	11.7
23. Matlab	"	DSS	39.7	12.9
23. BBS	1991-2000	Not known	27.8	9.4
24. Matlab	"	DSS	29.0	9.0
25. UNICEF	2004		27.0	8.0

Notes: * Refers to 1971-74; BBS is Bangladesh Bureau of Statistics; DSEP is Demographic Survey in East Pakistan; PGE is Population Growth Experiment; NIS is National Impact Survey; BFS is Bangladesh Fertility Survey.

Sources: BBS (1978) for rates up to 1980, thereafter the BBS rates were provided by the BBS office in Dhaka, Bangladesh, for my research; Matlab DSS reports; Kabir (1977); Begum (1990); my estimates were derived by pushing up the decadal registered rates by 1.55 for the period up to 1940, and by 1.73 for 1941-50.

The average of the decadal estimates available for West Bengal and Bangladesh, including my own are presented in Table 2-6. Some of the estimates in Tables 2-4 and 2-5 seem too high or low to be plausible which were dropped. For example, Roy (1993) estimates the CDR of West Bengal to be 13.9 for 1951-60. West Bengal did

make significant improvements in mortality from the 1920s onwards and especially during the late 1940s but not to the extent Roy estimated. Given that the average CDR for India was 23 during the 1950s, a rate of around 21 seems more likely to have been the case for West Bengal.

Again, the estimated crude death rate of 24 for Bangladesh for 1951-60 appears to be too low. Granted that the medical breakthrough of the late 1940s had global implications, the CDR in the country is not unlikely to have improved by more than ten percentage points, or to reach a level below that for India. Thus a rate of around 30 seems more plausible for that decade. Following this thread of argument, Begum's (1990) estimates for the 1950s and 1960s seem to be on the low side. As pointed out earlier, the different techniques of indirect estimation can give varying results.

Table 2-6: Decadal estimates of vital rates for Bangladesh and West Bengal

	Decadal Crude Birth Rate				Decadal Crude Death Rate			
	WB	% change	EB	% change	WB	% change	EB	% change
1901-10	47		56		48		47	
1911-20	43	-8	53	-5	46	-4	47	Unchanged
1921-30	42	-2	46	-13	37	-19	40	-15
1931-40	42	Unchanged	49	-6	31	-16	36	-10
1941-50	36	-14	41	-16	27	-13	40	+11
1951-60	45	+25	50	+18	21	-22	24	-40
1961-70	44	-2	47	-6	19	-10	17	-30
1971-80	34	- 23	45	-4	14	-26	15	-12
1981-90	30	-12	37	-18	10	-28	13	-13
1991-2000	23	-23	28	-32	8	-20	9	-31

Sources: based on Tables 2.4 and 2.5

The birth rate is affected by three main factors – changes in marital fertility or marital composition, and in the age-structure. Similarly death rate changes are influenced mainly by improved standard of living, and medical/public health interventions. These determinants of vital rates are discussed in detail in the next chapter. It is difficult to comment on vital rates without examining the underlying age structural, and socio-economic dynamics. Nevertheless, some general observations may be made. The greatest decline in the birth rate occurred during the

decades when the family planning programmes were revamped – this happened during the 1970s in West Bengal and during the1990s in Bangladesh. West Bengal made relatively greater gains in mortality over the course of the last century. A detailed discussion on the time series of CDR and CBR for pre and post-Partition Bengal are included in Chapters 3 and 4, respectively.

Infant mortality rates for Bangladesh and West Bengal

In estimating the infant mortality rate (IMR), the numerator was adjusted in order to match the cohort of the denominator. The annual rates of infant mortality (presented in Appendix A) were calculated for Bangladesh and West Bengal for the pre-Partition period using registration and census data. A far as trends in infant mortality rate (IMR) are concerned, they are almost identical to that in the crude death rate. The IMR was higher in West Bengal than in East until the early 1920s when the overall CDR was also higher. However with the improvements in malaria and cholera mortality during the 1920s and 1930s, the infant mortality rate in West Bengal declined considerably. By the 1930s, the IMR in West Bengal was lower than that in East Bengal and the difference widened over time. Thus IMR has been improving in West Bengal since the 1920s where as that in Bangladesh did not make much progress during the early decades of the last century.

Table 2-7: Infant mortality rates in Bangladesh and West Bengal, 1901-2007

	Bang			WB	
	CDR	IMR		CDR	IMR
1901-10	47	*288*	1901-10	48	*213*
1911-20	47	*307*	1911-20	46	*307*
1921-30	40	*295*	1921-30	37	*271*
1931-40	36	*268*	1931-40	31	*238*
1941-50	40	*271*	1941-50	27	*220*
1951-60	24	168	1951-60	21	120
1961-70	17	133	1961-70	16	104
1971-80	15	154	1971-80	14	85
1981-90	13	100	1981-90	10	76
1991-2000	9	80	1991-2000	8	60
2001-07	6	53	2001-07	6	40

Source: The rates for 1901-1950 were calculated using the registration and census data for undivided Bengal; 1951-70 for ESCAP (1981), 1971 onwards Matlab DSS for Bangladesh. Roy (993) for 1951-80 and SRS for 1981 onwards for West Bengal.

Dyson (1997) suggests that the average Indian infant mortality rate was around 300 per 100,000 livebirths at the beginning of the last century. The rates for East and West Bengal may have been slightly better than the Indian average. The figures for 1901-1951 (in italics) were calculated by multiplying the decadal average rates by the correction factors used for calculating the CDR and CBR. The decade of 1911-20 includes the elevated mortality from the 1918-19 influenza epidemic. Infant mortality has been consistently lower in West Bengal despite the fact the crude death rate was higher in the west relative to the east of the province until the 1920s. A higher rate in Bangladesh is at least partly explained by a higher birth rate. The dramatic improvement in both the Bengals between 1941-50 and 1951-60 may be partly real and partly attributable to the use of a different source of data. The determinants of infant mortality are addressed in Chapter 5.

2.3 Survey data for regression models

The primary source of data for the statistical analysis are the series of Demographic and Health Surveys for Bangladesh, and the National Family and Health Surveys for West Bengal. The surveys were undertaken as part of the worldwide DHS system. The Indian NFHS and the Bangladeshi DHS are very similar in design and in terms of the topics covered. A total of 27,487 women were included in the 1999-2000 BDHS household survey out of whom 10, 885 were identified to be eligible (ever-married women aged between 10 and 49) for the individual woman's survey. In the case of West Bengal 1998-99 NFHS, 4088 ever married women aged between 15 and 49 were taken to be eligible for the woman's questionnaire.

The women's questionnaire in both the BDHS and the Indian NFHS included questions on marriage, fertility, family planning use and mother and child care, among other things. It also included basic indicators of household and personal socio-economic status (SES), for example, husband's occupation and female education. The household questionnaire covered questions on household possessions and assets which can serve as a proxy for socio-economic status. These surveys do not ask questions on income. I was interested in examining if socio-economic background, beside factors like education, religion and type of residence, influences the age at marriage. It was quite straightforward constructing a socio-economic index

(SEI) using the woman's questionnaire in the BDHS which included many of the asset and possession variables to depict the economic background of the woman and her household. In the case of the NFHS for West Bengal, the household and the individual woman's questionnaires had to be merged in order to derive the SEI.

Ideally, survival analysis, the Cox Proportional Hazard Model to be specific, should be used to study the transition to marriage where the age at first marriage marks the transition (or failure rate) from a state of being single to one of being married. Essentially, the interest is in the 'survival' of women until they get married where first marriage may be considered to be the terminal event. However the Cox regression model could not be used given that both the BDHS and the NFHS only included ever-married women. Instead the linear regression model was carried out in order to compare the predictors of marriage in Bangladesh and West Bengal.

The co-variates used were religion, place of residence, female and husband's education, and socio-economic status. The respondent's characteristics before marriage, for example, her place of residence or the socio-economic status of her natal home, as the co-variates in the model. Except for one question on the respondent's childhood place of residence, the NFHS and DHS surveys only collected data on the respondent's characteristics at the time of survey. Thus the analysis had to be undertaken on the assumption that their circumstances did not change significantly after marriage. While some variables like religion usually remains constant over time, others, for example, socio-economic status and place of residence can change upon entry to marriage.

In order to serve as a proxy for socio-economic status, a wealth index was constructed using a combination of household possessions and living arrangements. Principal component analysis has sometimes been used to construct a socio-economic index, using a range of household assets and possessions recorded in the DHS surveys. I opted for using a simple index using the same eleven variables for Bangladesh and West Bengal, consisting of a combination of household possessions and living arrangements. Each household was given points for possessing items like watch, bike or chair. A respondent living in *pucca* (concrete/cement) housing was given three points compared to somebody in semi-*pucca* accommodation who was

given two, compared with one point for a respondent in *katcha* (basic/rudimentary) housing. The minimum a respondent could score was 3 and the maximum 17. The same cut off points were used for Bangladesh and West Bengal in order to get three categories of socio-economic class.

Table 2-8: Frequencies of the variables used in the regressions

	Bangladesh		West Bengal	
Variables	1993-94	1999-2000	1992-93	1998-99
Respondents' education				
No education	54.8	43.3	53.2	38.7
Primary	28.9	28.2	24.2	23.1
Secondary+	16.3	28.2	21.6	38.2
Respondents' age				
Below 24	36.0	33.5	27.3	25.0
25-34	36.0	35.0	36.4	36.7
35+	28.0	31.3	36.4	38.3
Children ever Born				
None	11.0	11.1	12.5	10.9
1-2	33.5	38.1	36.3	46.3
3+	55.5	50.7	51.0	42.8
Family planning use				
Modern methods	26.3	33.3	5.7	13.6
Sterilization	9.0	6.8	27.5	29.6
Traditional methods	7.7	10.2	18.7	21.0
Not using contraception	57.0	49.7	48.1	36.0
Husband's education				
None	45.0	38.6	20.3	24.0
Primary	23.6	21.2	23.0	38.5
Secondary+	31.3	40.2	46.7	37.5
Husband's occupation				
Professional/Administration	7.1	30.8	13.9	30.5
Agriculture	37.7	27.4	28.8	30.4
Skilled Manual	30.4	13.9	37.2	23.9
Unskilled/other	24.8	28.0	20.1	15.2
Religion				
Non-Hindu (mainly Muslim)	87.6	86.6	29.8	21.2
Non-Muslim (mainly Hindu)	12.4	13.4	71.2	78.8
Residence				
Urban	15.2	29.9	20.8	44.2
Rural	84.8	70.1	79.2	55.8
Index of Socio-Economic status				
Highest	7.1	12.5	16.6	24.9
Middle	39.7	53.4	49.2	41.4
Lowest	52.9	34.0	34.2	33.7

Source: Frequency table of recoded variables used for regressions

Some basic differences between the populations of the two Bengals are reflected in the frequency table. Both men and women have higher levels of education in West Bengal. Between the two surveys over the 1990s, a substantial number of people had moved up from low to middle levels of socio-economic status in Bangladesh. Within the same period in West Bengal, social mobility was from middle to the highest class (as defined in this study). These were the main variables used in the regressions presented in Chapters 5 and 6.

2.4 Conclusion

As discussed above, the time series of annual rates of births and deaths for the twentieth century has been constructed for West Bengal and Bangladesh using registration data which were adjusted for under-registration. The main weakness of this time series is that it was constructed using different data sources for the two regions thus possibly compromising comparison of trends over time. Each method of recording/collecting vital events has its own inherent problems, and by using more than one data source to construct a time series, inconsistencies may be introduced.[24] Moreover, the indirect methods of Growth Balance and Reverse Survival do not give full-proof results.

Nevertheless this was the best that could be done, given the dearth of reliable demographic data for the Indian sub-continent, especially for the 1950s, 1960s and 1970s. A time series was central in the study of the timing of the demographic transition. For West Bengal, I have used vital registration data for the period 1900-1979 with suitable corrections, and SRS data thereafter. In the case of Bangladesh, I used vital registration data until 1966 (adjusted for under-registration) and Matlab data from 1966 onwards. The use of Matlab data is often criticized as not being representative of Bangladesh because a) the sample is small and not nationally representative and b) the very act of surveillance can alter the behaviour of a population. The Matlab area is better served by family planning and healthcare facilities than the rest of the county. However this is only true of the "treatment areas" or the experimental zones of the Matlab Demographic Surveillance System

[24] Matlab is the only source of consistent, continuing annual data-series available for the country from 1966 onwards.

where family planning and mother and child healthcare interventions have been in effect since 1978. Since that year, demographic data have been published for the "treatment area" (which is subjected to interventions) as well as the "comparison area" (which does not benefit from any exceptional intervention). Yet, Matlab DSS data is used widely because it is the only source of consistent and reliable demographic data available for the country. In order to avoid bias, the average of the Matlab "comparison area" and "treatment area" were used in constructing my time series for Bangladesh. In addition, this chapter introduced the variables and statistical models which form integral parts of Chapters 5 and 6 of the dissertation.

The next chapter explores the demography of pre-Partition West Bengal and Bangladesh in greater detail using more refined sex and age specific measures of fertility and mortality and their determinants.

3 Chapter 3: THE DEMOGRAPHY OF BENGAL: 1900-1947

This chapter compares the population trends and their determinants in pre-Partition Bangladesh and West Bengal, drawing heavily on part of the time series discussed in the preceding chapter. It highlights the events occurring during this period, which plausibly shaped the subsequent demography of the region. All the rates presented here were calculated for West and East Bengal individually using registration and census data for undivided Bengal. The chapter starts with an introduction to basic demographic differences between the two Bengals before exploring fertility and mortality in greater detail. Migration is also touched upon before summarising the main findings.

Population change is a function of the rates of birth, death and migration. In pre-Partition India, the rate of population growth was largely determined by the death rate (Davis 1951). The synergism of endemic diseases, poverty, warfare and famines severely retarded the growth of population until the early decades of the twentieth century. An additional influence played a role in paving the course of the demography of the province of Bengal - namely, the British presence. The trade policies of the East India Company for at least a hundred years until 1857, and the development projects undertaken by the British Crown between 1857 and 1947, much influenced the subsequent trends in ecology, socio-economic structure and the general health of the population (Arnold, 1999; Sinha, 1998; Harrison, 1994). The province of Bengal stands out in that major famines, epidemics, and political upheavals continued to characterize its demographic history during the first fifty years of the twentieth century when they had more or less subsided in other parts of the Indian Sub-continent.

3.1 Comparison of Population Size and Growth

An insight into the basic demographic differences between the two Bengals is provided in Table 3-1. West and East Bengal comprised roughly a third and two-thirds of the total land area of the province, respectively. Assuming that the level of census undercount was the same across Bengal, the level of intercensal increase as

well as the rate of annual growth was generally higher in West Bengal during the first half of the last century as seen in Table 3-1. The period around the 1918-1919 influenza epidemic was the exception when West Bengal may have experienced negative growth. The high mortality conditions kept the average annual growth rate below one percent until the 1930s. The relatively greater intercensal increase in population in post-1921 West Bengal is explained by a higher level of net migration into West Bengal as well as a higher rate of natural increase. The rate of natural increase is the difference between the crude birth and death rates. Thus it can increase with an improvement (decline) in the death rate. The death rate was exceptionally high in West Bengal until the 1920s. Environmental and ecological, among other factors contributed to the relative unhealthiness of the west where malaria was endemic (Learmonth, 1957). Malaria was the most important cause of death in the province at the time. According to a report pertaining to the 1930s, the province accounted for 40 percent of the total cases of malaria infections and deaths in the country (Ray, 1998). Malaria related mortality was exacerbated by long-term ecological processes as well as the development projects undertaken by the British. The urban hub around Calcutta was home to migrant workers from all over the country. And the high density of population in urban centres facilitated the rapid transmission of diseases. However the decade of the 1920s was the turning point when the death rate started declining steadily in the western part of the province relative to east, resulting in a high rate of population increase. These processes are discussed in detail in the course of this chapter.

Table 3-1: Selected population statistics of pre-Partition West Bengal and Bangladesh

Year	Population		Annual Growth (%)		Percentage increase (%)		Population Sex Ratio (f/m)		Population Density (sq km)	
	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
1891	14050828	23150967							193	222
1901	15222385	24678870	0.80	0.69	8.34	6.60	.952	.909	209	236
1911	16135390	26813744	0.58	0.82	6.0	8.65	.917	.961	221	257
1921	15732706	28046514	-0.25	0.45	-2.48	4.58	.819	.952	216	269
1931	16965527	29825801	0.75	0.61	7.84	6.34	.840	.971	233	286
1941	21033010	35166323	2.14	1.65	23.97	17.91	.847	.729	289	337
1951	24139150*	37217854*	1.37	0.57	14.7	5.81			332	357

Notes: All the rates and estimates, including size of population presented were calculated based on the author's territorial definition of pre-Partition East and West Bengal. Bengal Presidency constituted a total land area of 183,560 square kilometres (1911 census) out of which West Bengal was defined by the author to have an area of 72,732 and East Bengal an area of 104,355 square km. WB is West Bengal and EB is East Bengal. *The 1951 population estimates presented for both regions are consistent with the geographical and population boundaries used to calculate those for the preceding decades.

Source: Census reports of Bengal – 1891, 1901, 1911, 1921, 1931 and 1941; Census report of Pakistan, 1951; Census report of West Bengal and Sikkim, 1951.

3.1.1 Sex Ratio in Bengal

Population sex ratios are determined by the combined effects of sex ratio at birth, sex differentials in mortality, under-enumeration of females in censuses, and migration patterns.[25] The sex ratio at birth, calculated by the author using registration data, was relatively masculine, averaging 1.08 in West Bengal and 1.07 in Bangladesh between 1901 and 1941. A balanced sex ratio is considered to be 1.05 since females are biologically predisposed to better survival chances than male. Masculine sex ratios at birth, as observed for Bengal for the first half of the last century, may be explained by both female infanticide and under-count of female births (Vishwanath, 1998; Panigrahi, 1972).[26]

[25] The technology for sex-selective abortions became widely available in India much later, during the last thirty years or so of the twentieth century.

[26] Female infanticide was most widely prevalent among *Rajputs* of northern India, and also among Gujaratis, and *Jats* of Punjab. The sacrifice of Bengali children by throwing them into the River Ganges is not unheard of. The fact that an Act was passed in 1804 proclaiming the banning of female infanticide in all territories of the Bengal government suggests that the practice may have been fairly common in the province (Panigrahi 1972:18).

West Bengal had a population sex ratio of .952 in 1901, implying that there were 952 women for every 100 men. The most important factor contributing to masculine population sex ratios in India is excess female mortality at young and reproductive ages (Griffiths, Matthews and Hinde, 2000). Using a simulation approach, they demonstrated that the persistent prevalence of even small differences in childhood mortality can result in long-term masculine population ratios. Analysis of age and sex-structural data on Bengal shows that the provincial under-fifteen female mortality rate was consistently lower than the male mortality rate between 1900 and 1940 (Sanitary Commissioner's annual reports). Chowdhury (1989), had arrived at the same odd conclusion although he did not probe into the causes. The phenomenon of female advantage in under-fifteen mortality recorded in pre-Partition Bengal is highly unlikely to be real. It is plausibly explained by large numbers of female under-fifteen deaths going unrecorded thus camouflaging the true extent of excess female mortality at young ages which translates to excess female mortality at adult ages and thus masculine sex ratios. Discrimination during childhood, along with early marriage and repeated childbearing, generally contribute to female excess mortality at adult ages, as established by Griffiths et al (2000).

The generally more masculine sex ratio observed in West Bengal is explained largely by a higher proportion of male migration to Calcutta, and to some extent, by under-enumeration of females (Visaria, 1967). The improvements in mortality during the 1920s is reflected in the population sex ratios of 1931 which increased relative to 1921 in both the Bengals. West Bengal seems to have followed the classical pattern of progressive masculine sex ratios as pointed out by Mari Bhat (2002). While the post-Partition masculine sex ratios are largely attributable to sex-selective abortion, the pre-Partition ones are explained by improved mortality, migration, and systematic under-reporting of women. Finally, the highly masculine sex ratio of 726 recorded in Bangladesh in 1941 is likely to be a manifestation of the poor quality of the 1941 census data.

3.1.2 Population Density

The higher average population density in East Bengal (Table 3-1) is accounted for by the fertile rice-producing tracts around the *Padma* and *Jamuna* rivers, namely the districts of Pabna, Faridpur, Dhaka and Mymenshingh. The pre-dominant

agricultural structure, along with the relative healthiness of the east, were important determinants of growth and density in pre-Partition East Bengal. The effect of religion has been established in various studies (for example, Davis, 1951; Mandelbaum, 1974). It is taken up in detail in later sections.

Table 3-2 suggests that Bengal had two areas of high density - one was the urban hub comprising Hooghly, Howrah and Calcutta, and the other along the rice producing tracts of eastern Bengal. The density of urban West Bengal was significantly higher than that of the high density hub of East Bengal. And it increased dramatically from 1931 onwards. This is explained by improving quality of censuses over time, improved mortality, industrial growth, and finally increased Partition-related migration to West Bengal.

Table 3-2: High density hubs of East and West Bengal (in sq km) - 1872-1951

	1872	1891	1901	1911	1921	1931	1941	1951
Urban WB	9673	8495	9682	10257	10412	14163	23328	28038
Rest WB	436	411	442	464	446	477	559	631
High Dens EB	537	679	737	817	865	940	1134	1133
Rest EB	457	478	502	533	542	567	648	702

Note: Urban West Bengal comprises Calcutta, Hooghly and Howrah. The densely populated parts of East Bengal comprised the central districts of Bogra, Pabna, Dhaka, Mymensingh Faridpur and Noakhali.

Source: Calculated by the author using Census reports for relevant years.

3.1.3 Growth Rates Compared

The difference between the intercensal growth rate and the crude rate of natural increase (CRNI) gives a rough indication of the level of migration (Dyson, 1989). According to Table 3.3, net migration predominantly influenced the level of intercensal growth in population in West Bengal. It was mainly natural increase in the east, resulting from a high birth rate.

Table 3-3: Estimates of intercensal growth rates and crude rates of natural increase: 1900-1950

Decade	10-year CBR		10-year CDR		CRNI		I. Growth rate		Net Migration	
	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
1901-10	50.0	53.2	48.1	49.4	0.19	0.98	0.58	0.82	0.39	-0.16
1911-20	46.1	52.5	51.1	46.5	-0.50	0.60	-0.25	0.45	0.25	0.07
1921-30	42.9	42.9	38.9	38.3	0.40	0.46	0.75	0.61	0.35	0.15
1931-40	41.7	45.1	31.6	34.1	1.01	1.10	2.14	1.65	1.13	0.55
1941-50	31.8	32.6*	29.1	38.8	0.27	-0.62	1.37	0.57	1.1	-0.05

Notes: The registered 10-year Crude Birth Rates (CBR) and Crude Death Rates (CDR) were adjusted using the correction factors 1.49 and 1.55 for West Bengal and Bangladesh, respectively. These correction factors for West Bengal and Bangladesh are the averages of the estimates obtained using the Growth Balance Method and the Reverse Survival Technique (details in Chapter 2). The Crude Rate of Natural Increase (CRNI) is the difference between the 10-year CBR and the 10-year CDR. The figures have been expressed in percentage terms in order to make them more comparable to the intercensal growth rates.
*The Public Health Reports did not publish registration data for East Bengal after 1945.

Source: Calculated by the author using relevant census and registration data

The figures presented in Table 3.3 are only estimates obtained by applying indirect techniques to age-structural data (details in Chapter 2). A higher rate of natural increase in East Bengal is explained by two main factors – firstly, the region's relative healthiness and therefore lower death rates, and secondly, the predominant Muslim population in the east whose fertility has historically been higher than that of Hindus. The healthier east of the province was relatively malaria-free when the disease is known to have fertility-inhibiting properties (Langford, 1996). Repeated attacks of malaria left its survivors weak and vulnerable to other disease. The disease also increased the rate of fetal loss. Malaria attacked the young and pregnant fearsomely (Klein, 1972). Pregnant women are more vulnerable to malaria infection than the general population and once infected, the risks are very high for complications like abortion, premature births and stillbirths (Nair and Nair 2003; Shulman and Dorman, 2002). The religious aspect operates mainly through the restrictions on widow re-marriage and polygamy in Hinduism. The final and somewhat secondary explanation is that East Bengal was relatively less urban, educated and industrialized.

Mandelbaum (1949) attributed the higher rate of population growth between 1881 and 1941 to better nutritional status in East Bengal in relation to the west. His

argument was that the level of nutrition was higher in East Bengal because the production of profitable crops like jute and rice was higher. Incidentally Travancore (comprising present-day Kerala) experienced a similar increase in population during the same period following an increase in the production of plantation of crops like tea, coffee, and rubber. Unlike East Bengal or Travancore, the population of the Ganges valley, encompassing most of West Bengal, stagnated between 1881 and 1941 despite being among the first in British India to benefit from 'western patterns of disease control, stable government and famine alleviation' (Mandelbaum 1949:286). He contended that there was no substantial increase in per capita food production in the Ganges valley where the malnourished population fell prey to tuberculosis and other diseases.

Mandelbaum's assertion that the nutritional level was higher in East Bengal is plausible. However it was more likely to have been attributable to dietary differences among Hindus and Muslims, and to general 'healthiness' of the east. There are stricter dietary restrictions in Hinduism than in Islam and therefore the latter population has a more varied diet. Sinha (1998) corroborated this proposition about the diet differential between the Hindu and Muslim populations. In addition, Hinduism and Buddhism generally encourage vegetarianism. That said, the populations of both East and West Bengal have historically been known to be ardent fish-eaters thus supplementing their staple diet of rice which is otherwise devoid of protein and nutrients.[27]

According to the final column in Table 3.3, the level of in-migration has consistently been higher in West Bengal. The urban hub around Calcutta served as the most important centre of trade and industry in eastern India. A large proportion of the urban population of West Bengal comprised migrant workers from all over India, including East Bengal. The trend of migration from east to west of the province may have increased during the period 1880 and 1980 when the agricultural sector was on the decline (Haan, 1995; Schendel and Faraizi, 1984). The final deduction from Table 3.3 is that the series of crises during the 1940s, in particular the famine of

[27] Hence the expression '*mache bhate bangali*' is associated with Bengalis which translates to, 'Bengalis live on rice and fish'.

1943-44 and impending Partition, resulted in net out migration from the East and a significantly large volume of in-migration to West Bengal.

3.1.4 Vital rate time series

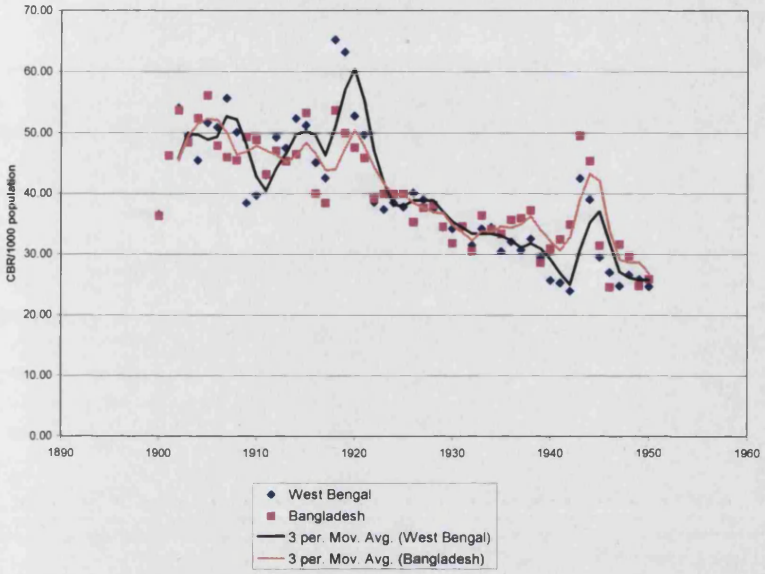
One way of assessing the impact of the crises during the period 1900-47 on the demography of the two Bengals is to examine trends in the annual rates of birth and death. Generally during a crisis year, the death rate would rise and the conception rate would fall, resulting in a dampened birth rate the following year. Food prices had a big influence on vital rates in historical India too; the birth rate would be high when the preceding year was relatively disease-free and food prices were stable (Dyson and Maharatna, 1991).

Critical events, for example famine or major epidemic, did not affect the province uniformly – some had a greater impact on East Bengal while others on West. The year 1902 was a bad one in terms of mortality from epidemics (Sanitary Commissioner's Report for 1902). The magnitude of its effect on the vital rates was similar in the two wings. However East Bengal may have been relatively worse affected by the crisis year of 1905 and West Bengal by 1907 when there were food scarcities accompanied by high prices.

The patterns and trends in the death rate were similar in the two Bengals although the levels varied, as depicted in Figure 3-1. West Bengal is clearly seen to have had a higher and a more volatile crude death rate than East Bengal during the early decades of the twentieth century, accounted for by its relative 'unhealthiness'. The period following the 1918-19 influenza epidemic was the turning point when the crude death rate became lower in West Bengal and has been so ever since. Details of the influenza epidemic are covered in later discussions but Figure 3-1 unmistakably shows that the epidemic had a far greater impact on the death rate in West Bengal than in East. Then again the excess mortality from the 1943-44 famine was much more pronounced in East Bengal. Considerable mortality gains were made during the 1920s and 1930s. The overall picture given by Figure 3-1 is of a declining trend in the death rate in both the Bengals since the beginning of the last century, only to be interrupted by the 1918-19 influenza epidemic and the 1943-44 famine.

Furthermore, the death rates did not return to pre-crisis levels after the influenza epidemic nor after the famine in either of the two wings of the province, suggesting that the decline in the death rate over this period was the continuation of a trend that initiated earlier, plausibly around the beginning of the twentieth century.

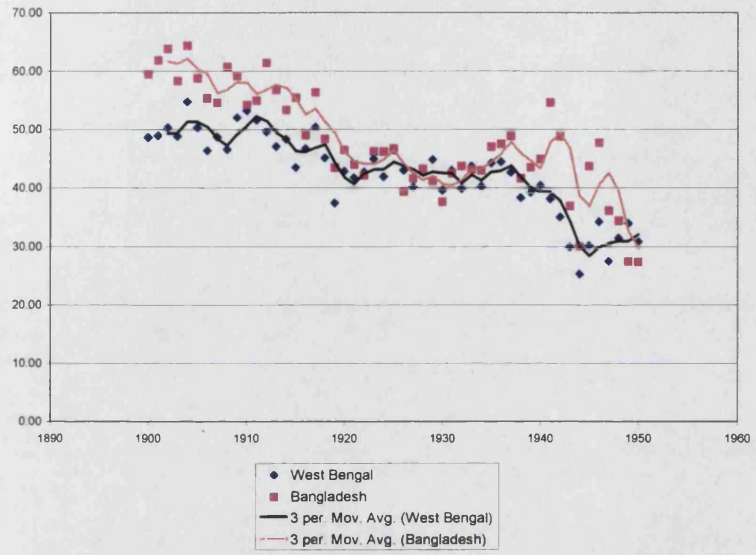
Figure 3-1: Annual crude death rates in Bangladesh and West Bengal 1900-1949



Source: Annual registered CDR in East Bengal (Bangladesh) and West Bengal were calculated using data for undivided Bengal. The registered rates were corrected using suitable correction factors (details in Chapter 2 and Appendix A).

As far as trends in infant mortality rate (IMR) are concerned, they are almost identical to that in the crude death rate. The IMR was higher in West Bengal than in East until the early 1920s when the overall CDR was also higher. However with the improvements in malaria and cholera mortality during the 1920s and 1930s, the infant mortality rate in West Bengal declined considerably. By the 1930s, the IMR in West Bengal was lower than that in East Bengal and the difference widened over time. However the rates are comparable in the two wings today after Bangladesh made rapid gains in fertility and mortality since the 1980s. Infant mortality is discussed in greater detail in Chapter 5.

Figure 3-2: Annual crude birth rates in Bangladesh and West Bengal 1900-1949



Source: Annual registered CBR in East and West Bengal were calculated using data for undivided Bengal. The registered rates were corrected for under-registration using suitable correction factors (details in Chapter 2 and Appendix A).

West Bengal has consistently had a lower birth rate than East. The yearly fluctuations in the birth rate were usually in response to either an epidemic/crisis or a rise in food prices in the preceding year. A dip in the birth rate in any year was usually followed by an upsurge in the next few years as a result of couples compensating for the delayed and postponed marriages and conceptions during crisis years (Dyson and Maharatna, 1991). The magnitude of the impact of the influenza epidemic on the birth rate seems to have been about the same in the two wings of the province, as seen in Figure 3-2. However East Bengal may have been relatively worse affected by the crises of the 1940s. The determinants of the vital rates are discussed in detail in later discussions.

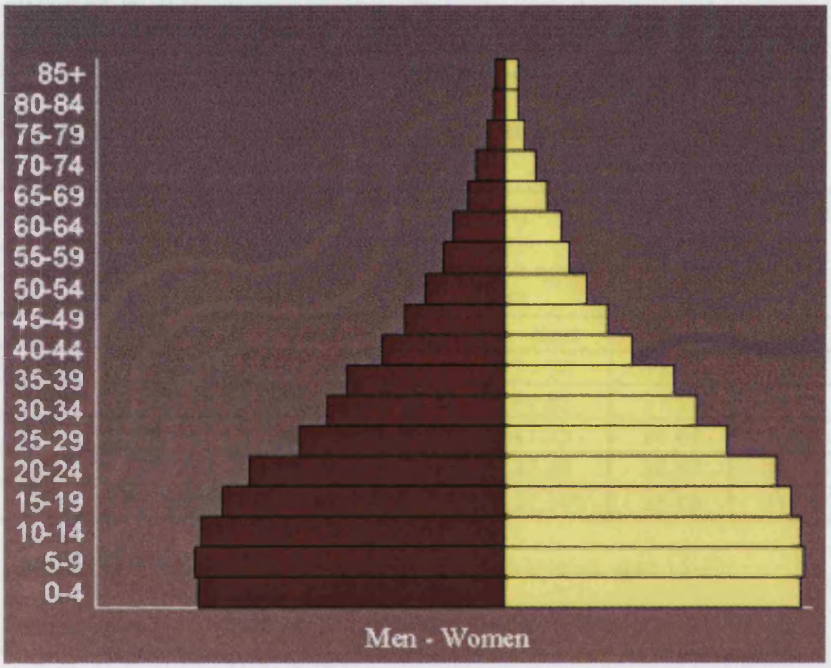
3.1.5 Age structure

It is useful to study some basic age-structural indicators in order to validate the trends in fertility and mortality presented for East and West Bengal so far. Age composition at any point in time is determined by past trends in births, deaths and migration (Coale 1956, 1972). A declining death rate usually has two contradictory

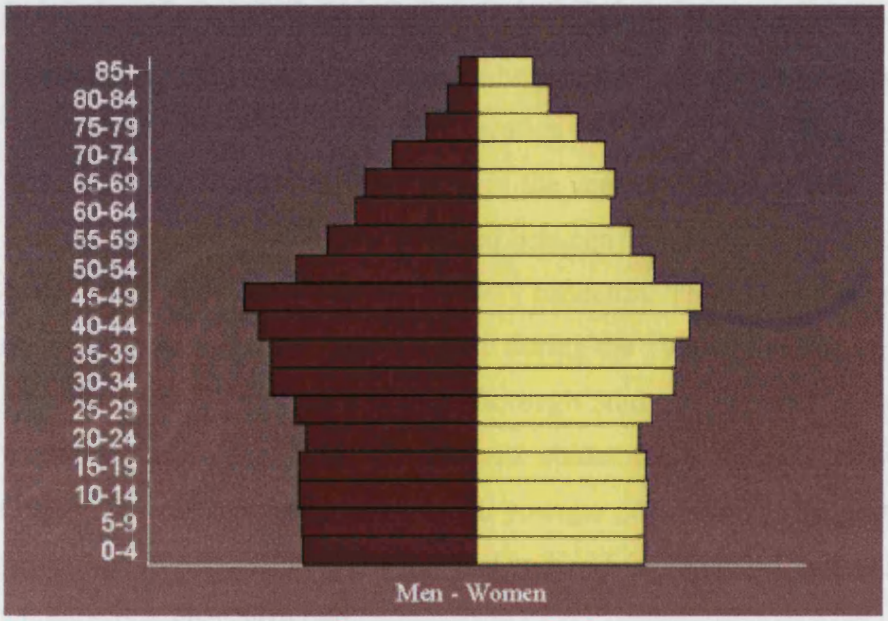
effects. On one hand it results in more people surviving from birth to older ages. On the other hand, it creates a younger age structure since the younger cohorts are progressively larger in size. A declining birth rate usually results in an older population as the younger cohorts re progressively smaller in size.

Figure 3-3: Population age structure under declining death and birth rate

(Young population with a declining death rate)



(Ageing population with a declining birth rate)



This first population pyramid reflects the typical age structure of a developing country like India where the death rate has been declining faster than the birth rate. There are more people in the younger and reproductive age groups than there are older. The second pyramid portrays the age structure of a developed country like the United Kingdom, where a declining fertility over the years has created an ageing population with more people in the older than younger age groups. With this background, I will examine the effect of the change in the CDR and CBR on the age structure of Bengal.

Table 3-4: Age structure in East and West Bengal: 1901-1941

	Female population		Percentage of female population aged 15-40		Percentage of total population aged below 15		Percentage of total population aged below 5	
	West	East	West	East	West	East	West	East
1901	7400266	11745693	40.34	39.30	37.18	42.12	12.7	14.8
1911	7724285	13135377	42.22	40.82	37.11	42.45	12.8	15.1
1921	7095742	13687035	46.48	41.35	34.44	42.05	10.5	13.8
1931	7754097	14705454	44.50	42.40	36.57	42.71	13.7	16.4
1941	9626504	14822140	53.17*	51.14*	35.86	41.18	12.2	18.7

*Notes:** For 1941, the female population refers to women aged 15-49.

Source: Calculated by author using relevant census reports

West Bengal had relatively more women in the reproductive ages. This is perplexing considering that the West was more disease-prone. It is possibly explained by a lower birth rate in comparison to East Bengal and therefore lower levels of maternal mortality. It could also reflect greater healthcare utilization among women of West Bengal or greater levels of female education and urbanization. Another hypothesis is that female representation was better in the census and registration reports of West Bengal. The percentage of women aged between 15 and 40 in West Bengal increased quite significantly following the 1918-19 influenza. This either indicates that female mortality improved faster than of male during the 1920s or that the male population bore the brunt of this epidemic. A thorough study of age and sex specific excess mortality during the 1918-19 influenza epidemic in India is provided by Mills (1989). The east generally had a much younger population as suggested by both the percentage of population under five and under 15 in Figure3-4, which is explained by a relatively higher birth rate.

3.2 Fertility in Bengal

The kind of data needed to study the proximate determinants of fertility (which include marriage, contraceptive use, abortion and post-partum infecundability) are not available for the period in study. Agarwala (1962) provided the mean age at marriage at the provincial level for pre-Partition India. His work suggests that the mean age at marriage for Muslim women was higher than that for Hindu women in India during the first half of the twentieth century. The trend was no different in Bengal – the Muslim mean age at female marriage was consistently higher than the Hindu age between 1891 and 1921, confirming the assertion made in Chapter 1 that early age at marriage in Bengal has its roots in Hinduism.

Table 3-5: Singulate Mean Age at Marriage in Bengal by Religion (1891-1931)

	1891-1901	1901-1911	1911-1921	1921-1931
Muslim male	20.0	20.7	20.9	16.9
Muslim female	11.5	11.8	12.4	10.2
Hindu male	18.2	22.3	22.1	19.7
Hindu female	10.6	11.0	11.5	11.0

Source: Agarwala (1962: pages 143 and 157)

The lower Hindu than Muslim age at marriage for men in 1891-1901 in Table 3-5 is intriguing. This was possibly before modern education came into the forefront of Bengali culture during the early twentieth century. Hindu men were more likely to stay in higher education thus explaining their higher age at marriage compared to their Muslim counterparts during the early decades of the twentieth century. However Hindu female age at marriage has consistently been lower than Muslim despite their higher educational achievement possibly because Hindu scriptures strictly prescribed the practice. It could also be that Muslims were economically more backward in Bengal when poverty is known to push up the age at marriage (Lindenbaum, 1981, Mukherjee, 1949). However the recent NFHS reports suggest that the Muslim age in West Bengal is lower than their Hindu counterparts, reflecting their backwardness in modern education.

The general fertility rate (GFR) and the child woman ratio (CWR) are two measures of fertility. These rates have been consistently higher in East Bengal (Table 3-6).

West Bengal recorded a higher GFR in 1931 in relation to 1921, reflecting the mortality gains of the 1920s when women in the reproductive ages benefited. Improvement in malaria mortality itself can also increase the birth rate by reducing the incidence of foetal loss (Langford, 1996). The general downward trend in the GFR and CWR over time is reflective of a changing age structure brought about by gains in mortality.

Table 3-6: Age-specific fertility indicators

	General Fertility Rate (GFR)		Child Woman Ratio (CWR)	
	West	East	West	East
1901	167.64	222.16	0.648	0.791
1911	142.63	177.59	0.630	0.750
1921	133.79	140.90	0.501	0.685
1931	141.99	132.48	0.654	0.782
1941	105.22	123.91	0.518	0.591

Notes: GFR was calculated by dividing the total births registered during the three years around the census year, by the female census population aged 15-40.
Child/Woman ratio was defined to be the percentage of population aged under five by the female population aged 15-39. The consistent exclusion of the age group 40-45 in the denominator should not make an considerable difference in the rates.

Source: Calculated by author using relevant census data

3.2.1 Reasons for fertility differentials

This section mainly addresses the socio-economic and cultural factors through which the proximate determinants affect fertility. One of the most significant differences between the east and west wings of the province has been in terms of religion – West Bengal has been predominantly Hindu and East Bengal overwhelmingly Muslim . Only the two pre-dominant religions, Hinduism and Islam are considered in this section; the other major religions, namely Christianity, Buddhism, Jainism together has constituted only a fraction of the total population of the province of Bengal.

Table 3-7: Percentage of Hindus and Muslims in West and East Bengal, 1901-1941

Year	Hindus (%)	Muslims (%)	Other (%)	Total (%)
West Bengal				
1901	70.86	25.98	3.16	100
1911	69.61	26.31	4.08	100
1921	68.54	26.07	5.39	100
1931	69.88	26.65	3.47	100
1941	67.05	26.18	6.77	100
East Bengal				
1901	33.18	65.99	0.83	100
1911	32.77	66.11	1.12	100
1921	30.66	67.99	1.35	100
1931	29.93	69.16	0.91	100
1941	28.63	69.71	1.66	100

Source: The above calculations were based on census data for undivided Bengal for the relevant years. Author's territorial definition prevails.

According to Table 3.7, the proportion of both Hindus and Muslims remained more or less constant in 'unhealthy' West Bengal during the early decades of the last century. The proportion of Muslims increased in East Bengal over time because they have higher fertility and also because they lived in the relatively disease-free part of the province. The salient feature of the religious composition of East Bengal is that there were far fewer people of other religions than in West Bengal. A big portion of the 'other' category in West Bengal comprised the European community (comprising mainly the British). Growth of the industrial and commercial sector in West Bengal under the British Crown attracted people of different faiths from all over the country. As mentioned in Chapter 1, Eaton (2001) gives an insightful account of why East Bengal came to be the home of the Muslims of the province. He points out that although there has been a presence of Muslim regimes in Bengal since the thirteenth century, the existence of noticeable proportions of Muslim cultivators can only be traced to the late sixteenth century under *Moghal* rulers who gave tax free tenures of land to clear and cultivate to men who were willing to convert to Islam.[28] Unlike West Bengal, the east was initially uninhabited and insulated from *Brahmanic* culture and only slightly touched by Indo-Aryan civilization (ibid). West Bengal developed much earlier than the east thus enjoying greater social stratification and

[28] Some of them went on to become *pirs* who are much revered religious leaders with mystical abilities.

occupational specialization (Obaidullah, 1966). The east of the province was less physically accessible and largely uninhabited until the *Moghal* rulers persuaded Hindus to convert by enticing them with cultivatable land.

Using census data for 1891 to 1941, Davis (1951) calculated the Child Woman Ratio (CWR) and established that the fertility rate of Muslims was a third higher than that of Hindus in the Indian sub-continent. Bengal's experience was no different – East Bengal, which was pre-dominantly Muslim, had higher fertility rates. The higher observed fertility rates of Indian Muslims may be attributable to both religious as well as to socio-economic factors (Davis 1951:92). Conversion from Hinduism to Islam had ceased to play a significant role in explaining the relative increase in Muslim population since the end of *Moghal* rule in India. Mandelbaum (1974:47) espoused that religion did influence fertility in Bengal but it operated indirectly through economic and educational forces. He maintained that more Muslims than Hindus tended to be in low socio-economic and educational levels at which people of all faiths have high fertility. On the other hand, Bloomfield (1968) contended that the Muslims in Bengal had a higher rate of population growth than Hindus because the overwhelming majority of Muslims lived in the healthier and more prosperous areas of eastern and northern Bengal, while most of the Hindus in the 'unhealthy' west.

The predominant occupation in the east could also have played a part. The positive correlation between agriculture and large family size is well documented. In rural agrarian societies, children are considered to be assets contributing to family resources by engaging in agricultural work from an early age (Cain 1978, and Arthur and McNicoll 1978). On the other hand, urbanization is less conducive to large families, mainly through the breakdown of the extended family system. The east was overwhelmingly agrarian and largely insulated from the western interventions which the west enjoyed, namely communication and educational infrastructure, public health interventions and urban growth. In addition, nutritional status may have been better in East Bengal (Mandelbaun, 1949).

An important explanation for the higher levels of fertility observed among Muslims was their backwardness in education (Table 3-8). Sinha (1965) noted that, English education during the nineteenth century was monopolized by the Hindu upper

classes. A brief historical background of the Muslims in Bengal may be useful at this point. Historically there have been two kinds of Muslims in Bengal, the *Ashrafs* (noble-born people) who claimed to be the direct descendants of the associates of the Prophet Muhammad, and the *Atrafs* (low-born people) who were mainly converts from Hinduism and Buddhism (Murshid, 1995, Ahmed, 1981). The *Ashrafs,* or the immigrant class from Persia and Afghanistan, almost always spoke Urdu and Persian/Arabic whereas the native *Atrafs* spoke only Bengali. The noble-born group maintained a sense of aristocratic pride by not associating with the low-born *Atrafs*. According to Eaton (2001:26), they 'cultivated a Persio-Islamic civilization'. They held high positions in civil, military and revenue sectors, but most importantly in the courts where Persian was the main language until 1837 (Sinha 1965). The *Atrafs*, on the other hand, were mainly cultivators living in the countryside. The *Ashrafs*, of whom there was only a handful compared to the A*traf* class, were to be found in West Bengal, because of the occupations they tended to be employed in. Agriculture was looked down upon by the *Ashraf* class - any manual labour was considered to be in the domain of the A*trafs* (Ahmed, 1981).

A number of factors explain why Bengali Muslims were not as forthcoming as Hindus in adopting English education or were not willing to participate in the new system set up by the British in India. For example, they considered the British to be responsible for the political and economic demise of Muslims in India. Muslim rulers of India were of the immigrant or noble *Ashraf* class who had to accede to British rule during the eighteenth century. Thus they may have been skeptical or resentful about embracing anything introduced by the British. Education was not a priority among either the *Ashrafs* or the *Atrafs,* but for different reasons. The 1901 census recorded about 6.6 percent of the Hindu population of Bengal as literate, while the literacy rate among Muslims was about half as much - 3.5 percent (Table 3-8). The general feeling among *Ashrafs* plausibly was that any kind of education except Urdu and Persian would mean breaking away from their culture and tradition. The *Atrafs*, on the other hand, were mostly rural cultivators for whom formal education was of little consequence. And finally, the were fewer educational institutions in the predominantly agrarian east of Bengal relative to the west.

Table 3-8: Literacy and occupation in Bengal by religion, 1901-1941

	1901		1911		1921		1931		1941	
	Lit.	Agri.	Lit.	Agri.	Lit.	Agri.	Lit.	Agri.	Lit.	Agri.
Hindu	6.6	72	11.8	64.7	14	57.5	13.7	NA	17.4	NA
Muslim	3.5	81	4.1	86	4.8	70.4	5.7	NA	8.9	NA

Note: Lit. is literacy and Agri. is Agriculture.; NA not available

Source: Relevant census reports

The proportion of Hindus in agriculture in the province has always been lower than the proportion of Muslims as seen in Table 3.8. However, by 1921, there was a decline in the proportion engaged in agriculture, both among the Hindu as well as the Muslim communities possibly as a result of the decline in the agricultural sector in Bengal since the early twentieth century (Blyn, 1966; Islam, 1978). Education spread relatively rapidly and consistently among the Hindu population of Bengal during the first half of the twentieth century. It was only between 1931 and 1941 that there was any appreciable increase in the level of literacy among the Muslim population – the same time that there was a decline in the agricultural sector. With the decline in their main occupation, agriculture, they progressively felt the need to embrace the modern education that they had resisted for decades.

Table 3-9: Urban/Rural residence in West and East Bengal – 1901-1941

	Urban Population		Decadal Urban Growth (%)		Urban Population (%)	
	West Bengal	East Bengal	West Bengal	East Bengal	West Bengal	East Bengal
1901	1974946	556093			12.97	2.25
1911	2257856	630060	14.32	13.30	14.04	2.35
1921	2414220	707832	6.93	12.34	15.34	2.48
1931	3071172	965660	27.21	36.42	17.80	3.22
1941	4565580	1248413	48.70	28.87	21.71	3.55

Source: Calculated for West and East Bengal using census data on undivided Bengal for relevant years.

The final explanation for the higher observed birth rate among Bengali Muslims is that they have historically been less urban. At the beginning of the twentieth century, roughly 13 percent of the population of West Bengal (home to Hindus) was urban compared with only two percent in the east of the province (Table 3.9). Forty

years later in 1941, the figures increased to roughly 22 percent and three percent, respectively. The growth of urban population in West Bengal was largely due to the growth of Kolkata. It was the biggest port as well as the center of legal, educational and commercial activities in eastern India, not to mention the capital of British India. The jute mills and other industrial activities were concentrated in the nearby areas of Hooghly and Howrah (Haan, 1997). Of all the cities of the British empire, only London was thought to be greater than Kolkata at the opening of the twentieth century (Bloomfield 1968).

To sum up, the socio-economic backwardness of East Bengal which is largely explained by the history of Muslims in the province, is an additional factor beside the relative 'healthiness' of the east in explaining the higher observed birth rate in East Bengal during the pre-Partition period.

3.3 Mortality in East and West Bengal

Mortality patterns in pre-Partition Bengal has been rather unique in the context of India, and is integral in explaining the contemporary demography of Bangladesh and West Bengal. The following section highlights the salient features of the mortality transition of the province in the Indian context during the first half of the twentieth century before addressing the impact of the 1918-19 influenza epidemic and famine of 1943-33 on the populations of East and West Bengal.

The last two decades of the nineteenth century were exceptionally unhealthy for Bengal. This is explained by the series of famines, in particular, the famine of 1896-1897, which ravaged the province (Chakrabarti, 2004). All the Indian provinces experienced an improvement in the life expectancy by two to up to five years between 1881 and 1891. Bengal was the only province in British India to experience a worsening of mortality rates between 1881 and 1891. The average life expectancy in the province decreased by 1.7 years from 24.5 to 22.8 years (Census of India, 1891).

The death rate was higher in West Bengal because malaria, the most important cause of death in Bengal between 1880s and 1940s, was endemic there (Davis, 1951,

Arnold, 2001). Repeated attacks left its survivors weak and vulnerable to other diseases. The high density of urban populations aided the rapid transmission of epidemics. Nutritional status was perhaps lower in the west where the majority of Hindus resided for reasons discussed earlier. However, these disadvantages in West Bengal were at least partially offset by relatively better health services and sanitary interventions relative to East Bengal (Harrison, 1994). The province was the disseminating point of homeopathy in the country during the nineteenth century (Arnold and Sarkar, 2002). Soon this form of medicine harmonized with the traditional *Ayurveda* and may have gained the strongest foothold in Bengal among all provinces. It was used to treat malaria and cholera in the province (ibid).

Finally, topographical differences in the two Bengals, as outlined in Chapter 1, also contributed to differential patterns of mortality. The extensive river system was conducive to agricultural growth. The province was producing a third of India's total rice requirements until the 1940s (Uppal 1984). Over the course of time, the eastern half of the province remained hydrologically 'active' while the western half gradually became 'moribund' as the *Ganges* could no longer find outlets to the sea and started to silt up. The stagnant rivers of West Bengal, including the *Bhagirathi,* slowly decayed and became the breeding grounds for malaria-bearing mosquitoes. This marked the beginning of severe epidemics of malaria in the western and central districts of Bengal from the second half of the nineteenth century. Although malaria was endemic in west and central Bengal, severe epidemics only started from the late nineteenth century onwards, coinciding with the construction of the railway network.

In addition, the increase in production of water-intensive sugarcane and cotton, along with jute cultivation, contributed to high malaria mortality in Bengal (Sumanta, 2001). Therefore, the British trade policy of switching more and more land to the cultivation of cash crops exacerbated the ecological processes that increased the incidence of malaria in the province. The bulk of the development work undertaken by the British was concentrated in the west (Harrison, 1994) when there was believed to be a direct relationship between development work and outbreak of malaria (Klein 1972, 2001).

3.3.1 Cause-specific mortality

Patterns and causes of mortality changed over the period in study. Communicable diseases like malaria, cholera and smallpox were initially the most important causes of death in the province (Akhtar and Learmonth, 1968) and their virulence was exacerbated by external factors like the presence of the British in India.

> To begin with, British rule had created as many medical problems as it had resolved. The military conquests of the early twentieth century resulted in the spread of cholera from Lower Bengal to much of the subcontinent, while unregulated urbanization produced the conditions in which such diseases could thrive. Agricultural development also disrupted traditional systems of drainage, exposing huge tracts of the country to the ravages of malaria and waterborne disease.
>
> Harrison (1994:227)

Malaria in Bengal

By the end of nineteenth century, smallpox (Banthia and Dyson, 1999) and cholera (Arnold 1986) had ceased to be major causes of death in Bengal; only malaria continued to ravage the province. At the beginning of the last century, fever deaths accounted for almost 70 percent and 80 percent of all registered deaths in West and East Bengal, respectively (Table 3-11). In comparison, cholera accounted for between six and seven percent of all deaths around 1901. By 1931, malaria still accounted for the same percentage of total recorded deaths but the overall death rates had declined significantly. The decline in total death rate since 1921 is partly real and partly attributable to deteriorating registration.

Malaria was initially known as *Burdwan* fever, named after the district where the first outbreak was recorded. It has historically been most devastating in the districts of Nadia (present-day Kushtia) and Jessore in East Bengal, and Burdwan, Hooghly, and 24 Parganas in West Bengal. Malaria was believed to be hyper-endemic in West Bengal, and the major cause of population stagnation in the region (Learmonth 1957,

1981)[29]. The eastern part of the province was relatively free from malaria because of its open-tidal, clean-banked rivers, which allowed natural drainage into the sea.

Between 1901 and 1941, the region with relatively high malaria mortality constituted the districts around the *Ganges* – namely, Rajshahi, Malda, Dinajpur and Rajshahi to the north, and Murshibabad, Burdwan, Birbhum, Nadia and Jessore to the south of the river. What is interesting is that the incidence of malaria may have changed course over time. During the early decades of the twentieth century, the scourge of malaria had somewhat died down in the traditionally malaria hyper-endemic districts of Burdwan and Hooghly, but it increased in Jessore, Nadia, Murshidabad, Rajshahi, Malda and Dinajpur – that is, in central Bengal. In other words, the western districts of the province bore the brunt of malaria mortality during the late 1800s where as the central part may have suffered more from the disease during the early decades of the last century. The possible explanation is that that the disease was directly related to development projects undertaken by the British (Klein, 1972, 2001). These were initiated in West Bengal during the mid nineteenth century. The railway network was built in the west of the province first, then in central, and the system had least mileage in the east, thus explaining the virulence of the disease in that direction (Sinha, 1998). Klein (2001) argued that West Bengal was more prone to malaria not because there was more arable land/agriculture in East Bengal, but because there was more development work undertaken by the British.

Cholera in Bengal

Bengal was the homeland of cholera (Arnold 1986). It is believed to have spread from Jessore, and soon became endemic in the whole of British Bengal. The intensity of cholera was dependent upon rainfall and the amount of water in the rivers; when the water currents were slow, cholera was virulent. Cholera affected people of all ages given that it was water-borne whereas malaria affected infants and elderly more (Marshall 1987). Several interventions were put in place following the 1919 Act of self-government. These included free mass inoculation and disinfecting water sources, which helped to lower cholera mortality to a certain extent (Ray 1998).

[29] Learmonth (1957) distinguished between the regions where malaria was endemic (constantly, and in fairly regular increments), epidemic (occasional, but severe outbreaks), and hyper-endemic (severely affected endemic).

Cholera may have ceased to be a significant contributor to the overall mortality rate in either west or east Bengal from the beginning of the twentieth century (Table 3-10). Although historically believed to be a disease of East Bengal, its effect was no less in Hooghly, Howrah and Japlaiguri. In fact all communicable diseases spread fast in the urban hub of West Bengal, namely Hooghly, Howrah and Calcutta. The high population density along with the varying degrees of immunity levels of migrant workers aided the rapid transmission of diseases in these areas.

Smallpox in Bengal

'Smallpox was apparently endemic in Bengal in the eighteenth century and it had an epidemic cycle based on the rate of replacement of the unimmunized population' (Nicholas, 1981:33). An early history of inoculation against smallpox in the province, to be gradually replaced by vaccination from around 1802, may have kept the disease at bay (Banthia and Dyson, 1999). Smallpox ceased to be a major cause of death during the early decades of the last century, except for seasonal epidemics and breakouts during food scarcities and socio-political crises, for example, the 1943-44 famine and the 1971 war. When smallpox vaccination was first introduced in 1802, the system was far from perfect owing to reasons like opposition from *tikadars* (traditional inoculators), and an inefficient system of compulsory re-vaccination. Full coverage of rural Bengal was not achieved until 1922 (Ray, 1998).

Table 3-10: Registered cause-specific death rates in West and East Bengal

Year	Cholera		Fever		Respiratory Diseases		Other		Total	
	West	East	West	East	West	East	West	East	West	East
1901	2.23	2.37	24.25	25.42	NA	NA	8.55	3.08	35.03	30.87
1911	1.80	1.49	22.43	21.80	0.47	0.09	4.70	7.79	29.40	25.68
1921	1.26	1.53	25.03	25.39	1.96	0.29	7.63	2.74	35.41	29.95
1931	0.74	1.11	15.70	17.11	2.37	0.93	4.34	3.58	23.15	22.73
1941	0.56	0.71	13.53	15.31	3.00	1.58	1.75	3.88	18.82	21.48

Notes: All figures refer to three-year averages and thus 1901 relates to 1900-02, with the exception of 1941, which relates to 1938-40. The rates refer to deaths per thousand population. The 'Total' column is the sum of the four other columns – cholera, fever, respiratory diseases and 'other'.

Source: All rates were calculated for West Bengal and Bangladesh separately using registration data in the annual Sanitary Commissioners' reports for undivided Bengal.

Sex differentials in mortality in pre-Partition Bengal has been covered elsewhere in detail (Chowdhury, 1989). Table 3-10 reflects the changing pattern of mortality and morbidity in the province during the first half of the twentieth century. The 'Other' category includes plague, smallpox, injury, and dysentery and diarrhoea. While death rates from the historically killer diseases like malaria and cholera declined over time, that from respiratory diseases worsened, especially in West Bengal. This category included tuberculosis (TB). Traditionally known as the disease of the poor, it has been a growing health concern in India (Misra, Chatterjee, Rao, 2003). Malnutrition is a prime cause of the disease and is perpetuated by lifestyle, e.g. smoking, and environmental factors like industrial emissions and pollution. Calcutta has historically recorded the highest mortality from respiratory diseases. Better reporting of deaths in Calcutta in relation to the rest of the province is only a partial explanation.

Air pollution is a leading cause of respiratory diseases. The smoke emitted from the jute mills, textile factories, and other industrial activities in and around Calcutta may have contributed to the higher death rate from respiratory diseases in West Bengal. The death rate from this cause in Calcutta was three to four times higher than the average rate for West Bengal. For example, in 1931, the death rate from respiratory diseases in Calcutta was 8.2 per thousand population compared with 2.4 for West Bengal as a whole (Public Health Report, Bengal for 1931). Another significant feature of mortality in Calcutta is that the total female death rate was substantially higher than the male death rate for every year during the period under study.[30] In Hooghly, Howrah and 24 Parganas (districts of West Bengal), which were relatively less urban than Calcutta, the female death rate was also slightly higher than the male rate. Ray (1998) noticed a higher incidence of tuberculosis among women of Bengal during the inter-war period; and that the disease was predominant among the age group 15-30. She cited a survey report pertaining to the 1930s where tuberculosis infection rate was 50 percent among women compared with 32 percent among men. She ascribed this finding to neglect of female children and to repeated attacks of malaria which leaves its survivors emaciated and vulnerable to other diseases like

[30] For example, for the year 1910, the Calcutta male and female death rates were 34 and 46 per 1000 population compared with 32 and 29 for the province. Again for 1921, the Calcutta male and female death rates were 28 and 44 compared with 31 and 30 for Bengal.

TB. Yet another possible explanation may be that it was from indoor pollution caused by cooking.

Daily exposure to biomass smoke from cooking fuels like dung, wood and straw, may lead to acute respiratory infections (World Bank, 1992). Unlike rural women in Bengal who usually cook outdoor in the open yard, urban housewives spend long hours in closed, congested kitchens. This may be a facilitating factor for respiratory infections among women. But the underlying cause for high female mortality from respiratory diseases is neglect and discrimination in food and healthcare from an early age. Even the contemporary surveys suggest that female healthcare utilization among young age groups is far lower than for males (West Bengal NFHS and Bangladesh DHS).

3.3.2 Mortality decline in post-1920s Bengal

Public health policies and interventions in colonial Bengal have been covered extensively in various studies (Sinha, 1998; Ray, 1998; Harrison, 1994; Arnold 1986, 1989, 1999, 2001). These suggest that the province was ahead of other parts of India in implementing health and sanitary interventions. According to Harrison (1994), government allocation of funds for sanitation was higher for Bengal in relation to other provinces. However sanitary activities were severely constrained in East Bengal as a result of insufficient funds. Most of the interventions were in the more urbanized west, where the British administrators and their military were based.

Sinha (1998) gives a thorough account of the public health policy of the British administrators in Bengal between 1850 and 1920. Ray (1998) covered the inter-war period, from 1921 until Partition in 1947, highlighting the various sanitary interventions undertaken in the province by the British government. She concluded that these measures were not that effective given that the population was still largely poor, ignorant and bound by traditional views and customs.[31]

[31] See, for example, Nicholas (1981) for the religious interpretation of smallpox in Bengal and its association with the goddess *Sitala* from as early as the twelfth century. Arnold (1986:130) also mentions the worship of the cholera deity, *Ola Bibi,* which was specific to the province of Bengal. Sinha (1998) discusses the myths surrounding the use of quinine that prevented its wide-scale use among the rural population of Bengal.

The Government of India Act of 1919 was a landmark in the history of public health in India, as it put most matters related to health in the hands of the state. Thus from 1919 onwards, provinces had greater autonomy to design and implement medical and public health policies - for example, operating dispensaries (Joyce 1961). The nationwide coverage of smallpox vaccination in 1922 was another stepping stone (Ray 1998).

Given that public health interventions to control malaria did not start in India until 1945 and the 'National Malaria Control Programme' only started in 1953, the decline in malaria mortality during the inter-war period is much debated.

Academics have proposed various theories in order to explain the improvements in mortality from communicable diseases. Arnold (1986) proposed explanations for the decline in cholera mortality in British India during the early decades of the last century which came about in the absence of apparent improvements in the standard of living. He maintained that the combination of sanitary (piped water) and medical interventions (mass inoculation) along with declining severity of famines were contributing factors. Bacteriological changes, whereby the more virulent strain was replaced by a less virulent one, was another possible explanation.

Malaria mortality was declining in Bengal during the first half of the last century as people gradually developed a greater resistance to the disease through 'years of exposure' which provided survivors 'a good level of immunity'. Malaria was 'milder' and no longer 'malignant' because Darwinian natural selection and the development of antibodies had reduced malaria mortality (Klein 1990:60). Ray (1998) pointed out that quinine and cinquona febrifuge had been made more widely available and often free of cost from 1909 onwards. Davis (1951) showed that per capita availability of quinine and cinchona febrifuge was the second highest in the province, or three times higher than the average for British India.

Greater availability of quinine in Bengal is certainly a possibility. Quinine was distributed freely in the province and could also be purchased from dispensaries. It was made from the bark of a tree called *Cinquona.* Bengal and Madras were the only

two regions of India were the tree was locally grown, producing up to 40 percent of the total quinine consumed in India (Strickland, 1939). The by-product or alkaloid produced in the process of making quinine could also be used to make drugs like *Totaquina* which was much cheaper than quinine and, in medical opinion, an effective remedy for malaria (ibid). Quinine and *Totaquina* were more widely available and used in Bengal than in other parts of India because the *Cinquona t*ree was grown locally. Possibly people were still infected by malaria but not that many succumbed to the disease because remedies like quinine and *Totaquina* were more easily available.

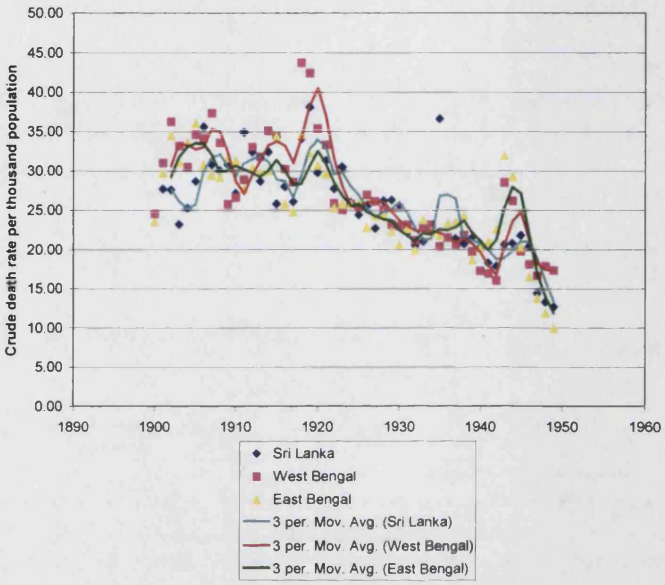
The administrators of Bengal discovered quite early on that malaria was caused by stagnant water bodies created by the construction of railway and irrigation tracks (Klein 2001). The annual Bengal Administration Reports suggest that anti-malarial measures had been in place in colonial Bengal since the late nineteenth century, although the exact scale or coverage of the undertakings is not clear. These measures included drainage schemes, cleaning ponds with kerosene oil, encouraging quinine use by reducing its price and also its free distribution, and finally the instigation of sub-soil drainage.[32] All these interventions, introduced in Bengal during the first and second decades of the twentieth century, were interrupted by the First World War and the 1918-1919 flu epidemic. There was an increase in government expenditure on sanitation and anti-malarial schemes during the 1920s, and,' within the last nine years, the number of deaths reported from malaria have been reduced by half' (1929-1930 Bengal Administration Report: 158). This report further stated that the use of quinine had increased in every district of Bengal in 1929 compared to 1921, thus having contributed to the decline in malaria mortality.

An anti-malaria mass mobilization campaign was also initiated by the class of *bhadrolok*[33] or local Bengali intelligentsia. It involved the advocacy of sanitary measures and use of quinine. It was launched in two villages of western Bengal in 1917 and spread to over a thousand villages by 1932 (Arnold, 1999).

[32] Sub-soil drainage, previously tried in Panama and Malaya with success, was introduced in Bengal in 1916 (1916-1917 Bengal Administration Report).
[33] The Bengali word *bhadrolok* literally translates to gentleman. See, for example, Chatterjee (1994) for an illustration of the role of *bhadrolok* in the context of Bengal.

Bengal was not the only region to have benefited from sanitary measures during that period. For example, Langford (1996) pointed out that measures like the elimination of mosquito breeding grounds through drainage, were in place in Sri Lanka from the beginning of the twentieth century, and were intensified during the 1920s and 1930s.

Figure 3-4: Registered crude death rates in Sri Lanka, West and East Bengal



Source: CDR for East and West Bengal were calculated by author; CDR for Sri Lanka was taken from Langford (1996). Registered rates were used.

Figure 3-4 compares the registered crude death rates (CDR) in the two Bengals with that in Sri Lanka. A downward trend in mortality was observed in Sri Lanka after about 1920. The trends in the CDR of East and West Bengal were identical to those observed in Sri Lanka during the same period. Similar to West Bengal, Sri Lanka is believed to have experienced a rapid decline in mortality for about eight years from the mid/late 1940s. Meegama (1967) asserted that improvements in health services in Sri Lanka largely explain the decline in malaria mortality during the post-1945 period. There is general consensus that the decline in mortality observed in Sri Lanka following the Second World War was attributable to improvements in malaria mortality (Newman, 1970; Gray, 1974). Registration data for West Bengal for the period 1946 to 1955 (in Table 3-11) also suggest that malaria mortality declined significantly in that part of the province over the latter part of 1940s and early

1950s. Gray (1974) re-enforced the point that changes in fertility after malaria eradication are more complex than changes in mortality.

Thus, the decline in mortality during the 1920s was unique to Bengal and Sri Lanka. Similar propositions have been made to explain the phenomenon in these two regions. The most plausible explanations for Bengal are greater availability and use of quinine; anti-malarial schemes undertaken by the British administrators as well as initiatives taken by the native intelligentsia; possibly greater immunity to malaria too as postulated by Klein. Rising incomes possibly did not play a role until the late 1940s ad 1950s (Dyson and Murphy, 1989).

According to Table 3-11, case fatality from all causes declined in West Bengal between the late 1930s and 1950s, but the greatest improvements were in malaria mortality. An increase in the use of modern drugs, in particular quinine, is an explanation. About 30 thousand pounds of anti-malarial drugs (quinine, totaquina and cinchona products) were consumed in 1951 compared with an average of 20 thousand in the preceding years – thus an increase of 50 percent (Bengal Public Health Department 1951). Considering that there was little net gain in population in 1951, attributable to Partition relation migration, this translates to much higher per capita availability of quinine relative to the preceding years. An increase in per capita availability does not necessarily assure its equal distribution. The strengthening of public health measures, for example, drainage and clearing of marshland since the early decades of the twentieth century certainly helped (Klein, 2001; Arnold, 1999). However the most plausible explanation seems to be that it was the lagged effect of health advances made earlier through the concerted efforts of the colonial administration (Caldwell, 1986).

Table 3-11: Registered cause-specific death in West Bengal, 1946-1955

	1938-42	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1955-59
D & D	0.9	1.1	1.1	1.1	1.1	1.1	0.8	0.7	0.7	0.5	0.6	0.3
Cholera	0.9	0.5	0.5	0.6	0.6	0.8	0.2	0.2	0.3	.08	.15	.15
Smallpox	0.1	0.2	0.1	0.4	0.6	0.6	1.1	0.1	.02	.03	.02	0.2
Kala-Azar	0.3	0.1	0.1	0.1	0.1	0.1	0.6	.05	.05	.04	.03	-
Malaria	**6.5**	**4.9**	**3.9**	**3.6**	**3.6**	**2.7**	**1.5**	**1.3**	**1.1**	**0.9**	**0.6**	**0.4**
Other Fever	6.2	5.3	5.4	5.1	4.7	4.7	3.6	3.1	3.0	2.9	2.8	-
Other	3.8	9.4	8.9	9.4	9.1	8.7	5.9	2.3	4.7	3.8	4.5	7.8
Tuberculosis	-	-	-	-	-	-	-	0.3	0.3	0.3	0.2	0.2
CDR	**18.7**	**19.6**	**18.2**	**18.1**	**17.4**	**16.1**	**13.0**	**10.8**	**10.2**	**9.3**	**8.9**	**8.9**
CBR	**25.1**	**24.7**	**20.1**	**21.3**	**22.8**	**20.3**	**21.9**	**23.1**	**22.7**	**23.0**	**25.5**	**23.5**

Notes: All the rates are expressed per thousand population.

Source: 1. Annual Report on the Health of the Population of West Bengal, 1951; Annual Report on the State of Health of West Bengal, 1955.

West Bengal seems to have made two waves of decline in malaria mortality, one during the 1920s and the other between 1947 and 1952 (Table 3-11). The possibility of deterioration in the quality of registration cannot be ruled out but a similar experience shared by Sri Lanka during that period goes to show that the dramatic decline in the death rate in West Bengal between 1947 and 1953 is largely true. Similar data on cause specific deaths were unavailable for East Bengal for that period.

A study of the demography of Bengal is incomplete without a look at the excess mortality during the two main crises during the last century, namely the 1918-19 flu epidemic and the 1943-44 Famine.

3.3.3 1918-1919 Influenza Epidemic

The influenza pandemic of 1918-1919 swept India from west to east, having originated in Bombay, and entering Bengal in December of 1918 (Mills 1986). However it may have entered Bengal earlier than Mills suggested, in July of 1918 (Sanitary Commissioner's Report, 1918). He maintained that the virus may have decreased in virulence over time as it spread from west to east, and that the less violent fluctuations in temperature in the eastern provinces, along with lower humidity may have presented less favourable conditions for the action of bacterial infection (Mills 1986:15). Table 3.12 suggests that the impact of the influenza

epidemic on Bengal was by no means insignificant. This is attributable to distressed conditions prevailing in the province at the time.

When the First World War (1914-1919) broke out, Bengal was also affected by a sudden fall in the price of jute by almost fifty percent (Census of India, 1921). It did not affect most people too much because 1914 was a reasonably good year in terms of crops when food prices remained unaffected. However, in 1915, rainfall was deficient in western and central Bengal leading to a serious crop failure in 1916 in Bankura in West Bengal where famine was declared. Food prices started to rise, especially in the west of the province, and by 1918 the price of rice in Bengal had doubled in just twelve months. This was coupled with a bad harvest in the province in 1918, and yet another famine in Bankura in 1919 (ibid).

Table 3-12: Registered excess deaths during the 1918-19 influenza epidemic

	Registered Deaths		
	West Bengal	**East Bengal**	**Total for province**
1917	453905	685259	1139164
1918	693221	960441	1653662
1919	670728	898934	1569662
	Excess Deaths Using 1917 as the Base Year		
Year	**West Bengal**	**East Bengal**	**Total for province**
1918	239316	275182	514498
1919	216823	213675	430498
	Excess Deaths as Percentage of 1917 Deaths		
Year	**West Bengal**	**East Bengal**	
1918	52.72	40.16	
1919	47.76	31.18	
	Excess Death Rate per Thousand Population		
Year	**West Bengal**	**East Bengal**	
1918	14.83	10.26	
1919	13.44	7.97	

Notes: 1. The excess death rate was calculated by dividing registered number of excess deaths in each Bengal by the 1911 census population – 16,135,390 for West Bengal and 26,813,744 for East Bengal

Source: Government of India (1919)

West Bengal may have suffered greater mortality because Calcutta was a main centre of dissemination for the disease and the railway communication system facilitated the rapid spread of influenza. In addition, food shortage was more acute in the west given the successive famines in Bankura. The second outbreak of influenza in the province had a 10-20 percent case fatality rate compared with just two percent in the first (Census of India 1921). Bombay Presidency, which was believed to have borne the brunt of the influenza epidemic, suffered a lower case fatality rate than in Bengal, of 10.3 percent although Mills did not make it clear if it pertained to the first or the second outbreak.

The main reasons for higher observed excess deaths in West Bengal may be summarized as the relative unhealthiness of the region where the population was already prone to respiratory diseases (Table 3-11); the lower immunity levels of migrant workers; and finally the high density of urban centres where infections spread rapidly. The total registered excess deaths in West Bengal during 1918 and 1919 was 456139, compared with 488857 in East. Using the corrections factors 1.49 and 1.55, for East and West Bengal respectively (Chapter 2 for details), the estimated figures are 679647, and 757728 for West and East Bengal. Thus the total excess death during the influenza epidemic was 1,437,375 in Bengal (as defined in this study) or slightly over seven percent of the 20 million excess deaths estimated for the Indian sub-continent by analysts such as Davis and Mills.

3.3.4 Bengal Famine of 1943-4

The study of the historical demography of Bengal is incomplete without mention of the 1943-44 famine. In terms of excess deaths, it was second only to the 1770 famine, which is said to have wiped out a third of the population of Bengal (Visaria and Visaria, 1983). Its effect on the subsequent demographics of Bengal went far beyond altering the age structure, (as a result of age and sex-selective excess famine mortality). Its impact extended to possibly wavering the psychē of the surviving population; a breakdown in the socio-economic system and the ensuing starvation and suffering of the rural masses testified to the vulnerability of the Bengalis during the 1940s.

Adnan (1990) highlights the impact that the 1943-44 famine had on the socio-economic structure of Bengal. It shook up the occupational structure of the economy when the number of waged labourers increased dramatically. Following the simple law of economics, there was a fall in the wage rate. The disintegration of the joint family; the continuing economic push of migrants from rural to urban areas; growing landlessness and dependency on wage labour, are all trends that were initiated during the aftermath of the famine. Osmani (1990) mentions land sale by the distressed poor to the well-off in eastern Bengal at the time, thus sowing the seeds of class polarization in contemporary Bangladeshi society.

While Indian famines were generally attributable to droughts and crop failures, the unanimous consent is that the 1943-44 famine of Bengal was 'more man-made than an act of God' and that the root cause was to be found in the food situation which had been allowed, due to neglect, to grow from bad to worse (Bhatia 1967:321). The declining trend in per capita availability of food output in Bengal during the first half of the twentieth century is well documented (Blyn 1966; Heston 1983 and Islam, 1978). The rate of population growth had accelerated in most parts of India from the late nineteenth century onwards, attributable to increased productivity, general political stability, and mortality gains. In Bengal, population was growing at an unprecedented rate following improvements in malaria mortality during the 1920s. Yet the net area cropped for food-grains in Bengal had remained constant between 1891 and 1947 (Blyn 1966). The import of food-grains, especially of rice, had become a normal feature of the Bengal economy from the beginning of the twentieth century. With the British conquest of Burma in 1852, the Irrawaddy delta soon replaced the Bengal delta as the major producer of cheap grain in South Asia (Greenough 1982). Soon Bengal was depending heavily on rice imports from Burma to meet local demands.

The food problem in Bengal became acute during the early 1940s as a result of the conditions created by the Second World War. These included cessation of rice imports from Burma after the Japanese invasion in 1942; increased demand for rice to feed the War army and refugees from besieged Burma, and strict controls on foodgrain movements within the province through schemes such as the 'Denial

Policy' and the 'Rice Denial Scheme.'[34] This was because Bengal was feared to be the next Japanese target after Burma. The eastern district of Chittagong, bordering Burma, was repeatedly bombed by the Japanese and this resulted in the stoppage of jute exports once Burma fell into their hands. These conditions were coupled with a shortage in the yield of the winter crop, *aman*, in 1942 when there was already a shortage in the stock of old rice carried forward from the previous year. The food shortage, along with speculative hoarding by suppliers and disruption of normal channels of distribution (a situation created by the 'Denial Policy'), sent prices of food-grains to record levels (Sen 1981). The high prices meant that rice was beyond the reach of the rural masses who began to starve.

Sen's (1981) is perhaps the most cited major attempt to calculate excess mortality after the report of the famine that was submitted by the Famine Inquiry Commission in 1945. It had estimated famine mortality to be 1.5 million. Based on the 1951 census of West Bengal, Sen arrived at an estimate of three million famine related excess deaths. Greenough (1982), using the same method as Sen, arrived at a figure of 3.5 to 3.8 million. Dyson and Maharatna (1991) used public health reports for undivided Bengal in order to estimate excess deaths during the 1943-44 Bengal famine. They concluded that famine-related excess mortality was up to 1945 and not 1946 as Sen (1981) had assumed, and re-calculated a figure of 2.1 million excess deaths.

[34] The Denial Policy was a government decision to remove and destroy boats from coastal regions of Bengal, designed to thwart a Japanese invasion. See Bhatia (1967) and Greenough (1982) for details. The Rice Denial scheme was again implemented to protect local supplies of rice from the Japanese whereby agents were authorized to purchase surplus grain from cultivators in Midnapore, Khulna, and Bakarganj. The agents ended up hoarding these supplies for personal speculative trading.

Table 3-13: Impact of the 1943-44 famine on West and East Bengal

	Registered Births		Registered Deaths	
	West Bengal	East Bengal	West Bengal	East Bengal
(1938+1940)/3	520728	894923	362185	768170
1943	436063	654775	620230	1137226
	-16.26 %	-26.83 %	71.25 %	48.04 %
1944	375074	532103	573331	1047866
	-38.80 %	-40.5 %	58.30 %	36.41 %
1945	454593	760202	445495	731292
	-12.70 %	-15.05 %	23.03 %	- 4.80 %

Notes: Calculations are based on registered births and deaths in the Sanitary Commissioners' Reports for Bengal. The figures in brackets are the percentage rise or fall in relation to the average births or deaths for 1938- 1940.

The quality of registration data was known to suffer during the famine years (Dyson, 1991). Table 3-13 assumes that the level of incompleteness of registration was not too different in the two wings. The average of births and deaths during 1938-40 have been taken as the base to compare the effect of famine with. The famine entailed two waves of deaths, the first being caused by starvation, and the second by epidemic diseases (Sen, 1981; Greenough, 1982). Food shortage was more acute in the rural areas which resulted in the mass migration to cities in search of food. Maharatna (1996) inferred that adult male mortality was higher in rural areas than of female or children. As pointed out in earlier discussions, high food prices during a year resulted in a depressed birth rate in the following year. The relatively worse impact of the famine on the birth rate in East Bengal may be explained by a number of factors. Firstly, it is men who usually migrate to cities thus resulting in high levels of spousal separation in largely rural East Bengal. Secondly, those men in rural areas who did not migrate may have been too weak and emaciated in the first place thus succumbing to starvation and epidemics. Thirdly, the conception rate among women possibly dropped given the physical and emotional stress associated with such a crisis. A fall of roughly 40 percent in the birth rate in both the regions in 1944, as seen in Table 3-14, is likely to have long-term implications on the age structure of the population. Finally, the higher observed death rate in West Bengal during the famine years is explained by the usual factors that have been responsible for greater mortality during preceding crises events – namely, relative unhealthiness of the region along with the high population density where epidemics spread fast. An

additional explanation in this case may be that many of the destitute deaths recorded in West Bengal were from rural East Bengal.

3.4 Migration in Bengal

In the short run, migration is influenced by levels of economic development and in the long run, migration influences economic development (Mahto 1985:192). There have been different waves of migration in and out of Bengal and within the province during the pre-Partition period. Haan (1995) traced the earliest streams of migration to Bengal to the seventeenth century when the flourishing agricultural sector of eastern Bengal attracted migrants from Bihar, Orissa and United Provinces. Until the growth of industries in West Bengal during the second half of the nineteenth century, migration flows within the province were from the west to the east during seasonal crop harvests (ibid). The wage rate for day labourers decreased as one went from the west to the east of the province thus explaining the flow of migration from western to eastern Bengal (Schendel and Faraizi, 1984). However the late nineteenth century witnessed the end of the *Sonar Bangla*[35] era in East Bengal ushering in a new wave of migration – that from east to west.

Haan (1995) proposed two reasons for the fall in the volume of migration into eastern Bengal from the beginning of the last century and especially after 1921. Firstly, the increase in population following the mortality gains of the 1920s created greater supply of labourers than jobs available. Secondly, the growth of industries in western Bengal attracted migration from the traditional sending regions of Bihar, Orissa and Uttar Pradesh. A third possible explanation is that rice production in eastern Bengal was declining from the beginning of the twentieth century and hence there were fewer job opportunities in agriculture in East Bengal.

The decline in agriculture in Bengal from the end of the nineteenth century has been established in various studies (Rogaly, Harriss-White and Bose, 1999; Blyn, 1966). Blyn (1966) analyzed agricultural statistics of colonial India at the provincial level. He attributed the steady decline in per capita availability of food between 1891-1941

[35] *Sonar,* in Bengali, means 'of gold'. *Sonar Bangla* refers to golden paddy which epitomized the glory of Bengal agriculture. This era lasted roughly until the end of the nineteenth century (Rogaly, Harris-White and Bose, 1999).

to distribution rather than problems with total output. He showed that Greater Bengal, comprising Bengal, Bihar and Orissa, experienced the largest decline (38 percent) in per capita food availability in India between 1901 and 1941. His explanation was that non-foodgrain acreage was more favourable than food acreage in the province.

Decline in rice production may be ascribed to repeated cropping and nitrogen depletion of the soil, substitution of food for cash crops, and a decaying river system. Greenough(1982:63) pointed out that wage labourers made up a fifth of the working population in Bengal in 1931 when wage labour in the context of Bengali agriculture is synonymous with economic impoverishment.

Table 3-14 :Per capita acreage of rice output in West and East Bengal, 1900-1940

	West Bengal	East Bengal
1900	0.499	0.498
1910	0.448	0.469
1920	0.498	0.434
1930	0.405	0.412
1940	0.353	0.400

Notes: The figures for 1900 and 1930 refer to three-year averages and thus 1901 relates to 1900-02. The figures for 1910, 1920 and 1940 refer to 1912-14, 1920-22 and 1938-40, respectively in order to exclude the effects of Partition of 1905, 1918-19 influenza epidemic and 1943-44 famine. The rates were calculated by dividing the total rice acreage in each Bengal by the census population. The author's territorial definitions of East and West Bengal, as outlined in Chapter 2, apply.

Source: Calculated by author using the annual reports on Bengal Agricultural Statistics for 1900-02, 1912-14, 1920-22, 1930-32 and 1938-40.

Table 3-14 of district-level acreage of selected agricultural products confirms the province's declining trend in per capita availability of food during the first half of the twentieth century. After 1920, per capita acreage was much lower in West Bengal, possibly reflecting the mortality gains during that decade and thus a high rate of population growth. Bengali immigration to Assam started at the beginning of the twentieth century (Weiner, 1978) which incidentally coincided with the decline in agricultural sector in the province. The decline in agriculture was accompanied by increasing opportunities in the cities of West Bengal. The rate of urban growth in

East Bengal remained stagnant throughout the first half of the last century where as that in the west increased steadily during this period.

Economic distress has been the impetus for the ongoing migration from Bangladesh to the north-eastern Indian states and to West Bengal (Samaddar, 1999). In addition there have been short-term crisis-induced migration from east to west of the province, for example, during the 1943-44 famine. And finally there was the 1947 Partition when there were migration flows in both directions. Migration is taken up in detail in the next chapter.

3.5 Conclusion

This chapter compared the population trajectories of the two Bengals during the first half of the twentieth century when they were under the same provincial government. The main conclusion is that even when Bangladesh and West Bengal were part of the same province, their population trends were distinctly different. The demographic characteristics of pre-partition Bengal were much influenced by long-term ecological processes and British development projects, among other things. The higher birth rate observed in East Bengal throughout the first half of the twentieth century is explained by general healthiness of the region, higher levels of Muslim fertility and the predominant agrarian socio-economic structure. On the other hand, the underlying reasons for the higher observed death rate in West Bengal were the greater incidence of malaria and respiratory diseases and perhaps, a higher proportion of less nourished population consisting of migrant workers. The mortality gains of the 1920s may have been unique to Bengal and Sri Lanka in South Asia. In Bengal improvements in mortality may be attributable to a combination of factors – greater immunity to malaria from repeated attacks as postulated by Klein; greater use of medicinal prophylactics against malaria; and mobilization of the masses by the urban *bhadrolok* to take preventive measures against malaria. West Bengal benefited relatively more from the mortality improvements of the 1920s. Migration in Bengal changed direction with the decline in the agricultural sector. Prior to the decline, agriculture in East Bengal attracted seasonal migrant workers from West Bengal as well as from Bihar and Orissa. From about the beginning of the last century, migration flows have been mainly from impoverished East Bengal to eastern and

north-eastern India except of course during Partition of 1947 when migration flowed in both directions.

The next chapter explores how the population trends in the two wings of Bengal changed after Partition in 1947.

4 Chapter 4: OVERVIEW OF POST-PARTITION BENGAL

The preceding chapter studied the population trends in the two Bengals while they were part of the same provincial government. This chapter assesses why and how their demographic profile changed after Partition of 1947. It starts with a discussion of the implications of Partition, followed by an overview of the macro determinants that explain the course of population trends, namely changes in the socio-economic structure, and trends in literacy and urbanization. The study of these variables is useful as they influence fertility and mortality. The final section of the chapter briefly compares the basic population statistics of the two Bengals in light of the Partition-related changes. Bangladesh, East Bengal and East Pakistan, have been used interchangeably in the discussions.

While the death rate was the primary determinant of population growth in Bengal during the pre-Partition period, the birth rate played a more significant role during the second half of the twentieth century, when global mortality fell dramatically as a result of advancements in health and western medicine. Migration, both rural-urban and trans-border, has had more important implications during and following Partition.

4.1 Partition of 1947

Although the political, and to some extent, socio-economic aspects surrounding the Partition of 1947 have been extensively researched, little is known about its demographic impact. One deterrent to such a study is the paucity of reliable demographic data given that the system of registration of vital events and the censuses were severely disrupted during these crisis periods (Visaria, 1969). Such a study would need to cover the entire region affected by Partition namely, present-day Bangladesh, India and Pakistan. Additional problems with studying the division of the Indian-subcontinent in 1947 are the boundary changes that took place and choice of an appropriate time-frame to consider. Partition related migration is known to have continued well into the 1950s (Census of India, 1951). A research study initiated by the Harvard School of Public Health in 2003 illustrated yet another problem with studying the demographic impact of Partition on the province of

Bengal – that of isolating the effect of the division from that of the 1943-44 famine (Hill et al, 2005). Indeed the time series of vital rates presented in this chapter re-affirms this point (Figures 4.2 and 4.3).

British rule in India ended in 1947 with the division of the sub-continent into Pakistan and India, homes created for Muslims and Hindus, respectively. Punjab and Bengal were the only two provinces that were divided at Partition on a religious basis. The Hindu-dominated parts of these provinces were given to India and came to be known as Indian Punjab, and West Bengal respectively, while the Muslim-majority areas went to Pakistan, comprising present-day Pakistani Punjab and Bangladesh.

4.1.1 The eve of Partition

The intellectual awakening of the late nineteenth century gave rise to a feeling of national unity among Indians. It culminated in the nationalist movement during the 1920s, demanding an end to British rule in India. Bengal played a crucial role in this movement given the province's historical lead in education, culture and literary heritage when eminent proponents like *Subhas Chandra Bose*, and *Rabindranath Tagore* challenged Bengalis to question British colonialism (see, for example, De, 1992). Hindus and Muslims were urged to forgo their communal differences and unite in the drive to gain independence from colonial rule. This growing political awareness among Bengalis was a matter of concern for the British Crown. And they resorted to two measures in order to thwart the unity and harmony of Bengali Hindus and Muslims – partition of Bengal in 1905, and changing their capital from Kolkata to Delhi in 1911. Bengal was one of the few states in India around the time of division with a higher Muslim than Hindu population (Murshid, 1995). While the Indian National Congress adopted the Quit India Resolution calling for Britain to leave India, the Muslim League wanted the British to divide Bengal into Hindu and Muslim parts.[36] The result was a hasty decision by the British to divide up India into

[36] The Indian National Congress, representing the interests of Hindus, and the Muslim League, representing the interests of Muslims, were the two main players of the independence movement from Britain and in the Partition of India in 1947. Mahatma Gandhi's role in the independence movement was more in the social than in the political sphere through urging Hindus and Muslims to unite and to resort to non-violent ways (*ahimsa*) in their plight to overthrow the British. Details on the politics surrounding Partition may be found in Collins and Lapierre (1975), Chatterjee (1994), French (1998) and Talbot and Singh (1999).

Muslim Pakistan and Hindu India (each containing a part of Bengal) as the country was believed to be on the verge of a civil war.

As outlined in the previous chapter, the period immediately preceding the Partition of 1947 was a trying time in the history of Bengal characterized by the Second World War, the famine of 1943-44, and growing tension between Hindus and Muslims created by the impending Partition. Bengal was badly hit because Partition took place while the province was still suffering from the aftermath of the 1943-44 famine – the effect of the famine is known to have lasted till at least 1945 (Dyson and Maharatna, 1991). Thus it was a tremendous challenge on the part of the respective governments post-1947 to re-build the economies of newly created West Bengal and East Bengal that had been devastated by years of communal riots, the Second World War, the famine and finally Partition.

4.1.2 Partition related migration in Bengal

Partition was accompanied by out-migration of Muslims from West Bengal, and of Hindus from East Bengal. The poor quality of the census of 1941 is one of the many problems in studying the population changes between 1941 and 1951 (see, for example, Hill et al, 2005). The following analysis assumes that the level of under-registration of the 1941 census was uniform across the districts of the province. Partition essentially made separate homes for the two main religious groups of Bengal - West Bengal for Hindus and East Bengal for Muslims. Thus West Bengal would be expected to have experienced an increase in the Hindu population between 1941 and 1951 with the influx of Hindus from East Bengal (column 3 in Table 4-1). Similarly, the percentage of Muslims should have increased in East Bengal as Muslims of West Bengal migrated there. The district level census data suggest that this was not the case. Some districts of West Bengal experienced an increase in the Muslim population while others in East Bengal a rise in the Hindu population following Partition. The fact that the same pattern was observed in both the Bengals warrants further investigation.

Table 4-1: Percentage of Hindu and Muslim population by district- 1941 & 1951

West Bengal						
	1	2	3	4	5	6
	1941 Hindu	1951 Hindu	% change 1941-51	1941 Muslim	1951 Muslim	% change 1941-51
Burdwan	76.4	83.7	+9.5	19.5	15.6	-20.0
Birbhum	79.4	72.6	-8.5	17.9	26.8	+49.7
Bankura	94.9	91.1	-4.0	3.8	4.4	+15.8
Midnapore	80.8	91.8	+13.6	13.2	7.2	-45.4
Hooghly	83.3	86.5	+3.8	15.5	13.3	-14.2
Howrah	81.0	83.5	+3.1	17.9	16.2	-9.5
24 Parganas	73.5	73.9	+0.5	25.1	25.3	+0.7
Calcutta	72.6	83.4	+14.8	23.6	12.0	-49.1
Nadia	79.3	77.0	-2.9	19.2	22.3	+16.1
Murshidabad	70.5	44.6	-36.7	26.9	55.2	+105
Jalpaiguri	73.3	84.2	-14.8	25.9	9.7	-62.5
Darjeeling	48.6	81.7	+ 67.9	6.4	1.4	-78.1
Malda	47.5	62.9	+32.4	52.3	36.9	-29.4
East Bengal						
	1941 Hindu	1951 Hindu	% change 1941-51	1941 Muslim	1951 Muslim	% change 1941-51
Jessore	29.2	31.3	+7.1	69.9	68.6	-1.8
Khulna	27.0	45.2	+67.4	72.3	54.5	- 24.6
Rajshahi	38.3	19.4	-49.5	61.1	80.3	-31.4
Dinajpur	28.6	35.1	+ 22.7	68.3	64.5	-5.5
Rangpur	27.6	20.2	-26.8	71.2	79.8	+12.1
Bogra	38.8	12.7	-67.2	58.9	87.2	+48.0
Pabna	51.9	16.3	-68.6	45.2	83.7	+85.2
Dacca	41.3	20.6	-50.2	58.0	78.8	+35.8
Mymensingh	28.4	16.4	-42.2	57.1	82.8	+45.0
Faridpur	29.4	28.8	-0.6	69.9	70.7	+1.1
Bakarganj	31.5	19.6	-37.8	67.5	79.6	+18.0
Noakhali	65.8	15.7	-76.1	33.0	84.2	+ 155
Chittagong	51.2	18.8	-63.3	43.3	77.4	+78.7

Note: Sylhet and Cooch Behar are not included in the table as they were not part of the province of pre-Partition Bengal. Details on territorial boundaries may be found in Chapter 2. Column 3 represents the percentage change in Hindu population and Column 6 in Muslim population between 1941 and 1951.

Source: Census reports of India and Pakistan for 1941 and 1951.

Murshidabad, Jailpaiguri and Nadia, districts of West Bengal bordering with East Bengal, along with Birbhum, in the far west of West Bengal, stand out in that they experienced an actual increase in Muslim population in 1951. These Muslims were unlikely to be Partition-related migrants from East Bengal as there was little need for

East Bengali Muslims to migrate. The explanation may be that the Muslims, who decided against leaving West Bengal, deemed it safer to relocate from the heartland to the eastern and western most borders of the state. Incidentally, the increase in the Muslim population in Murshidabad was accompanied by a significant decrease in the proportion of Hindus in the district. The Hindus living in these bordering districts, possibly viewed it to be safer to relocate to inland West Bengal. On the other hand, many Muslims in bordering Darjeeling and Jalpaiguri may have migrated to East Bengal, thus explaining the dramatic fall in the percentage of the Muslim population in these districts.

One notices a similar pattern in the geographical re-distribution of the Hindu population in East Bengal between 1941 and 1951. Partition-related immigration from West to East Bengal consisted primarily of Muslims who were, in most cases, forced to leave for the new home created for them. The proportion of Hindus increased in the border district of Jessore, and Khulna while there was considerable emigration of Hindus from inland districts to bordering ones. Thus Pabna and Bogra in central East Bengal experienced a significant decline in the Hindu population in 1951. The district of Noakhali and Chittagong in south east Bangladesh experienced the largest decline in the Hindu population among all the districts, over 76 percent and 63 percent, respectively. There must have been substantial migrations from these districts to the north-eastern Indian states of Assam and Tripura. It is beyond the scope of the dissertation to include them in the analysis. To sum up, there may have been substantial relocation of Hindus and Muslims alike within each Bengal. Among the religious minorities of the two wings of the province who did not migrate following Partition, there was a general tendency to relocate to bordering districts while the majority groups moved inland. The logic for the former phenomenon is obvious – if communal problems were to break out, they could easily cross over the border.

The two million or so displaced East Pakistanis enumerated in the 1951 census of West Bengal (primarily Hindus) tended to settle along the bordering districts. The districts in the state, which recorded the highest absolute number of displaced persons were 24 Parganas, Nadia, Jalpaiguri and Cooch Bihar. Incidentally these are currently the demographic laggers in West Bengal in terms of healthcare utilization

and contraceptive use (Rapid Household Survey 1998-99). Similarly the western districts of Bangladesh like Khulna, Jessore and Dinajpur which experienced an increase in the Hindu population following Partition (migrants from West Bengal), are the demographic leaders where the fertility and contraceptive prevalence rates are higher than the national average (Bangladesh DHS, various years). Thus the regional variation in reproductive behaviour that is observed in present-day Bangladesh and West Bengal could very well have historical roots, namely Partition-related relocation. This hypothesis however requires further exploration before firm conclusions may be drawn.

4.1.3 Religious composition

Partition of India led to the largest migrations in history when fifteen million people are said to have crossed borders (Davis, 1951). It changed the lives of those who migrated as well as those who stayed behind.[37]

The migration patterns outlined so far made the religious composition of each of the Bengals more homogenous. That is, West Bengal became more Hindu than before while East Bengal became more Muslim.

[37] Two very powerful and well-acclaimed movies on the way Partition affected lives in the Indian sub-continent are *Pinjar*- Beyond Boundaries (2003), and 1947- Earth (1999) which is the second in Deepa Mehta's Elements Trilogy.

Table 4-2: Religious Composition of West Bengal and Bangladesh, 1900-2001

	West Bengal				Bangladesh			
Year	Hindu	Muslim	Other	Total	Hindu	Muslim	Other	Total
1901	70.8	25.9	3.3	100	33.0	65.9	1.1	100
1911	69.6	26.3	4.1	100	31.5	66.1	2.4	100
1921	68.5	26.0	5.5	100	30.6	67.9	1.5	100
1931	69.9	26.6	3.5	100	29.4	69.2	1.4	100
1941	67.0	26.2	6.8	100	28.0	69.7	2.3	100
1951	78.7	19.4	1.9	100	22.0	76.9	1.1	100
1961	78.8	19.8	1.4	100	18.5	80.4	1.1	100
1971	78.1	20.5	1.4	100	13.5	85.4	1.1	100
1981	76.9	21.4	1.7	100	12.1	86.6	1.3	100
1991	74.7	23.6	1.7	100	10.5	88.3	1.2	100
2001	72.5	25.0	2.5	100	9.2	89.7	1.1	100

Source: Relevant census reports of West Bengal and Bangladesh

The Muslim population of West Bengal had remained more or less constant at 26 percent during the earlier decades of the twentieth century, dropping to 19 percent following Partition (Table 4-2). The proportion of the minority group in Bangladesh (Hindus) decreased over time while that of minority Muslims in West Bengal increased. The relatively higher rate of increase of the Muslim population in West Bengal following the initial Partition related re-distribution of religious groups, is a function of two factors – first, the higher fertility levels of Muslims and second, the continuing migration from Bangladesh to the state (Samaddar, 1999; Schendel, 2005). The size of the 'other' category has also been relatively higher in West Bengal. Much of this category comprised members of the British administration whose departure upon Partition resulted in a drop in the proportion of Christians in the state. Another intriguing point in the case of West Bengal was the unusual increase in the 'other' category from 3.5 percent to 6.8 between 1931 and 1941. The high proportion recorded in 1941 was most probably never that high in the first place. Many Hindus and Muslims may have concealed their true religion in the 1941 census fearing persecution during the tensed period preceding the division. The Hindu population of Bangladesh has progressively declined for similar reasons; that is, lower Hindu fertility, and also their continuing out-migration to West Bengal. Thus religion has continued to be an important explanation for fertility differentials between the two Bengals, as will be illustrated in Chapter 6.

As far as Partition related migration between the East and West wings is concerned, West Bengal experienced an overwhelmingly greater proportion of in-migration, over two million compared with roughly 700,000 in East Bengal (Census of India, 1951). East Bengal at the time was largely agrarian while the West was relatively more urban and industrial with greater economic prospects, thus attracting immigrants from the economically depressed East. Large numbers of non-Hindu East Bengalis possibly left for West Bengal too, enticed by better economic prospects there. According to one estimate, about 70 percent of the emigration from East Bengal to India that took place between 1941 and 1951 was to West Bengal (Khan, 1972). This is plausible given the proximity of West Bengal and more importantly, because of the ease with which they could assimilate given the similarities in language and culture.

Table 4-3: Displaced Persons in West Bengal from East and West Pakistan, 1946-51

	East Pakistan	West Pakistan
1946	44,624	NA
1947	377,899	8,062
1948	419,018	2,000
1949	273,592	670
1950	925,185	528
1951	30,879	73
TOTAL	**2,071,197**	**11,333**

Source: Census of India, 1951

The 1951 census of West Bengal estimated the number of displaced persons[38] from East and West Pakistan to be roughly 2.1 million and a little over 11, 000, respectively (Table 4-3). Getting to West Bengal from West Pakistan involved crossing over a thousand miles of Indian territory, however, and required considerable amount of time, energy, not to mention, capital. It is rather strange that West Bengal received over 11,000 immigrants from West Pakistan following Partition. Some of these displaced persons were possibly non-Bengali speaking

[38] The census reports of West Bengal term the refugees from East Bengal who arrived between 1946 and 1958 as "old migrants" where as those arriving between 1964 and 1971 are the "new migrants".

migrants from East Pakistan (or East Bengal) who, for some reason got recorded as West Pakistanis on the basis of language.

'Displaced persons' were defined as those who had to leave either of the two wings of Pakistan for West Bengal on account of the civil disturbances related to the creation of India and Pakistan. Assuming these census estimates to be reasonably accurate, 7.6 percent of the total population of West Bengal comprised displaced persons in 1951. The unusual increase in the volume of out-migration from East Bengal in 1950, as seen in Table 4-3, is partially explained by communal conflict in 1949 in Khulna in East Bengal, which soon spread all over East Bengal (ibid).

4.1.4 Political changes following Partition

Bangladesh

Until Partition in 1947, the different make-up of the east and west of Bengal in terms of ecology, economy, urbanization, demographics and religion, had complemented each other. The East provided the fertile lands for growing cash and food crops while the industrialized West served as the centre for trade and industry. Bengal was partitioned such that the industrial and commercial hub of the province, namely Calcutta, Hooghly and Howrah went to West Bengal (Feldman, 1975; Etienne, 1977).

In addition, East Bengal was left with a weak political and administrative structure after partition of 1947 with the emigration of Hindus who traditionally held high positions in trade, civil service, health provision and skilled work (ibid). Export of jute, a product of East Pakistan, earned the whole of Pakistan a third of her total foreign exchange earnings. Yet little of the foreign revenue earned from jute grown in East was actually ploughed back into the economy. During the 1960s, per capita income in East Pakistan was about half of that in West (Feldman, 1962; Baxter, 1984). As a result, discontent among East Bengalis kept growing. Feldman (1975) compared the capital flow from East to West Pakistan in the 1950s and 1960s to that from India to Britain during colonial rule whereby the economic disparity between East and West Pakistan increased over time. Bengali nationalism intensified during the late 1960s upon the Pakistan government's decision to make Urdu the state

language of the eastern wing when the overwhelming majority there spoke *Bangla*. The culmination was a nine- month long civil war in 1971. Bangladesh emerged as an independent nation with military assistance from India. The estimate of total civilian deaths range from 300,000 to three million, the latter being the official estimate of the Bangladeshi government. A more realistic estimate of the death toll may be 1.5 million by Mosley and Hossain (1973). Ten million or 16 percent of the population of East Pakistan, mostly Hindus, are said to have left for India fearing death in the hands of the Pakistani army (Curlin, Chen and Hussian, 1976). Towards the end of the 1971 war when independence was imminent, the Pakistani army went on a rampage to eliminate the intellectuals, in an attempt to paralyze the new nation.

During the early 1970s, Bangladesh was one of the poorest countries in the world having just recovered from a long civil war followed by a devastating famine (1974-75) that had left the socio-economic and industrial base shattered. The country was at the centre of much international media attention. This was when the NGO sector created its niche in the country. Hashemi and Mirza (1999) highlight the reasons why the NGOs in the country gained legitimacy in providing leadership and in promoting human rights. After a succession of military coups and martial law, two civilian parties have taken turns to run the government since 1990. A caretaker government took over in January 2007. The next elections are expected in early 2009. Sobhan (2004) is among others to give an insightful account of the problems with governance in the country.

West Bengal

The economy of Bengal had been on the decline since the beginning of the last century. Depeasantization of agricultural labourers in Bengal between 1880 and 1980 had much to do with the land laws enacted during colonial rule, in particular, the Permanent Settlement Act of 1793 (Bose, 1982; Schendel and Faraizi, 1984). Poverty in pre-Partition Bengal gave rise to a revolutionary spirit among the intelligentsia. Left-oriented politics, including Marxism gained popular support in West Bengal since its inception in India during the early decades of the twentieth century. Thus the series of uprisings in the history of the state (as outlined in Table 4-4) intended to improve the plight of the peasant class. The Left parties of West Bengal played a prominent role in mobilizing the impoverished peasant class

following the 1943-44 famine to initiate what is known as the *Tebagha* Movement, demanding a third of the total crop share for peasants (Bose, 1982; Duyker, 1987)). Weiner (1959) articulates well the influence of Congress and leftist parties on West Bengal at various points in time. His general conclusion was that Kolkata politics had a pervasive effect on the rural masses.

The West Bengal Estates Acquisition Act was passed in1953, aimed at abolishing the feudal landlord or *zamindari* system. But poor implementation of land reform under the Congress government at the time led to further class polarization (Chandrasekhar, 1993). Adnan (1990) points out that the *zamindari* system continued in West Bengal longer than it did in East Bengal. This initiated a series of uprisings like the Food Movement in 1959 and *Naxalbari* Movement in the late 1960s (Bhattacharyya, 2003). [39] The leftist party symbolized the plight of the impoverished masses and gained popular support of the peasantry. They came into the forefront of state politics during the late 1960s. The United Front won a landslide victory in 1977 and has remained in power ever since. United Front is the coalition of leftist parties in West Bengal. Perhaps the most famous among the parties comprising the United Front is the Communist Party of India, Marxist, commonly known as CPI (M). It was formed in 1964, and is synonymous with Jyoti Basu, who led the party between 1977 and 2000, and is the longest serving leader of a Communist party in history. West Bengal has had leftist influence since the 1920s and leftist coalition has been in power continuously since 1977.[40]

[39] The food movement was in protest of the acute scarcity of food at the time. The *Naxalite* movement got its name from the place where it started. It was an uprising against the exploitation of the peasant class by feudal landlords. It became fashionable among the youth of the time to be a *Naxalite* (participant in the movement) to liberate the proletariat from the bourgeois *zamindars* (Dasgupta, 1975).

[40] West Bengal has had leftist government intermittently during the 1960s.

Table 4-4: Timeline of socio-political events: 1950-2000

1950s	
1952	Bengali language movement in East Pakistan (present-day Bangladesh); First general elections in West Bengal, Congress assumes power
1954	Chandernagore, formerly a French colony, annexed to West Bengal
1959	Food Movement erupted in West Bengal protesting food scarcity; Basic Democracies System (local government) introduced in East Pakistan
1960s	
1967	Congress defeated in West Bengal and United Front government sworn in with Jyoti Basu as Home Minister
1968	*Naxalbari* (peasant) Movement started in northern West Bengal
1970s	
1970	Severe cyclone and tidal wave in East Pakistan; *Naxalbari* Movement spreads across West Bengal
1971	Bangladeshi war of independence from Pakistan
1971	Political turmoil in West Bengal following influx of refugees from Bangladesh
1972	Nationalization of key industries in Bangladesh
1974	1974-75 famine; National Emergency declared in Bangladesh
1975	Emergency was declared in West Bengal as in rest of India; political unrest worsens in Bangladesh with assassination of President Mujibur Rahman, Martial Law was declared
1977	Emergency was lifted in India. Left Front came into power in West Bengal with Jyoti Basu as Chief Minister. "Operation *Barga*" or land reform movement initiated by leftist government. In Bangladesh, Islam is adopted in Constitution
1980s	
1980-81	3 tier *Panchayat* introduced in West Bengal
1981	President Ziaur Rahman assassinated during abortive military coup in Bangladesh
1986	Martial Law lifted in Bangladesh and constitution reinstated
1987	Emergency was declared in Bangladesh following political unrest
1990s	
1992	Communal riots broke out in West Bengal after demolition of Babri Mosque; Jyoti Basu created world record by being selected Chief Minister for 4th term
1994	Industrial sector was revamped in West Bengal as part of economic reforms
1996	Awami League assumed power in Bangladesh
1998	Two-thirds of Bangladesh was devastated by floods
2001	New government (Bangladesh National Party) comes into power; Buddhadeb Bhattacharya replaces Jyoti Basu as Chief Minister of West Bengal
2007	Emergency was declared in Bangladesh

Source: Compiled by author using various sources including Duyker (1987)

The state's history of movements and uprisings for social justice is apparent in Table 4-4. The only time the government of independent Bangladesh did try to implement socialist reforms was following liberation from Pakistan. The nationalization of key industries like jute and cotton textiles, which had been abandoned by non-Bangladeshi owners, was short- lived (see, for example, Mondal, 2003). One of the possible reasons explaining why leftist politics did not survive in Bangladesh may be

a high level of donor influence on the country's politics. The World Bank, among others, has been a strong advocate of the free market system. The history of Bangladesh has been marked by political instability and a series of natural calamities.

Against this backdrop, trends in poverty in post-Partition Bangladesh and West Bengal will be compared.

4.1.5 Role of local government/Poverty alleviation

The village economy underwent structural changes from the beginning of the twentieth century. This was in response to the culmination of ongoing processes, most important of which was the decline in agriculture. The changing land laws also gave rise to new socio-economic power structures. The Bengal Tenancy Act of 1885, acknowledged the rights of tenants and not just of *zamindars* (landlords) as was the case under the Permanent Settlement Act of 1793. The transfer of land was made easier under the Act of 1885 which in turn led to the emergence of an agrarian middle class who acted as money-lenders. This was a landmark change in the village structure, giving rise to a new kind of socio-economic problem, that of indebtedness and marginalization. The East Bengal State Acquisition and Tenancy Act of 1950 was passed in order to consolidate the rights of tenants and to alleviate some of the problems associated with indebtedness (Bose, 1982).

Upon assuming power in 1977, the United Front government embarked upon tackling the agrarian crisis. It reformed land laws in order to protect the interests of tenants rather than of landlords and to ensure redistribution of land among small and marginal farmers, through Operation *Barga,* (instating a land ceiling of 25 acres per household). The establishment of the three-tier *Panchayat* system of local-government decentralized power and gave political representation to the peasant class. This system works better in West Bengal than in other Indian states (Dreze and Sen, 2002; Leiten, 1996; Westergaard, 1986).The strong trade union facilitates better implementation of Minimum wage in West Bengal than in most other Indian states (ibid). The downside of a strong association of trade unions is that it dissuades investors. However land reform did not effectively target women in West Bengal whose plight may have worsened as a result of this reform in West Bengal (Crook and Sverrisson, 2001; Kodoth, 2005).

Thus West Bengal has had an effective system of local government since the late 1970s where as this sector never really evolved in Bangladesh (Westergaard and Alam, 1986; Panday, 2005). The Comilla model was initiated by the pioneer in participatory rural development in the country, Dr Akhter Hameed Khan during the 1950s. The grass-root level democratic system, Basic Democracies System was introduced in Bangladesh (erstwhile East Pakistan) by the Pakistani government in 1959 but was transitory. The *Swanirvar Gram Sarkar* Ordinance of 1980 under President Ziaur Rahman was among the series of laws passed in Bangladesh during the 1980s in order to decentralize power and strengthen grass-root level local government. In fact every government starting from Ayub Khan's regime during the Pakistan era, has initiated reform for local participation (Friedman, 1960). But like most other development efforts of the government, they were not implemented effectively whereby the interests of the masses remained unheard. Lack of motivation on the part of government personnel who are in charge of implementation is one factor for the programme's failure (Government of Bangladesh, 1998) The *Swanirvar Gram Sarkar* (meaning independent village government, in Bangla) was instituted by President Ziaur Rahman to be abolished by President Ershad in 1982, who replaced it by the new system of *Upazila Parishad.* The last two governments also introduced yet new structures of local government. Blair (1990) analysed the successive governments' efforts on local government to conclude that one of the factors explaining why such a system never developed in the country was the transitory nature of the initiatives.

During the early 1970s, West Bengal had the highest proportion of population, living below the income poverty line in India, followed by Orissa in second position. Since then the rate of progress in poverty alleviation has been faster in the state than the Indian average. Pro-poor policies of the Left-oriented government, effectively implemented by the *Panchayat*, facilitated the steady decline in poverty over time (Sengupta and Gazdar, 1997, Dreze and Sen, 2002; Maharatna, 2007).

Since India's economic reforms during the early 1990s, West Bengal has emerged as the fastest growing state when most other states may have even deteriorated (Guruswamy, Sharma et al 2005). The average annual percentage growth has been

8.55 percent in West Bengal during the 1990s compared with 6.87 for India as a whole. The authors however point out that the average mean monthly consumption continues to be low in the state. The growth in the agricultural sector may be explained to a large extent by the growth in economy during the 1980s (Rogaly, Harriss-White and Bose, 1999).

In post-Partition India, the trickle-down effect of economic growth failed to emulate the desired effect on poverty for a number of reasons. The high rate of population growth was just one of the factors acting as a deterrent, others being poor political leadership and centralization and unequal access to resources. India adopted direct anti-poverty programmes during the late 1960s. These schemes consist of self and wage employment and are implemented by the *Gram Panchayat* or the lowest tier of rural government (Mallick, 1993).

Table 4-5: Headcount ratio and Gini index for rural West Bengal, mid 1970s to 1990s

Year	Headcount ratio	Gini index
1973-74	69.1	.1763
1983-84	54.2	.1510
1986-87	36.6	.1295
1987-88	36.3	NA
1993-94	25.2	NA
1999-2000	21.9	NA

Source: Part of table from Bhaumik (1993:309) for 1973 to 1987; Deaton and Dreze (2002:3731) for 1987 onwards.

Bhaumik (1993) used 28th, 38th and 42nd rounds of National Sample Survey and Labour Bureau data in order to study trends in poverty in West Bengal over time (Table 4-5). The headcount ratio measures the percentage of population below the national poverty line which may be a set level of per capita income or consumption. It has been declining steadily in West Bengal since the early 1970s and gathered momentum since the late 1980s. The Gini index is a measure of inequality. The higher the value, the greater the extent of inequality. A declining value over time, as observed in Table 4-5 is indicative of greater equality. Every measure of poverty

declined steadily in the state since the 1970s. Consumption levels have been in line with the improvements in poverty. Bhaumik's work asserted that every measure of poverty – the ones mentioned here along with Sen's index and average consumption expenditure of the poor, had improved during that period. And the state experienced further declines during the 1990s. Deaton and Dreze (2002) modified the fiftieth Round of the National Sample Survey, which had used a new questionnaire design, in order to make time-trend analysis more comparable. According to their revised estimates for West Bengal, poverty declined faster in the state between 1987 and 2000 than that suggested by official estimates. They contend that the decline in poverty is largely attributable to revision and setting of the wage rate during 1990 along with the fast rate of economic growth in the state. They highlight a close association between wage rate and rural poverty in India. Kerala, the exemplary state in the Indian context, had the highest wage rate in the country. Maharatna (2007) maintained that the decline in poverty has not been as impressive as in the southern states and there is still widespread poverty in West Bengal.

The role of various NGOs in alleviating poverty in Bangladesh is well documented (Lovell, 1992; Pitt, Khandker and Cartwright, 2003; Littlefield, Murdoch and Hashemi, 2003). The impact of this sector on the marginalised has been through creating social awareness, providing micro-finance and skills for income generation, and increasing channels of support and co-operation. The rate of development during the last three decades has been unprecedented (Ahluwalia and Hussain, 2004). However, the rate of decline in poverty in Bangladesh has been lower than that observed in West Bengal. The headcount ratio has been declining at both the rural and urban levels in the country but the level of inequality has risen, as seen from the increasing Gini index in Table 4-6. Both the headcount ratio as well as the level of inequality are higher in Bangladesh relative to West Bengal. However, human poverty index, which encompasses deprivations in health, education and nutrition has been improving at a faster rate than income poverty in the country (IMF, 2005).

Table 4-6 Headcount ratio and Gini index for Bangladesh

	1991-92	2000
Headcount Ratio		
National	58.8	49.8
Rural	61.2	53.0
Urban	44.9	36.6
Gini Index		
National	.259	.307
Rural	.243	.271
Urban	.307	.368

Source: International Monetary Fund (2005:13)

Chapter 1 illustrated the role of a decline in fertility in alleviating income poverty. A lower level of fertility in West Bengal may be a partial factor for the faster decline in poverty in relation to Bangladesh. The country lacks an effective system of income re-distribution although the NGO sector, in particular the availability of microfinance for women, has been a notable agency for poverty alleviation (Khandker, 2003). However this sector currently covers only about 20 percent of the population (Perry, 2000). The importance of good governance and effective public programmes cannot be overemphasized (Amin and Pierre, 2002).

The following discussion is on social elements of poverty, namely trends in migration and education.

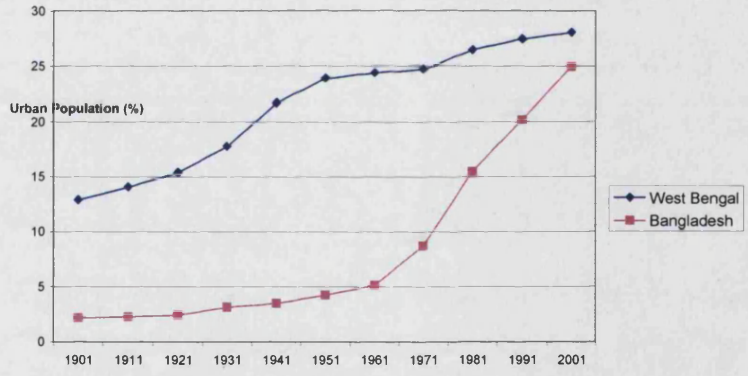
4.1.6 Urbanization and migration

The definition of urban population often varies from one census to next as some previously rural areas are enumerated as urban, but this is generally thought to play a minor role in the change in urbanization (Khan, 1982).[41] The 1901 census recorded the percentage of urban population in West Bengal to be roughly four times greater than that in Bangladesh (Figure 4.1). By 1941, the gap in the rates of urbanization had widened between Bangladesh and West Bengal. Partition-related migration much affected the urban population between 1941 and 1951 (Visaria, 1969; Crook and Dyson, 1982). After having remained at the low level of under five percent during the first seven decades of the last century, urban growth accelerated in the

[41] For a list of the classification of Indian towns by size of population, see, for example, Crook and Dyson 1982, p.148. These authors maintained that much of the urban growth in India between 1961 and 1981 was attributable to a faster rate of growth in the larger towns.

country since the 1960s. On the other hand, West Bengal experienced a stagnation in urban growth since Partition. A slowdown in industrial investments, in the state attributable to power shortages and history of industrial action by the strong trade union, is an explanation for the decline in urban growth since the 1960s (Crook and Dyson, 1982). Rural industrialization has never really been promoted in the state (Dutta, 2002). Another factor explaining the slower rate of urban growth in West Bengal relative to Bangladesh during the post-Partition period has been a lower level of fertility. Yet another explanation for the slow growth in urbanization in West Bengal since Partition is a lower level of rural to urban migration relative to Bangladesh.

Figure 4-1: Urban Population in Bangladesh and West Bengal: 1901-2001



Source: Census data, relevant years.

Rural to urban migration is a significant component of urban growth in developing countries. Fifty percent of the dramatic increase in urban population in Bangladesh between 1961 and 1975 was explained by internal migration, 29 percent by natural increase and the remaining 21 percent by reclassification of rural towns as urban (Khan, 1982). Since 1971, rural to urban migration has accounted for two thirds of the urban growth in Bangladesh (Afsar, 2003). The increasing trend in rural to urban migration has brought about social changes like an increase in the number of female headed households (Lewis, 1993). Internal migration is also an important characteristic of urbanization in West Bengal but perhaps not as much as in Bangladesh, as seen from a stagnation in urban growth during the post-Partition

period.. There are more 'push' than 'pull' factors for rural to urban migration. Poverty, landlessness and a lack of employment opportunities are the main driving forces and especially so in the case of migrating women in West Bengal (Kak, 1994:45). The migration patterns of seasonal agricultural wage labourers in West Bengal and the precarious lives of their families staying behind is well documented (Rogaly and Rafique, 2003). Bangladesh has also experienced a significant increase in female migration since 1985 (Ahsan et al, 1997). Women work under extremely poor and risky conditions in both the formal (garments) and informal (construction) sectors in Bangladesh (Swaminathan, 2004). There is a high demand for female labourers in the urban construction sites in Bangladesh as they command a much lower wage rate than men do – often as little as half of the male wage rate (ibid). Male and female wage differential in West Bengal is relatively small. The differential has been much lower than the Indian average since the mid 1960s and even lower than in Kerala (Singh, 1996:109). However the average earning per day per worker continues to be low – Rupees 21 compared with the All-India average of Rs 23 (Shariff, 1999). There appears to be relatively low levels of female labour force participation in the state. Only about ten percent of all female workers had principal employment status in West Bengal during the late 1980s compared with 24.5 percent at the national level (Kak, 1995). Bangladesh has similar levels of female employment (BBS, 2007). These low rates may be explained by the way the censuses and surveys define economic activities.

Remittances from cities have multiplier effects and are undoubtedly beneficial to rural households. According to a study in Matlab, Bangladesh, one-fourth of rural households' net income comprise remittances- both from urban and international sources (Kuhn, 2002). The downside is the poor health and living condition of migrant workers who reside in unplanned city slums infested with crime, disease and squalor. The morbidity rate is as high as 52 percent among the slum dwellers in Dhaka (Afsar, 2003). Studies on West Bengal suggest that urban poverty and infant mortality are not improving as fast as rural rates (Agnihotri, 2001; Deaton and Dreze, 2002). The cities are not equipped to accommodate or provide for the thousands of migrants coming to cities in search of work. The haphazard settlements cause water-logging and congestion – diseases like malaria and dengue fever have made a comeback.

The Bangladeshi economy has benefited from remittances from overseas. Table 4-7 depicts the rapid rate at which per capita income in Bangladesh has been increasing as a result of remittances. The prime destinations for Bangladeshi migrant workers are India, Saudi Arabia, United Kingdom and the United States of America, in that order (Ratha et al, 2008). Between 1976 and 2002, roughly three million Bangladeshis, predominantly male, have migrated overseas for employment (Siddiqui, 2003). Although the volume of migration has to some extent declined in recent years as a result of rising costs of migration and competition from other sending countries, remittance flows into the country have grown at around ten percent over the past 25 years (ibid). Per capita income of Bangladesh rose dramatically in 2007-2008 to $599, attributable to record flows of remittances from abroad. But per capita income does not necessarily reflect on inequalities in health education and income, or quality of life.

Table 4-7: Remittances in India and Bangladesh, 1995-2007: In billions of US $

	1	2	3
	India	**Bangladesh**	**Per capita Income, Bangladesh US$**
1995	6.2	1.1	
2001	14.2	2.1	
2005	18.7	4.3	476
2006	21.3	5.4	523
2007	25.4	6.4	599

Source: Columns 1 and 2 Ratha et al (2008); column 3 Bangladesh Bureau of Statistics (2007)

The issue of undocumented migration from Bangladesh to India deserves mention. India shares over 4000 kilometres of border with Bangladesh and over half of this is with West Bengal (Datta, 2005). Trans-border migration from Bangladesh to India started long before the Partition of 1947. For example, Bangladeshi migration to Assam originated during the early decades of the twentieth century and increased after the partitions of 1947 and 1971 (Murayama, 2006). Large-scale migrations from Sylhet to Assam is believed to have taken place following Partition in 1947 (Hill et al, 2005). But it took a violent shape between 1979 and 1985 when the native Assamese had to compete with illegal migrants for economic opportunities (Weiner, 1978). As Weiner points out, migration can have destabilizing effects and can cause

conflicts due to competition over scarce resources. The illegal migration of Bangladeshis to India, particularly to West Bengal is well documented where the motivating factor is primarily economic and in some cases to avoid religious persecution of minorities like Hindus (Samaddar, 1999; Schendel, 2005). Migration carries the impact of economic problems across national borders (Findlay and Hoy, 2000). The percentage of female migrants from other countries (mainly Bangladesh) is 2.4 percent in West Bengal when it is below one percent in all other major Indian states (Shanti, 2006). Environmental degradation, for example, an increase in salinity of water and river erosion of the *Meghna* basin, have resulted in a new wave of undocumented migration to India – that of 'climate refugees' (Mitra, 2004; Pender, 2008). Given the unique geographical location, the country is vulnerable to regular floods and cyclones along with long – term processes in riverine hazards. It has been postulated that disaster impacts in Bangladesh are caused by social, economic, political and cultural factors as much as they are by natural environment (Haque, 1997).

To sum up, the fast rate of urbanisation is to a large extent attributable to growing poverty and inequality. The country does not have an effective system of local government to implement pro-poor policies. Growing landlessness in the absence of alternative economic opportunities have forced rural masses to migrate to cities or to India.

4.1.7 Literacy/Education

This section compares trends in education during the post-Partition period. Literacy rates increased progressively faster among all sexes and religious groups in relation to the pre-Partition period.

Table 4-8: Literacy among 6+ population in West Bengal and 5+ in Bangladesh

	Bangladesh			West Bengal		
	Both	Male	Female	Both	Male	Female
1961	19.9	29.2	9.6	29.3	40.1	19.9
1971	24.3	32.9	14.8	33.2	42.8	22.4
1981	23.8	31.0	16	48.6	59.9	36.1
1991	29.8	35.8	23.4	57.7	67.2	47.1
2001	42.5	46.4	38.3	69.2	77.6	60.2

Source: Various census reports

Recent trends suggest that female education has improved at a faster rate than male in Bangladesh since the 1980s (Table 4-8). This has been made possible through government programmes as well as efforts of NGOs like BRAC (Ahmed and Prather, 1993). Government programmes like 'food for education', and stipend for girls, designed to increase female enrolment, have been successful in attracting students (Amin and Sedgh, 1996; Hossain and Kabeer, 2004). That said, West Bengal continues to be ahead of Bangladesh in education in general. Religion and culture partly explain the higher levels of education in the state. Murshid (1995) and Ahmed (1981) highlight the historical reasons for the backwardness of Bengali Muslims in education. The colonial government introduced English education and encouraged elitist higher education but mass education did not get patronage under them (Goon, 1993). The improvement of primary education in West Bengal was better during the two decades immediately following Partition than during the last two decades of twentieth century (Acharya 2002). While West Bengal has effectively implemented pro-poor policies, health and education have been neglected (Maharatna, 2007). Bangladesh, on the hand, achieved 100% enrolment during the 1990s (Hossain and Kabeer 2004). Rates of enrolment do not say anything about quality of education or rates of retention. Still 100 percent enrolment within a short span of time is remarkable in a society that observes *purdah* strictly. The rate of improvement in

education in post-Partition West Bengal been slow. The state lost its former tempo in increasing educational levels where as Bangladesh accelerated during the last two decades. Beside the socio-economic returns associated with education, it has special significance for lowering infant mortality and fertility levels (Cleland and Kaufman, 1998). Studies suggest that the popular perception among parents in West Bengal is that children get better education in private schools (Rana et al, 2005) which are much more expensive. At present, primary education is free and so is female education up to the secondary level in both the Bengals.

Another set back in West Bengal's progress in education was the withdrawal of English from primary level by leftist government soon after assuming power. This created a social gap by giving private school students an edge over those who went to state schools were English was not offered. English was reintroduced in state schools by popular demand. The popular belief is that higher female education will make them non-conformist wives, and higher education for girls also entails getting even higher educated grooms which comes at the cost of higher dowries (Arends-Kuenning and Amin 2000). Calcutta's decision to stop mid-day meals caused a setback as children need food to concentrate, plus it serves to feed needy, vulnerable children (Sachs, 2005). Amartya Sen started the *Particihi* Trust on the assumption that education will have an avalanche effect in fostering health and economic opportunities. State run primary schools in both regions are below unsatisfactory levels with very high teacher-student ratio and poor quality of teaching (Maharatna, 2007).

4.2 Summary of change in population: 1941-2001

Post-Partition demography of Bengal needs to be understood against the backdrop of the Partition-related religious and socio-economic changes discussed so far.

Table 4-9: Basic Population Indicators, 1941-2001

Year	Census Population 1	Decadal Increase (%) 2	Population density (km2) 3	Population Sex Ratio (m/f) 4
West Bengal				
1941	23222552	-	264	1.17
1951	26299980	13.2	299	1.16
1961	34926279	32.8	297	1.14
1971	44312011	26.9	504	1.12
1981	54580647	23.1	620	1.10
1991	68077965	24.7	766	1.09
2001	80200000	17.9	904	1.07
East Bengal				
1941	41997000	-	291	1.08
1951	44100000	5.2	312	1.10
1961	55200000	25.2	379	1.08
1974	76300000	38.2	533	1.08
1981	89900000	17.8	650	1.06
1991	111500000	24.0	774	1.06
2001	129,247,000	15.3	897	

Notes: Columns 2 refers to the 10-year periods while the rest of the columns refer to census years

Source: Relevant census reports

Between 1941 and 2001, the populations in both the wings increased at least threefold. West Bengal experienced the highest decadal growth during the period 1951-1961, attributable to both Partition related immigration and natural increase. Couples may have been compensating for the depressed rate of births during the crises of the 1940s. Again, with the global improvements in mortality since the late 1940s, the successive birth cohorts were larger than the older ones. Bangladesh experienced the highest growth in 1961-1974, mainly as a result of declining mortality. Both West Bengal and Bangladesh continue to be extremely densely populated. The increasing density gives some idea of the extent of decline in land-man ratio over time, resulting from a high rate of population growth.

The high sex ratios in India is explained mainly by sex differentials in mortality as discussed in Chapter 3. The declining sex ratio in both the regions, since Partition is indicative of better coverage as well as better survival of women. As illustrated in the next chapter, the pace of improvement in female mortality gained momentum in

West Bengal during the 1970s and in Bangladesh during the 1980s. In the case of West Bengal, the trend of a less masculine sex ratio is also suggestive of stagnation in the rate of urbanization.

For India as a whole, the level of census undercount is usually between 1.5 and 2 percent (Dyson 2001). Dyson suggested the masculinity of the sex ratio as a possible indicator for the reliability of a census – the extent of female undercount is greater in bad censuses, thus resulting in high sex ratios. It is usually the more urban areas of India, which have a relatively higher sex ratio. The sex ratio for Bangladesh has been consistently lower than that in West Bengal, reflecting a much lower urban population there, although the pace of increase has been relatively faster.

Table 4-10: Decadal Crude Birth and Death Rates: 1941-2001

West Bengal				
Decade	**10-year CBR**	**10- year CDR**	**CRNI**	**Annual Intercensal Growth rate (%)**
1941-50	39.6	29.0	1.06	1.24
1951-60	44.8	21.0	2.38	2.83
1961-70	44.3	18.5	2.58	2.38
1971-80	34.5	14.5	2.0	2.08
1981-90	30.5	9.8	2.07	2.21
1991-2001	25.0	8.0	1.70	1.64
Bangladesh				
Decade	**10-year CBR**	**10- year CDR**	**CRNI**	**Annual Intercensal Growth rate (%)**
1941-51	49.4	40.7	0.87	0.50
1951-61	50.6	29.7	2.16	2.23
1961-74	47.2	16.6	3.2	2.50
1974-81	44.7	15.4	2.67	2.33
1981-91	36.7	12.9	2.75	2.15
1991-99	28.4	9.2	1.97	1.72

Note: 1981-2000 – average of SRS figures for West Bengal

Source: For 1951 to 1965, Bangladesh Vital Registration, adjusted for under-registration, 1966 onwards, Matlab DSS. For West Bengal, 1951-79, Vital Registration, and 1980 onwards – Sample Registration System.

The crude rate of natural increase (CRNI) are only as accurate as the birth and death rates used to calculate them – the CBR and CDRs in Table 4-10 are only estimates. Nevertheless, some general comparisons may be made. Unlike the first half of the century when the death rate was higher in West Bengal (where malaria was endemic), the death rate has been consistently lower in West Bengal during the post Partition period. A lower rate of infant mortality, and greater levels of utilization of healthcare, have contributed to this trend in West Bengal (details in Chapter 5). Greater equality relative to Bangladesh may be another factor. Poverty has been declining faster and literacy levels are higher in the state relative to Bangladesh. After 1961, the crude rate of natural increase (CRNI) was higher in Bangladesh, the main reason being that the death rate has been falling at a much faster rate than the birth rate. The largest fall in the birth rate was during the 1970s in West Bengal. The mass sterilization campaigns during the Emergency period in India (1975-77) is an explanation. It also implies that the fertility decline was already underway in the state. In Bangladesh, a significant decline in the birth rate occurred a decade later during the 1980s. The difference between the interecensal growth rate and rate of natural increase gives a rough idea of the level of migration. And West Bengal experienced net positive migration throughout the post-Partition period where as Bangladesh has experienced a progressive decline in the Hindu population. These Bangladeshi Hindus are plausibly migrating to West Bengal and other parts of India under growing persecution of minorities in the country (Narula, 2003).

4.2.1 Age Structure

The effects of declining birth and death rates on the age structure have been discussed in Chapter 3. Relative to the pre-Partition period, the percentage of the age group 0-5 declined slightly in West Bengal. On the other hand, it increased in Bangladesh suggesting that the death rate has been falling faster than the birth rate.

Table 4-11: Age Structure of West Bengal and Bangladesh – 1951-1991

	0-5 (%)	<15 (%)	Women aged 15-44 (%)	CWR	
West Bengal					
1951	11.7	35.0	21.8	537	
1961	12.3	32.4	15.4	799	
1971	14.5	42.9	19.2	758	
1981	12.6	38.8	21.3	594	
1991	11.5	36.6	36.6	524	
Bangladesh					
1951	14.6	42.0			
1961	19.6	46.8	18.3	1068	
1974	16.9	48.1	18.3	922	
1981	17.1	46.6	19.5	872	
1991	16.8	45.3	20.6	815	

Notes: CWR is abbreviation for Child Woman Ratio which is calculated by dividing the age group 0-5 by women aged 15 to 44, each age group is expressed as a percentage of the total population.

Source: Various census reports for adjusted age-structures for Bangladesh and West Bengal

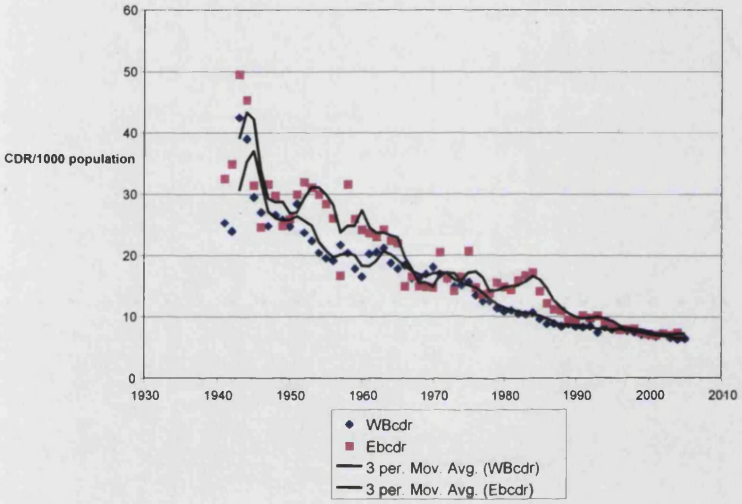
With the birth and death rates declining progressively, the shape of the population pyramids have been getting more and more rectangular at the younger and reproductive ages. The percentage of population aged 0-5 was more or less constant in West Bengal between 1951 and 1991 while that in Bangladesh increased steadily, reflecting a higher birth rate in the country. The drop in the percentage of 0-5 during 1961-74 in Bangladesh indicates the depressed birth rate during the civil war and famine. Bangladesh continues to have a much younger population. In 1991, almost half (45 percent) of the population was aged below 15 compared with a little over 36 percent in West Bengal. A slightly higher percentage of women in the reproductive ages in West Bengal is explained by better female mortality. In 1951, the child woman ratio was almost double in Bangladesh relative to the state. This ratio has consistently been higher in the country primarily as a result of the larger size of those in the population aged below five.

4.2.2 Time Series of annual births and deaths: West Bengal and Bangladesh

A decline in the death rate in facilitated by public health measures, a rise in living conditions or import of medical technology but is generally followed by a sustained decline in the birth rate. The birth rate declines through a change in marital fertility, nuptiality patterns, and age-sex distribution of the population. The following time

series of annual rates of births and deaths were constructed using various sources of registration data. For West Bengal sample registration data (SRS) data was used for 1980 onwards and for Bangladesh, Matlab DSS data for 1966 onwards. Details on the construction of the time series may be found in Chapter 2. A three-years average was used for the trend line so that the yearly fluctuations could be smoothed out.

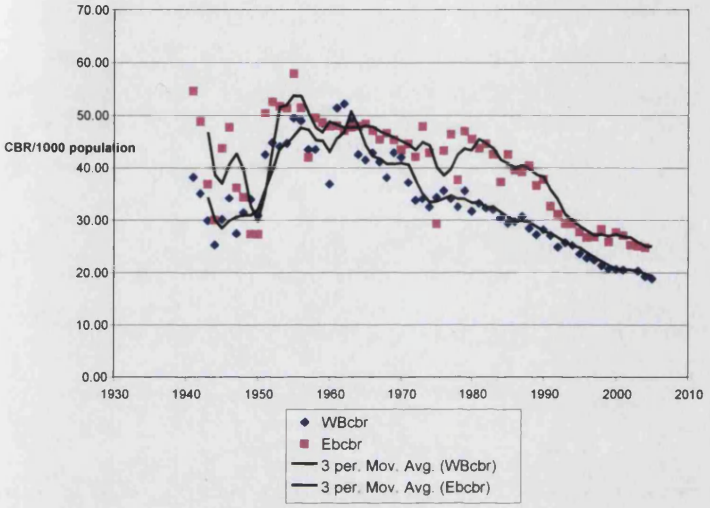
Figure 4-2: Crude Death Rates in Bangladesh and West Bengal: 1941-2006



Following the excess mortality during the 1940s (attributable mainly to the 1943-44 famine) the death ate has been declining consistently in both the Bengals. As illustrated in the preceding chapter, this was when the province of Bengal made significant gains in malaria mortality. A faster rate of decline in the death rate explains the faster pace of decline in the birth rate in West Bengal. Dyson (2001) suggests that a sustained decline in mortality can lead to a decline in fertility as well as an increase in urbanization. Earlier discussions established that the level of urbanization has always been higher in West Bengal although the pace of growth was relatively faster in Bangladesh since the 1960s. The effects of the tidal wave, war and famine on the country during the 1970s is evident. The upsurge in the CDR observed during the 1980s is plausibly explained by age structural changes induced

by earlier changes in fertility and mortality. As mentioned elsewhere, the CDR is sensitive to age-structural changes in the population.

Figure 4-3: Crude Birth Rates in Bangladesh and West Bengal: 1941-2006



Fertility has consistently been higher in Bangladesh during the latter half of the last century. After a pre decline rise during the mid 1960s, the birth rate has been declining steadily in West Bengal. Matlab data that are available for Bangladesh from 1966 onwards show a declining trend in the birth rate since the mid 1960s, which is exactly when the birth rate started declining in West Bengal. The non-availability of VR data for the period between 1958 and 1966 makes it difficult to ascertain a pre-decline rise in the birth rate in Bangladesh before the onset of the decline. The sharp decline in fertility in West Bengal during the late 1970s is explained by the mass sterilization campaigns during the Emergency period in India. Matlab data suggest that the 1974-75 famine had a far greater impact on the demography of Bangladesh than the 1971 war of independence. The average life expectancy fell by over seven years as a result of the war of 1971. It fell from roughly 50 to 42 years following the famine. The impact on the birth rate and on infant mortality was significantly more pronounced during the famine than during the war. The 1974-75 famine is believed to have been responsible for roughly 3 million excess deaths and an exodus of up to ten million Bangladeshis to India (Chen 1973). Dyson (1991) points out that real wage of agricultural labourers had fallen by 40

percent between 1969 and 1974 making the population already vulnerable when the famine struck in 1975.

4.3 Conclusion

This chapter illustrated how the population trajectories of East and West Bengal changed following Partition. It focused on the implications of Partition and the related changes in the socio-economic structure and religious composition. Analysis of the 1941 and 1951 censuses revealed that there may have been considerable relocation among the Hindu and Muslim populations who did not cross border following Partition. There was a tendency among the Hindus of West Bengal to move away from the bordering to inland districts. The same phenomenon was observed among the Muslims in Bangladesh following Partition. The population grew at a faster rate in Bangladesh during the latter part of the last century. And this happened despite the fact that Partition-related migration to West Bengal was at least three times greater. Migration has played an important role in population change at and after Partition. The Muslim population has been increasing in West Bengal as a result of both greater Muslim relative to Hindu fertility and migration from Bangladesh. The Hindu population in Bangladesh has declined progressively. This chapter examined the macro determinants for the higher rate of population growth in Bangladesh relative to West Bengal. Factors like economic development and government ideology can influence the rate of population growth by having an effect on fertility and mortality. This chapter has revealed that an effective system of local government in West Bengal has ensured more equal distribution of wealth since the late 1970s. Higher levels of education and urbanization since the beginning of the last century have been contributing factors to the steady decline in fertility and mortality. The rate of urbanization increased faster in the country during the post-Partition period primarily because landlessness and lack of employment opportunities 'pushed' people from villages to cities. Another explanation for the higher growth rate in Bangladesh was the relatively younger population, thus creating a 'population momentum'. Although the birth rate has started declining, the young age structure means that the young cohorts would reach reproductive ages and sustain the high rate of growth for years to come. In conclusion it may be said that

the demographic indicators improved at a slower rate in Bangladesh during the last 50 years due to a weak political and intellectual base and greater inequality.

The next two chapters explore the trends and determinants of mortality and fertility.

5 Chapter 5: TRENDS AND DETERMINANTS OF MORTALITY

The dissertation so far has established that the crude death rate has been higher in Bangladesh since the 1920s. However this measure of mortality does not tell us if the higher death rate in Bangladesh is attributable to higher levels of infant/child mortality or to poor health status of women or both. There are relatively more sources of demographic data available for the last fifty years or so thus making it possible to compare the more refined measures of mortality like infant mortality and life expectancy. The focus of this chapter is on the comparison of the various dimensions of mortality between the two Bengals using registration and census data in addition to the statistical analysis of survey data.

Despite the limitations of registration data, trends in the death rate, infant mortality and life expectancy can be ascertained with reasonable accuracy. There is, however, severe paucity of reliable data on morbidity and causes of age and gender-specific deaths in both Bangladesh and West Bengal. Unlike the norm in the western world, few deaths occur in medical institutions to be accurately diagnosed and recorded. Nevertheless some general comparisons can be made. This chapter addresses two aspects of mortality in the context of post-Partition Bengal. First, the reasons behind the faster improvements in mortality in West Bengal are explored. I address this section with particular reference to the evolution of health systems in Bangladesh and West Bengal and to trends in the crude death rate, infant mortality rate and life expectancy. In addition, the section briefly investigates the epidemiological transition using the scanty reliable statistics on age and cause specific deaths. The second section discusses infant and maternal health using statistical analysis of survey data. The main findings are then summarized.

Nineteenth century mortality decline in the western world was aided by two main factors, an increase in living standards, and in technological advances in medicine and public health (Stolnitz, 1955). The transition in mortality in the less developed regions has been relatively faster and increasingly disassociated from economic development. The easier diffusion and import of health technology has made this possible (Preston, 1975). Health interventions have played a major role in the

mortality transition in the less developed countries. Many Asian countries, including present-day Bengal, have achieved low mortality at very low levels of income (Caldwell, 1999). The declining trend in the death rate in Bengal gained momentum during the late 1940s when modern medicine was made widely available as part of a global drive to eradicate communicable diseases (see, for example, Ruzicka and Hansluwka, 1982). Stolnitz's prediction that subsequent decline in mortality would be difficult to achieve in the absence of socio-economic development seemed to apply in the case of Bangladesh where improvements in mortality have been relatively slow until the 1980s. West Bengal on the other hand has experienced a consistent decline in mortality throughout the last century even in the absence of substantial improvements in income. The state possesses many of the attributes which Caldwell outlined to be leading to low mortality, namely, mass education, history of exposure to modern ideas and relative egalitarianism (Caldwell; 1986, 1990). And this was coupled with greater utilization of healthcare in the state relative to Bangladesh as is pointed out in this chapter.

5.1 Trends and patterns in mortality

The general health of the population of Bengal was particularly poor around the time of Partition in 1947. Per capita availability of food had been on the decline since the beginning of the twentieth century (Blyn, 1966). This was attributable to trade policies of the British rulers coupled with a fast rate of population growth since the 1920s. The decade of the 1940s was of particular significance. As discussed in earlier chapters, both East and West Bengal were much affected by the conditions created by the Second World War and by the impending Partition. The famine of 1943-44 left a huge impact on the vital rates, in particular on mortality rates of Bangladesh. The food scarcity of the early 1940s left the survivors of the famine weak and emaciated. The following excerpt aptly describes the causes for the vulnerable health conditions of the Indian masses during colonial rule:

> 'The increased prevalence of disease generated by disruption of the ecological balance, the breakdown in pre-existing health services, and the denial of access to the Western system of medicine, combined to considerably worsen the condition of the masses, making them even more vulnerable to exploitation.'
>
> (Banerji 1985:8)

5.1.1 Evolution of health policy in Bangladesh

Partition put East Bengal at a major disadvantage over West Bengal. The health system was among the sectors to suffer as a result of emigration of skilled workforce and medical professionals from East Bengal. Health positions were traditionally held by Hindus, most of whom opted for West Bengal at Partition (Etienne, 1977; Chowdhury et al, 1999). And the east already had a poor health infrastructure compared with the west of the province, due to relative neglect under British rule (Harrison, 1994).

Healthcare in present-day Bangladesh got further left behind between 1947 and 1971 when the country was under Pakistani rule. Health got lower priority in Pakistan than it did in India during the decades following Partition (Jeffrey, 1993). The author maintained that the health policy of Pakistan post-1947 was set by the military and the commercial elite of a capitalist society, while that in independent India reflected the ideology of the nationalist movement, thus giving priority to the provision of social services for the masses. And while under the Pakistani regime, Bangladesh received lower funds from the central government and produced fewer doctors and nurses than did West Pakistan. Private healthcare was concentrated in the western wing (ibid). Only about ten percent of the rural population in the country was covered by government healthcare in 1965 (Robinson, 1966). The non-governmental sector (NGO) did not create a considerable impact until after independence in 1971.

The first Five Year Plan (FYP) of independent Bangladesh, stretching from 1973 to 1978, set out to expand the rural health infrastructure, providing comprehensive health services around the concept of Primary Health Care (PHC).[42] Since the 1980s, Bangladesh has had an impressive infrastructure of outreach sites, clinics, hospitals and fieldworkers for a country so poor (Perry, 2000:34).

Population control was already high on the donor community's agenda by the 1960s, following the unprecedented rate of population growth in developing countries that resulted from the rapid gains in mortality at the end of the Second World War

[42] The Primary Health Centre (PHC) forms the backbone for the provision of healthcare services in India and Bangladesh. Its functions include provision of medical care, control of communicable diseases, and mother and child health services, among other things.

(Connelly, 2006). Healthcare took a backseat since the 1970s when family planning became the primary focus of the donor community and of the government. More resources were being channelled into increasing the contraceptive prevalence rate than on primary healthcare. Only about 40 percent of the population had access to modern primary care beyond immunization and family planning services at the turn of the last century (Perry, 2000). But the need for revamping the health sector was soon recognized. The result was the Health and Population Sector Programme, HPSP (1998-2002) which was a high budget health reform project. It aimed to unite health and family planning services to be provided at static community clinics, abolishing the earlier method of providing door-step family planning services. The HSPS project was too ambitious in nature – just about half of the envisaged 13,000 community clinics were operational in 2002. Subsequently, the community clinic system was abolished and replaced by the earlier system of domiciliary services and satellite clinics (Mercer et al, 2005:116). Only about 22 percent of the population was being served by government healthcare when roughly 60 percent could be covered if properly managed (Jahan, 2003). But poor management of staff and facilities and quality of services have acted as a deterrent to utilization of government health services (ibid).

The health sector is financed mainly by the government revenue budget while family planning by foreign donors (Akhter, 2004). Similar to India, health and family planning continue to be provided by the same Ministry – that of Health and Family Welfare (MoHFW).The country spends substantially less of the MoHFW budget on health than does the state government of West Bengal (Table 6.13 of Chapter 6). Per capita expenditure on health in Bangladesh is between US $4 and $7 when ideally it should be $12 (Government of Bangladesh, 2002). Total health expenditure as a percentage of Gross Domestic Product (GDP) was 4.9 in Bangladesh during the 1990s compared with 5.2 in India (Misra, Chatterjee and Rao, 2003).

Among the positive developments in the health sector was the inception of National Drug Policy. It was drawn up in 1982 under President Ershad (1982-1990). It essentially aimed to make basic drugs more accessible by promoting locally manufactured generic drugs, some of which were put under price control (Chowdhury 1995). Most foreign drugs available until that point were eliminated.

Medical providers were also made more accountable. For obvious reasons, this policy has been unpopular among health providers and multinational pharmaceutical lobbyists. The policy to post local medical graduates in rural areas however has not been very effective, one reason being that unlike in India, government doctors are still able to practise privately. It is a substantially more lucrative venture.

The Expanded Programme on Immunization (EPI) was initiated in 1979 in Bangladesh but intensified in 1986. The immunization coverage in the country increased from 2 percent in 1985 to 61 percent by 1991 - a dramatic improvement but still below the UNICEF target of 80 percent (Chowdhury et al, 2003). The level of coverage has plateaued at around 50 percent since the mid 1990s, as a result of supply as well as demand factors. The withdrawal of NGOs partially explains the slowdown when NGOs played a dominant role in providing immunization services in city slums (ibid). There are wide disparities in terms of gender, class and region. Female children had a 30 percent lower chance of getting immunized during the early 1990s (Jamil et al, 1999).

There were over 4000 NGOs working in health, population and nutrition in the country as of late 1990s (Perry, 2000). The areas served by this sector have better health statistics than those run by the public sector. One reason why NGOs flourished is the general perception that they provide relatively better quality of services (Perry, 2000:57). The Bangladesh Rural Advancement Committee better known as BRAC, is among the local private development agencies that is worthy of mention. Besides its own health, education and human rights initiatives, it promotes the government's maternal and child health (MCH) activities (Chowdhury and Cash, 1996). West Bengal has not benefited from the extent of NGO involvement that Bangladesh has.

5.1.2 Evolution of health policy India/West Bengal

At Partition, expectation of life at birth was 26.9 for Indian males, and 26.5 for females (Banerji 1985:10). The Bhore Committee report was published in 1946 providing recommendations for combating the greatest obstacle to health in the country, namely poverty.

The focus of the national health policy has been to combat communicable diseases as India 'lacked commitment to carry through a public health revolution' (Ramasubban 1984:108). The first and second FYPs (1951-56 and 1956-61, respectively) made large investments in expanding rural infrastructure through construction of PHCs, along with procurement of life-saving drugs and vaccines (Banerji 1985:25). Thus the drive to expand rural infrastructure initiated earlier in India than in Bangladesh. The 1953 Malaria Eradication Programme of India was one of the largest public health programmes in history, taking up 30 percent of the Indian health budget at the time (Amrith 2007:25). It is a testament of the fact that health investments do pay off – incidence of malaria dropped dramatically in West Bengal, as in the rest of the country (Visaria, 2004). However family planning got priority over health in general from 1966 onwards when population control came into the forefront of Indian politics. The share of family planning in Plan outlays increased while that for health decreased.[43] As a result of the decline in per capita expenditure on health, there was a resurgence of communicable diseases and consequently a slowdown in mortality decline during the 1970s (Cassen, 1978). The Minimum Needs programme was introduced in 1974 in order to address the nutritional and health needs of the underprivileged – namely, mothers and children. Similar to Bangladesh, there has also been a drive to integrate health with family planning.

The delivery of healthcare in India is under the jurisdiction of the state and local governments. The overall health strategy however is set by the central government. The lion's share of the central funds going to states is for the family welfare programme - roughly 75 percent, leaving the rest for health (Ramasubban, 1984).

In practice, the success in delivering health services to masses has varied from state to state. Provision of public sector healthcare in West Bengal has been far from satisfactory (Dreze and Sen, 1995). Yet the state recently ranked third in the country in reducing the rate of infant mortality (Agnihotri, 2001). Health infrastructure in West Bengal, in terms of number of beds per *lakh*[44] population is comparable to

[43] The share of family planning increased from 1 percent in the first FYP (1951-56) to 26 percent during the mid 1970s. On the other hand, the percentage share for communicable diseases reached a peak of 28.5 percent during the Second Plan (1956-61) after which it has been declining steadily (Ramasubban, 1984:104).

[44] One *lakh* is equivalent to 100,000

Karnataka and Tamil Nadu (Misra et al, 2003) but far less than in Kerala. Per capita expenditure on public health has been higher in West Bengal than the national average since the 1980s, reaching 41.2 Rupees in 1998-99 compared with an Indian average of 33.9 Rupees (ibid:145). It has been argued that party cadres in the state ensure proper functioning of the PHCs (Caldwell, 1986). But the growing reliance on the private sector, even by the poorest sections of the population indicates that public health centres in West Bengal are beset with the usual problems like inadequate staffing, lack of medical supplies and poor quality of care. The primary health centres (PHCs) continue to run in a centralized manner from Kolkata (State Bureau of Intelligence, 2005). According to one study, among those with chronic illnesses in West Bengal, 70 percent relied on the private sector, four on non-governmental and the remaining 26 percent on government healthcare (Soman, 2002). The use of traditional medicine like homeopathy and *ayurveda*[45] are widely prevalent in the state (Development and Planning Department, 2004).

Overall medical care was already better in WB than the Indian average during the 1970s (Banerji 198). According to health statistics pertaining to that decade, the ratio of population per doctor was lowest in WB among major India states. The availability of hospital beds per 1000 population was 0.77 in West Bengal compared with 0.55 in India; only Kerala and Himachal Pradesh had better health input than West Bengal during the 1970s (Cassen 1978:194).

West Bengal achieved a total life expectancy of 50 years during the 1970s while Bangladesh did so during the mid 1980s. It was not only the series of floods, war and famine in Bangladesh that explain the slowdown in mortality improvements during the 1970s. By 1974, drug imports by the Bangladeshi government from socialist countries had declined from 40 to ten percent, under US pressure (Chowdhury, 1995). The effect of the global oil crisis and accompanying high prices of foodstuff plausibly exacerbated the already depressed health of the population that had just recovered from the 1974-75 famine.

[45] It is an ancient Indian philosophy on health and well-being.

What is striking about the mortality transition in West Bengal is that major gains were made before the advent of the Leftist government in 1977. The state had one of the fastest rates of decline in the death rate in India between 1968 and 1978 which, unlike Bangladesh, was accompanied by gains in life expectancy and IMR (Bhat, Preston and Dyson, 1984). The explanation lies at least partly on a faster declining birth rate in West Bengal. Declining fertility has a positive effect on infant mortality and female survival (Cleland and Kaufman, 1998). The IMR was already 85 in 1972 compared with 154 in Bangladesh during the 1970s (Table 2.7 in Chapter 2).

The health infrastructure has expanded in WB since the 1970s (Nag 1982). According to Berman and Khan (1993), the states of West Bengal, Nagaland, Meghalaya and Tamil Nadu spend more than half of their health funds on medical relief. These states also spend proportionately more than other Indian states on the purchase of drugs and there is a high negative correlation between funds spent on drugs and the infant mortality rate. The state had one of the highest densities of service delivery points in India during the 1980s and the distance travelled to a clinic is shorter in West Bengal than in Kerala, the state with the lowest mortality rates in the country (DPD, 2004).

The average family expenditure on health in West Bengal is higher than the Indian average suggesting greater utilization of health care in the state (Gupta, Chen and Krishnan 1996). The state has the highest percentage of registered homeopath practitioners in the country, 20 percent, and wide use of non-allopathic and traditional medicine (State Bureau of Health Intelligence, 2005). However the involvement of NGOs is lower in West Bengal than the national average (6.4 and 10.6 percent, respectively) when they serve roughly 20 percent of the population of Bangladesh (Perry, 2000).

Thus both the wings of Bengal have an extensive yet poorly functioning government infrastructure that is underutilized, more so in Bangladesh. According to a research study, 42% of Bangladeshi physicians remain absent at the upgraded Family Welfare Centres (Jahan, 2003). The poor in West Bengal rely mainly on private healthcare too – 85% of household expenditure on health is to private practitioners (Misra et al, 2003). West Bengal almost certainly produces better doctors relative to Bangladesh,

given the British legacy of institutions of modern education. In fact, some of the most important institutions of western medicine had been set up in colonial Kolkata during the mid nineteenth century (Banerji,1985: 16). This explains the growing trend among middle-class Bangladeshis to travel to Kolkata for medical care. Public health in post-Independence Bangladesh has been corrupt and ineffective (Miranda, 1981). The health programmes in both India and Bangladesh underwent radical transformation during the late 1990s. The move is towards community based service delivery.

5.1.3 Trends in mortality rates

It should be emphasized that the crude death rate, as the name implies, is a crude and simple measure which is not as useful an indicator of mortality as life expectancy is. In populations with low female status and high levels of fertility, infant and maternal mortality and life expectancy are more insightful indicators.

Decadal averages of CDR and IMR have been used in Figure 5.2 as the time series of annual rates of IMR was not available for the entire post-Partition period. As mentioned in Chapter 3, use of decadal estimates can exaggerate the steadiness of the decline.

Figure 5-1: Crude Death Rate and Infant Mortality in Bangladesh: 1900-2007

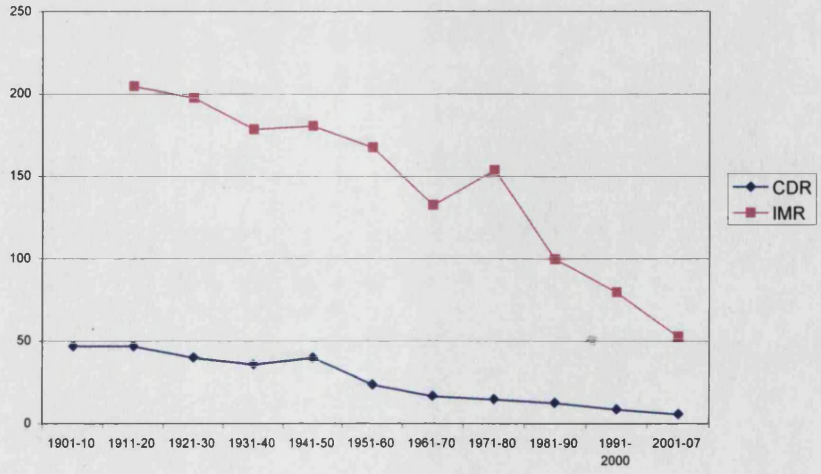
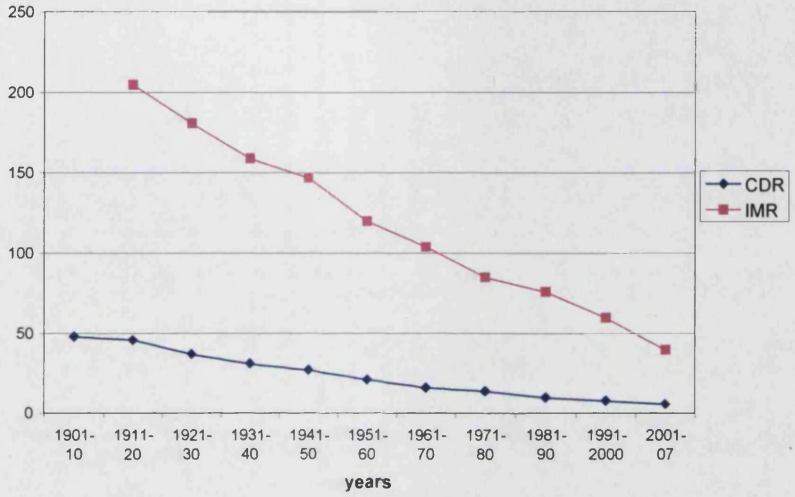


Figure 5-2: Crude Death Rate and Infant Mortality Rate in West Bengal: 1900-2007



5.1.4 Time trends in crude death and infant mortality rates (IMR)

Post-Partition mortality transition in Bengal has to be understood in light of population changes since the beginning of the last century, in particular to the changes since the 1920s. A decline in mortality has two affects on the age structure. First, it results in more people surviving from birth to old ages and second, it can create a younger population.

Details on the construction of these figures may be found in Chapter 2. In estimating the infant mortality rates (IMR), the numerator was adjusted in order to match the cohort of the denominator. The registered rates were then adjusted for under-registration using the same correction factors used for the birth and death rates in East and West Bengal.

At the beginning of the twentieth century, the two Bengals had more or less the same levels of CDR and IMR. Over the course of the century, the CDR declined steadily in both but the IMR declined in an erratic manner in Bangladesh. The difference

between the CDR and IMR has been much more pronounced in Bangladesh throughout the period in study. One explanation for the relatively higher IMR in Bangladesh is a higher birth rate. The series of problems of the 1940s, in particular the 1943-44 famine and Partition-related breakdown in the health system are reflected in the mortality rates for the country. Osman (1990) showed that per capita food availability and wage rates fell during the 1950s and to some extent during the 1960s. A decline in the average calorie intake during the 1960s in relation to the preceding decade has also been documented (Begum, 1990). The India-Pakistan War in 1965 and the crop failure in 1966-67 possibly contributed to the socio-economic slowdown in Bangladesh during that time.

The trend in the death rate during the 1960s could at least partly be explained in light of changes in the age structure. Malaria control programmes can alter the age distribution of mortality by shifting deaths from first years of life to later in childhood thus raising the overall death rate (Samuel and Bhat 1984). This possibly explains the relative slowdown in the mortality decline in West Bengal during the 1960s. The rapid decline in IMR in Bangladesh during the 1960s is not true but explained by the use of Matlab data for the time series from 1966 onwards. In fact studies suggest that infant mortality may have increased as a proportion of total deaths during that period (Robinson 1967; Jeffrey 1993). This was possibly because large-scale interventions for improving infant health, for example immunization programmes, were not in place until much later.

This decline in IMR is partially explained by the decline in the birth rate brought about by the mass sterilization campaign during the Emergency period. The slowdown in gains in mortality during the 1970s was typical of the whole of India when per capita expenditure on health had declined (Cassen, 1978). The upsurge in the IMR in Bangladesh reflects the political and socio-economic problems of the early 1970s, in particular the 1974-75 famine.

A number of factors explain the steady decline in mortality in Bangladesh since the 1980s. The country has not had a major food crisis since the famine of the 1970s. The decade witnessed a rapid decline in fertility by at least two children. The strengthening of the Expanded Programme on Immunization (EPI) in 1986 brought

about significant increases in rates of immunization (details in Chapter 6). The Drug policy of 1982 made essential drugs affordable. There have been increases in female education through the efforts of both the government and NGO sectors. Female autonomy plays an important role in female health. The availability of micro-credit has increased the status of women in rural Bangladesh (Schuler and Hashemi, 1994). The political stability and liberalisation of agricultural markets generated agricultural growth when annual growth rate and per capita income increased (Rogaly, Harris-White and Bose, 1999). The momentum created by these factors during the 1980s largely explains subsequent gains in mortality.

5.1.5 Trends in life expectancy

Populations in developed countries currently enjoy a life expectancy of up to eighty years. Women are biologically predisposed to live, on average, five years longer than men. Female life expectancy is an indicator of female status in developing countries. An increase in life expectancy is influenced more by an increase in literacy than in national income (Preston, 1995). Historically female life expectancy was higher in the Indian sub continent (Davis 1951) and it only reversed in 1920 after the rapid gains in mortality. Lower female life expectancy is attributable to excess female mortality at childhood and maternal ages caused by social discrimination at young ages and multiple high-risk pregnancies in the absence of adequate healthcare, respectively (Visaria and Visaria, 1983).

Table 5-1: Male and female life expectancy in Bangladesh, West Bengal and India, 1960-2006

	Bangladesh		West Bengal		India	
	Male	Female	Male	Female	Male	Female
1960s	48.1	49.2				
1970s	45.8	46.9	49.0	50.9		
1981-85	54.8	52.1	56.4	58.0	55.4	55.7
1986-90	60.6	60.9	60.2	61.2	57.7	58.1
1991-95	61.4	63.1	61.5	62.8	59.7	60.9
1996-2000	64.6	66.1	64.5	67.2	62.4	63.4
2001-06			66.1	69.3	64.1	65.4

Source: 1970s for Bangladesh – 1974 BRSFM; 1981 onwards are Matlab MCH-FP data.
For West Bengal – SRS data for 1981-95; 1996 onwards, Health on the March 2003-04, and figures for 1970s are from Dyson (1979).

It should be pointed out that Matlab DSS data has been used for Bangladesh from 1981-85 onwards in Table 5.2. This area of the country enjoys far better health facilities than the rest of Bangladesh. Thus the actual levels of life expectancy in the country are lower than what is presented here. According to the Bangladesh Bureau of Statistics, the combined life expectancy was 65 years in 2004 (BBS, 2007). The Population Reference Bureau suggests 62 and 63 years for male and female, respectively (PRB, 2007). A level of about 65 years may be a reasonable estimate for the female longevity in the country.

The effects of the 1971 War and the 1974-75 famine in Bangladesh are clearly reflected in the life expectancies during the 1970s when they fell by roughly two years in relation to the levels recorded for the 1960s (Table 5.2). The significant improvement in male and female mortality during 1981-85 in relation to the preceding decades is partly real and partly explained by the use of Matlab data. Matlab data reveal that the average life expectancy has increased very slowly in Bangladesh until the mid 1980s. Female life expectancy crossed over that for male only during the late 1980s following the rapid decline in the birth rate since 1979. West Bengal achieved a higher female than male life expectancy at least a decade earlier.

In comparison to West Bengal, Bangladesh has made only modest improvements in female mortality. The level in West Bengal was already higher by six years than in Bangladesh during the early 1980s – 58 and 52 years, respectively. The explanations are varied - a lower birth rate than in Bangladesh, lower levels of infant mortality and higher levels of healthcare utilization. Even in the Indian context, West Bengal has made major gains in female mortality, the life expectancy for women was about 4 years higher in the state than the national average during 2001-06.

Despite considerable improvements in mortality in both the Bengals during the last two decades, people do not perceive the quality of life to have improved. A recent study on the perceptions of changing mortality among the rural populations of both the Bengals gave rather gloomy results (Amin and Basu, 2004). While the respondents consented to improvements in infant mortality in recent years, they

believed that adult survival prospects were better in the past. In other words, they were of the opinion that adult health and life expectancy had declined over time as a result of environmental degradation and changing lifestyles.

The non-availability of reliable sex and age-specific data on mortality in West Bengal did not allow the comparison of excess mortality at childhood and reproductive ages. The significant difference in female survival between the two Bengals is likely to be attributable to mortality differentials at the reproductive ages. The maternal mortality ratios, and rates of healthcare utilization which are covered in later discussions, will shed light on this.

5.1.6 Epidemiological transition

The province of Bengal historically had its own pattern of morbidity and mortality arising from its unique geographical and socio-economic attributes (as discussed in Chapter 3). Since Partition, the continuing poverty, malnutrition, and environment degradation, under increasing population pressure, slowly gave way to new patterns of diseases. The post-Partition period saw a marked increase in respiratory infections including tuberculosis, gastrointestinal diseases, diarrhoea and dysentery, and degenerative/lifestyle related health problems like cancer (State Bureau of Intelligence, 2005; Matlab DSS). Factors like unplanned urban growth, climate change and the presence of arsenic in ground water have added to the health threats facing the population of the Bengal delta.

The concept of the epidemiological transition was formulated by Omran (1971) who defined it as the transition that a society undergoes with respect to a change in disease-patterns as it completes the mortality transition.[46] The basic shift is from communicable to non-communicable diseases. A part of the mortality transition is a change in the burden of diseases – infectious diseases are replaced by 'manmade and degenerative diseases' (ibid:517). With increases in life expectancy, levels of adult morbidity tend to be on the rise.

[46] Omran called the three stages of the epidemiological transition a) the age of pestilence and famine, b) age of receding pandemics and c) age of degenerative and man-made diseases.

Registration data on cause-specific deaths is especially deficient in the Indian Sub-continent. In 1964-65, only three percent of rural and 13 percent of urban deaths occurred in hospitals in West Bengal. Even in 2001, only 22.2 percent of total deaths took place at health facilities in order to be accurately diagnosed and recorded (Nag, 1981;West Bengal Development Report 2004). The Model Registration Scheme introduced by the Office of Registrar General did not prove to be that effective as it recorded 84 percent of all deaths in West Bengal under the "unidentified" category in 1971 (Nag, 1981).

A comparison of cause-specific deaths in district hospitals of West Bengal and in Matlab DSS area on Bangladesh gives some insights into the varying patterns of deaths in the two Bengals. At present, cardiovascular disease is the most important cause of death in the two Bengals (State Bureau of Intelligence, 2005). A big difference in seen in the percentage distribution of this disease, roughly 15 and 30 percent, in Bangladesh and West Bengal, respectively. The actual rates are plausibly higher in Bangladesh and comparable to rates in West Bengal. More cases are reported in West Bengal where the level of healthcare utilization is greater and medical diagnostic facilities are possibly better than in Bangladesh given that per capita expenditure on health is higher there. As a result, more and more middle-class Bangladeshis are travelling to Kolkata for medical care and not the other way around.

Strangely enough, senility was recorded as the second most important cause of death among Bangladeshi men when this does not appear among the top causes in West Bengal. The fatality rate from this cause among women was recorded to be double that of men in the country. The Matlab reports do not offer explanations for this trend that has been observed for a while. The category 'senility' probably encompasses a broad range of causes related to old age for example dementia, and Alzheimer's disease which do not get proper diagnosis. The emotional well-being of women has not been studied. Ahmed, Chowdhury, Bhuiya (2001) rightly point out that development efforts in the country have focused on improving the material conditions of women only. Their study of female recipients of micro-credit in the Matlab area revealed a high incidence of symptoms of depression. This phenomenon deserves further research.

The incidence of respiratory infections has been on the rise in West Bengal. In fact it has been increasing since the beginning of the last century (Chapter 3). Indoor and industrial pollution is certainly a cause along with poor immunity among a largely undernourished population. Environmental causes are also responsible. Studies on West Bengal have established that the long-term ingestion of inorganic arsenic can cause respiratory infections (Mazumder et al, 2000). Arsenic is present in the groundwater along the border of the two Bengals. A total population of roughly 147 million is believed to be exposed to arsenic levels in groundwater that are over the safe limit set by WHO (Rahman et al, 2001). Since the first nationally representative survey in Bangladesh in 2000 to test the level of knowledge on arsenicosis, there has been a joint drive by the government and NGO sectors and foreign donors to promote awareness in the country (Caldwell et al, 2005). It should be emphasized that there is severe paucity of reliable data on cause-specific mortality to undertake any meaningful comparison.

5.2 Infant and maternal health

Earlier discussions revealed that the IMR has and continues to be more favourable in West Bengal. According to recent estimates, the IMR is at least 1.5 times higher in Bangladesh – 56 and 38 per thousand livebirths in the country and state, respectively. Jain (1985) and Dyson (1997) are among studies highlighting the regional variation in infant mortality in contemporary and historical India, respectively. Dyson pointed out that following the gains in mortality during the 1920s, Bengal and Madras experienced noticeably lower infant mortality than the northern and central provinces (Dyson, 1997:121).

I have taken a more micro approach in the following analysis, using contemporary survey data for Bangladesh and West Bengal. The statistical analysis of the determinants of IMR was not possible given the design and sample size of the DHS and NFHS surveys. In West Bengal, only a handful of infant deaths had occurred to respondents in the survey, too few to give significant statistical results. Therefore the section on infant health discusses the survey reports while that on maternal and child health uses statistical analysis. In the context of the Indian sub-continent, maternal factors; nutritional status; disease patterns and healthcare utilization stand out as the

salient proximate determinants of infant morbidity and mortality and they encompass elements of the framework postulated by Mosley and Chen (1984).[47]

5.2.1 Determinants of infant health

Maternal Factors

Biological attributes, for example, birth order of child and interval between successive births, are instrumental in ensuring child survival. The relationship between birth order and mortality is u-shaped implying that mortality risks for the first, and fourth and higher birth orders are greater than for the ones in between (Gupta 1987). Parity Progression Ratios in Chapter 6 suggest that more women in Bangladesh than in West Bengal have births of higher order which carry greater risks.

The average length of spacing between births is over the optimum level of 24 months in both the Bengals (Table 5.6). However births tend to be more closely spaced in West Bengal where the median number of months since the previous birth was 33.6 months compared with 38.8 in Bangladesh. Table 5.6 also shows that more women in West Bengal have shorter than the optimum birth interval than their counterparts in Bangladesh. This may be attributable to a relatively later age at marriage in the state following which women complete their desired family size within a short span of time before getting sterilized. Female sterilization is the main method of contraception offered in the Indian programme. The mean age at sterilization was about 25 years in the state during the late 1990s (1998-99 NFHS). The family planning programmes are covered in detail in the next chapter.

[47] According to Mosley and Chen (1984), socio-economic determinants affect infant health through 14 proximate determinants that they identified, which operate at three levels. At the individual level, factors like parents' education and values are important determinants of infant mortality. Income, housing and nutrition are also significant correlates, which operate at the household level. Finally, factors at the community level like health system, infrastructure and political economy, also influence infant morbidity and mortality. They grouped the 14 determinants into five categories: maternal factors, environmental, nutrient deficiency, injury, and personal illness control.

Table 5-2: Birth interval (in months): Bangladesh and West Bengal

	Median no. of months since previous birth	Birth Interval <18 months (%)	Birth Interval 18-24 months (%)	Birth Interval 25-36 months	Birth Interval >36 months
Bangladesh	38.8	6.6	9.7	26.9	56.8
West Bengal	33.6	9.6	13.4	31.9	45.0

Source: 1999-2000 Bangladesh DHS and 1998-1999 West Bengal NFHS reports.

A young mother aged below 18, poses higher mortality risks for the baby as well as for herself. Young age pregnancies are more prevalent in Bangladesh. The median age at first birth for currently married women aged 25-49 was 19.2 years in West Bengal and 17.8 in Bangladesh .[48] Younger age is coupled with a much lower rate of institutional deliveries in the country. The proportions of births that took place at a health facility were roughly eight and 40 percent in Bangladesh and West Bengal, respectively (1999-2000 BDHS and 1998-99 NFHS). The median age at first birth for women aged 20-24 at time of survey was 18.7 years where as that among women aged 45-49 was 16.9. The implication is that the younger cohorts are getting married, on average, two years later than the older cohorts in Bangladesh. On the other hand, the NFHS reports reveal the age at marriage had remained more or less unchanged in West Bengal during the decade of the 1990s. Moreover, the median age at sterilization in West Bengal has decreased from 26 to 25 years during the same period. Thus women in West Bengal are progressively completing their childbearing within a short span of time.

A mother with poor health/nutritional status generally gives birth to low-weight babies when low birth weight babies (who weigh below 2500 grams) carry much higher mortality risks. The body mass index (BMI)[49] is a useful measure of women's health status. The BMI is partly genetically determined and partly dependent on nutrition. The mean BMI is about the same in the two regions, roughly 20. Those with a BMI of below 18.5 are considered undernourished. The proportion of women with BMI of below 18.5 was the same, around 45 percent in the two Bengals. More mothers in the Indian sub-continent are prone to low BMI where their economic

[48] This figure is marginally lower than the Indian average of 19.4 years (NFHS-2)
[49] Body Mass Index, also known as the Quetelet Index, is defined as weight in kilograms divided by the square of height in meters (kg/m^2).

deprivation is coupled with the hard physical work that rural life entails thus depriving them of the kind of nutrition, rest and care required for a healthy pregnancy. Nutritional status of women in West Bengal is worse than the national average. In fact the state ranks 24th among the 25 major states in health status of women (State Bureau of Intelligence, 2005) While per capita consumption of cereals, vegetables and fish is higher in West Bengal, that of pulses, milk and fruit is below the national average for India (ibid). The 1999-2000 Bangladesh DHS did not collect information on the prevalence of anaemia among women. Its prevalence is high among all age groups in West Bengal (1998 NFHS). This is largely explained by poor nutritional status of mothers as well as closely spaced births.

According to a FAO report, 50 percent of women in Bangladesh suffer from chronic energy deficiency and there has been little improvement in the nutritional status of women during the past 20 years. Upto 85 percent of the Bangladeshi diet comprises carbohydrates, in particular, rice. Proteins and fat combined supply less than 18 percent of the total energy requirement, which is far below the recommended daily allowance (RDA) of 30 percent of total caloric intake from such sources (FAO, 1999). The average daily per capita energy intake had declined by 18 percent from 2118 to 1868 kcal between 1962-64 and 1995-95 (ibid). Nutritional status is seasonal in the country; it is highest during the food secure post-harvest months of December/January and worst during pre-harvest months.

A relatively better functioning local government in West Bengal has ensured the successful implementation of various projects focusing on enhancement of child nutrition. There are 850 *Anganwadi centres* in four low-performing districts of West Bengal striving to improve the nutritional status of over 1.2 million children aged below three, using the Positive Deviance approach. This approach is funded by UNICEF and the *Panchayat*, among other concerns, and aims to bring about behavioural change through participatory learning and community mobilization. In the low-performing district of Murshidabad in West Bengal, the programme brought about a 41 percent decline in the percentage of malnourished children between 2001 and 2004 (Positive Deviance, 2008).

Disease and Immunization

In the Indian sub-continent, three major causes of infant deaths, namely tetanus, measles and *pertussis* (whooping cough) are preventable by immunization (Koenig, Fauveau and Wojtyniak, 1991). In West Bengal and Bangladesh, tetanus ceases to be a major cause of neo-natal deaths (deaths within the first month of life) following the wide coverage of tetanus toxoid vaccination for expecting mothers since the 1980s. Among the causes that are not preventable by immunization include complications arising from low birth weight, prematurity and trauma during birth. Proper antenatal care and delivery of babies under the supervision of trained medical personnel are especially important for such cases.

Malnutrition continues to be the underlying cause of most childhood deaths in the Indian sub-continent although the immediate causes may be respiratory diseases or diarrhoea (ibid). Acute respiratory infection (ARI) is one of the leading causes of childhood deaths in both. Surprisingly its incidence among infants was relatively lower in Bangladesh during the late 1990s (Table 5.3). The last two columns show the percentage of infants with ARI who were taken to a health facility for treatment. Roughly half as many infants of every age group were taken in Bangladesh than their counterparts in West Bengal. The same pattern is observed among infants suffering from other illnesses.

Table 5-3: Prevalence of Acute Respiratory Infection (ARI)

	ARI (%)		Taken to health facility (%)	
	West Bengal	Bangladesh	West Bengal	Bangladesh
<6 months	27.3	23.4	42.9	24.8
6-11 months	35.6	22.6	59.6	23.7
12-24	22.3	23.5	55.2	31.5
Total	24.8	18.3	52.4	27.2

Note: Percentage of infants aged under one who were ill with a cough accompanied by rapid breathing during the two weeks preceding the survey

Source: 1998-1999 NFHS and 1999-2000 BDHS survey reports

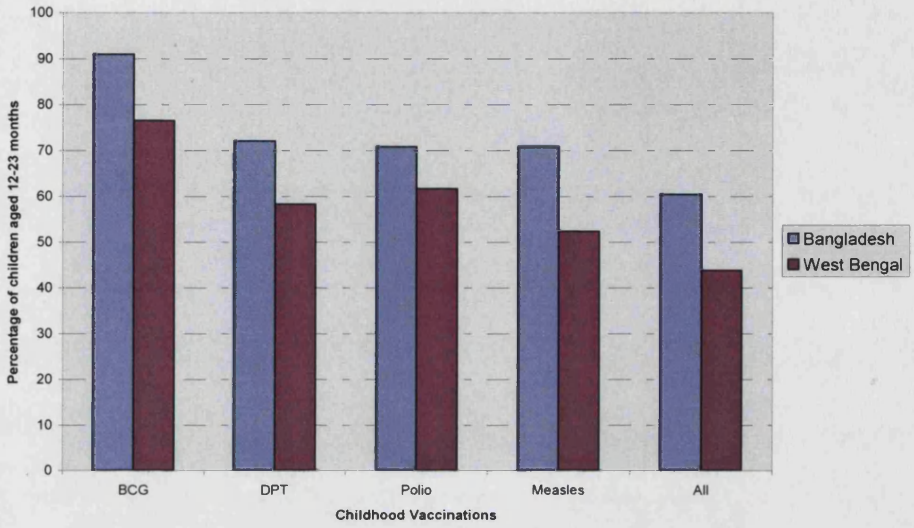
Diarrhoea is caused primarily through the introduction of supplemental feeding to infants given that it is primarily water-borne. Its prevalence is directly related to childcare practices. Its incidence is relatively higher in Bangladesh plausibly because

supplemental feeding is initiated earlier there (BDHS and NFHS reports). Over half of the children in West Bengal who reportedly had diarrhoea during the two weeks preceding the survey were taken to a health facility for treatment compared with less than a quarter in Bangladesh. On the other hand, the coverage of home treatment is better in Bangladesh, plausibly as a result of the mass IEC campaigns that followed the discovery of Oral Redydration Solution (ORS) in the country in 1978. The reason for the earlier initiation of supplemental feeding in Bangladesh may be inadequate knowledge of the benefits of exclusive breastfeeding up to six months among mothers who have lower levels of education than their counterparts in West Bengal. Another explanation may be that undernourished mothers do not produce sufficient breast-milk and thus the need to augment the child's feeding with supplements.

The DHS and NFHS reports confirm the continuing practice of discrimination against female children in Bangladesh and West Bengal in seeking treatment at health facilities (Das Gupta 1987; Sen and Sengupta, 1983; Chen, 1980). For every childhood illness studied in the NFHS and DHS surveys, boys were more likely to be given medical treatment than girls were. And it is this type of discrimination against female children that explains why female mortality has improved at a slow rate in the region.

For each of the child vaccinations, the coverage was better in Bangladesh during the late 1990s as seen in Fig. 5.3. The provision of immunization through home-visits certainly contributed to the favourable child immunization situation in Bangladesh. The country also holds satellite clinics at regular intervals in order to make immunisation more accessible. BRAC, one of the leading local development agencies in the country, has played a big role in promoting the government's EPI (Chowdhury and Cash, 1996)

Figure 5-3: Percentage of children aged 12-23 months who had received each vaccine at the time of the survey



Note: The bars for DPT and Polio refer to the percentage of children who were given at least three doses of DPT and Polio shots
Source: 1999-2000 BDHS P.123 and 1998-1999 NFHS P.134

Finally, the state government has successfully implemented certain measures for improved child survival that are unique to West Bengal. Based on a combination of WHO guidelines and practical experience of Indian health workers, many village level hospitals have been providing Essential Newborn Care (ENC) since 1999 (Panos, 2003). Hypothermia is a leading cause of death among newborns. Under the ENC, the labour rooms in village level hospitals are equipped with simple 200 watt light bulbs, designed to protect newborns from hypothermia. Midwives have been trained to improvise alternative methods like cow-dung and fire in remote villages that have no electricity. Many infant deaths have been prevented under this programme (ibid). But women can only avail of such services through greater use of health services. The need for greater utilization of healthcare cannot be over emphasized to prevent both infant and maternal mortality.

5.2.2 Determinants of maternal health

Societies with high IMR also have high Maternal Mortality Ratio (MMR). The MMR is the number of female deaths among 100,000 livebirths. Deaths associated with abortion-related complications are also included in the MMR. The ratio gives an insight into women's access to healthcare, adequacy of healthcare and the general status of women in a society. The MMR can be reduced significantly through medical interventions.

Abortion

Induced abortions are known as Menstrual Regulation (MR) in Bangladesh and Medical Termination of Pregnancy (MTP) in India, to be performed during the first trimester of pregnancy. Poor quality of abortions, and poor health of the mother contribute to a high rate of abortion-related morbidity and mortality. The prevalence of abortion is high in both the Bengals (Visaria and Ramachandran, 2007; Ahmed et al, 1999). In Bangladesh, the rate of abortion is lower in areas with better family planning services (Rahman et al, 2001). Since most abortions are performed as clandestine operations, it is difficult to monitor the quality of services. According to a study of rural Bangladesh, the number of women who developed complications after an abortion was 43 percent (Ahmed et al, 1999). Studies on India show that women often prefer abortion to the use of temporary methods of family planning (Visaria and Ramachandran, 2007). Although the qualifying conditions for the MTP in India do not include sex-selective abortions, amniocentesis is commonly used in order to abort pregnancies of the unwanted sex, thus resulting in the increasing masculine sex ratio in India (Bhat, 2002). However the culture of preference for sons is perhaps not as extreme in West Bengal as it is in states like Haryana, Gujarat and Punjab. That is not to say that the use of induced abortions as a method to abort unwanted pregnancies is not widespread in the state. In fact the rate of abortions increases during the fertility transition when the desire to limit family size decreases, and therefore the need to provide quality family planning services.

Antenatal care

Antenatal care refers to dietary advice, physical examination, and provision of iron and folic acid tablets to ensure the healthy development of the baby in the mother's womb. Mothers-to-be are also required to take at least two doses of tetanus toxoid

shots to prevent infant deaths from tetanus. In West Bengal, over 82 percent of the respondents, who had a livebirth during the four years preceding the survey had at least two tetanus toxoid injections compared with roughly 64 percent in Bangladesh. As far as antenatal care is concerned, about 90 percent of women in the state got antenatal care from a doctor or health worker. For Bangladesh, the corresponding figure was about a third - 33.7 percent (1999-2000 BDHS and 1998-99 NFHS). Therefore while Bangladesh leads in childhood vaccination, West Bengal does in antenatal care and coverage of tetanus toxoid for expecting mothers.

Place of Delivery

When deliveries take place at home, there are serious health consequences for the mother and child because there are no medical provisions to deal with delivery complications that may arise. Only eight percent of the expected number of deliveries take place by Caesarian section in Bangladesh (Perry, 2000). Even under optimal conditions, mothers in these regions (who are relatively young and of low body height and weight) are more likely to suffer pregnancy related complications. Iron-deficiency anaemia, eclampsia (which is pregnancy induced high blood pressure), haemorrhage and obstructed labour are among the many life-threatening complications facing young mothers. Young mothers have additional health risks associated with childbirth (see for example, Kamal, Streatfield and Noor, 1996).

Even in the Matlab area of Bangladesh that enjoys better health interventions than the rest of the country, over 72 percent of maternal mortality was related to direct obstetric causes like post partum hemorrhage and sepsis (Ronsman et al, 1997). Proper medical care during childbirth is beneficial for newborns too. Complications during labour and delivery can increase the risks of perinatal mortality fivefold and accounted for 30 percent of perinatal deaths among infants in Matlab (Kusiako et al, 2000).

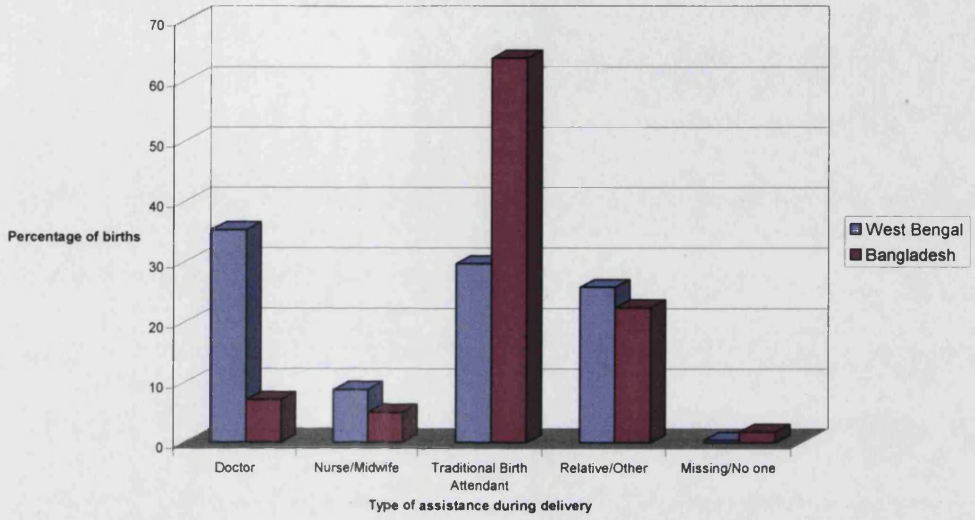
Table 5-4: Place of delivery

	Health facility		Home		Other	
Age of Mother	**WB**	**B'desh**	**WB**	**B'desh**	**WB**	**B'desh**
<20	41.2	6.7	57.2	93.1	1.6	0.5
20-34	40.5	8.9	58.5	90.6	1.0	0.3
35+	14.3	3.2	85.7	96.5	-	0.0
Residence						
Urban	79.7	25.1	19.0	74.2	1.1	1.1
Rural	31.3	4.6	67.6	95.1	1.1	0.2
Mother's Education						
No Education	26.6	3.1	72.3	96.6	1.1	0.2
Primary Incomplete	38.4	4.7	60.3	94.6	1.3	0.6
Primary Complete	66.9	5.3	33.1	94.5	0.0	0.6
Secondary/higher	89.0	21.4	9.1	78.2	1.9	0.6
TOTAL	**40.1**	**7.9**	**58.8**	**91.6**	**1.1**	**0.5**

Source: 1998-99 West Bengal NFHS and 1999-2000 Bangladesh DHS

Despite the elevated mortality risks associated with adolescent pregnancy and childbirth, less than seven percent of adolescent mothers in Bangladesh were taken to a medical facility for a delivery compared with a little over 41 percent in West Bengal, as seen in Table 5.4. Even in urban Bangladesh, 74 percent of women deliver at home compared with only 19 percent in West Bengal. Among women with secondary and higher education, there are marked differences between the two wings – a quarter of women with no education gave birth at a health facility in West Bengal compared with only three percent in Bangladesh. Looking at the total figures, the proportion of births taking place at a health facility in the country is less than a fourth of that in West Bengal

Figure 5-4: Assistance During Delivery



*Note** for Bangladesh the bar for Traditional Birth attendant consists of 54.0 % untrained TBA and 9.7% trained.

Source: 1998-99 West Bengal NFHS and 1999-2000 BDHS reports

The type of assistance during childbirth is important for the survival of mother and baby. Over 60 percent of births in Bangladesh take place at home under the supervision of the TBA, who may be medically trained or a village elderly called in to perform the job. There are 52,000 registered TBAs in the country trained by the government who cover less than ten percent of deliveries (Perry, 2000). The proportion of births taking place in the presence of any trained assistance (doctor, nurse/midwife or trained TBA) was roughly 22 percent in Bangladesh. In West Bengal, the figure was at least double that. The country has an extensive government as well as NGO health infrastructure. Healthcare utilization may be increased through greater female education and autonomy, not to mention economic stability.

Logistic regression for female utilisation of healthcare

The reasons for lower health use among Bangladesh women deserves further investigation. The levels of female literacy and autonomy, and political awareness are important determinants of healthcare utilization. Basu (1990) ascribes differences in use of health care to cultural differences among regional groups within India. In her study, the commonly cited reasons for not delivering at health facilities include fear of being sterilized, a son being changed for a daughter, and financial and social costs associated with hospital stay.

I ran a logistic regression where the dependent variable was place of delivery. Logistic regression is used when the dependent variable is a dichotomous variable, that is, it takes only two values, usually coded 1 for occurrence of an event and 0 for not. It was 1 in the case of any kind of health centre - private/public/NGO and zero in the case of a delivery taking place at home. The model is represented by the formula:

$$\log(\frac{p}{1-p}) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k$$

where p is the probability of the event occurring and can only range from 0 to one, and X_1, X_2,.. .,X_k are the independent variables (predictors), b_0 , b_1, b_2, ... b_k are known as the regression coefficients, which are estimated from the datasets. A logistic regression estimates the probability of a certain event occurring, in this case, the probability that a woman will give birth at a health facility. The covariates in my model like female education and birth order are the Xs in the logit formula.

The primary source of data for the following analysis was the series of Demographic and Health Surveys for Bangladesh and Indian National Family and Health Survey for West Bengal. The Indian NFHS and the Bangladeshi DHS are very similar in design and in terms of the topics covered; details are in Chapter 2. Eligible women for the survey were ever-married women aged between 13 and 49 in Bangladesh and between 15 and 49 in the case of West Bengal.

First I ran models for Bangladesh and West Bengal separately, using covariates like residence, religion, woman's age at marriage, birth order and socio-economic status. Almost all the covariates came out as significant. As expected, women who are rural,

who have low or no education and who are from low socio-economic backgrounds are less likely to go to a health facility for a delivery. The religion effect was stronger in West Bengal, that is, Muslim women in the state are relatively less likely to avail themselves of health facilities than their counterparts in Bangladesh. Husband's education did not play a role in West Bengal but it did in Bangladesh. However effect of age at marriage was much greater in Bangladesh where women get married earlier than women in West Bengal. Early marriage is almost always associated with curtailment of education (Field and Ambrus, 2005). Young age coupled with low or no education gives women very little autonomy or say over their health related decisions. Young wives are more likely to live in the same household as her mother-in-law whose presence can be a deterrent to female autonomy. Physical and financial costs of hospitalization continue to be high – distances have to be travelled to get to the health facility more often than not accompanied by an older family member; and costs are involved in buying food/drugs and bribing health providers, more so at government clinics.

I then proceeded to combine the data files for the two Bengals in order to see the net region effect controlling for the covariates outlined above. In other words, I wanted to examine if there was something about West Bengal that explained the higher rate of female utilization of healthcare in addition to the covariates captured by the DHS and NFHS surveys. Indeed there was a strong country effect (Table 5-5). Thus there is something over and above the greater levels of female education, urbanization and religious differences. It is in the culture of the Bengalis of West Bengal to avail themselves of health services where this practice was instilled in them at least partly by the colonial influence.

Table 5-5: Logistic regression of the determinants of institutional deliveries in Bangladesh and West Bengal

		Exp (B)
Female education	None	.429***
	Primary	.510***
	Secondary+	Ref.
Birth order	First	3.026***
	Second-third	1.689***
	Fourth+	Ref.
Age at marriage	Below 16	.358***
	17-19	.488***
	20+	Ref.
Socio-economic status	Low	.261***
	Middle	.344***
	High	Ref.
Current use of family planning	Reversible	1.216***
	Sterilization	3.927***
	Traditional	1.501***
	Not using contraception	Ref.
Residence	Urban	3.202***
	Rural	Ref.
Religion	Muslim	.256
	Non-Muslim	Ref.
COUNTRY_ID		**.107***

* p<.05, ** p<.01, ***p<.001; Ref. is reference category

Note: The p value represents the level of significance of the Exponential B values; the higher the number of stars, the higher the significance of the variable.

Source: 1999-2000 Bangladesh DHS and 1998-99 West Bengal NFHS

The coefficient of the variable COUNTRY_ID denotes the country effect which is seen to be highly significant at the level of p<.001. West Bengal has many of the features that Caldwell outlined, for example, egalitarian society, and mass education, which act as routes to low mortality (Caldwell, 1986). Caldwell (1990) further pointed out that the roots for health success lie far back in history. He attributed the extensive use of traditional medicine to at least partially explain the mortality decline in Sri Lanka. West Bengal has been home of homeopathy in India. Unlike Bangladesh, West Bengal has an evolved system of public health interventions, not only those initiated by British administrators but also indigenous practices of medicine and inoculation (Banthia and Dyson, 1999). Similar to Sri Lanka, West Bengal has had a long history of outside contact - European traders and Christian Missionaries followed by colonial rulers. Their export of 'social modernization'

shaped the health culture in the state. Culture is an important determinant of healthcare utilization in India (Basu, 1990). Muslims are not among the superior health achievers and this works mainly through their low levels of female autonomy and education (Caldwell, 1986). The religion in Bangladesh coupled with the historical insulation of the area from much foreign contact has been detrimental to health success. And supply-side factors are responsible too. The Communist government of West Bengal spends substantially more per head on health. In fact, per capita expenditure has been the fourth highest among major India states since the 1980s (Misra et al, 2003).

Position of women is of particular significance when explaining mortality in the Indian context. Bloom at al (2001) highlight the influence of female autonomy on the use of health care in northern India. Mortality is believed to be lower in the Dravidian south where there is greater female autonomy than in the Aryan influenced north of India (Dyson and Moore, 1983). West Bengal resembles the south pattern according to Dyson and Moore's classification, given its history of longer exposure to modern influences, greater female education, later age at marriage and relatively greater socio-economic development. These factors to a large extent explain the state's lead in mortality transition in relation to Bangladesh.

The health Transition Theory (term coined in 1985 at a meeting of demographers, medical experts and social scientists) states that mortality can fall as a result of behavioural and socio-cultural factors in the absence of increases in standard of living or in availability of medicine Fieldworkers both government and NGO, have been instrumental in creating awareness on childcare practices in Bangladesh. They have provided information on basic things like using boiling water, seeking medical care for illnesses and general hygiene practices, thus bringing about the "behavioural" change which the Health Transition Theory identifies as an agent for mortality decline. Thus despite the plateauing in the immunization rates, the infant mortality rate has declined steadily in the country. And of course, declining fertility has been a contributing factor.

5.3 Conclusion

The main aim of this chapter was to investigate the reasons for the higher observed death rate in Bangladesh. West Bengal's lead in mortality decline in relation to Bangladesh has been facilitated by an early exposure to modern influences as well as greater levels of social development namely education and urbanization. The state has not experienced any major upheaval after Partition. The 1943-44 famine and the crises of the 1970s further slowed down the pace of mortality transition in Bangladesh. The famine left a much deeper mark on the vital rates of the country than it did on West Bengal. Bangladesh made major gains in mortality during the 1980s. The strengthening of the immunization and family planning programmes, increases in female education and autonomy (through micro-finance) and economic stability have aided the decline in mortality. The crude death rates are comparable today but the infant mortality rate is still at least 1.5 times higher in Bangladesh. Government health services are underutilized in both the Bengals. For every childhood vaccination, the coverage was better in the country suggesting that the EPI has been more successful there than in West Bengal. However the coverage of tetanus toxoid among expecting mothers was better in West Bengal. The levels of female healthcare utilization are abysmally low in the country. The results of statistical analysis suggest that the culture in the state may be more conducive to healthcare use. Women in both Bangladesh and West Bengal suffer from severe malnutrition. Yet the significantly lower levels of maternal mortality ratio and infant mortality rates in the state relative to Bangladesh is largely explained by better healthcare practices in the country.

6 Chapter 6: TRENDS AND DETERMINANTS OF FERTILITY

The aim of this chapter is to explain why the birth rate has consistently been higher in Bangladesh. It examines the trends and differentials in fertility in the two wings of post-Partition Bengal using the proximate determinants framework. Variables like contraceptive use, marriage and abortion, along with the non-susceptible period after a childbirth are the main proximate or intermediate determinants through which social, economic and cultural factors influence fertility (Davis and Blake, 1956; Bongaarts and Potter, 1978). Several attempts have been made to study fertility change in Bangladesh using this framework.[50] West Bengal, on the other hand, has been less extensively researched.[51] My analysis uses more contemporary and comparable data for the two Bengals. The results reveal that marriage and postpartum infecundability have played a relatively more dominant role in determining fertility change in West Bengal than they have in Bangladesh. The use of contraception has been the most significant factor in Bangladesh. I explore why this was the case in the course of the chapter.

The structure of this chapter is similar to the previous one. It starts with a comparison of trends and levels of fertility in Bangladesh and West Bengal. The subsequent discussion is on the proximate determinants of fertility. Marriage and contraceptive use are discussed in detail covering both the historical aspects as well as statistical modelling using the series of BDHS and NFHS survey data. The determinants of postpartum infecundability are also explored. The fourth proximate determinant, abortion, is touched upon in the preceding chapter on mortality. The final section of this chapter summarizes the factors explaining higher fertility in Bangladesh.

[50] Islam, Islam and Chakroborti (2003) is one of the more thorough studies, looking at the role of the determinants between 1975 and 1999. They concluded that post-partum infecundability was the most important fertility inhibiting factor during the 1980s while it was contraceptive use during the 1990s.
[51] Paul and Kulkarni (2006) ascribed the change in fertility in West Bengal between 1980 and 2001 roughly equally to an increase in age at marriage and in use of contraception.

6.1 Trends in fertility

6.1.1 Trends in total fertility rate

The availability of demographic surveys during the post-Partition period enables the study of more refined measures of fertility than the crude birth rate. The TFR is a more powerful indicator of fertility than the CBR which is sensitive to age-structural changes. The total fertility rate (TFR) is a convenient and widely used index of fertility, despite its limitations (see, for example, Bongaarts and Feeney, 2000). Hirschman (1994) defined the TFR as the average number of children born to women who survive to age 50 in a population. It is the observed period fertility rate of a hypothetical cohort of women.

Table 6-1:Total fertility rates (TFR) in Bangladesh: 1962-2003

Year	TFR (adjusted)	Source
1962-65	6.3 (7.4)	Population Growth Experiment (PGE)
1963-65	7.0	National Impact Survey (NIS)
1974	7.1	BRSFM
1975	6.3	Bangladesh Fertility Survey
1979	7.0	Contraceptive Prevalence Survey 1983
1981	6.5	Contraceptive Prevalence Survey 1985
1988	4.8	1989 Bangladesh Fertility Survey
1989-91	4.3	Contraceptive Prevalence Survey 1991
1991-93	3.4	BDHS 1993-94
1994-96	3.3	BDHS1996-97
1997-99	3.3	BDHS 1999-2000
2001-03	3.0	BDHS 2004

Note: The total fertility rate (TFR) is a synthetic measure which is the number of children a hypothetical cohort of women would be expected to have if they survived through the end of their reproductive years and experienced at each age a particular set of age-specific fertility rates. BRSFM stands for Bangladesh Retrospective Survey of Fertility and Mortality

Source: Parts of Table 2.1 in Cleland et al (1994:10) and relevant BDHS reports.

The downward trend in fertility in Bangladesh since the 1960s as depicted in Table 6.1 has generally been dismissed as being deceptive or unauthentic, accredited to the methodological flaws in the earlier surveys like the PGE and NIS (National Academy of Sciences, 1981; Cleland et al, 1994).[52] The general contention in the

[52]The pregnancy histories collected by these surveys had inaccuracies, this being the result of both poor questionnaire design, as well as misreporting of timing and number of births by women. For the

existing literature is that the 1975 BFS was the first survey to give a reliable estimate of the TFR for the country and that fertility has been declining in Bangladesh since the late 1970s. One of the reasons for arriving at this conclusion was that fertility data pertaining to the period prior to the 1970s has not been examined. Although the data available for that period is deficient, adjustments can be made, within reasonable limits, in order to study time trends. And this approach has been tried and tested in an earlier study by Dyson (2001).

An examination of the trend in the crude birth rates in Bangladesh in Chapters 2 and 3 revealed that the CBR has been declining since the beginning of the twentieth century as it has been in West Bengal. Although the crude birth rate is not as powerful a measure of fertility as the TFR is, a similar downward trend in the CBR in West Bengal lends credence to the proposition that fertility has likely been declining in Bangladesh since the 1960s. More localized studies, for example, Stoeckel (1970), Schultz (1972) and Sirageldin and Ahmad (1975) came to a similar conclusion – that there had been a decline in marital fertility since the early 1960s. Timing and causes of fertility decline are taken up in detail in the next chapter.

Following a sharp decline in fertility during the 1980s, the TFR plateaued in Bangladesh at 3.4 children for almost a decade. It then made a small further decline during the early 2000s and stagnated once again at the level of three children. Interestingly enough, the contraceptive prevalence rate has risen consistently throughout that period when fertility had plateaued. One explanation for the plateauing is a change in delivery of family planning services. The switch from the doorstep delivery to static community clinics during the 1998-2003 Health and Population Sector Programme (HSPC) is certainly a factor explaining the slowdown in fertility decline in the country. As a result, the government reverted back to the door-step delivery system in the sectoral programme for 2004-2007 (Mercer et al, 2005). Other more important explanations are cultural ones, for example, preference for sons and switching to less effective methods of contraception (Saha and Bairagi, 2007). Similarly, the most recent Indian NFHS (2007) reveals that fertility in West Bengal has not experienced any decline since the second NFHS conducted during the

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specific flaws in the PGE (1963-35), NIS (1968-69), and BFS (1975), see National Academy of Sciences, 1981.

late 1990s. The TFR in the state has remained constant at 2.3 since the late 1990s. This slowdown in fertility is not unique to Bangladesh and West Bengal and the underlying socio-economic reasons for high fertility and/or son preference need to be addressed through greater education and economic security. The FPP cannot be effective in lowering fertility if the desired family size is still high. Desired fertility is shaped by socio-economic and cultural factors and can be lowered through female education and greater economic-security (Bairagi, 2001).

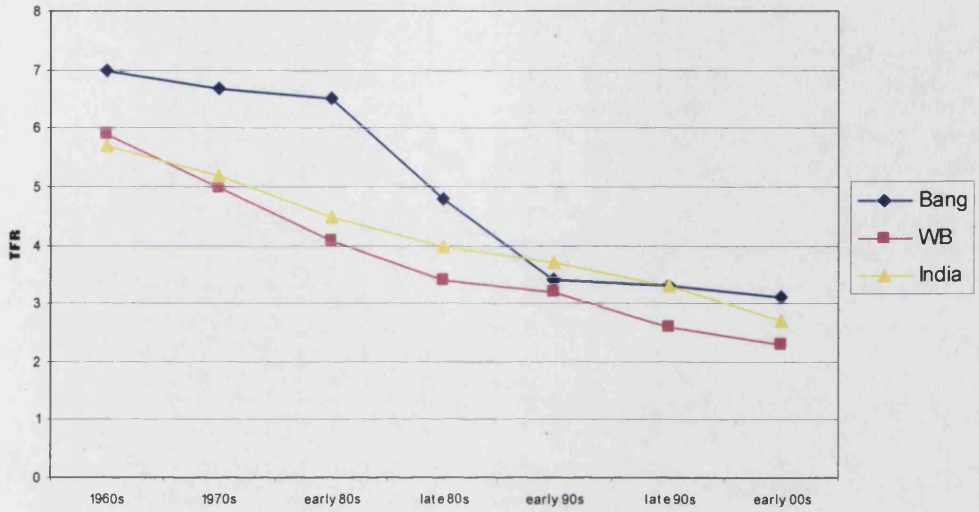
Table 6-2: Trends in TFR in West Bengal and All-India

	1961-71*	1970-72	1974-80***	1980-82	1990-92	1996-98	2001-03	2007
West Bengal	5.9	4.2**	4.0	4.1	(3.2) 2.9	(2.6) 2.3	(2.4)	2.3
All-India	5.7	6.2	4.9	4.5	(3.7) 3.7	(3.3) 2.8	3.0 @	2.7

Source: * Bhat, Preston and Dyson (1984:133 ** From Dyson and Moore (1989), it is the average SRS for 1970-72. *** Bhat (1996) @ 2001 census estimate for India. Those in parenthesis are SRS based TFR . For the cells with two estimates, the ones in parenthesis are SRS based while the rest are NFHS estimates.

It is useful to place the level of fertility in West Bengal in the context of India. Except for the rate for 1970-72, which is based on SRS data, the fertility rates for West Bengal presented in Table 6.2 are reasonably reliable. The TFR for 1961-71 was estimated by the Panel on India, (Bhat, Preston and Dyson, 1984), using indirect techniques. The rate for 1970-72 is likely to be a gross underestimate because SRS system was known to be particularly deficient in West Bengal until 1980. A figure close to five may be have been the true TFR in West Bengal during the early 1970s; the corresponding rates were 5.8 for India (Dyson and Moore, 1989).

Figure 6-1: Total Fertility Rates in Bangladesh, West Bengal and India, 1960s to early 2000s



Source: Tables 6-1 and 6-2.

The salient feature of Figure 6-1 is that Bangladesh experienced relatively little decline in fertility until the 1980s. A TFR of around six children per woman in West Bengal during the 1960s was marginally higher than the national level of fertility. The level in Bangladesh at the time was higher by at least one child. However these rates were not that high by world standards – the world TFR during 1960-65 was 4.7 while the South-eastern rate was 6.1 (Gubhaju, 2007). Between the 1960s and the 1980s, Bangladesh made only modest progress in fertility decline by half a child, where as West Bengal experienced a significant decline in the total fertility rate by almost two children. The rapid decline in West Bengal during the 1970s (as seen in Table 6.2) is largely explained by the mass coercive sterilization campaigns that are known to have taken place during the Emergency period of 1975-1977 (Frank, 2001; Connelly, 2006).

In Bangladesh the fastest decline in fertility occurred during the 1980s and coincided with the strengthening of the door-step delivery system in the country. The TFR fell by at least two children in the country compared with roughly one child in West

Bengal during the 1980s. The relative stagnation in fertility decline observed in the state during the late 1980s was not a phenomenon unique to the state but was typical of India (Mari Bhat 1996).

6.1.2 Trends in age-specific fertility rates

It is useful to examine if the change in TFR was attributable to a change in the reproductive behaviour of a specific age-group or across all age groups. Figures 6-3 and 6-4 illustrate the different patterns of childbearing among the age groups. Women of all ages in Bangladesh have higher fertility than their counterparts in West Bengal. However the age-specific fertility have been declining rapidly in the country and are now comparable to those in West Bengal.

Looking at the age-specific-fertility-rates in figures 6.2 and 6.3, the age range 20-24 is the peak childbearing group in both the Bengals after which there is a much steeper decline in West Bengal. This is explained by the early average age for female sterilization in the state of 25.2 years (NFHS-2). What is interesting in Figure 6.2 is that, the fertility rates for the age groups 20-24 and 25-29 in Bangladesh were almost identical in 1975 after which the rate for the latter age group declined progressively in the subsequent surveys. Thus in Bangladesh, similar to the trend observed in West Bengal, childbearing has been increasingly concentrated in the age range 20 to 24. The implication of this is the need to provide suitable birth 'limiting' methods for women in their late 20s who may have already completed their desired family size.

Figure 6-2: Age Specific Fertility Rates in Bangladesh, 1975-2004

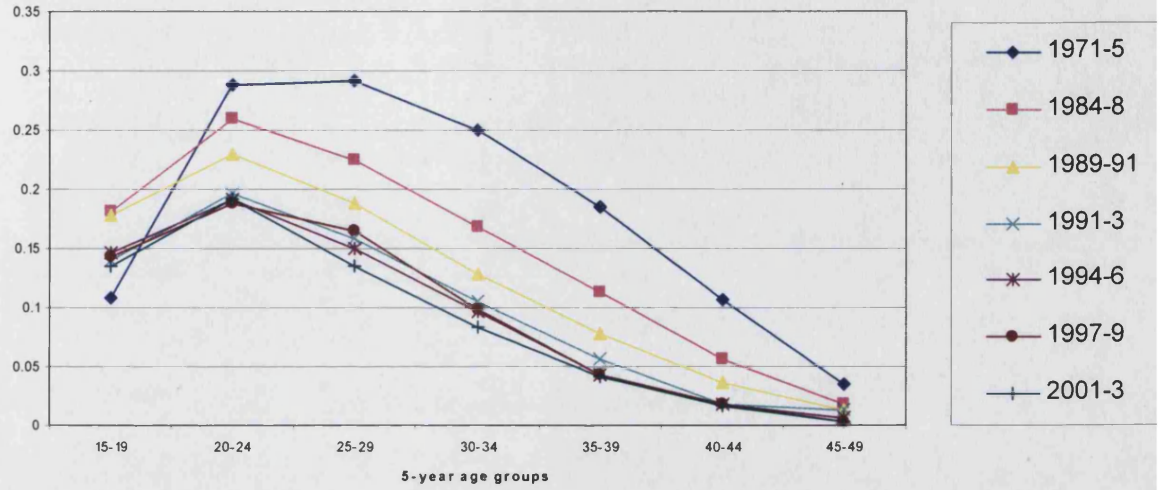
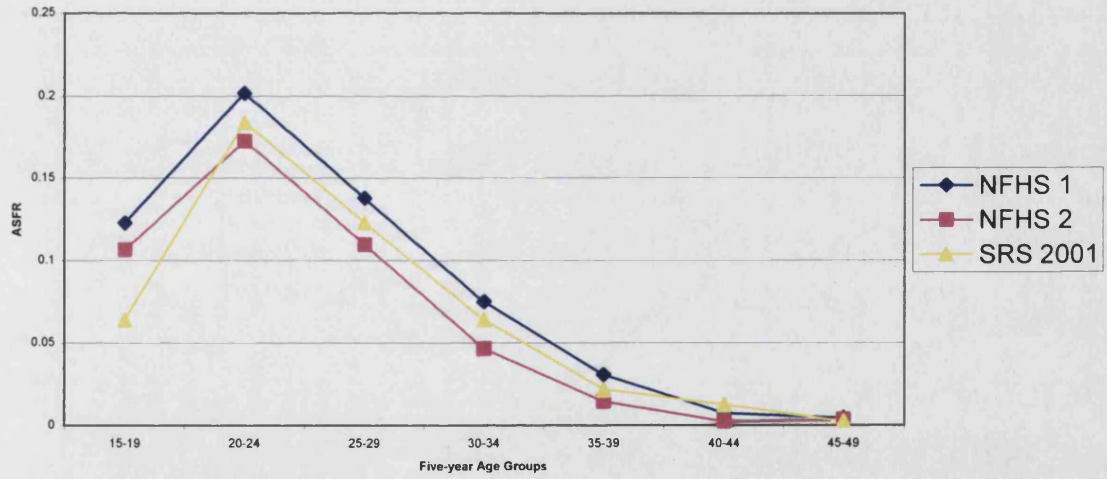


Figure 6-3: Age Specific Fertility Rates in West Bengal, 1999-2001



Source: For Bangladesh – 1975 Bangladesh Fertility Survey, 1989 Bangladesh Fertility Survey, 1991 Contraceptive Prevalence Survey, 1993-4 Bangladesh Demographic and Health Survey (BDHS), 1996-7 BDHS, 1999-2000 BDHS, and 2004 BDHS. For West Bengal – 1992-3 National Family and Health Survey (NFHS), 1998-99 NFHS, and data from Sample Registration system (SRS) for 2001.

Parity progression ratios

Parity Progression Ratios (PPRs) show the proportion of women who, having reached a certain parity or birth order, go on to have progressive births. Thus for women aged 30-34, the proportion of women with no children who went on to have one child was .973. The PPRs of three cohorts of women in Bangladesh, namely those aged 30-34, 35-39 and 40-44 are examined to see how their reproductive behaviour changed between the 1993 and the 1996 DHS. Comparisons are then made to the PPRs of their counterparts in West Bengal.

Table 6-3: Parity Progression Ratios – 1990s, Bangladesh

	30-34		35-39		40-44	
Parity	1993-94	1996-97	1993-94	1996-97	1993-94	1996-97
0	.973	.987	.983	.987	.993	.984
1	.962	.955	.982	.973	.988	.976
2	.877	.846	.936	.908	.960	.955
3	.765	.754	.881	.823	.949	.907
4	.667	.603	.808	.778	.905	.813
5	.597	.570	.703	.670	.825	.808
6	.489	.440	.657	.656	.770	.729
7	.440	.373	.566	.567	.686	.632
8	.315	.364	.475	.389	.631	.597
9	.130	.250	.442	.446	.608	.495

Source: Calculated by author using 1993-94 BDHS and 1996-97 BDHS.

Looking at the PPR of the age group 30 to 34, fewer women went on to have a successive child in 1996-97 compared with those in the 1993 survey between parities 1 and 7; as evident from the smaller proportions in the 1996-97 survey. Fewer women in the age group 35-39 had progressive births in 1996-97 up to parity 5. Finally for the age group 40-44, the ratio was smaller for every parity in 1996-97. The essence of this table is that fertility declined among all age groups during the 1990s in Bangladesh.

Table 6-4: Parity Progression Ratios, West Bengal and Bangladesh: 1993-94 BDHS and 1992-93 NFHS

	30-34		35-39		40-44	
Parity	WB	B'desh	WB	B'desh	WB	B'desh
0	.971	.973	.967	.983	.975	.933
1	.876	.962	.925	.982	.941	.988
2	.787	.877	.847	.936	.896	.960
3	.678	.765	.767	.881	.805	.949
4	.623	.667	.708	.808	.781	.905
5	.511	.597	.631	.703	.744	.825
6	.466	.489	.555	.657	.623	.770
7	.585	.440	.662	.566	.552	.686
8	.333	.315	.509	.475	.698	.631
9	.125	.130	.333	.442	.432	.608

Source: Calculated by author using 1992-93 West Bengal NFHS and 1993-94 Bangladesh DHS

For the age group 30-34 in Table 6.4, the proportions who went on to have their first birth were similar in Bangladesh and West Bengal, 0.973 and 0.971, respectively. However much greater proportions of women in Bangladesh aged 30 to 34 proceed to have second, third and successive births up to parity 6. For the age group 35 to 39, the PPR is higher in Bangladesh up to parity six. Finally for the age group 40-44 (women who have completed their childbearing), one notices the largest differences in PPR between West Bengal and Bangladesh. In other words, greater proportions of women of all age groups in Bangladesh go on to have progressive births thus explaining why the total fertility rate in higher there. Once again, the explanation plausibly lies in the method-mix. Women in West Bengal use permanent methods of birth control upon completing their desired family size where as those in Bangladesh use temporary methods which have a high failure rate especially in the context of Bangladesh (Bairagi, 1996).

6.1.3 Decomposition analysis

The fertility differentials between the two Bengals may be explained by looking at the determinants of fertility. Bongaarts decomposition analysis is a well established method for examining the individual role of the four proximate or direct determinants of fertility.[53] The concept of the direct and indirect determinants of

[53] See, for example, Singh, Casterline and Cleland (1985); Islam, Islam and Chakroborty (2003)

fertility was initially put forward by Davis and Blake (1956) to be refined and condensed by Bongaaarts and Potter (1978). Bongaarts narrowed down the 11 variables originally suggested by Davis and Blake to the 4 outlined above which explain about 96% of the observed differences in fertility among populations.

$$TFR=Cm.Cc.Ca.Ci.TF$$

Cm, Cc, Ca, and Ci are indices of marriage, contraception, abortion and post-partum infecundability, respectively. Each of these indices represent the fertility inhibiting effect of the four proximate determinants of fertility. TF is total fecundity which Bongaarts and Potter calculated to be 15.3. This would be the average fertility of a woman in the absence of any of the four fertility-inhibiting indices.

- Cm is the index of marriage; it refers to the proportions married . The index equals 1 if all women of reproductive age are married, and 0 if none are married.
- Cc is index of contraception; takes account of prevalence and use-effectiveness of contraception . The index equals 1 if contraception is absent or ineffective, and 0 if all fecund women use 100 percent contraception.
- Ca is index of induced abortion, takes the value of 1 in the absence of induced abortion and 0 if all pregnancies are aborted. Reliable data on abortions is particularly deficient and thus its calculation is usually omitted.
- Ci is index of post partum infecundability which equals 1 in absence of breastfeeding and post partum abstinence, and 0 if the duration of infecundability is indefinite.

Table 6-5: Proximate Determinants of Fertility, early 1990s and 2001

	Cm		Cc		Ca		Ci		TF		TFR	
	1990s	2001	1990s	2001	1990s	2001	1990s	2001	1990s	2001	1990s	2001
WB	.675	.579	.457	.371	.822	-	.714	.704	15.3	15.3	2.8	2.3
Bang	.756	.727	.605	.451	.971		.653	.714	15.3	15.3	4.4	3.6

Note:

1.Using this method, I get a TFR of 4.4 and 3.6 for BDHS-1and BDHS-3 and not 3.4 and 3.3 as given in the reports, respectively.

2. The fertility-inhibiting contribution of each of these indices is obtained by subtracting the index from 1, thus the higher the value of the index, the lower its contribution (1-c).

Using the Bongaarts equation, I get the same values of TFR as those estimated by the first and second rounds of the West Bengal NFHS. However for Bangladesh, I get fertility rates that are higher than the DHS rates. My TFR estimates are 4.4 and 3.6 compared with DHS estimates of 3.4 and 3.3, respectively. It is possible that the DHS did not use the census estimates of proportions married for calculating the marriage index or that, the values of use effectiveness of contraceptive methods that I did. Incidentally there is controversy over the TFR of 3.4 estimated for the country during the early 1990s. It has been suggested that it was an underestimate and the true level at the time was higher (Das Gupta and Narayan, 1997). Even if a TFR during the early 1990s was not 3.4 but closer to four, as is suggested by my analysis, the decline during the 1980s was still rapid.

Use of contraception had the greatest fertility reducing effect in both West Bengal and Bangladesh during the last two decades (Table 6.5). In Bangladesh it accounted for 39 percent of the decline (1-.605) in natural fertility (TN) during the early 1990s, compared with a decline of 54 percent in West Bengal during the same period. The index of post partum infecundability was the second most important fertility-inhibiting factor in Bangladesh during the early 1990s (responsible for 34.7 percent of decline). The second contributor in West Bengal, on the other hand, was marriage. The age at marriage did not increase considerably in West Bengal during that period but the proportions married had decreased in almost every age group in 2001 in relation to the previous census year as later discussions will unveil.

Retherforld and Rele (1989) had carried out a similar decomposition of fertility change in countries of the Indian sub-continent including Bangladesh between 1960-64 and 1980-84, using a slightly different technique. They demonstrated that the fall in fertility in Bangladesh from a TFR of 6.68 to 6.15 during that period was equally attributable to changes in nuptiality (0.27) and marital fertility (0.26). My analysis suggests that the role of nuptiality has progressively been outweighed by use of contraception in Bangladesh since the 1960s.

The three most important proximate determinants of fertility in Bengal, namely marriage, family planning use, and postpartum non-susceptability merit detailed discussion.

6.2 Marriage in Bengal

The proportions married in each age group and the age at first marriage have important implications for fertility. Entry into marriage marks the beginning of exposure to childbearing as there is almost no childbearing outside marriage in the region in study (Field and Ambrus, 2005). In order to institute changes in nuptiality, for example, to set legal minimum age at marriage or to abolish dowry, an understanding of how marriage patterns have been shaped by religious, economic and demographic history of Bengal, is useful.

Common nuptiality patterns may be traced to most of the contemporary traditional societies like the Indian sub-continent. These include a large spousal age gap where the husband is typically older, early age at female marriage, and exchange of wealth. These practices perpetuate subordination of women by men (Cain, Khanam and Shamshur, 1979). In the context of Bengal, these patterns may have been further consolidated by Hindu *Brahmanic* influences (Maloney et al, 1981). The exception may be *purdah* (female seclusion), which has its roots in practices of the Muslim elite (Murshid, 1995). In addition, marriage patterns in Bengal evolved over time as a response to changes in socio-economic, political, legislative and demographic structures.

As the Bengal economy stagnated from the late nineteenth century onwards, weddings became much simpler affairs and exchange of wealth came to change direction. The rising trend in female age at marriage in Bengal, since the late nineteenth century, reflected the deteriorating economic conditions in the region (Lindenbaum, 1981). Two other factors beside her explanations for the observed changes in nuptiality are: movements like *Brahmo Samaj*, demanding social reform which succeeded in passing legislation to ban early female marriage - Child Marriage Act of 1929, also known as *Sarda* Act, which made 14 the minimum age at female marriage), and changes in age structure. Lindenbaum's conclusions are supported by results of the Khanna study of Punjab showing that age at female marriage was rising with growing poverty. Mensch et al (2005) made a similar observation about Sri Lanka regarding economic distress and age at marriage. Thus this relationship between poverty and age at marriage has been common in parts of the Indian sub-continent.

Lindenbaum also observed that during the 1960s, marriage-related wealth flow had reversed direction from the bride's family (bride-price) to the groom's (dowry) in Bangladesh. This finding is in agreement with the more recent work by Amin and Cain (1997). Lindenbaum maintained that with long-term economic impoverishment, the focus of marriage had shifted from a desirable bride to a desirable groom, who was one capable of supporting his wife, and thus the justification for demanding dowry.

Mukherjee's (1949) study of rural life in the north-west of present-day Bangladesh between 1942 and 1945, drew similar conclusions. He observed that 'the rural society of Bengal, on account of its long history and contact with various cultural patterns, has evolved many complex institutions' (Mukherjee 1949:416). He saw village society undergoing rapid changes in order to survive the deteriorating economic conditions exacerbated by the 1943-44 Bengal famine. One of the noticeable changes was in the traditional form of marriage ceremony in rural Bengal. The depressed classes of both Hindu and Muslim communities were increasingly practising '*uthano biya*' (translates to physically taking the bride), a form of simple, inexpensive ceremony, as opposed to '*sajano biya*' (translating to ornate wedding) or expensive and elaborate wedding.

6.2.1 Effect of demographic changes on nuptiality

The change in the direction of marriage related wealth flow in the Indian sub-continent has been addressed by Caldwell (1983), Amin and Cain (1997), and Bhat and Halli (1999), among others. The first two of these studies ascribe the shift from brideprice to dowry to a marriage squeeze in favour of men, created by mortality improvements during the 1940s. The term refers to a demographic imbalance when there are unequal numbers of prospective brides and grooms of marriageable age. As a result, the extra men or women are squeezed out of the marriage market. Bhat and Halli (1999) contended that the rise in mean age at first marriage for females from 13 to 19 between 1911 and 1991 was not an outcome of rising literacy but due to demographic changes. Improving mortality during that period had resulted in larger numbers of younger cohorts. Given that Indian wives are almost always younger than their husbands, girls found it progressively more difficult to find eligible grooms from older cohorts. Thus many had to wait longer than usual before finding a suitable groom, who were fewer in numbers, consequently driving up the mean age at marriage.

It is helpful to discuss how nuptiality patterns have been shaped by demographic changes, by referring to trends in age at marriage and the proportions married.

6.2.2 Trends in age at Marriage

Age at first marriage has important implications for the individual as well as her children. It determines the length of exposure to the risk of childbearing. Early female marriage curtails educational opportunities, and usually entails high fertility, not to mention high rates of infant and maternal morbidity and mortality (Mensch, Singh and Casterline, 2005).

The Singulate Mean Age at Marriage (SMAM) is a measure of the average age at marriage in a population, calculated using current status data. SMAM refers to the mean number of years spent in the single or never married state by those in the hypothetical cohort who marry by the age of 50 (Hajnal, 1953) . It is calculated using proportions married and unmarried up to age 50.

The SMAM in Bengal was lower than the national average until about 1961 (Agarwala, 1962). In fact the SMAM for the period 1891-1951 showed that Bengal had the second lowest age at female marriage among Indian states after Hyderabad. It was only in the 1971 census that West Bengal recorded a higher than the national female age at marriage.[54] In fact between 1961 and 1971, West Bengal recorded the second highest decadal increase in the mean age at marriage in India after Jammu and Kashmir – the decadal increase was by 1.63 years in West Bengal compared with 1.13 for the country (Goyal 1988:75).

An interesting phenomenon is that Pakistan, pre-dominantly a Muslim country, has a significantly higher age at marriage than either India or Bengal since the 1950s. Yet the fertility rates were higher there and the decline in fertility initiated much later than in Bengal (Sathar and Casterline, 1998). It supports the proposition that the practice of early age for female marriage in Bengal is of Hindu and not Muslim origin, as was discussed in Chapter 1.

The fall in age in 1931 in Table 6.6 is explained by the fact that parents rushed to marry their daughters off before the *Sarda* Act of 1929 came into effect which prohibited marriage of girls aged below 14 (Agarwala, 1962; Miranda, 1982). In 1941, both the Bengals experienced a significant rise in the age at marriage not just in relation to the preceding decade but also to 1921. This is possibly explained by the mortality gains of the 1920s – there were not enough prospective grooms for the relatively large female birth cohort of the 1920s when they reached marriageable age in the late 1930s and early 1940s. It could also be attributable to fewer marriages taking place during the economically and politically charged period in the history of Bengal characterized by effects of the Second World War, 1943-44 famine and Partition.

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[54] Since SMAM takes into account proportions who do not marry, it can increase simply because fewer men or women in any age group are getting married, even though those who do marry still have the same median marriage age as earlier cohorts (1990-2000 BDHS, Streatfield :170). Therefore if the proportions married declines in each age group, SMAM will fall although the mean age may remain the same.

Table 6-6: Trends in Singulate Mean Age at Marriage (SMAM) for India, Pakistan, West Bengal and Bangladesh, 1891-2001

Year	India	Pakistan	West Bengal			Bangladesh		
			Female	Decadal change (f)	Male	Female	Decadal change (f)	Male
1891	NA		11.2					
1901	12.8		11.4	0.2				
1911	13.0		11.7	0.3				
1921	13.5		*12.3*	0.6		*12.3*		21.9
1931	12.5		*10.7*	-1.6		*10.8*	-1.5	18.7
1941	14.9		*13.2*	2.5		*13.4*	2.6	21.7
1951	15.4	17	14.7	1.5		14.4	1.0	22.4
1961	16.1	16.7	15.9	1.2	24.3	13.9	-0.5	22.9
1971	*17.2*	19.7	*18.0*	2.1	24.6	15.9	2.0	23.9
1981	18.4	20.2	19.3	1.3	26.0	16.6	0.7	23.9
1991	19.3	21.7	19.7	0.4	25.9	18.0	1.4	24.9
2001	19.9*		19.5*	-0.2		18.7	0.7	

Note: The figures for India refer to decadal estimates, that is, 12.8 refers to 1891-1901, 13.0 to 1901-1911, and so on. *Mean age at effective marriage for 2005 from State Bureau of Intelligence (2005). Agarwala (1962) estimated the SMAM at the state and national levels of India using census data on marital status for women aged up to 35. (f) refers to female.

Source: Agarwala (1962) for India and West Bengal from1891 to 1951; Das and Dey (1998) for 1961 onwards. Islam and Ahmed (1998) for Bangladesh.

The concept of 'new patriarchy' may explain why Bengal had one of the lowest female ages at marriage during the earlier part of the last century despite being in the vanguard of social reform and modernism (Walsh 1997:642). It was the revision of existing patriarchal rules and customs. Female education was encouraged in this new system of patriarchy but only that much which would be helpful in making them better home-makers. Anything more was perceived to carry the risk of jeopardizing

the traditional supremacy of the husband at home. One of the reasons explaining the custom of early female marriage was to keep women in their traditional roles of home-maker and subordinate to the husband (Caldwell et al, 1983).

With the introduction of modern schools and English education in Bengal during the 1920s, Bengali grooms became much in demand. Parents competed to secure these grooms, holding government jobs, for their daughters. The younger the girl, the more attractive she was considered to be. The 'evil' of dowry is believed to have originated in Bengal during this time when parents tried to entice grooms for their daughters with monetary/other gifts (Bhat and Halli, 1999).

The change in marriage indicators between 1961 and 1971 is especially striking. In both Bangladesh and West Bengal, female age at first marriage increased by 2 years, the largest decadal increase in their history. The highest rise in age at marriage was also observed in Karnataka around this time (Caldwell et al, 1983). This was largely a manifestation of the mortality gains of the 1940s. The birth cohorts following the mortality gains were larger than the older cohorts and given that wives are typically younger than husbands, there were more girls than boys in the marriage market during the 1960s and 1970s. The increase in the male age in Bangladesh by one year between 1961 and 1974 is reflective of the series of crises during the early 1970s when marriages may have been postponed.[55]

The experience of Bengal suggests and the age at female marriage can rise by both economic decline as well as socio-economic prosperity. Mortality improvements leading to changes in the demographic structure may have been the underlying factor explaining the progressive rise in age at marriage. The trend, prior to the 1960s, was possibly facilitated by adverse economic conditions in Bengal in addition to passing of legislation banning child marriage (Lindenbaum, 1981; Mukherjee, 1949). The more recent trend in the rising age at marriage (post 1960s) has been aided by social development namely, increase in female ducation and urbanisation (Saha 2004; Das and Dey, 1998; Islam and Ahmed, 1998).

[55] See Randall (2005) on how a crisis like conflict and war can affect fertility through its effect of nuptiality .

6.2.3 Trends in proportions married

A decreasing trend in the proportions married among young age groups, as observed in Table 6.7, is desirable, because early age at marriage is directly and indirectly detrimental to female status. However the opposite is true for older cohorts, the reason being that it is suggestive of improvements in adult mortality, and to some extent, of greater marital stability. For every census year, greater proportions of women were married in Bangladesh. For example in 1991, almost half (49 percent) were married in the age group 15-19 in Bangladesh compared with a third (33 percent) in West Bengal.

Table 6-7 Proportions Married in Bangladesh and West Bengal: 1961-2001

	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
	1961	1961	1974	1971	1981	1981	1991	1991	2001	2001
10-14	0.32	0.18	0.09	0.05	0.07	0.02	0.03	0.02	0.02	
15-19	0.89	0.73	0.72	0.51	0.65	0.37	0.49	0.33	0.32	0.22
20-24	0.96	0.90	0.93	0.85	0.91	0.78	0.87	0.79	0.76	0.68
25-29	0.95	0.92	0.95	0.89	0.94	0.90	0.94	0.91	0.86	0.87
30-34	0.91	0.88	0.93	0.91	0.93	0.92	0.94	0.92	0.89	0.92
35-39	0.85	0.82	0.9	0.88	0.9	0.91	0.95	0.92	0.91	0.91
40-44	0.72	0.70	0.81	0.79	0.82	0.84	0.87	0.87	0.91	0.88
45-49	0.61	0.59	0.75	0.71	0.75	0.76	0.82	0.82	0.87	0.82
50-54	0.45	0.45	0.6	0.55	0.62	0.61	0.71	0.7	0.78	
55-59			0.53	0.46	0.54	0.51	0.64	0.61	0.66	
60+			0.27	0.25	0.33	0.34	0.43	0.3	0.52	

Source: Calculated by author using relevant census reports

In Bangladesh as well as in West Bengal, the proportions married in the age groups up to 20-24 has consistently declined over time. The proportions married in every age group is higher in Bangladesh. This is almost certainly explained by a higher rate of widow remarriage and the practice of polygamy among Muslims. The proportions married among the older age groups in West Bengal are relatively larger since 1981. Greater marital stability among Hindus as well as better adult mortality in the state in relation to Bangladesh may be an explanation. Indeed Chapter 5 established that the female life expectancy is roughly two years higher in West Bengal. As mentioned elsewhere, marriage dissolution is much easier in Islam and dowry is the most

common cause of marriage dissolution in Bangladesh.[56] ' Divorce is unknown to customary Hindu law, because marriage is an indissoluble union between the husband and wife' (Nair 1978:14). Dowry is quite common in West Bengal too and is possibly rising (Brown and Chowdhury, 2002; Rogaly and Rafique, 2003; Kodoth, 2005). Brown and Chowdhury add that it is the most common reason for selling land, where the average dowry that a father has to give during a daughter's wedding is equivalent to the average cost of an acre of non-irrigated land (approximately Rs. 50,000).

Table 6-8A: Female surplus in marriage market: pre-Partition Bengal

	1901	1911	1921	1931
Female Population aged 10-19 as % of total population	9.5	9.7	9.9	10.6
Male Population aged 20-29 as % of total population	8.3	8.8	8.9	9.5
Mate Availability Ratio	**1.14**	**1.01**	**1.11**	**1.11**

Note: Mate Availability Ratio is calculated by simply expressing the female population aged 10-19 as a percentage of the male population aged 20-29.

Source: Calculated using relevant census reports on Pre-Partition Bengal

Table 6-8B: Female surplus in marriage market: Bangladesh and West Bengal, 1951-2001

	1951		1961		1971		1981		1991		2001	
	Bang	WB	Bang	WB	Bang	WB	Bang	WB	Bang	WB	Bang	WB
F10-19	10.6	11.1	7.9		10.1	10.4	11.2	11.6	10.1	10.2		10.5
M20-29	8.2	10.6	7.5		6.4	8.0	7.2	9.4	7.7	9.3		8.5
Mate Availability Ratio	**1.29**	**1.05**	**1.05**		**1.58**	**1.3**	**1.55**	**1.23**	**1.3**	**1.09**		**1.23**

Source: Calculated using Relevant census reports

A simple way of assessing the extent of marriage squeeze is by looking at mate availability ratio. It is the ratio of marriageable women to marriageable men. A ratio of one reflects equal numbers of men and women of marriage age; the higher the

[56] Rate of divorce is higher in Bangladesh up to age 30 after which it is slightly higher in West Bengal. The overall rate reported is roughly 2-3 % in both the Bengals during the early 1990s (DHS and NFHS). The actual rates are much higher given that there is an element of stigma associated with marriage dissolution.

ratio, the greater the marriage squeeze against women, thus reflecting a favourable situation for unmarried men who have many prospective brides to choose from. Between 1951 and 2001, West Bengal had a relatively balanced ratio (Table 6.9). This may be attributed to the steady pace of mortality and fertility decline in the state relative to Bangladesh. The rise in the ratio and thus unfavourable marriage market for women until the 1970s in largely explained by mortality decline where as the relative fall in the ratio from 1981 onwards is reflective of fertility decline. This is assuming that wives are younger than husbands.

Finally, a word on female autonomy. Despite higher levels of education, urbanization and economic development in West Bengal, the conventional indicators of female autonomy, namely female mobility and participation in decision-making, are no better in the state in relation to Bangladesh (DHS and NFHS). On the contrary, women in Bangladesh enjoy a higher level of financial autonomy (Chattopadhyay and Goswami, 2006). They analyzed NFHS and DHS data to show that Bangladeshi women have relatively greater autonomy in spending household income. This is explained by greater participation of these women in the income-generating activities of the household, largely made possible by wide availability of micro-credit (Schuler and Hashemi, 1994).

Kinship and marriage patterns, to a large extent, influence the level of female autonomy among other things. (Dyson and Moore, 1983). West Bengal has kinship patterns that resemble the system found in southern India (Klass, 1966). According to his anthropological study of rural life in West Bengal, there is no village exogamy in marriage, nor consanguinity. Although the same village is avoided when choosing a groom for the daughter, a village too far is not considered desirable as it makes trips expensive and infrequent between the husband's and natal home.

Marriages in Bangladesh resemble the north Indian kinship system in that there is a preference for village exogamy (Cain, Khanam and Nahar 1979). Brides are generally brought from faraway villages, largely curtailing their ties with her natal home after marriage. A large age gap is also preferred, a custom that has perpetuated male dominance in a marriage (ibid). This coupled with *purdah* largely explained the poor demographic profile of Bangladesh. But the dramatic turnaround since the

1980s in terms of improvements in fertility and mortality has been facilitated by a host of factors including increased opportunities for female education and employment.

6.2.4 Linear regression on age at marriage

With this background on the aggregate trends and patterns of marriage in Bengal, I will proceed to undertake statistical analysis. In the first set of linear regressions, I examined how different covariates, for example, having no education or being Hindu, affected the age at first marriage in Bangladesh at two points in time – early 1990s and early 2000s. Models were run for the two age groups separately, for younger women (aged 13-29) versus the older ones (aged 30 and over) at the time of the survey. This was to account for the different circumstances under which different cohorts of women get married. Younger women normally marry at a later age than older cohorts. The problem of 'censoring' should not be an issue with the younger age group because the first marriage for almost all women in Bangladesh take place before the age of 29. The constants suggest that the average age at female marriage among women aged 13-29 increased by roughly two years in the country between DHS 1993-94 and DHS 2004 – 16.6 and 18.3 years, respectively.

The linear multiple regression equation takes the form

$$y = b_1x_1 + b_2x_2 + \ldots + b_nx_n + c$$

The b's in the equation are the regression coefficients, representing the amount the dependent variable y, in this case, the age at first marriage, changes when the corresponding independent variable (x's) changes one unit. The c is the constant, where the regression line crosses the y axis. Thus 16.579 years is the age at marriage for women aged 13 to 29 in the 1993-94 BDHS when all covariates are held constant (Table 6-9A). The reference is the one to which the other categories are compared. Thus in column 3, compared with women who have secondary or higher education (reference category), women with no education in Bangladesh may be expected to get married 1.422 years earlier than the constant of 16.579.

Table 6-9A: Linear regression of age at first marriage in Bangladesh, 1993 and 2004

		Bang (1993-4)	Bang (2004)	Bang (1993-4)	Bang (2004)
		Women aged 13-29	Women aged 13-29	Women aged 30+	Women aged 30+
	R squared	**.105**		**.071**	
		B		B	
	(Constant)	**16.579**	**18.33**	**16.262**	**17.95**
Female Education	No education	-1.422***	-.902***	-1.826***	-1.940***
	Primary	-1.367***	-.805***	-1.597***	-1.736***
	Secondary+	Ref.	Ref.	Ref.	Ref.
Husband's Education	No education	-.363***	-.700***	-.185	-.015
	Primary	-.401***	-.424***	-.176	.090
	Secondary+	Ref.	Ref.	Ref.	Ref.
Husband's Occupation	Semi-skilled	-.179	-2.163***	-.400*	-1.828***
	Skilled	-.131	-2.232***	-.283	-1.399***
	Agriculture	-.396*	-2.467***	-.515**	-2.079***
	Non-manual	Ref.	Ref.	Ref.	Ref.
Socio-Economic status	Lowest	-.584***	-.534***	-.126	.041
	Middle	-.362**	-.357***	-.182	-.174
	Highest	Ref.	Ref.	Ref.	Ref.
Residence	Rural	-.023*	.022	-.378**	.100
	Urban	Ref.	Ref.	Ref.	Ref.
Religion	Muslim	-.625***	-.706***	- .425***	-.992***
	Non-Muslim	Ref.	Ref.	Ref.	Ref.

* p<.05, ** p<.01, ***p<.001, Ref – reference category

Source: 1993-4 and 2004 BDHS

Female education continued to be an important determinant of age at first marriage in the country during the 1990s although husband's occupation also played a major role in 2004 (Table 6-9A). Female education played a stronger role in 2004 than in 1993. That is, having no education decreased the expected age at marriage by 1.4 and 1.9 years in 1993 and 2004, respectively. Women getting married to men who are in manual and agrarian occupations on average tend to be two years younger than women marrying men in non-manual occupations in the latter survey. Women from low and middle socio-economic backgrounds tend to marry earlier than their better-off counterparts. Using the model for linear regression with the 1993-94 BDHS, a Muslim girl who is rural, with no education, and belonging to the lowest economic

class could be expected to get married at the age of 13.9 years compared with 14.6 years for her Hindu counterpart in the country.[57]

Table 6-9B: Linear regression for age at first marriage, Bangladesh and West Bengal

		Bang (1999-2000)	WB (1998-1999)	Bang (1999-2000)	WB (1998-1999)
		Women aged 13-29	Women aged 13-29	Women aged 30+	Women aged 30+
	R squared	**.171**	**.251**	**.160**	**.282**
		B	B	B	B
	(Constant)	**17.323**	**19.242**	**17.022**	**19.912**
Female Education	No education	-1.298***	-1.115***	-2.470***	-2.757***
	Primary	-1.264***	-.955***	-2.040***	-2.473***
	Secondary+	Ref.	Ref.	Ref.	Ref.
Husband's Education	No education	-.730***	-1.270***	-.325**	-.970
	Primary	-.550***	-1.094***	-.225	-1.471
	Secondary+	Ref.	Ref.	Ref.	Ref.
Husband's Occupation	Semi-skilled	-.086	-.295	.172	-.424*
	Skilled	-.194	-.459**	-.187	-.417
	Agriculture	-.298**	-.465*	-.202	-.320***
	Non-manual	Ref.	Ref.	Ref.	Ref.
Socio-Economic status	Lowest	-.724***	-.864***	-.018	-.529
	Middle	-.763***	-.692***	-.243	-.345
	Highest	Ref.	Ref.	Ref.	Ref.
Residence	Rural	.-.416***	-.478**	-.404***	-.621**
	Urban	Ref.	Ref.	Ref.	Ref.
Religion	Muslim	-.898***	-.809***	-1.314***	-.999***
	Non-Muslim	Ref.	Ref.	Ref.	Ref.

* p<.05, ** p<.01, ***p<.001

Source: 1999-2000 BDHS and 1998-99 West Bengal NFHS

Table 6.9B suggests that young women as well as older cohorts in West Bengal got married on average two years later than their counterparts in Bangladesh. Husband's education plays a more significant role in West Bengal. Husbands with no or little education choose relatively younger wives and more so in West Bengal, 1.27 years in the state compared with a little less than a year in Bangladesh. Low levels of socio-economic status among 13 to 29 year-olds may decrease the age at marriage by .763

[57] Muslim age at marriage for 13-29 according to 1993-94 BDHS is:
$Y=(-1.422)X_1+(-.584)X_2+(-.023)X_3-.625X_4+16.597 = 13.94$ years
Hindu age at marriage for the same is:
$Y=(-1.422)X_1+(-.584)X_2+(-.023)X_3+16.597+ = 14.57$ years

year in Bangladesh and by .864 year in West Bengal. The religion effect is strong in both Bengals suggesting that Muslims in both the wings marry at an earlier age than Hindus. This works mainly through relatively lower levels of education among Muslims who are known to observe *purdah* or female seclusion relatively more strictly. Among women aged 30 and over, being Muslim reduced the age at marriage by roughly a year in both wings.

6.3 Family Planning Programmes

The family planning programme in Bangladesh is one of the most talked about programmes in the world. Because of its unique and innovative concept of taking family planning services to the door-step of the client, the contraceptive prevalence rate increased dramatically resulting in the most rapid decline in fertility in Asia – the TFR decreased by around 3 children within the span of roughly fifteen years (Figure 6.1). The experience of Bangladesh was one where the demand for the small family norm was largely created through ideational changes brought about by an effective Information, Education and Communication (IEC) campaign of the FPP, in the absence of much apparent socio- economic development. The fertility level in West Bengal, on the other hand, has been declining steadily without as rigorous a programme as in states like Tamil Nadu. The programme inputs in West Bengal, in terms of per capita expenditure, have not been as substantial as that in Punjab or Tamil Nadu (Chandra, 1987). Yet the level of contraceptive uptake is one of the highest in the country, largely constituting female sterilization and use of traditional methods. What has facilitated the consistent decline in fertility in West Bengal in the absence of a rigorous family planning programme is a favourable social setting – namely, lower mortality levels than in Bangladesh or in most other Indian states, and higher than the national levels of female education and urbanization.

What follows is an account of the historical evolution of family planning programmes in Bangladesh and India before addressing the more recent differences and similarities in the two programmes.

6.3.1 Evolution of post-Independence Family Planning Programmes

Birth control, mainly through traditional methods and induced abortion,[58] has been practised in pre-Partition Bengal for generations (Chandrasekaran and George 1962). Induced abortion may have been the more common method of birth control among Bengali women of the lower socio-economic classes (Guha 1996) while traditional methods may have been more favoured by the educated elite (Nag, 1962).

Advocacy of birth control originated in India during the early part of the twentieth century when the region was still under British rule. Some of the Bengali political and social leaders of pre-Partition India who spearheaded the nationalist movement also advocated population control and small family norm, for example, Rabindranath Tagore and *Netaji* Bose (Visaria and Chari, 1998). Mahatma Gandhi advocated *brahmacharya* or abstinence but not birth control per se (Chaubey 2001, Krishnaji 1998).[59] The British rulers of India neither supported nor opposed the notion of birth control but viewed it as a sensitive matter best left up to the Indians. The Famine Inquiry, set up to study the Bengal famine of 1943-44, pointed out the population pressure on land in that region.

Simmons (1971:78) noted, 'India's immense size and poverty made the task more difficult than it would be in most countries.' The decision to launch a FPP in India was initially prompted by a nationalist concern about sustaining the rapidly growing population with the limited resource base. According to the Indian Constitution, health and family planning are under state jurisdiction. The state level family planning programmes are fully funded by the central government although implementation is the responsibility of the state. The Indian government allocated family planning budgets to states based on their demographic profile. It could be augmented by the state from its own budget. On paper the organisational structure was identical for every state of India, but at the field level the situation varied from state to state depending on the availability of personnel and resources, organisation, state-level commitment and general socio-economic conditions. After repeated failures to meet the demographic targets set by the central government, the Indian

[58] Other traditional methods of birth control may include abstinence and non-marriage.
[59] Gandhi believed that sexual intercourse was for procreation only. He advocated abstinence to married couples, which is preached in Hinduism for moral and spiritual elevation.

programme recognized the need for greater decentralization and flexibility of the programme and to adapt to local socio-cultural needs. Consequently, the *Panchayat Raj* (for rural areas) and *Nagar Palika* (for urban areas) Acts were passed in 1992 giving greater autonomy to state governments. The policy of setting family planning method specific targets to states was also not working, as evident from the increasing trend in effective couple protection rates (ECPR) while the birth rate remained unchanged. Thus this system was abolished in 1996 to be replaced by the Reproductive and Child Health (RCH) approach, which integrated family planning with Child Survival and Safe Motherhood (CSSM), and total reproductive health needs of women. Recent studies suggest that despite the doubling of the post 1997 RCH budget, the RCH indicators have not improved significantly. In fact, per capita expenditure continues to be far less than the Indian average in West Bengal where the total fertility rate has plateaued since the late 1990s (Srinivasan, Sekhar and Arokiasamy, 2007; NFHS 2007). One of the factors explaining this phenomenon may be that the Indian programme continues to be sterilization focused, with the needs of birth 'spacers' largely unmet.

As far as Bangladesh is concerned, the stage for family planning was set during the 1960s by the Pakistani government. The motivation to adopt a national FPP in Pakistan may have been partly prompted by the need to check the rapid growth in population, especially in the eastern wing, and perhaps also by the fact that foreign aid during the 1960s may have been conditional upon recipient governments enforcing population policies (Connelly, 2006). Using the Indian programme as a guiding model, a comprehensive programme was in place in Pakistan by the mid 1960s, employing a combination of clinical and extension approaches. It failed to meet the expected targets in terms of contraceptive acceptance during the 1960s but managed to increase the level of knowledge of family planning from 6 to over 50 percent in rural East Pakistan (NIS 1962-65).

Although the urgent need of an effective population policy was recognized by the government of newly created Bangladesh in 1971, there were more pressing problems at hand like reconstruction after the 1971 war and the famine of 1974-75. It was not until 1979 that the family planning programme was revamped. The outreach service of the FPP was extensively increased by training 23,000 female

field workers. In addition, there was an increase in IEC activities, involving the non-governmental sector and taking a multi-sectoral approach (Haider, 1994).

Table 6-10: Evolution of Bangladeshi and Indian Family Planning Programmes

Bangladesh	India
	1935: National FP Commission under Nehru
	1925-30: earliest Government clinics
	1949: Family Planning Association of India founded
1950-55: Voluntary efforts 1953: Family Planning Association of Pakistan founded	**1951-56**: Launch of national programme; cautious and experimental in nature; rhythm method and abstinence advocated 1956: Sterilisation included in programme
1955-60: 'Stage-setting' of programme	**1956-61**: Investment in expansion of infrastructure; CC (Condoms, diaphragm and foam tablets) included
1960-65: Clinic-based approach 1962-65: PGE Survey 1963-65: NIS Survey	**1961-66**: Demographic targets set; IUD and condom produced locally 1963: Extension approach 1965: IUD introduced
1965-70: Comprehensive approach with IEC and door-step services 1965: National programme launched (Pakistan)	**1966-69**: Inter-Plan period; FP integrated with MCH 1968: *Nirodh* (condom) commercial distribution 1969: Fist ORG Survey
1970-73: Transitional phase; 1971: Bangladesh's Independence from Pakistan 1972: Monetary incentives for sterilisation and IUD discontinued; oral pill and menstrual regulation (MR) introduced	**1969-74**: Minimum Needs programme 1972: Medical Termination of Pregnancy Act (MTP) introduced
1973-78: FP integrated with MCH; massive IEC campaign, knowledge of modern methods increased from 50 to 90 % 1975: Registration of eligible couples 1976: National Population Policy established	**1974-79**: Crucial period in the history of programme 1976: National Population Policy 1977: 'Emergency Period' during which the number of sterilisation and IUD acceptors rose dramatically; Janata Party comes into power and renames programme' Family Welfare'; cafeteria approach; some NGO involvement
1978-80: Inter-Plan period 1979: NIPORT founded Contraceptive Prevalence Surveys initiated	**1979-80**: Inter-Plan period
1980-85: Integration of FP with Health Ministry; multi-sectotal approach; NGO/donor involvement; IEC campaign	**1980-85**: Mass education and motivation programme
1985-90: Satellite clinics introduced for greater coverage; IEC strengthened; contraceptive prevalence surveys every 2/3 years; logistics and MIS	**1985-90**: Performance of the programme at the state level reviewed
1990-95: MCH goals set; Norplant and low-dose oral Pill introduced	**1990-95**: Depo-Provera (injectable) introduced; first modern demographic retrospective survey (NFHS)
Late 1990s onwards: Outreach services downsized; integrated health and reproductive health services provided at community clinics	**1997 onwards**: target method withdrawn; RCH programme launched, integrating family planning with mother and child health, and other reproductive health services

Source: Compiled by author using sources like Visaria and Chari (1998), and Haider (1994)

Table 6-10 indicates that the Bangladeshi programme was largely modelled on the Indian one with the country taking on board the new features introduced in the Indian programme with a time lag of a few years. For example, the National Population Policy was launched in India in 1951-56 while in Pakistan in 1965. Similarly FP was integrated with MCH in the Indian and Bangladeshi programmes in 1966-69 and 1973-78, respectively. What is interesting is the fact that although the Bangladeshi programme was modelled on the Indian one, the former succeeded in dramatically increasing CPR over a short time span. This was largely made possible by huge donor support that enabled the deployment of field visits and IEC.

6.3.2 Similarities and differences

Kantner and Finkle (1996) and Das Gupta (1996), among others, point out the importance of the quality of leadership and governance, and the political environment for the success of FPPs. Government budgets for family planning may be taken as a measure for political commitment.

Table 6-11: Allocation and utilization of Family Welfare budget (Bangladesh)

Plan period	Allocation	dev. budget	Foreign Aid	Utilization	CPR
	(Million TK)	(%)	(%)	(%)	(%)
1975-80	1000.00	2.0	88.4	71.07	7.7*
1980-85	3100.00	2.8	90.0	122.92	25.3**
1985-90	8700.00	3.5	87.0	111.72	30.8***
1990-95	15980.00	4.5	73.2	93.1	49.2****

Notes: * Refers to the 1975 BFS
** Refers to 1985 CPS,
*** 1989 BFS
**** 1996-97 DHS

Source: Haider (1994), pages 163 and 174; and CRP from various survey reports .

The share of the development budget on family planning increased from two to 4.5 percent in Bangladesh between 1975-80 and 1990-95. Foreign aid constituted as much as 90 percent of the budget for family planning during the mid 1980s. Its share has declined gradually in Bangladesh where as it has increased in India as seen in Table 6-12. The last column, effective couple protection rate (ECPR) presented for India in Table 6-12 does not take the use of traditional methods into account. This explains why it is lower than the contraceptive prevalence rate (CPR) estimated for

Bangladesh by the series of DHS surveys (Table 6-11). The ECPR is based on service statistics, that is, on the number of sterilization, IUD, condoms, cycles of pills, etc. provided in a year.

Table 6-12: Allocation and utilization of Family Welfare budget (India)

Plan period	Allocation	dev. budget	Foreign Aid	Utilization	ECPR
	(Million Rs)	(%)	(%)	(%)	
1974-79	491.8	1.2	15.0	83.2	22.5
1980-85	1309.0	1.3	14.8	108.9	32.3
1985-90	2868.0	1.3	15.2	108.3	43.3
1992-97	6500.0	1.5	26.2	104.5	46.5

Source: Maharatna 2002, p.973

Per capita budget for family planning during the mid 1990s was approximately 2.4 US dollars in Bangladesh compared to about 17 cents in India.[60] As Maharatna (2002) observed, the Indian budget for family planning has never exceeded even two percent of the total development budget The main reason explaining the higher per capita expenditure of family planning in Bangladesh may be the programme's greater reliance on and availability of foreign assistance. Conly and Camp (1992) offer two explanations for the relatively lower foreign assistance to the Indian FPP. The first is the Indian government's general policy towards foreign assistance, requiring donors to relinquish all control over the aid they provide. The second cited reason they provide is India's 'negative legacy of the emergency period' coupled with red tape in the government system and continued problems related to sterilization (Conly and Camp 1992:54). Donors, especially USAID, are reluctant to fund sterilization. Budget utilization rate was higher in Bangladesh during the 1980s when former President Ershad made population stabilisation a priority. The share of foreign assistance in FPP increased significantly after India adopted more open policies to foreign donors. The share of foreign assistance decreased in Bangladesh over time as donors became more and more reluctant to fund the expensive outreach campaign (Arends-Kuenning, 2002).

[60] These figures were calculated assuming an exchange rate of one US$= 60 Bangladeshi Taka and one US$=45 Indian Rupees as of January 2003, and 1991 census populations of Bangladesh and India of 111 million and 846 million, respectively.

Visaria and Chari (1998) contend that state governments are more concerned with sectors like education which is financed by the state budget than in family planning, which is almost completely funded by the central government. Smooth running of the programme at the state level is hampered by factors like untimely release of funds and general red tape in the central government based in Delhi (Conly and Camp, 1992).

As far as infrastructure is concerned, only 47 percent of the required sub-centers in West Bengal were functioning in 1975 compared with 80 percent for India as a whole and 98 percent in Kerala (Ministry of Health and Family Welfare, 1975-76). A number of other developments in West Bengal during the 1980s explain the improved performance of the subsequent programme. One was the inclusion of four districts of West Bengal in the Area Development Project (ADP). [61] By the late 1980s, the density of sub centers in West Bengal and the percentage of personnel in position increased and were comparable to the Indian averages. [62] Secondly, the state–wise allocation of family welfare budget increased during the 1990s following an increase in the share of foreign assistance to the Indian family welfare programme. In West Bengal, annual average per capita expenditure on family planning increased during the late 1990s but did not quite reach the Indian average.

[61] The ADP was mainly a World Bank assisted project initiated in India in 1973 to strengthen the family welfare programme through expanding infrastructure, training of personnel, IEC, etc.

[62] In 1978, there were only 56 percent of the required 3335 sub centres operating in West Bengal. By the late 1980s, this percentage increased to 68 (India Family Welfare Report, 1989-90)). In 1986-87, the percentage of staff in position in the family welfare service delivery system in West Bengal had increased to 82 percent, which was comparable to the Indian average of 84 percent.

Table 6-13: Budget Allocation for Family Welfare in mid 1990s: Bangladesh and West Bengal

	Total budget for Health and Family Welfare in US$	Percentage of H&FW budget spent on Family Welfare	Per capita FW expenditure on married women aged 15-44 (US$)
Bangladesh (1994-95)	57,000,000	61.6	1.9
West Bengal (1995-96)	137,287,500	11.3	1.3

Source: For West Bengal, State Bureau of Health Intelligence (1996-97:55), and for Bangladesh, Haider (1995:175).

Notes: The budget for West Bengal includes the allocation for public health. The proportion of married women aged 15 to 44 were calculated from the age-sex distribution of the 1991 census to be 11.5 and 18.1 million for West Bengal and Bangladesh, respectively.

As seen in Table 6.13, per capita expenditure on FW was almost one and half times more in Bangladesh than in West Bengal during the mid 1990s. Even in the context of India, fertility decline has been faster in the southern states where per capita expenditure on FP has been higher and the quality of services relatively better (Maharatna, 2002). Indeed, Kerala and Tamil Nadu had the highest per capita expenditures on family planning even before the Emergency period (Annual Year books of Family Welfare).

6.3.3 Organization and infrastructure of the FPP

The organization and infrastructure were similar in the two programmes as the initial programme in Bangladeshi was originally modelled on the Indian one. The Bangladeshi programme employed two forms of service delivery, one at the household level through outreach workers known as the Family Welfare Assistants (FWA),[63] and the other through the extensive network of static service delivery points (SDPs). In rural Bangladesh, SDPs are located at the different levels of administrative units like the Health and Family Welfare Centre (H&FWC),[64] Thana

[63] In the mid 1990s, there were over 23,000 FWAs in the programme where each FWA is responsible for 600 to 800 eligible couples (Haider 1994:28)

[64] There were 3200 of them all over the country in the mid 1990s (Haider 1994:)

Health Complex (THC), and rural dispensaries.[65] Urban areas are served by ngos, providing family planning services mainly through clinics.

The FWAs are the field-level female workers who implement the programme at the grassroots level. They visit households every three months for providing the pill, condom and injectables, and more importantly for motivational and counseling services. They are supervised by male field-level workers known as the Family Planning Assistants (FPA) who also motivated male village members. Clinical services like IUD insertion, sterilization, Menstrual Regulation (MR) and MCH services are offered at SDPs. In addition, satellite (mobile) clinics are organised twice a week for MCH services, and two sterilisation camps organised once a month to take services to those without easy access to health facilities.

The government also markets pills, condoms and ORS through the 40,000 sales outlets of the Social Marketing Company (SMC) at subsidized prices (Haider 1994:35). In addition, SMC carries out a lot of the IEC/promotional activities of the national programme.

Finally, the non-governmental sector (NGOs) played a vital role by providing over 20 percent of the total family planning services in the country (Haider 1995:109). It is the main provider of family planning services in the growing urban sector. The NGOs can perform well by bypassing the bureaucracy, inflexibility and inefficiency generally associated with the government sector.

The Indian programme is similar in infrastructure but different at the top level of policy-making. The state government has been in charge of implementing the programme within guidelines set by the central government in Delhi. Each state has a Family Planning Bureau, which implements the programme through the national network of service delivery system. The structure of personnel for providing family planning services is determined at the national level on the basis of the population size in each state with no regard for differences in the states in terms of urban-rural population distribution, literacy level, health conditions, and other factors. Since

[65] For administrative purposes, the country is at present divided into six Divisions (Khulna, Rajshahi, Barisal, Dhaka, Chittagong and Sylhet) which are in turn divided into 64 districts. Each district is in turn divided into Thanas, Unions, Wards and villages.

1997, the State Family Planning Bureau has had the autonomy to develop and implement the FPP under the RCH approach but FPP budget is still allocated by the central government. Like the Bangladesh programme, rural services are provided through field-level workers known as the Auxiliary Nurse Midwife (ANM) as well as through a tiered network of sub-centres, Primary Health Centres (PHC) and Community Health Centres (CHC). [66] These service delivery points are equipped to function in a manner similar to the Bangladeshi programme. These establishments are responsible for organising mobile units for performing sterilisations and IUD insertions. In the urban areas, family planning services are provided through state and municipal hospitals, Family Welfare Centres and urban dispensaries. The ANM, who may be compared to the FWA in the Bangladeshi programme, continues to form the backbone of the programme (Simmons 1971). The Indian programme also employs other channels for providing family planning services including non-government health projects, employment based programme (organized sector)[67], and SMC (for subsidized pills and condoms at commercial retail outlets).

The sub-center in the Indian programme may be compared to the FWC in Bangladesh, which is the first contact point between a rural client and a health provider. The densities of sub-centers in West Bengal and FWCs in Bangladesh in the early 1990s indicate that both the programme were performing below the mark, as far as infrastructure was concerned, but the Bangladeshi programme was doing relatively better. The ratios of sub-center to population in West Bengal and FWC to population in Bangladesh were roughly 1:8,300 (when the ideal ratio is considered to be 1:5000)[68] and 1:34,600 (the ideal ratio being 1:20,000), respectively. However, various studies on Bangladesh (Kamal, 1994; Koenig et al 1997) conclude that the presence of a FWC does not increase the probability of contraceptive use as much as the visit of a FWA does. Health centres in both the programme are often

[66] The sub-centers in the Indian programme are run by the central government and the PHCs and CHCs by the state government.
[67] Since the 1960s, some of the large business houses and industries in India, for example, Tata and the Railway, have maintained in-house facilities for providing family planning services for their employees.
[68] This ratio was calculated using the 1991 census population of West Bengal and official number of sub centres in the state in the late 1990s.

understaffed, and short of equipment and supplies, deterring clients to avail of these facilities.[69]

Roy and Verma (1999) studied the quality of family planning services in four states on India. According to them, 61 percent of the women surveyed in West Bengal were visited by an ANM in the preceding three months compared to over 90 percent in Karnataka and a little over 50 percent in Bihar. In West Bengal and Bihar, approval ratings for the ANM were lower and dissatisfaction with services greater than in the southern states. Again, Nagdeve (2002), using the Rapid Household Survey 1998 data, concluded that only about eight percent of women had been visited by an ANM in West Bengal during the three months preceding the survey compared to the national average of about 14 percent, and about 19 percent in Bangladesh (1999-2000 BDHS). The study concluded that the quality of services was poorest in Bihar while that in West Bengal was anything but satisfactory.

One reason for the unsatisfactory outreach services in West Bengal could be the increased overload on ANMs in the Indian programme who have to divide their time between providing MCH/FP services at the static sub-centers and making home-visits, among other responsibilities (Srinivasan, Sekhar and Arokiasamy, 2007). Although the Indian government tries to provide, on average, one ANM for every five thousand population, this is often ineffective given the vast physical size of the country. That said, the high density of population in West Bengal should theoretically make the work of outreach workers more manageable.[70] Roy and Verma (1999) suggest that West Bengal has roughly 78 percent of the required number of ANMs for the state. In the new RCH approach which has been in place since 1997, Child Survival and Safe Motherhood (CSSM) has been given as much importance as family planning when the ANM is the main provider for these services (Nagdeve 2002).

[69] See, for example, Roy, Ravi and Verma, (1999) for West Bengal.

[70] According to Conly and Camp(1992), the success of the programme in Kerala could be explained in terms of the high density of population which makes it easier to provide services. Again, (Hanifi and Bhiuya 2001) conclude that inadequate/irregular programme inputs (e.g., irregular home visits) owing to the physical inaccessibility of the hilly regions of Chittagong, partly explain the lower contraceptive prevalence rates in that part of Bangladesh.

6.3.4 Trends in Contraceptive Prevalence Rate

The difference in measuring contraceptive acceptance in the two programmes should be pointed out. In Bangladesh, the Contraceptive Prevalence Rate (CPR) is used that refers to the level of prevalence at the time of a survey. In India, the Effective Couple Protection Rate (ECPR) was used until the advent of the NFHs surveys. The ECPR is based on service statistics by estimating the number of years of protection provided by each family planning service (for example, IUD or sterilization) adopted.[71]

Methods of contraception may be broadly grouped into three categories. The first group of modern or reversible methods consists of the oral contraceptive pill, condom, IUD and injectables. The terminal method is sterilization, comprising both male and female sterilization. The third category of traditional methods refer to natural methods of contraception like the safe period or rhythm, and *coitus interruptus* (withdrawal). According to BDHS 2004 and NFHS-2, the terminal method, female sterilization, was adopted by only 5.2 percent of all currently married women in Bangladesh compared with 32 percent in West Bengal, although the ASFR is almost identical for the age group 25-29 in both. Thus the majority of women in the country rely on the pill as a method of limiting births when it is ideally a spacing method. During the 1990s, all the oral contraceptive pills available in the country had more or less the same hormonal combination.[72] Considering that the pill was originally designed with the western woman in mind, this combination can be too high for the average Bengali women who is much smaller in size.

Although low-dose pills are available in western markets, donors do not support their use in the country since they do not provide as much protection as the high-dose ones. Therefore it is not surprising that almost 50 percent of users discontinue the pill after the first 12 months, citing side-effects as the most common reason for discontinuation. Some of these women then switch to more effective methods, e.g. injectables while others to less effective ones (for example, traditional methods). But the majority of them remain unprotected (Khan, 2001). The pill as a method of

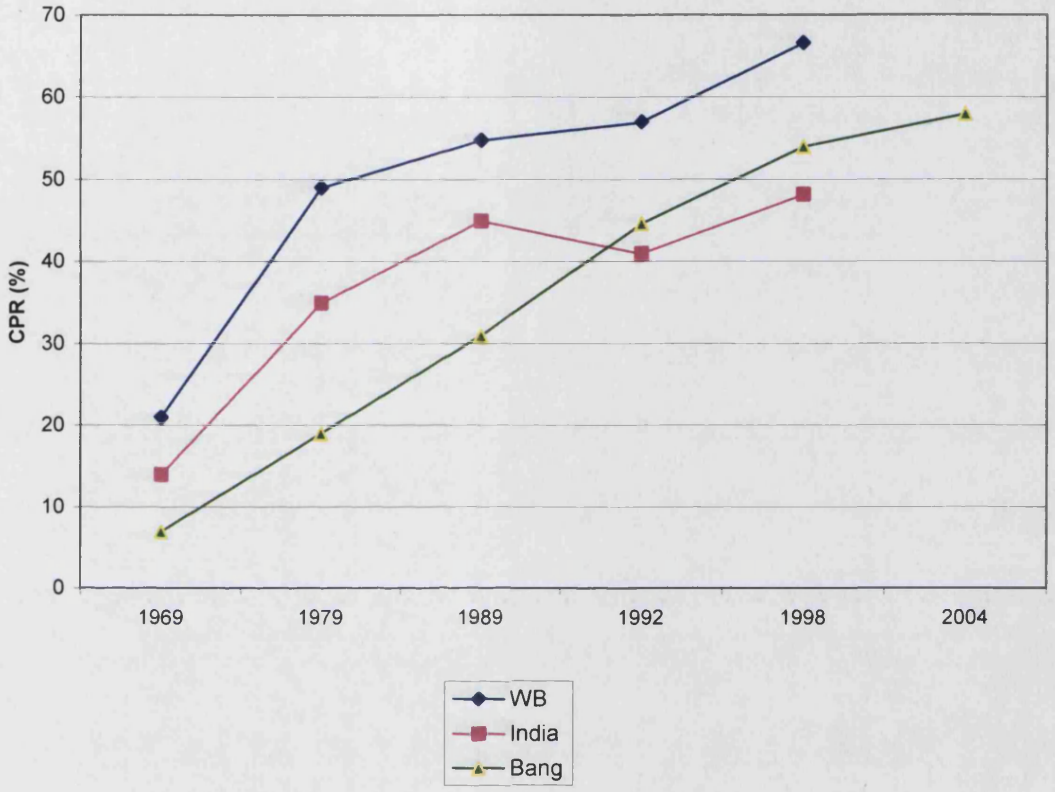
[71] See Simmons (1971) for details.

[72] It was a research project I was involved in while working as a National Fellow at the Population Council in Bangladesh. The study aimed to ascertain the reasons behind the high reported levels of side-effects associated with the oral contraceptive pill in the country. See for example, 1999-2000 BDHS, p.59.

contraception has had a high rate of failure in the country, often as a result of poor counselling and follow-up by service providers. Women are not told what to do in the event of missing a dose, etc. According to one estimate, ten percent of all births in Bangladesh during the early 1990s was attributable to method-failure (Streatfield, et al, 1996).

Bangladesh has a larger rural population and a lower literacy rate than West Bengal and yet the knowledge of modern methods of contraception was relatively higher there. This was made possible by a massive IEC campaign through home visits, and mass media like the radio. The trends in ever use of modern methods suggest that the rate of ever use of reversible methods in higher in Bangladesh. This is attributable to the focus of the Indian programme on terminal methods and also because non-terminal methods are made more accessible to clients in Bangladesh by making them available at the door-step and also at service delivery points. In general knowledge of spacing methods in inadequate or inaccurate among Indian women (Visaria and Ramachandran, 2007).

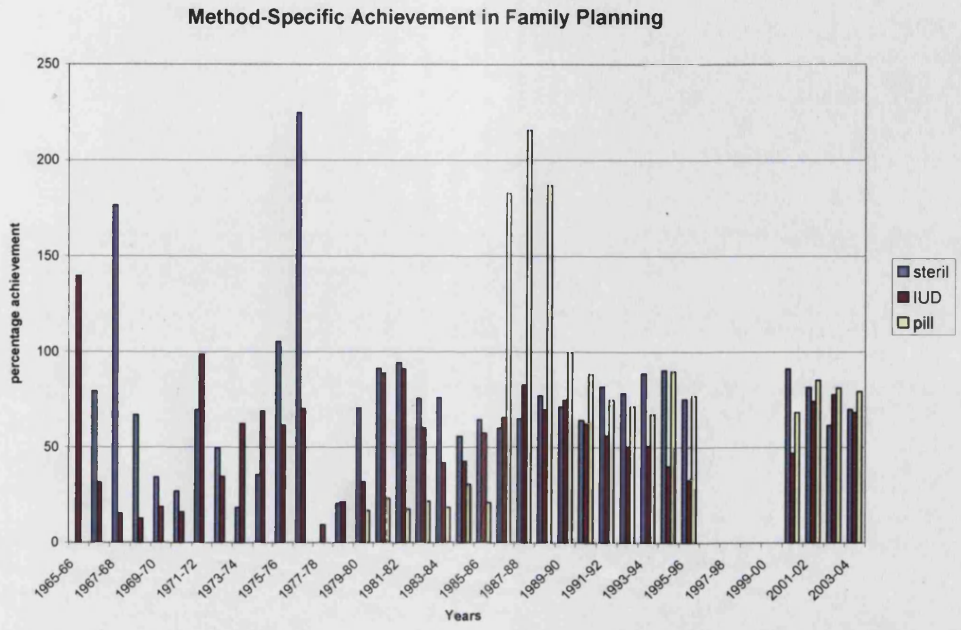
Figure 6-4: Trends in Contraceptive Prevalence Rates in Bangladesh, West Bengal and India:1969-2004



Source: ORG and NFHS surveys for India and West Bengal; list f surveys in Table 6.1 for Bangladesh

The divergence in the contraceptive prevalence rates between Bangladesh and West Bengal during the 1970s, as observed in Figure 6.4, is explained by the Emergency period when the Indian government revamped the FPP by setting strict male sterilization targets. A large number of coercive vasectomies are believed to have taken place when the focus was on quantity and not on quality. This made the FPP unpopular at the time, so much so that the Congress government lost power. The programme subsequently came to be known as the Family Welfare programme with a shift in focus from male to female sterilization in an attempt to remove the negative legacy of the Emergency period.

Figure 6-5: Contraceptive Method-Specific Achievement in West Bengal: 1966-2004



Source: State Bureau of Health Intelligence (2005)

The above graph is based on government statistics. The annual rates of achievement of targets suggest that the performance of the programme in the state has been mixed; in some years the state's achievement was over 100 percent while in other years, it was not even 25 percent. The upsurge in use of intra-uterine device (IUD) in 1965-66 may be explained by a drive by the Population Council to market IUDs worldwide at the time (Connelly 2006).The coercive male sterilization campaigns during the Emergency years in India is well documented (see, for example, Gwatkin, 1979; Vicziany, 1983). Figure 6.2 implies that the percent achievement of sterilization during the Emergency year of 1977-78 was well over 200 percent.

'In West Bengal, Tamil Nadu, Kerala and Karnataka, the combination of higher adopter-incentives and drought conditions produced a large response from the poor and unemployed. Some of these states are often pictured as areas where the Emergency family-planning campaigns did not make deep inroads. By using the narrow criteria of physical violence and disincentives, this is correct; but the argument cannot be sustained if we use the wider conception of coercion.'

(Vicziany, 1983:589)

Both the Indian and the Bangladeshi programmes went through some major changes during the mid 1990s, integrating family planning with mother and child and complete reproductive heath services. The landmark change in the new Indian Reproductive and Child Health (RCH) programme launched in 1997 was that the method-specific- target system was withdrawn. The increase in the CPR in West Bengal between 1992 and 1998 is attributable to an increase in the use of traditional methods and of the oral contraceptive pill. With the downsize of the outreach service in the Bangladeshi FPP since the late 1990s, the CPR lost its former momentum.

Figure 6-6: Method-Mix in Bangladesh

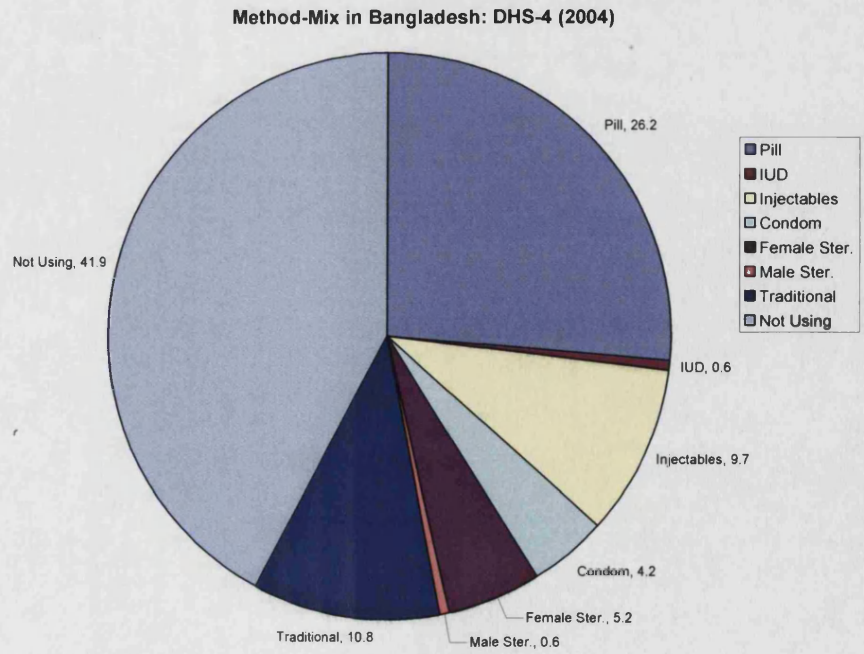
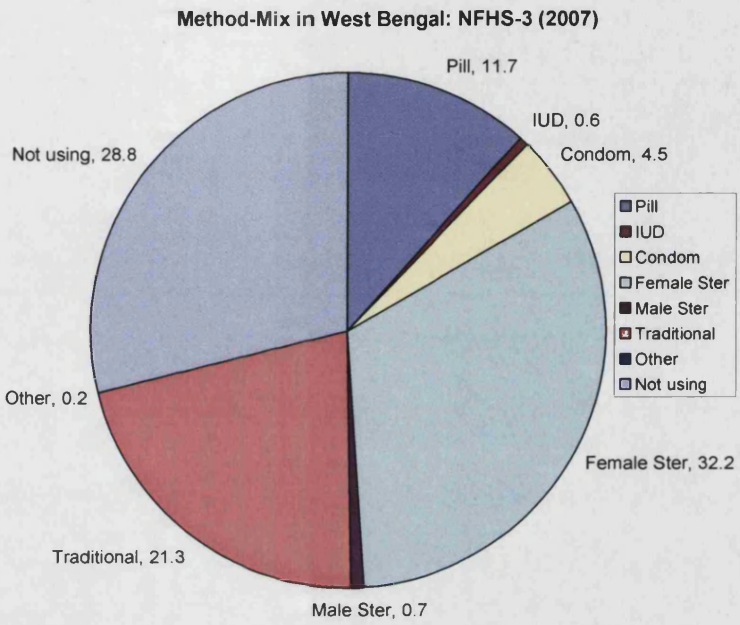


Figure 6-7: Methods-Mix in West Bengal



One of the most important differences in the two programmes is in the method-mix. Male sterilization, to be replaced by female sterilization following the Emergency period, has dominated the Indian programme, so much so that it has often been referred to as the 'sterilization programme' (Narayana and Kantner 1992:105). The oral contraceptive pill has been the most prevalent method in Bangladesh since the earliest surveys pertaining to the 1970s. The second most important methods, according to the latest survey, are injectables and traditional methods in Bang and WB respectively. In fact West Bengal recorded the highest CPR in India in 2007, which was attributable mainly to a sharp increase in use of traditional methods.

The emphasis on permanent methods in the Indian programme is attributable to the bias of the Indian medical establishment, the Indian Medical Association (IMA) which is a powerful political lobby against reversible methods (Conly and Camp 1992:31). With the abolition of method-specific targets, the oral contraceptive pill shot up in West Bengal, increasing threefold between the two NFHS surveys. The

increasing use of traditional methods also goes to show that there is a high level of unmet need for spacing or reversible methods in West Bengal.

The terminal methods never took off in Bangladesh for both demand and supply side reasons. From the clients' perspective, the social costs are very high for female sterilization. Firstly, Islamic teachings condemn it. Secondly, the withdrawal of financial incentives during the early 1990s may have deterred clients (Cleland, 1990). Donors were concerned that clients were being coerced through financial incentives. Finally the opportunity costs of female sterilization are too high – prospective clients often have to be accompanied by a male family member to a clinic who will need to take time off from work; hospital stay incurs costs both in terms of money, and in terms of running the household during the client's stay at hospital. Finally, poor quality of care in the provision of clinical methods continues to plague the health system in Bangladesh, often resulting in iatrogenic infections.

Earlier discussions illustrated that Bangladeshi women complete childbearing at a relatively early age, by their late 20s. They then rely on the pill and/or traditional methods until their late 40s which is when women reach the end of their reproductive life. These methods are ideally spacing and not limiting methods. Thus the high rate of accidental/unwanted pregnancies in the country. Among all births which took place during the five years preceding the 1999-2000 BDHS and 1998-99 West Bengal NFHS, 14 percent and a little over eight percent of births were unwanted.

6.3.5 Multi-nomial regression for Family Planning Use

A multinomial regression model was run in order to study the significance of various determinants in explaining the current use of modern reversible, terminal and traditional methods of contraception. Models were run for the early and late 1990s in order to identify any major change over time. Husband's education was included because better educated husbands may be more open to modern ideas and thus to the idea of small family norm. In addition, some methods like the traditional methods require some cooperation from husbands. Younger women and women with few or no children will be less likely to use contraception and thus their inclusion in the model (younger women are less likely to have completed their desired family size)

are less likely to use contraception. The models include women aged 25 and over since not many women will get sterilized before that age.

Multinomial regression expands on logistic regression by estimating the effect of one or more exposure variables on the probability that the outcome is in a particular category. In other words, this regression is used when the dependent variable is nominal (a set of categories which cannot be ordered in any meaningful way) and consists of more than two categories. One of the outcome levels is chosen as the reference level, and (k-1) regression coefficients, corresponding to each other outcome level, are estimated for each exposure variable in the regression model. In this case, the reference category for the three categories of contraceptive methods was 'not using contraception'.

In both the Bengals, less educated women and those from the lower socio-economic classes are less likely to use modern methods, probably because of prejudices and myths surrounding these methods, as well as poor knowledge of where and how to access them. The policy implication is to increase accessibility of contraception among the socio-economically disadvantaged.

In West Bengal rural women are less likely to be sterilized possibly because healthcare is not as accessible there. Women with no education are much more likely to use the traditional methods in both the wings in relation to educated women. This is plausibly explained by lower accessibility to family planning methods among women with no education. Finally for each of the four methods examined, Muslims in both the Bengals are less likely to use contraception and especially sterilization. This operates at the religious as well as socio-economic levels. Sterilization is perceived to be a form of castration and altering the human body is considered to be going against the will of God (Kamal and Mejia-Pailles, 2008). The social factor operates through lower levels of education among Muslims and there is usually a positive relationship between education and use of contraception.

Table 6-14A: Multinomial regression for three types of contraception among women aged over 25, 1993-94 BDHS and 1992-93 West Bengal NFHS

		Modern		Sterilization		Traditional	
		Bang	WB	Bang	WB	Bang	WB
Female education	None	-.946***	-2.07***	-.251	-.229	-1.130***	-1.501***
	Primary	-.617***	-.922***	-.281	.402**	-.651***	-.694***
	Second.+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Husband's education	None	.047	-.796**	.283*	-.087	-.124	-.284
	Primary	.155	-.030	.171	-.026	.049	-.238
	Second.+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Children ever born	None	-4.54***	-2.928***	-1.719***	-3.500***	-3.460***	-2.64***
	1-3	-.364***	-.313	-.397**	-.197*	-.405***	-.019
	4+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Current age of women	25-30	1.472***	2.089***	-.658***	.427***	.165	.776***
	31-40	1.255***	1.544***	.207**	.786***	.455***	.773***
	41+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Socio-economic status	Lowest	-.458***	-.619*	.657***	-.148	-.541***	-.272
	Middle	-.244**	-.563**	.201	-.065	-.311*	-.056
	Highest	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Residence	Urban	-.218**	-.129	-.123	.525***	.074	.017
	Rural	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Religion	Muslim	-.314**	-.174	-.702***	-1.163***	-.628***	-.219
	Non-Muslim	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.

* p<.05, ** p<.01, ***p<.001

Note: R Square for Bangladesh= 0.166; R Square for West Bengal=0.259; N for Bangladesh=5714, N for West Bengal=2663. Reference category was 'not using contraception'.

Husband's education was important during the late 1990s – no or little schooling of the husband increased the chances of sterilization in both the Bengals. Female education was still very important where low education was associated with low use of contraception. There were inequalities in family planning use by socio-economic status in both the Bengals in the earlier survey. However by the late 1990s, SES had ceased to be a determinant of birth control in West Bengal. The poor in Bangladesh are still less likely to use contraception than their economically better-off counterparts where as the rich and the poor were equally likely to control fertility in West Bengal during the late 1990s. The religion effect on use of sterilization continues to be higher in Bangladesh. This suggests that the FPP in the country has not been effective in reducing the social and psychological costs associated with the

use of permanent methods. This has important implications given that the temporary methods have a high failure rate.

Table 6-14B: Multinomial regression for three types of contraception among women aged over 25, 1999-2000 BDHS and 1998-99 NFHS

		Modern		Sterilization		Traditional	
		Bang	WB	Bang	WB	Bang	WB
Female education	None	-.679***	-1.588***	-.073	-.284	-.590***	-1.327***
	Primary	-.215***	-.741***	.068	-.097	0.307**	-.740***
	Second.+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Husband's education	None	.079	.437	.484***	.825***	-.138	-.042
	Primary	.056	.039	.248	.562***	-.171	-.179
	Second.+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Children ever born	None	-3.763***	-4.484***	-22.878***	-24.80***	-2.350***	-3.066***
	1-3	-.228***	-.421*	.217*	-.311**	-.360***	-.019
	4+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Current age of women	25-30	1.607***	2.493***	-1.462***	.342*	.317**	1.035***
	31-40	1.307***	1.901***	-.189*	.555***	.479***	1.048***
	41+	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Socio-economic status	Lowest	-.720***	-.373	-.119	.150	-.547***	.039
	Middle	-.221***	.489	.049	.383	-.134	.506
	Highest	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Residence	Urban	-.016	.103	-.082	.397**	.034	-.161
	Rural	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Religion	Muslim	-.159	.175	-.293**	-11.124***	-.604***	-.199
	Non-Muslim	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.

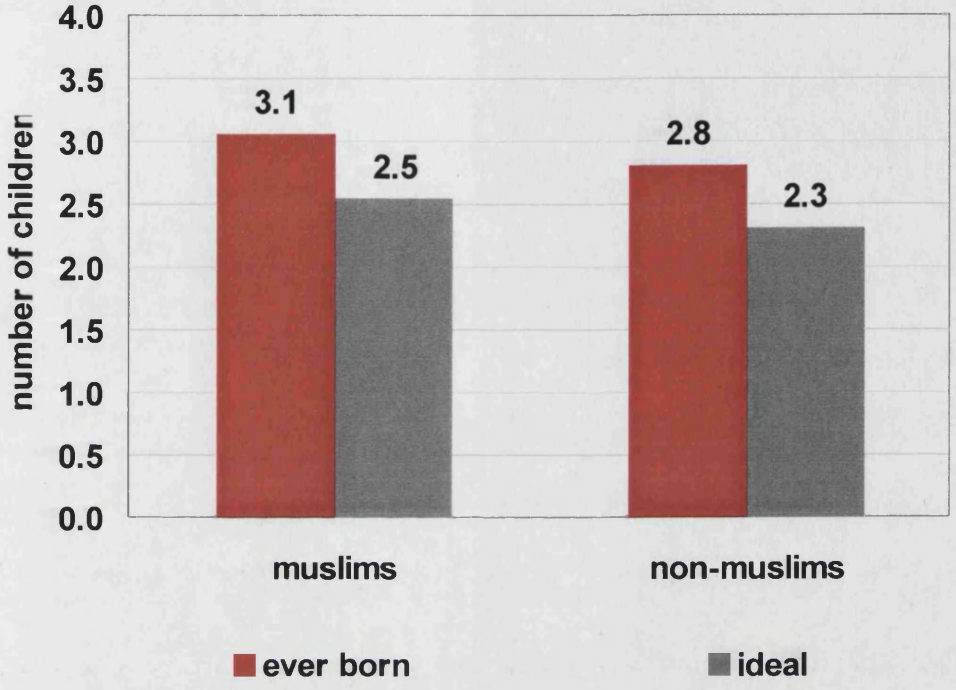
* p<.05, ** p<.01, ***p<.001

R Square for Bangladesh= 0.146; R Square for West Bengal=0.314. N for Bangladesh=6609; N for West Bengal=3108. Reference category was 'not using contraception'.

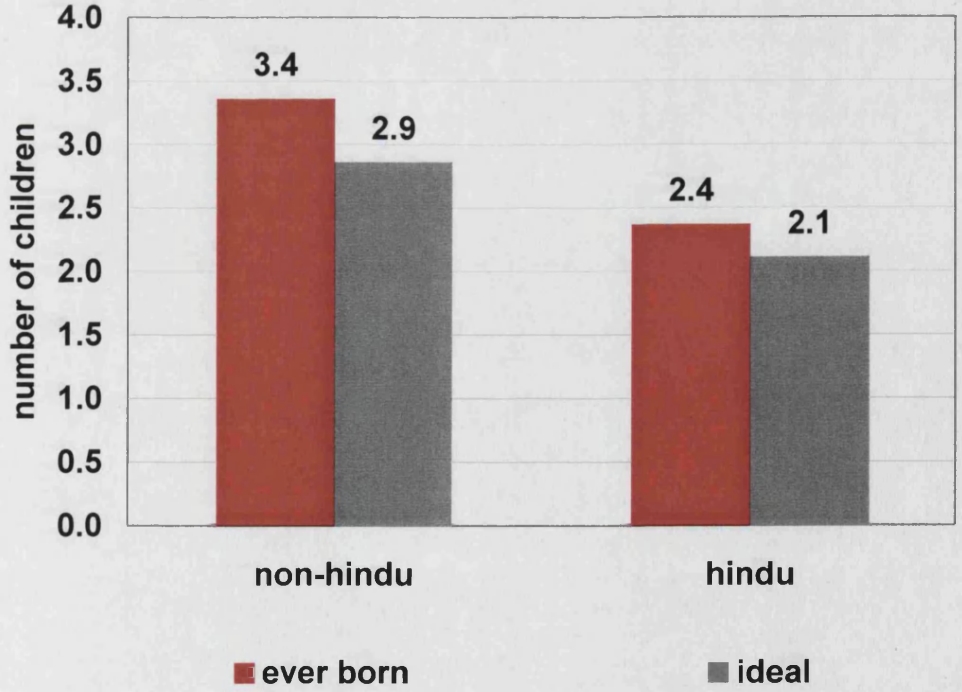
There are significant fertility differentials by religion in the two wings of Bengal. Discussions so far have established that Muslims in general are relatively adverse to all kinds of contraception. This largely explains their higher fertility levels relative to Hindus. It is interesting to see that the fertility differential by religion is much more pronounced in West Bengal than in Bangladesh. In other words, the minority group in Bangladesh (Hindus) emulate the fertility behaviour of Muslims where as the Muslim minority in west Bengal have substantially higher fertility levels than the Hindu majority in the state.

Figure 6-8: Hindu-Muslim fertility differentials

Bangladesh



West Bengal



The red bars represent the mean number of children ever born (actual fertility) and the grey ones show the mean number of ideal children (ideal family size) among Hindu and Muslim populations in the two Bengals. Actual fertility (in red bars) is seen to be greater than ideal fertility (grey bars) in every case and the difference is roughly half a child across the four groups. The difference between actual and ideal family size gives some idea of the level of unmet need of contraception. The interesting story here is that in Bangladesh, the fertility differential between Muslims who form the majority and Hindus, who form the minority, is not that pronounced (difference of .3). However in West Bengal, the Muslim minority group have on average one child more than the Hindu majority who have 2.4. The minority status hypothesis whereby the minority group members consciously have high fertility in order to feel 'powerful' in numbers, is possibly not the only explanation for such a discrepancy in West Bengal relative to Bangladesh (Rindfuss, 1980). Another explanation may be that the minority Muslims in West Bengal have an unmet need for reversible or non-terminal methods of contraception. Earlier regressions showed that Muslims everywhere are adverse to sterilization and it is the main method offered in West Bengal. The Muslim population in the state includes the second wave of migrants from Bangladesh who are those arriving since 1970. Those who cross the border illegally often lead marginalized lives, largely insulated from educational, employment and healthcare opportunities, as well as family planning services. The special reproductive needs of Muslims in West Bengal require attention.

6.4 Postpartum non-susceptibility

Post-partum non-susceptibility is the third significant proximate determinant influencing the fertility differential between Bangladesh and West Bengal, as was also indicated by the Bongaarts indices in earlier discussions. It refers to the period following childbirth when a woman is not at the risk of conception. A declining trend in the duration of breastfeeding in Bangladesh since the late 1980s at least partly explains why fertility has plateaued at the level reached during the early 1990s.

The nutritional status of women; their breastfeeding behaviour; initiation of sexual relations after childbirth, and their socio-economic environment influence the length

of this infecund period. Among these factors, breastfeeding plays the predominant role in influencing the duration of postpartum amenorrhea which together with abstinence determines the duration of the non-susceptible period following the birth of a child. The duration of anovulation after childbirth varies typically between two and nine months depending on the frequency and intensity of breastfeeding. Apart from the National Family and Health Survey reports (NFHS 1992-93 and 1998-1999), little is known about patterns of breastfeeding in West Bengal. Breastfeeding and its effect on post-partum infecundability in Bangladesh has been studied in the past. This may be because it used to serve as a major form of contraception until the 1980s when any substantial uptake of modern contraception took place. The country is also known to have one of the longest recorded durations of breastfeeding – the median duration was 36 months during the early 1990s compared with 24 months in India (Haggerty and Rutstein;1999). However the median duration of breastfeeding declined by five months between the 1993-94 and 1999-2000 BDHS surveys. Among studies on Bangladesh is Huffman et al (1978) who used proportional hazard models in order to study the factors that extend the duration of post partum anovulation. This study pertaining to the late 1970s concluded that a mother's poor nutritional status delayed her menses and thus increased the duration of amenorrhea while higher education decreased its duration. Thus poor nutrition of mother at least partly explains the long duration of post partum amenorrhea among Bangladeshi women. Another factor could be that supplements are beyond the financial and physical reach of most mothers in the country who rely on breast-milk for as long as possible. A recent study concluded that Bangladeshi urban women with high education, and high socio-economic status were more likely to terminate breastfeeding than the rural, uneducated poor (Giashuddin and Kabir, 2004). This could possibly be because well-to-do women have greater access to formula milk and other supplements.[73]

In the following discussions, I will summarise the basic differences in patterns of breastfeeding between Bangladesh and West Bengal using the only comparable source available - the BDHS and the NFHS reports.

[73] Other studies on various aspects of non-susceptible period among Bangladeshi women include John, Menken and Chowdhury (1987) and Mannan and Islam (1995).

The NFHS surveys only asked questions on the children born during the three years preceding the survey while the BDHS covered births during the last 5 years. The following discussion is based on the number of births.

Table 6-15: Duration of breastfeeding in Bangladesh and West Bengal (in months): late 1990s

	Exclusive Breastfeeding		Any breastfeeding	
	Bangladesh (N=4995)	West Bengal (N=1316)	Bangladesh	West Bengal
Median	NA	1.1	31	≥ 36
Mean	3.8 (2.9)	3.6	30.1 (28.8)	30.2
Prevalence/Incidence Mean	2.9	3.0	25.3	29.8

Median Duration of Exclusive Breastfeeding by Sex of Child (in months)		
	Bangladesh	West Bengal
Male	1.3	1.6
Female	2.2	0.7

Note: Prevalence refers to the number of children being breastfed at the time of survey where as incidence is defined as the average number of births per month (1999-2000 BDHS:137). The values in parenthesis in the columns for Bangladesh refer to the 2004 BDHS. The Ns refer to the number of children aged three and below at the time of the survey.

Source: 1999-2000 and 2004 Bangladesh DHS and 1998-1999 West Bengal NFHS

Breastfeeding deserves special attention because it affects both the period of post-partum amenorrhea and thus fertility levels of the mother, as well as the risks of morbidity and mortality of the child. Breast milk not only provides nutrients but also increases the long-term immunity of the baby. In Table 6-15, median and prevalence/incidence means are better indicators than the mean which may be affected by outliers. The Prevalence/Incidence mean duration of exclusive breastfeeding is almost identical in the two Bengals, that is two months. In both the Bengals, this is far below the six months recommended by WHO and UNICEF (Haggerty and Rutstein, 1999). A plausible explanation may be that mothers who are themselves often undernourished, do not produce sufficient breastmilk and have to resort to supplements. The duration of any breastfeeding appears to be substantially longer in West Bengal, by roughly five months. This could very well contribute to relatively lower infant and child morbidity and mortality rates in the state. What is strikingly different is the duration of exclusive breastfeeding by sex of the infant. In West Bengal, the duration for female infants is shorter where as in Bangladesh it is

significantly longer than that for male infants. The phenomenon in West Bengal may be explained in terms of son preference in the context of the Indian sub-continent. A possible explanation for Bangladesh could be that supplements like formula milk are perceived to be superior to breastmilk . Thus the diet of infant sons, who are valued more than daughters, is supplemented from an early age.

In light of above discussion, overall breastfeeding is better in West Bengal. As mentioned earlier, it is the primary determinant of the duration of post partum amenorrhea, which together with abstinence, determines the length of the non susceptible period.

Table 6-16: Post Partum Amenorrhea, Abstinence and Non-susceptibility (in months), late 1990s

	Amenorrheic		Abstaining		Non-susceptible	
	Bang	WB	Bang	WB	Bang	WB
Median	7.9 (6.1)	6.7	2.0 (2.0)	2.4	8.4 (6.5)	7.5
Mean	9.5 (8.7)	10.3	3.4 (3.5)	4.9	10.2 (9.5)	11.4
Prevalence/Incidence Mean	9.4	9.9	3.3	4.2	10.1	11.1

Source: Bangladesh Demographic and Health Survey Reports 1999-2000, and 2004; and National Health and Family Survey for West Bengal 1998-1999

Note: The values in parenthesis in the columns for Bangladesh refer to the 2004 BDHS

All the rates in the table 6-16 pertain to current –status data. Amenorrhea means the absence of menstruation. Post-partum amenorrhea refers to the period following childbirth when a woman des not ovulate. And ovulation, to some extent, may be suppressed beyond the initial two months through intense breastfeeding. The mean duration of amenorrhea has declined in Bangladesh from 12 months (1989 BFS survey) to 9.5 months (late 1990s) to 8.7 months (2004). Undoubtedly this has been influenced by the progressive decline in the durations of exclusive and any breastfeeding (Table 6-15).

Perhaps the biggest difference between the two Bengals lies in the percentage of women abstaining after a birth. Over 44 percent of women with a birth 2-3 months prior to the survey were abstaining in West Bengal compared with 24 percent in

Bangladesh. Similarly at 6-7 months after a birth, 13.7 and 5.5 percent of women were abstaining in West Bengal and Bangladesh, respectively (1998-1999 West Bengal NFHS and 1999-2000 BDHS). This is attributable to religious sanctions in Hinduism against resumption of sexual relations after childbirth (Caldwell, 1982). The gradual increase in nuclear families in Bangladesh has possibly made it easier for couples to breakaway from the restrictions on timing of sexual initiation after childbirth that may have been traditionally exercised by older relatives.

6.5 Conclusion

This chapter confirms that Bangladesh has experienced a significant decline in fertility within a short span of time. The pattern of fertility decline has been quite different in the two Bengals. West Bengal experienced a steady decline since the 1960s. In contrast Bangladesh made little progress in fertility decline until the decade of the 1980s. Time-trend comparison of Parity Progression Ratios and age-specific-fertility-rates reveal that fertility has been declining steadily among all age groups, and that women in both the Bengals complete their desired family size relatively early, that is, by the age of twenty-four.

Analysis of the proximate determinants of fertility reveals that the role played by each has differed over time. Post-partum non-susceptibility is becoming less and less significant in Bangladesh resulting from a progressive decline in the duration of breastfeeding in the country. In West Bengal, the duration of breastfeeding is about the same as in Bangladesh but the duration of past-partum abstinence is appreciably longer. Changes in the age at marriage and in proportions married also facilitated the decline in the two wings, especially in West Bengal. The current contraceptive prevalence rate may be high in Bangladesh but the high reliance on the oral contraceptive pill as a method for limiting births is a matter of concern given that the pill has a high failure rate compared with methods like sterilization. According to the latest round of the Indian NFHS conducted in 2007, West Bengal recorded the highest use of traditional methods implying that there may be an unmet need for non-terminal methods of family planning in the state.

There are three significant findings from my survey data. My primary research contribution from the statistical analysis of survey data are regarding two proximate determinants of fertility, namely age at first marriage for women, and use of contraceptive use . Female education stood out as the primary determinant of age at marriage in Bangladesh during the last two decades. Bangladeshi women with no formal schooling could be expected to get married two years earlier than their counterparts who had up to secondary level education. Husband's occupation was another significant factor accounting for wife's age at first marriage. According to my analysis, wives of men who were in agriculture or in semi-skilled occupations were up to 2.5 years younger than the wives of men who were in skilled and non-manual occupations. This is plausibly explained by the fact that men in manual or agrarian occupations tend to have low or no education. And men in Bangladesh, as in most patriarchal societies, generally prefer to marry women who have the same level of education as them or less, but not more. The implication of this analysis is that increasing female education alone cannot increase their age at marriage. It is equally important to educate men in the country.

The statistical comparison of Bangladesh and West Bengal elucidates striking differences in the determinants of female age at marriage. The average age at marriage in West Bengal is roughly two years higher than in Bangladesh. Again this is explained by relatively more women completing primary and secondary education in West Bengal. The effect of husband's education is stronger in West Bengal implying that educated men marry older girls. Thus, once again, Bangladesh will benefit from increasing the levels of male education alongside female education. This is because educated husbands choose educated girls to marry and vice versa, and staying in education increases the female age at first marriage.

My second research contribution is on the determinants of contraceptive use. Multinomial regression of method-specific contraception illustrates that in Bangladesh, the less educated women and women from lower socio-economic classes are less likely to use the reversible/modern methods of contraception. Thus the national family planning programme needs to increase the accessibility of contraception among the socio-economically disadvantaged classes by targeting specific groups like slum-dwellers. My analysis also suggests that there is a positive

correlation between female education and level of family planning use. The religion factor is more significant in West Bengal, that is, Muslims are less likely to use contraception in the state. This is because Muslims in general disfavour sterilization as a method of birth control which is the dominant method offered in the Indian programme.

A third important finding of this chapter is that the minorities of Bangladesh, that is, Hindus, emulate the fertility behaviour of Bangladeshi Muslims. On the other hand, the fertility level of the Muslims of West Bengal, who form the minority group in the state, is substantially higher than that of Hindus. Thus in order to increase future contraceptive use and to avoid unwanted fertility, the family planning programmes in both the Bengals need to cater to the needs of different religious and socio-economic groups.

7 Chapter 7: DEMOGRAPHIC TRANSITION IN BENGAL

This chapter answers the second research question of this study. It examines the extent to which the demographic transition has been similar in the two Bengals. My premise is that although the initial timing and factors for the decline in fertility and mortality were similar in the two wings of Bengal, the determinants for the subsequent transition during the post-Partition period have been different. The chapter starts with an introduction to the classical theory of demographic transition, to be followed by an examination of the explanations that have been put forward for Bengal. The final section proposes a new perspective in light of the findings in the study, in particular the time series of vital rates for the last hundred years or so.

7.1 Overview of the classical demographic transition theory

The concept of demographic transition was introduced in Chapter 1. This section will lay out the tenets of classical demographic transition theory before assessing its relevance in explaining the transition in Bengal. Demographic transition refers to the progression from a state of high levels of mortality and fertility to one of low levels. Thompson (1929) and Landry (1934) were among the earliest proponents of the theory. Notestein (1944) later made significant contributions to it. The central premise of the theory is that modernization and economic development lead to improved mortality, and also to changing fertility aspirations as large families become less conducive. It was originally put forward as an explanation for western societies which underwent the transition during the late eighteenth and nineteenth centuries.

Subsequent studies, for example, by Coale (1973) and Cleland and Wilson (1987), revealed that the relationship between economic development and fertility has proved to be rather weak. For example, Cleland and Wilson (1987) observed that during the twentieth century, socio-cultural and linguistic settings were more important determinants of fertility decline than economic development. Nor was improved survival necessarily a pre-requisite for the birth rate to fall in some of the African countries that have experienced the transition more recently. Cleland and Wilson were among the first to endorse the theory of ideational change as an

explanation for fertility decline. Ideational change refers to the shift from a fatalistic, tradition-bound mindset to a more rational and secular one. They contended that the timing of the demographic transition has been more strongly influenced by cultural boundaries and is associated with indicators of social development, rather than with indicators of economic development. However, a structural change like a mortality decline can be a precursor. They maintained that the speed of decline in marital fertility through birth control, and its pervasive nature among all socio-economic classes testify to the validity of a diffusion hypothesis.

According to Coale (1973), one weakness of the demographic transition theory is its inability to forecast the precise threshold required for fertility to decline. He put forward three pre-conditions for a decline in marital fertility, the first being that fertility must be within the calculus of conscious choice. The second is that effective techniques of birth control must be known and available to people. The final condition, he postulated, was that reduced fertility must be perceived to be advantageous.

The reversal of intergenerational wealth flows as the primary force of change in reproductive behaviour, also seemed a plausible explanation for societies in transition, where the short-term costs of raising children outweighed the long term benefits (Caldwell, 1976). Caldwell's contention was that economic gains motivated couples to restrict fertility, and that this change in fertility behaviour is brought about by social changes. He maintained that the primary force of change was westernization, broadly encompassing secularization, mass education and mastery over the environment. Lesthaeghe and Surkyn (1988) made a similar argument. According to them, the two most salient features of western ideational change have been growing secularization and individualism. In other words, a shift towards individualism leads to lower fertility. Kirk (1996) conceded that demographic transition has been progressively faster in poorer settings in the less developed regions largely because it has been aided by government interventions like family planning programmes. He concluded that despite its limitations, demographic transition theory has survived because no better theory has emerged that satisfactorily explains this global phenomenon. Bongaarts and Watkins (1996) also endorsed the diffusion hypothesis, distinguishing between leaders and followers in

the transition process. They studied 69 developing countries between 1960 and 1990. They showed that Bangladesh and India had a Human Development Index (HDI) of less than 0.4 at the onset of transition, when Costa Rica and Mexico had a HDI of 0.7. Similarly Singapore and Sri Lanka needed a greater level of economic development for the transition to occur than Bangladesh or Nepal did. Mason (1997) illustrated that the causes of fertility decline have been different in different countries. Her premise has been that there is no universal theory that can be generalized to explain fertility transition in contemporary societies.

More recent work by Reher (2004) highlights important differences and similarities between the earlier and the more recent transitions. The historical transitions in developed societies had three common traits. First, the decline in fertility was invariably preceded by a decline in mortality. Second, the transitions in vital rates were gradual and spread over a long period of time. Third, the rate of natural increase was lower in historical Europe than among contemporary societies, the reason being that the gap between the onset of mortality decline and the onset of fertility decline was much shorter. Among developing countries undergoing the transition during the second half of the twentieth century, the pace of decline in vital rates has been considerably faster. The timing of the response of fertility decline to mortality decline has also been much longer in recent transitions. This explains why the developing countries experienced a higher rate of population growth in relation to the developed ones. On the other hand, both historical Europe and contemporary societies undergoing the transition have one common feature, namely that mortality decline has been a pre-condition for the fertility decline (Reher, 2004).

There are also marked differences in the determining factors for the earlier and more recent transitions. In historical Europe, mortality decline was triggered by overall socio-economic development while fertility decline by industrialization, urbanization and economic growth. The faster pace of transition experienced by the developing world during the period after 1956 is explained by factors like modern medicine, technology, mass education, and government sponsored family planning programmes (Kirk, 1996).

The classical demographic transition theory has received much criticism over the years, mainly for having laid too much emphasis on socio-economic factors as the driving force for the transitional process. The theory has sometimes had limited explanatory power in the modern world, primarily because it was based on the experience of historical Europe. The developing countries have undergone the transition under diverse socio-economic and cultural circumstances. Urbanization, industrialisation and economic growth are no longer pre-conditions for the process. No two societies have followed the same pace or path. Although what is happening in the world today is not quite what was prescribed by the classical theory, it still describes something that is a universal phenomenon – every society either has or is at present in the process of going through the transition. The theory has limited predictive power in the sense that it cannot predict the exact timing of the onset of fertility decline for any given population. Neither can it predict what combination of conditioning factors might initiate the decline. For example, the family planning programme was effective in Bangladesh but not very effective in Pakistan. This is because every society is unique with its own history, culture and social structure. But the basic prediction is correct that a mortality decline will eventually bring about a fertility decline. There has been no instance where fertility decline has not been preceded by mortality decline (Bhrolchain and Dyson, 2007).

Bengal fits rather well with the re-theorisation put forward by Reher (2004), although his categorizations of India and Bangladesh appears to be incorrect. In light of the time series presented in Chapters three to six, West Bengal can clearly be grouped with Reher's 'followers' in the demographic transition. According to him, the followers are the countries where the onset of fertility decline started between 1950 and 1964. Among these populations, the onset of mortality decline is believed to have begun during the 1920s. Mortality certainly started declining in West Bengal during the 1920s following the 1918-19 influenza epidemic, while fertility began declining during the early 1960s. Thus there was a gap of roughly forty years between the onset of the decline in fertility and the onset of the decline in mortality in West Bengal, as Reher applies in the case for the followers.

The case of Bangladesh, on the other hand, is not that clear-cut. While it may appear that the country is a 'latecomer' in the demographic transition following Reher's

classification, one can also find traits of it being a 'trailer'. Bangladesh fits the category of 'latecomer' in that the process, in particular the process of fertility transition, has been faster than in West Bengal. Bangladesh also fits another condition of a latecomer in terms of our limited understanding of the determinants of the transition. Among latecomers, fertility started declining after 1980 (see Reher 2004: 21). The time series presented in this thesis suggest that the timing of the initiation of the decline in the birth rate in the country was much earlier than has previously been thought. Contrary to the findings in the existing literature on demographic transition in Bangladesh, fertility started falling during the 1960s, i.e. about the same time that it actually started declining in West Bengal. In fact, considering that the onset of the mortality transition occurred during the 1920s, Bangladesh might even be classified as a 'follower', that is the same as West Bengal.

In conclusion, it may be said that West Bengal fits well into Reher's classification of a 'follower' in the transition, where mortality decline began during the 1920s and fertility decline between 1950 and 1964. Bangladesh, on the other hand, seems to show traits of being both a follower and a trailer. However it is not a latecomer. Both the Bengals do follow Reher's theorisation that mortality decline played a central role for the fertility decline in their transitions. However, the difference in the timing of the response of fertility to mortality decline in the two Bengals has been a reflection of contextual factors which are discussed in later sections. Therefore, given the research in this thesis, Bangladesh is probably more a 'trailer' than a 'latecomer'. In other words, Reher may well have been incorrect in classifying Bangladesh as a latecomer.

7.2 Existing explanations for transition in West Bengal and Bangladesh

Very little has been said about the transition in West Bengal. Maharatna (2007) is perhaps the only study to have addressed the transition in the state. He attested the ideational theory. According to him, the diffusion mechanism in West Bengal has been outside the conventional channels like mass media, communication, and female education. Nor could the family welfare programme be given credit for the phenomenon. It was the Left Front's organized grassroots mobilization network that

acted as the catalyst for diffusing ideational changes. He argued that levels of economic development and education in West Bengal could not explain the fertility transition in the state. He maintained that the efficient *Panchayat* system (local government) ensured greater political participation of the Schedule Tribes (ST) which explains why the decline in ST and non-ST populations occurred simultaneously in West Bengal.

It may be useful to place the state in the context of India. The regional variation in fertility decline in the Indian context is well documented (for example, Guilmoto and Rajan, 2001). The transition initiated earlier in the coastal states in the south than in the rest of the country, although these states are among the poorest in terms of economic development. Even among these southern states, no two states have followed the same path. Kerala's experience has been unique; the state achieved low levels of death and birth rates even during the economic crisis of the 1970s, and was the first in the country to complete the transition. High rates of female literacy coupled with greater political awareness and healthcare utilization have been most significant in facilitating the transition in the state (Mari Bhat and Rajan, 1997; Nag, 1989). A relatively greater level of social justice in the state has also been a determining factor (Ratcliffe, 1978). Female literacy played less of a role in the fertility decline in Tamil Nadu, where social reform and political will were more important factors. Finally a committed family planning programme is believed to have aided the transition in Karnataka and Andhra Pradesh (Dev, James and Sen, 2002; Sekher, Raju and Sivakumar, 2001).

As far as Bangladesh is concerned, a series of research studies were published during the 1970s suggesting signs of falling marital fertility in the country during the 1960s (Stoeckel, 1970; Schultz, 1972; and Sirageldin, Norris and Ahmad, 1975). Stoeckel found the rate of infant mortality to have fallen by twenty percent in a rural area of East Pakistan between 1958 and 1967 which he ascribed to development programmes and family planning services. Schultz's analysis of survey data revealed that the high levels of infant and child deaths along with age-specific fertility rates among women over age 19 had fallen noticeably during the period 1952-61. Similarly, Sirageldin et al (1975) found a ten percent decline in age-specific fertility rates during 1960-68 although the cohort fertility rates remained in

disagreement with the downward trend in age-specific fertility rates. The authors contended that if the decline were to be real, it was attributable to biological factors, for example an increase in the duration of post partum amenorrhea and not to social development. The declining trend in fertility indicated by the aforementioned studies were later dismissed on grounds of having methodological shortcomings (Cleland et al, 1994). These authors argued that fertility only started declining since the late 1970s and has been primarily facilitated by the family planning programme.

Academics were intrigued by the phenomenon that couples in Bangladesh continued to have large families amidst economic distress. Cain (1977, 1981) was among the earliest to offer an explanation for the persistence of high levels of fertility observed in Bangladesh during the economic stagnation of the Pakistan era. His contention was that high fertility was an insurance against the economic and environmental risks that the poor are exposed to. He showed that the short-term rearing costs of children were small compared to the long-term insurance benefits of having large families, especially sons. Large families were desirable because children contributed to the family income from an early age usually by working on the family land. Robinson (1966) dismissed this proposition based on the finding that the relatively better-off in Bangladesh had just as high fertility as the economically vulnerable classes. His argument was that if high fertility is a coping mechanism among the poor, they would have more children than the economically better-off. Arthur and McNicoll (1978) made similar inferences as Cain in that they attributed the prevailing economic uncertainties to be the driving force behind the high fertility levels. Schendel and Faraizi (1984) once again stressed the economic motivations for high fertility; they pointed out that the child wage rate was higher than the female wage rate at the time. Another study concluded that both the landed and the landless groups in Bangladesh had reasons to sustain high levels of fertility during the early 1980s (Kabeer, 1986).

The fact that the persistent levels of high fertility in Bangladesh had suddenly started to decline in Bangladesh became apparent for the first time in the results of the 1989 Bangladesh Fertility Survey (Huq and Cleland 1990). The most obvious explanation for the phenomenon seemed to have been the mortality improvements since the 1940s - as more and more children survived to adulthood, parents needed to have

fewer children in order to ensure that at least some would survive to be adults to serve as old-age security. Thus this created a latent demand for birth control which the strengthened FPP of the Bangladesh government was able to absorb successfully (Cleland and Streatfield, 1992; Cleland et al, 1994). There was a fall in the fertility rate from the late 1970s in the absence of any major change in the circumstances that favoured large families. Cleland et al (1994) argued that there had not been sufficient economic or social advancement in the country to induce the fertility decline, and strongly endorsed the family planning programme as the primary determinant of the decline in fertility in the country. The trend in the contraceptive prevalence rate was in line with the decline in fertility; the CPR increased from 7 % to over 58 % between 1975 and 2005 during which the TFR halved (BDHS 2004). They contended that the family planning program had reduced the social and psychological costs of contraception by promoting its social acceptability.

Caldwell et al (1999) have attributed the decline primarily to positive socio-economic changes in female education and employment. Adnan (1993, 1996) and Kabeer (2001) maintained that the change in reproductive behaviour was the result of structural changes taking place in the wider context. Adnan (1996) observed that economic poverty, which had remained relatively unchanged in Bangladesh, perpetuated high levels of fertility during the 1970s and yet sustained the decline in later decades. Kabeer (2001) made similar arguments. She agreed with Adnan in that the factors that led to the onset of the fertility decline may have been different from those which led to its later progress. She acknowledged that falling economic conditions over several decades had culminated in the acute poverty/economic crisis of the 1970s when people had to re-visit their family aspirations. While Cleland et al (1994) contended that there was no socio-economic variation in fertility behaviour, Kabeer argued that the decline occurred earlier among the landless and the relatively poorer, and then spread to the rest of the population. Adnan (1996) also observed that fertility decline was faster among the rural population.

Drawing on the work of Cleland and Wilson (1987), and Bongaarts and Watkins (1996), Basu and Amin (2000) proposed the diffusion theory in order to explain the fertility transition in Bengal where a strong language and history identity transcend the geographical and political barriers. Their assertion was that West Bengal was the

leader and Bangladesh the follower and that a common language and culture had facilitated the diffusion process. Bengali nationalism has led to close interaction between the two Bengals even after Partition. They point out that the fertility levels of West Bengal have historically been lower than of other states in India since the 1930s and 1940s, because birth control was a part of the intellectual *renaissance* during the early decades of the last century. The three main preconditions for a decline in fertility, they argued, are socio-economic progress, major improvements in mortality and in status of women. However none of these had come about in the country at the time of the decline. They also acknowledged the importance of social change as the underpinning factor, and quoted the unique political situation (Communist government) and agrarian change as the two markers in West Bengal. They have argued that the family planning programme may be compared with agrarian change or development in West Bengal which acted as the catalyst.

All these explanations partly but not fully explain the transition in Bangladesh, possibly because none of them have taken a long-term view of the phenomenon. The family planning programme as suggested by Cleland at al (1994) has undoubtedly facilitated the decline during the 1980s and 1990s. The family planning hypothesis has two limitations. It fails to explain why contraceptive use did not increase during the 1960s when the FPP was strengthened, or why the Matlab area, which has had better health and family planning interventions since the 1960s, experienced the transition at the same time as the rest of the country. It should be emphasized that the FPP has been a facilitating and not an initiating factor for the transition.[74] Structural changes for example, improvements in mortality can bring about the transition in fertility as put forward by Cleland and Wilson (1987). It was the mortality decline since the early decades of the last century (1920s to be specific) which initiated the decline in fertility with a time lag of roughly 40 years.

The diffusion hypothesis as an explanation for the fertility decline in Bangladesh again leaves some questions unanswered (Basu and Amin, 1999). A common language, culture, and history shared by Bangladesh and West Bengal has certainly been a conditioning factor but not the sole one. An alternative reason explaining why

[74] See, for example, Dyson (2001) for the distinction between initiating and facilitating factors during a demographic transition.

the two populations might behave in a similar fashion is that the vast majority of Bangladeshis are converts from Hinduism. The religious history of the province, as outlined in Chapter 1, could be a determining factor. Again, the low levels of fertility observed in the bordering districts of modern-day Bangladesh and West Bengal (Basu, Amin, Stephenson, 2000) may be explained by Partition related migration outlined in Chapter 4 and not solely by the diffusion hypothesis.

I will present the time series of crude birth and death dates before presenting plausible explanations for the fertility transition in Bengal.

7.3 Timing of transition in Bengal

Mortality data for the entire twentieth century has not been analysed before. The death rate has been declining in both the Bengals since the beginning of the last century, only to be interrupted by the influenza epidemic of 1918-19 and the famine of 1943-44. The fact that the death rates did not return to pre-crisis levels following either the epidemic or the famine re-affirms the hypothesis that the death rate has been part of a trend that initiated much earlier. Unlike Bangladesh, the mortality decline in West Bengal was accompanied by improvements in infant mortality. This was at least partly attributable to improvements in malaria mortality during the 1920s. The disease is known to take a toll on infants and children in addition to inhibiting pregnancies. Thus deaths were increasingly being shifted away from infant to reproductive and older age groups.

Figure 7-1: Adjusted Death Rates in Bangladesh and West Bengal:1901-2001

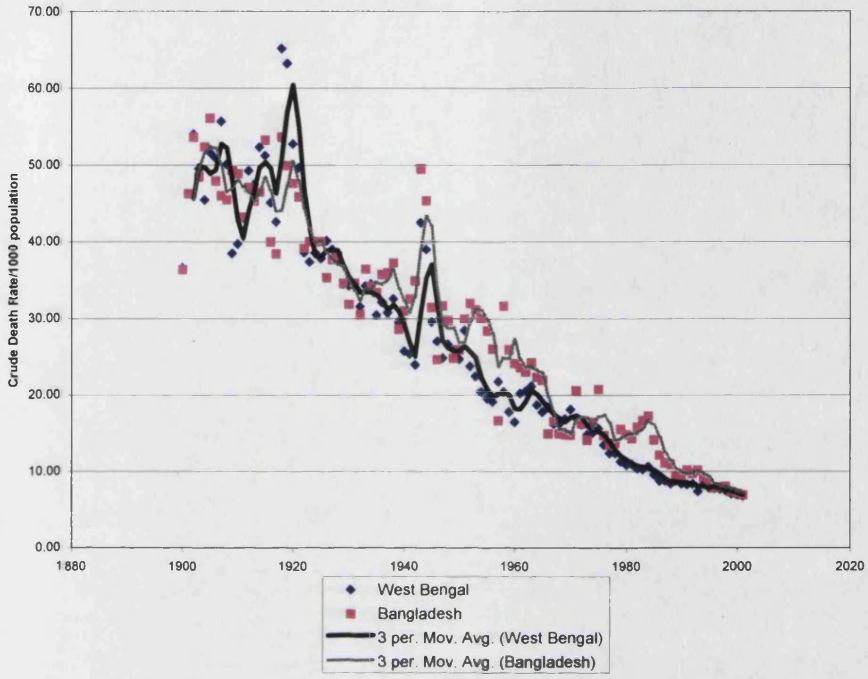
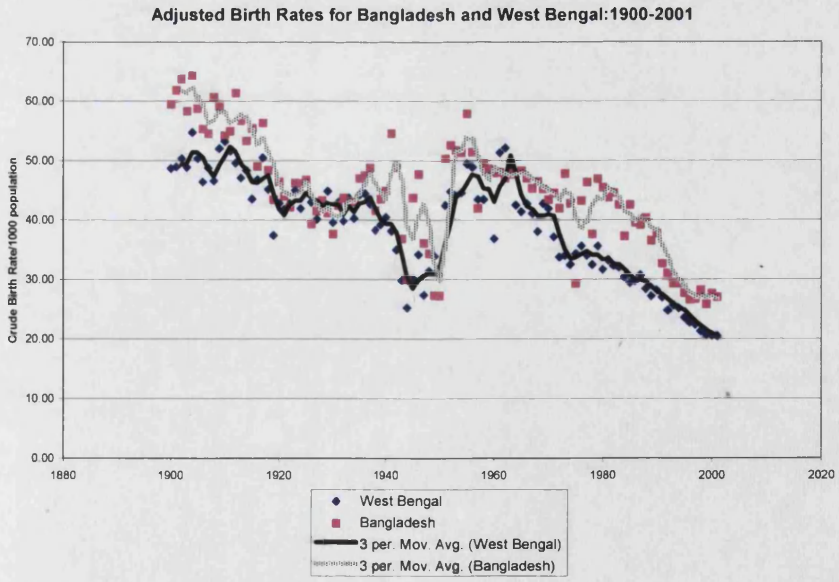


Figure 7-2: Adjusted Birth Rates for Bangladesh and West Bengal: 1900-2001



The birth rate has been systematically higher in Bangladesh. The pronounced downturns in the birth rate during the pre-Partition period are explained by the influenza epidemic of 1918-19 and series of crises during the 1940s, in particular the

famine of 1943-44 and Partition. The early part of the 1950s witnessed a recovery in the birth rate as couples made up for the depressed birth rate of the earlier decade. After this transitory increase, the CBR has been declining consistently since the late 1950s but at a faster rate in West Bengal.

The trend in CBR/CDR observed in Bengal is not entirely an outlier in the Indian context. Dyson and Somawat (1983) used state level vital registration data to identify two main kinds of CBR trends. According to my analysis, West Bengal shared elements of both these patterns. Dyson (2001a) also demonstrated that the birth rate has been falling in the two Bengals since the late 1950s. Finally Mamdani (1972) noticed a falling trend in the birth rate in the Singur area of West Bengal during the 1950s.[75] He could not explain the phenomenon but concluded that the decline was certainly not attributable to the family planning interventions in place at the time.

In light of the time series, the timing of the initial decline in the CDR was the same in the two Bengals. The province made major gains in malaria mortality during the 1920s. Given that West Bengal was better served by modern infrastructure than East, West Bengal benefited more relative to East. Improvements in the CDR in West Bengal was accompanied by improvements in infant deaths as malaria mortality is highest among the young age groups. As mentioned elsewhere this change in the death rate brought about changes in the age structure. The younger cohorts were increasingly larger than the older ones. This in turn brought about changes in marriage patterns in years to come. Wives are typically younger than husbands in the Indian sub-continent. By the time the female birth cohort of the 1920s (who were larger in size than the older cohorts) reached marriageable age roughly around the 1940s, there were fewer marriageable men. As a result, many women had to wait longer than usual before getting married (given the shortage of prospective grooms) this driving up the mean age at marriage. Indeed the province recorded an increase in the age at marriage during this period (Chapter 6). The prevailing conditions during the 1940s also had an impact on the subsequent demography of Bengal. The birth rate had fallen by as much as 40 percent following the famine of 1943-44 and was

[75] Singur study in West Bengal is the equivalent of the Matlab experiment in Bangladesh although the scale is much larger in the latter. The Population Council had set up a surveillance system in the area during the early 1950s in order to test family planning interventions.

accompanied by an upsurge in the death rate. The depressed birth rate was possibly exacerbated by prevailing socio-economic factors, namely impoverishment. The birth rate improved briefly following the series of crises of the 1940s following which there has been a steady decline. Bangladesh followed exactly the same pattern but the level was not as pronounced as in West Bengal. This is possibly explained by the fact that the effect of changing mortality depends on whether improvements are taking place at young or older ages. Unlike West Bengal, Bangladesh did not make appreciable gains in infant mortality during the first half of the twentieth century. As a result the pace of demographic transition has been relatively slower in the country.

The effect of the crises-related fall in the birth rate of the 1940s was felt around the late 1950s or early 1960s. This was when the small birth cohort of the 1940s reached marriageable age. Again there may have been further changes in nuptiality patterns arising from unequal numbers of men and women in the marriage market. As mentioned in earlier chapters, a decline in the birth rate is influenced by changes in marriage patterns and in marital fertility. The declining trend in the birth rate observed in both Bangladesh and West Bengal since the late 1950s is to a large extent explained by changes in nuptiality. This was the result of declining mortality since the beginning of the last century. After the initial onset of the decline in the birth rate, the facilitating factors as well as the pathways of transition have been different in the two Bengals.

7.4 Proposed explanations for fertility transition in post-Partition West Bengal

The fertility transition initiated earlier in West Bengal relative to East for a number of reasons. A faster pace of mortality decline in the state has been a contributing factor which created a latent demand for fertility control. Modern influences and greater healthcare utilization explain a relatively faster pace of mortality transition. Secularization is an important determinant of fertility decline (Lesthaege and Surkyn, 1988). Earlier chapters have illustrated West Bengal's lead in modern education, culture and openness to change. This explains the series of uprisings since the late nineteenth century and the history of social and religious reform like *Brahmo Samaj.* The state has historically had a large presence of non-Hindus in the population.

Currently Muslims, Schedule Castes and Schedule Tribes together comprise almost half of the total population. In contrast, roughly 90 percent of the Bangladeshi population is Muslim and the proportion of the minority group, Hindus, is declining progressively. The levels of female education have not been as impressive as in the southern states on India. However they have historically been higher than in Bangladesh.

A history of social reform and equality are conducive to a decline in fertility. Thomas (1993) identified two elements which contributed to the transition in China; they were land reform and the provision of social welfare. He emphasized that the history of political struggles in explaining the transition has been largely overlooked. Beside the history of social reform and secularization, West Bengal had an additional advantage over Bangladesh – greater equality. The leftist government has effectively implemented pro-poor policies and land reform through the local government which works better in the state than in the rest of India (Sengupta and Gazdar, 1997).

West Bengal shares many similarities with Kerala, for example, a long history of modern influence through trade with Arabs and Europeans. Kerala had already completed the demographic transition when most other Indian states were still at the infancy stage. The early initiation of the demographic transition amidst modest economic development in the state is explained by a history of social reform, as well as specific cultural practices for example, boiling water (Nag, 1983). The explanations for the fertility decline in Kerala have ranged from poverty-induced (Basu, 1986), high levels of female literacy (Bhat and Rajan, 1997), social justice (Ratcliffe, 1978), to egalitarianism and matrilineal inheritance (Caldwell 1976).

The type of governance is another contributing factor. At the time of transition, West Bengal did not have many of the features commonly cited for Kerala's transition, , namely a high level of female literacy, and improved mortality – the IMR in 1993 was 13 per 100,000 livebirths in Kerala (Zachariah and Rajan, 1997) and 58 in West Bengal (SRS).[76] However, what the states did have in common was a history of communist governments, early implementation of social/land reform, foreign

[76] The corresponding figure in Bangladesh was 99 (Matlab DSS).

influences, and a relatively large non-Hindu population. The current population of Kerala comprises 60 percent Hindu, 20 percent Christians and 20 percent Muslims (Iyer 2002) while almost half of the total population of West Bengal consists of non-Hindus. West Bengal and Kerala had important port cities frequented by foreign traders. Both the states are cultivators and consumers of rice. They are both very densely populated and recorded a high incidence of poverty during the 1970s (Shariff 1999). Kerala has also had a long history of social reform. The *Mopilla* revolt was a peasant uprising similar to the series of peasant movements in West Bengal, which sought to improve the plight of the untouchables or Schedule Castes. During the early decades of the twentieth century, social reform in West Bengal increased the age at marriage and sanctioned widow remarriage. Both the states have had Communist governments which have implemented pro-poor policies effectively.

Influence of elite, as put forward by Basu and Amin, is a plausible explanation for West Bengal where the elites have traditionally led the way – figures like *Tagore* and *Netaji Shubhas Chandra Bose* have had much influence on the subsequent Bengali thinking. As Weiner (1959) pointed out, the impact of Kolkata politics had far reaching effects on the state. And there was hardly any elite left to turn to after the elimination of the Bengali intellectuals by the Pakistan army during the Liberation war of Bangladesh in 1971. The creation of social awareness largely by the NGO sector in the country since the late 1970s was plausibly the first among Coale's three preconditions - it brought fertility within the calculus of conscious choice. The FPP was strengthened in 1979, thus meeting Coale's second condition (of birth control being available).

7.5 Proposed explanations for fertility transition in post-Partition Bangladesh

The structural changes following the economic stagnation of the 1940s may have sowed the seeds of a fertility transition in the country. A latent demand for birth control was possibly created as early as in the 1950s, stemming from mortality improvements. After all, there were studies e.g. Stoeckel (1970), indicating a decline in fertility around the 1960s. Profound changes at the individual, familial and societal levels were in place following the series of crises of the 1940s. These included increasing trends in landlessness, and a shift from agriculture to service/wage-oriented professions, and multi-occupation households. There is

evidence, based on Matlab data, that rates of abortion were rather high during the 1960s indicating a latent demand for family planning (Kabeer 2001). According to the National Impact Survey (1969) which was conducted during the late 1960s to assess the level of family planning use in East Bengal, 44 percent of the respondents reported that they 'want no more children'. The previous chapter on fertility outlined studies which indicate that use of traditional methods of birth control was prevalent among Muslims as well as Hindus of pre-Partition Bengal.

The concept of a poverty-induced fertility decline has been used for several regions in the Indian sub-continent. Basu (1986) pointed out that the largest number of acceptors of sterilization in Kerala were in the wage-earning sector for whom the financial motivation (compensation payments) was greater than change in aspirations. Freedman and Freedman (1986) also suggested that the fertility decline in Bangladesh was poverty-induced, following the calamities of the early 1970s which impoverished the population. But Cain (1986) dismissed this theory saying that there was no sign of a fertility decline during the economic crisis of the early 1970s. He asserted that decline started in the 1980s after the crisis was over.

Under certain circumstances, poverty can increase fertility while in others, poverty can be caused by high fertility (Sinding, Kelly and Birdsall, 2001). The role of economic considerations in reproductive change cannot be totally dismissed. Schoumaker (2004), upon studying 25 countries in sub-Saharan Africa endorsed the poverty induced hypothesis. Ambrosetti (2006) has attributed the transition in Egypt to economic factors where the fertility levels are lower among the poorer classes. A similar hypothesis has been used to explain the fertility transition in Pakistan (Sathar and Casterline, 1998). Cleland (2001) is a strong proponent of the social diffusion theory who dismissed the economic consideration behind fertility control on the argument that 'copying' is easier than 'calculation'.

Kabeer (2001) has highlighted that fertility decline was uneven across the population thus reflecting cultural, regional and economic differentials. She argued that the decline was greater among the impoverished and the landless. This contradicts Basu and Amin's thesis that the elites were the forerunners and the concept of small family gradually diffused to the masses. Analysis of the 1999-2000 BDHS data confirms

that the mean number of children ever born is lower among the lower socio-economic classes. Thus the poor were having fewer children than the better-off in Bangladesh during the late 1990s. Similarly women with low or no education had lower levels of desired future fertility (Kamal and Mejia-Pailles, 2008). Desired fertility is an important concept to consider in societies undergoing the transition. Desired fertility is shaped by socio-economic, and cultural factors. Pritchett and Summers (1994) have argued that family planning programmes cannot be effective as long as couples desire large families. The recent platueaing of fertility levels and contraceptive prevalence rates attest to the fact that a family planning programme alone cannot induce or complete the transition. Further declines in fertility will require increasing economic security, female education and modernisation (Bairagi, 2001). Female education is perhaps the most important which has direct and indirect (through delayed marriage) effects on fertility.

Bangladeshis have historically been resistant to change in any sphere of life compared with people of West Bengal (Murshid, 1995; Ahmed, 1981). This explains why Muslims did not adopt modern English education in pre-Partition Bengal or were unwilling to co-operate in the new system created by the British in Bengal. *Purdah,* or female seclusion, was practiced more strictly by Muslims. The phenomenon of rapid acceptance of FP and increase in female employment and education, is nothing short of a social revolution in Bangladesh, considering how closed Bengali Muslims have historically been to change. All the changes which Adnan (1996) and Kabeer (2001) term as 'structural' namely, women leaving their traditional roles in *purdah* and opting for paid employment; men engaging in non-agricultural occupations; spousal separation when either of the spouse migrates to cities in search of work, and breaking away from the extended family norm, are essentially all manifestations of poverty.

The family planning programme was successful in increasing the contraceptive prevalence rate largely because the timing was right. It was not the only new change sweeping the country at the time. It coincided with the advent of other profound changes taking place in society, brought about by the large presence of the NGO sector that has been involved in various fields of development. This sector has been instrumental in increasing female education and employment (Caldwell et al, 1999).

New avenues of education were created by the public and private sectors around the same time The emergence of the garments industry during the early 1980s provided new opportunities for female employment.. The garments sector alone has created employment for 1.2 million people, 90 percent of whom are women (Newby, 1998). While the motivating factor for going into paid employment is almost always economic (Newby, 1998 and Amin 1995), their income generating capability then empowers them to negotiate their fertility.

For women, avenues of female education and employment have enhanced their overall position in the household and society. Studies suggest that leaving unhappy and/or abusive marriages is an option these days given the relative ease with which women can now financially support themselves (Jesmin and Salway, 2000). Financial autonomy is terms of spending household income, is greater among women of Bangladesh than in West Bengal (Chattopadhyay and Baishali, 2006). Kabeer (2000) has illustrated that women in employment in Bangladesh have greater control over their income in relation to their expatriate counterparts in the United Kingdom. Thus women have benefited considerably from the development efforts in the country and this is known to expedite the transition process.

7.6 Conclusion

Although the current fertility transition in the developing world is not that prescribed by the classical theory, the theory is still useful as a benchmark for comparison. No two countries have followed the same route to a regime of low fertility and mortality, even East and West Bengal have had their own unique trajectories.

Adnan (1996) and Kabeer (2001) seem to have aptly identified that the reasons for the initial onset and later progress of the fertility transition in Bangladesh were quite different. The initial transition in the birth rate occurred around the late 1950s/early 1960s in both the Bengals following the crises of the 1940s. It was the effect of changes in nuptiality and possibly of marital fertility too given the socio-economic crisis at the time. Kabeer (2001) states that the rural population was 'disenchanted' with agriculture following the economic crisis of the 1970s and especially the 1974 famine. My contention is that the disenchantment with agriculture originated not in the 1970s but much earlier, during the 1950s, following the calamities of the 1940s.

This conjecture is based on the observation that both West Bengal and Bangladesh were in the midst of an economic crisis at the initial onset of the decline in the birth rate. It was accompanied by major mortality improvements when the rate of population growth catapulted. The profound effect of the economic problems of the 1940s has been under-estimated. Mukherjee (1949), Greenough (1982), and Adnan (1990) have given insights into the shattered and shaken life in Bengal during the late 1940s following the effects of the Second World War, famine of 1943-44 and finally Partition.

To summarize, there are similarities and differences between the demographic transitions in Bangladesh and West Bengal - the timing of the initial onset was simultaneous in the two regions. A decline in infant mortality preceded fertility decline in West Bengal where as it accompanied the fertility decline in Bangladesh. The strengthened FPP in Bangladesh certainly facilitating the rapid decline.

The intellectual renaissance in urban Bengal of the early decades of the last century is central to an understanding of the demographic transition in West Bengal. Similarly the socio-cultural revolution in Bangladesh since the late 1970s, following the increased developmental efforts of the NGO sector, is integral to an understanding of the transition in the country.

8 Chapter 8: SUMMARY AND IMPLICATIONS

This dissertation had set out to add to our limited understanding of the demographic transition in Bengal by providing historical and regional perspectives. The historical background is important because it helps to understand the origins of events. The comparison of Bangladesh with West Bengal, with which the country has shared a common language, political history and elements of culture, serves as a useful benchmark for comparison. Based on analysis of pre- and post-Partition demographic rates and their determinants, the study concludes that the facilitating factors for the demographic transition have been quite different in Bangladesh and West Bengal. An early exposure to modernism since the colonial period has conditioned the population of West Bengal to an openness to change, including change in reproductive behaviour. In the case of Bangladesh, social awareness created by the advocacy efforts of the nongovernmental sector had set in motion profound changes which in turn facilitated the rapid uptake of female education, employment and family planning.

8.1 Summary and Discussion

My time trend analysis of rates of births and deaths during the twentieth century is based on census and registration data. So far no attempt had been made to study time trends in vital rates for either of the two Bengals for such long a period, simply because registration data is incomplete or of poor quality. I have taken different data sources and made suitable adjustments, within reasonable limits, in order to make them more reliable and comparable over time.

According to these time series, the trends and patterns in crude birth and death dates were identical in the two Bengals, but the levels varied. The birth rate has always been higher in the eastern wing of the province, that is, present-day Bangladesh, which has historically been more rural, agrarian-based and predominantly Muslim. Present-day West Bengal was the 'unhealthy' part of the province. Malaria used to be one of the most important causes of death in British India and the disease was endemic in the west of Bengal. This was partly because of natural processes whereby

the river system shifted to the east, and partly because of the embankment and railway projects undertaken by the British in order to foster their economic interests in India. West Bengal, however, made major gains in reducing malaria mortality during the 1920s. Among the contributing factors was the 1919 Self Government Act, which gave local governments greater autonomy to control public health activities. Per capita availability of quinine and other cinchona products was possibly greater in Bengal than in other provinces of British India. The decade of the 1920s was the turning point when the death rate became lower in West Bengal than in Bangladesh and it has been so ever since.

Overall, the death rate has been declining in Bengal from the beginning of the twentieth century – essentially only to be interrupted by the 1918-19 influenza epidemic and the series of crises of the 1940s. In relation to these disasters, deaths never returned to pre-crises levels suggesting that the decline was part of a trend that was initiated earlier.

The present study demonstrates clearly how the influenza epidemic of 1918-19 had a greater impact on West Bengal in terms of excess mortality. This was probably due to a number of reasons – the west was more urbanized and this facilitated the epidemic to spread rapidly; it was home to migrants who had differing, more compromised levels of immunity; and the population was probably generally more unhealthy, having suffered from repeated bouts of malaria.

The combined effects of the Second World War, the famine of 1943-44, and the Partition of 1947 had a long-lasting impact on Bengal. One noteworthy repercussion of the Second World War was a fall in the import of rice from Burma. The Bengal famine of 1943-44 was partially a result of the conditions created by the war. Once again, the immediate impact on mortality was greater on West Bengal. However, the birth rate declined more in East Bengal as a result of the famine. As the food scarcity was more acute in rural Bengal, men migrated to the cities in search of work. As a result, more marital unions were disrupted or postponed. Poor nutritional status of women during crisis periods is also known to depress the rate of conception.

The first signs of a downward trend in the birth rate were observed in both the Bengals during the early 1960s, or even perhaps the late 1950s. The birth rates have been on a declining trend in both the Bengals ever since, although at a somewhat faster pace in West Bengal. The simultaneity of the decline in the birth rate in both the wings during the late 1950s, even though Bangladesh had a much higher death rate at the time, suggests that the 1940s possibly played a role in the initiation of the fertility transition. The series of crises during the 1940s may have worked as the 'quake or sudden change in a hitherto placid environment' that can bring about behavioural change (Basu and Amin, 2000:786). Besides the immediate effects of crises on rates of birth and death, Adnan (1996) and Osmani (1999) have documented the structural changes that the Bengali economy underwent following the 1943-44 famine. One such change was a substantial increase in distress land sales, which plausibly intensified the processes of landlessness and pauperization.

What this work has added relates to the timing and innate causes of the demographic transition in Bengal. The precursor to the decline in the birth rate was a fall in the death rate. The times series used in this study suggest that the decline in the death rate started at the beginning of the twentieth century, and not in the middle of the century as suggested by some (Cleland and Streatfield 1992). However the trend gained momentum during the late 1940s. Bengal was not the only region in the Indian subcontinent to have experienced mortality improvements from the beginning of the last century – for example, Sri Lanka benefited from similar gains. Anyhow, after a lag of roughly 40 years, the birth rate started declining in both Bangladesh and West Bengal from the early 1960s. And both wings of Bengal experienced a pre-decline rise in the birth rate, as has been observed in other countries going through the transition. Bangladesh caught up with West Bengal after experiencing a remarkably rapid decline in fertility during the 1980s.

Changes in birth and death rates in earlier decades of the last century set in motion important alterations in marriage patterns which were possibly exacerbated by the prevailing socio-economic conditions. The census of 1971 recorded a significant rise in the mean age at marriage of two years in both Bengals. The mate availability ratios calculated in this study also show an increase during this period, implying a surplus of females over males in the marriage market. This was certainly a

manifestation of the mortality improvements of the 1950s – the younger cohorts were greater in number than the older ones, and given that wives are younger than husbands throughout the region being studied, there was consequently a surplus of marriageable girls. The decade of the 1960s was roughly the time when marriage transactions turned against women; dowry, and not bride-price, became the norm from then on.

The Partition of 1947 ushered in considerable changes in the population composition of both eastern and western Bengal, when each became more homogeneous in terms of religious composition. It has long been known that Muslims in India had higher fertility than Hindus (e.g. see Davis, 1951). An increase in the Muslim population since Partition has probably contributed to a greater rate of population growth in Bangladesh. Besides the Partition related out-migration of Hindus and Muslims from present-day Bangladesh and West Bengal respectively, there was also considerable relocation along religious lines among those who stayed behind. Thus district-level comparison of the 1941 and 1951 censuses reveals that within West Bengal there was a fall in the proportion of Hindus in the bordering districts and an increase in the inland ones - indicating that Hindus felt safer to be in the hinterland than living along the borders. A similar pattern was observed among Muslims in Bangladesh. In this connection there may have been a tendency for migrants to settle in border districts. Thus the districts of Jessore, Khulna and Dinajpur in Bangladesh all experienced an increase in the proportion of Hindus, while Murshidabad and Nadia in West Bengal experienced an increase in the Muslim population. It is not only cross-border interactions that explain the similarity in fertility behaviour in the border districts of the two Bengals (Basu and Amin 2000). The patterns of Partition-related relocation and re-settlement outlined above also help to explain why the bordering districts of Bangladesh – Jessore, Khulna, and Dinajpur – are the leaders in fertility decline in the country, and why Murshidabad and Nadia are the demographic laggers in West Bengal.

What explains the faster rate of decline in fertility and mortality in post-Partition West Bengal, relative to Bangladesh, extends far beyond the higher levels of urbanization and female literacy that are found in the Indian state. As part of this study, I ran regressions in order to examine the net effect of region in explaining the

higher utilization of healthcare among women in West Bengal. Roughly 40 percent of births in the state take place in medical institutions compared to less than eight percent in Bangladesh (1998-99 Indian NFHS and 1999-2000 BDHS). There was a very significant (and strong) effect of region. This suggests that factors which cannot be included or captured in statistical modelling explain the observed difference between the two Bengals. The main factor in this connection seems to be culture.

Culture is in large part a set of informal rules that members of a population share. It is shaped by religion, environment, history, and the level of social development, among other things. It is a dynamic phenomenon that changes with time and circumstances, and in turn this can provoke a feeling to 'preserve culture'. Greenough (1986) articulates well how rice and agriculture embodied Bengali rural culture during the golden age of Bengal's agricultural history. The advent of industrialization, British policies, and ecological changes, shaped the subsequent development of culture in the region. West Bengal and Bangladesh have certain similarities in their culture, arising from the fact that they share a common language and political history, and that the vast majority of Bengali Muslims are Hindu converts. At the same time, there are differences in culture stemming from differences in governance (both pre- and post-Partition), religion, environment, occupational structure, urbanization and levels of education. The importance of the role played by culture in demographic processes has been well established (Hammel, 1990). Such considerations help to explain why West Bengalis tend to be relatively more aware politically, and more curious, pro-active and assertive (e.g. in terms of healthcare utilization). The early history of modernism in Bengal that Basu and Amin (2000) identify as the conditioning factor for the fertility decline in the region applies largely to West Bengal.

Consciousness raising, or social awareness, is a necessary pre-condition for behavioural change. Its seeds were sown in West Bengal by the urban intelligentsia during pre-Partition times, which then spearheaded the movement to end British rule in India, and various movements for social, religious, and economic reform. The rural and agrarian population of East Bengal was generally insulated from such an 'awakening'. Political awareness and social justice have also been used to explain the relatively early demographic transition experienced by Kerala. A long history of

social movements and uprisings condition people to have their voices heard and to be more aware of their rights (Nag, 1982, 1983). Kerala and West Bengal are the only major states in India to have had leftist governments. Representation of the general population was made possible in West Bengal through the existence of an effective system of local government. The revolutionary spirit of most Bangladeshis was awakened much later, under Pakistani rule and this culminated in the gaining of independence from Pakistan in 1971. It could be argued that the conditions leading to the 1971 War of Liberation in Bangladesh were the equivalent of the intellectual renaissance experienced in pre-Partition West Bengal. The NGO sector brought to Bangladesh the kind of social awareness which colonial history and intellectual *renaissance* brought to West Bengal about a century earlier.

The coastal regions of the subcontinent have a long history of early exposure to outside influences though trade with Arabs and Europeans, missionary involvement, and as a result of colonial interventions. Kolkata was the capital of British India until 1911 and it was made so for strategic reasons. Being home to British officers and the army, the city and its environs enjoyed many benefits, for example, sanitary and public health interventions, that the eastern part of Bengal did not. According to estimates made in this study, West Bengal was at least six times more urbanized than East Bengal during the first fifty years of the twentieth century. In 1921, a little over five percent of the population of the west were people other than Muslims and Hindus (British officials, mostly). The corresponding figure for East Bengal was just above one percent. The literacy rate was at least twice as high among Bengali Hindus as among Muslims. The population of East Bengal was largely cut-off from many outside influences until the construction of a railway during the 1860s to connect Kolkata to eastern Bengal.

Without doubt, secularization facilitates behavioural change (Basu and Amin, 2000). And it is plausible to suggest that the west of the province became secular earlier given the considerations outlined above. The modernism and westernization that Basu and Amin identify as the conditioning factor for social change did not extend to large parts of Bangladesh during the colonial period. Even when they were under the same administration (i.e. until 1947), East and West Bengal had distinctly different

demographic profiles arising from differences in religion and socio-economic development, as has been demonstrated in this study.

Basu and Amin's (2000) hypothesis that Bengali identity is stronger than religious and national identity is not beyond question. They contend that the common language, history and culture of West Bengal and Bangladesh have facilitated fertility decline in the latter region through diffusion. However, a number of points can be raised here. The important role of Hinduism and Islam in shaping culture and social change in West Bengal and Bangladesh respectively, cannot really be challenged. In pre-Partition Bengal, Muslims were less urban and less educated than their Hindu counterparts because of the unique history of the two groups. The greater willingness to embrace change among Bengalis applies largely to the Hindus of Bengal. Bengali Hinduism is much evolved and quite unique to the province.

Bengal has been home to three major religions – Buddhism, Hinduism and Islam, in that order. And the influence of these other religions helps to explain both why there is a fairly fluid class structure among Bengali Hindus in West Bengal, and why Bangladeshi Muslims are different from the Muslims of Pakistan. Bengal's history of conquests by foreign invaders, when natives were more often than not forced to adopt ways of the conquerors, may explain why Hindus have traditionally been more open to change. The Hindus of pre-Partition Bengal were ahead of the Muslims in adopting English education introduced by the colonial administration (Murshid, 1995). Bengali Muslims' passiveness and lesser receptivity to change may also be explained by the resentment they felt towards the colonial power for abolishing Persian as the main language of court (Ahmed, 1981). Because of the smaller geographical size and better communications infrastructure of West Bengal, Kolkata and its urban peripheries had close connections to rural West Bengal through both education and employment channels. East Bengal had no such hub to radiate modernism to its hinterlands. Dhaka was in no way comparable to Kolkata. And Bangladeshi culture is different from Muslim *Ashraf* culture (mainly Urdu speaking) which formed the Muslim intelligentsia of colonial Bengal (Ikramullah, 2004). The *Atraf* Muslims (Bengali speaking, mainly Hindu converts) constituted the overwhelming majority of the population of pre- and post-Partition Bangladesh.

Despite the common language and culture, there are subtle differences and often elements of tension between the populations of the two Bengals. So the situation is actually somewhat different from the congenial relationship portrayed by Basu and Amin. The two populations speak the same language, but with distinctly different accents. Thus the '*ghoti*' accent of West Bengal is perceived to be superior to the '*bangal*' accent of Bangladeshis. There are differences too in cooking and diet. To this day, West Bengalis tend to consider Bangladeshis as being something of their 'country-cousins'. Also, the *Farakka* Barrage has been a sore point since its construction in 1975. It is a dam in West Bengal built to direct Ganges water into the Hooghly river in order to flush out silt. This has contaminated fisheries in Bangladesh and increased the level of salinity in the water, among other things. Again, the increasing migration of Bangladeshis (mostly illegal) into West Bengal is another sensitive issue between the two governments.

8.2 Policy implications

The word 'development' has positive connotations and is usually assessed in economic terms (Haider, 1995). Development implies an increase in the level of well-being or prosperity. Today, in low-income countries, development is considered to be the universal provision of healthcare, education and skill acquisition to obtain a secure livelihood, along with the freedom to make choices.

In this context, the non-governmental sector has had a strong presence in Bangladesh since the mid-1970s. There are probably more arguments for than against the growth of the NGO sector in Bangladesh. Its opponents contend that it has undermined and undervalued the role of the government. It is widely acknowledged that NGOs have played an instrumental role in the fields of education, family planning, and micro-credit in Bangladesh. But perhaps their single most important role has been as an agent for creating social awareness. Thus a home visit made by a field worker goes far beyond the supplying of oral contraceptive pills and immunization services (Kamal, 1994). For many women in Bangladesh, the field worker has been their only connection to the world beyond their homestead. Therefore the continuation and possible expansion of the NGO sector is much needed in order to maintain the pace of development in the country. At the same time it should be said that the NGO

sector cannot replace the government. The public sector is able to make a greater impact through its extensive infrastructure and network.

In traditional patriarchal societies, improving the plight of women has proved to be complex, but once attained the effects are far-reaching. The micro-credit programme in Bangladesh demonstrates that women can indeed be effective agents of development. Empowered women can make choices regarding fertility and healthcare utilization for themselves and their dependents. Women may be empowered through education and through the acquisition of income generating skills and resources. West Bengal's general lead over Bangladesh is explained, to a large extent, by greater levels of female education. Thus in 2001, the rate of female literacy was 38 percent in Bangladesh compared to 60 percent in West Bengal. Relatedly, as noted, the mean age at marriage has been two years higher in the Indian state. Female education may perhaps be facilitated by raising the legal age at female marriage from 18 to 20 years. Strengthening of the stipend programme for girls in higher education may also help to keep more young women in school. The regression results presented in this study show that the level of male education is a strong predictor of the female age at marriage. Raising educational levels among both men and women is therefore imperative.

A certain degree of equality in income distribution may also be considered as being a pre-requisite for development. Local democracy and political representation among the general population played a role in mortality decline in India (Jeffrey, 1993). In this connection statistical data published by the respective governments suggest that levels of socioeconomic inequality are appreciably higher in Bangladesh. A strong and effective system of local government is much needed in the country. This has not happened yet in large part because of factional politics. Each new government in the country has overturned its predecessor's administrative reforms and half-heartedly installed new ones.

Strict enforcement of birth and death registration, and the production of birth certificates at the time of marriage, are both important to effectively implement the minimum legal age at marriage. However, even in West Bengal the vast majority of women get married before the legal minimum age of 18, simply because they are not

aware of the law (1998-1999 NFHS). The quality of Vital Registration system in Bangladesh has not quite reached the level of the Sample Registration System in West Bengal. We have seen that there is a wide gap in quality between the health and demographic statistics published by the Bangladesh Bureau of Statistics and those produced by the Matlab Demographic Surveillance System. The Matlab project in Comilla, run by the International Centre for Diarrhoeal Diseases Research, Bangladesh, benefits from health interventions that are unparalleled. The result, however, is that Matlab data are really not representative of the country.

Studies show that the poor in both parts of Bengal consider private healthcare to be superior to that available at government facilities. Privatization of the health sector in West Bengal, as suggested by the World Bank, may persuade more people to switch from less effective traditional healers to more reliable medical health providers (Soman, 2002). India has some of the most competitive medical colleges in the world, partly as a result of its colonial past. Consequently West Bengal has better doctors and healthcare personnel than does Bangladesh. This explains the increasing trend for middle class Bangladeshis to go to Kolkata in search of medical care. The political machinery of the Leftist government in West Bengal helps to ensure proper implementation of the state's health programme.

In Bangladesh, healthcare provided by NGOs is perceived to be better than that provided by the public sector. Indeed, the government health system is utilized only to about a third of its capacity. The government's health care reforms during the last decade proved unsuccessful and had to be disbanded. Putting health care provision in the hands of the NGO sector may be a promising option. After all, evidence suggests that the NGO sector has successfully implemented family planning, immunization, education, and micro-credit so far. Further improvements in health and mortality are needed for future decline in fertility. The NGO sector in West Bengal is not as evolved. The state could benefit from strengthening this sector, especially for the implementation of the FPP. There seems to be a high degree of unmet need of family planning in the state, especially among the Muslim population, as suggested by the high use of traditional methods.

This dissertation analyzed survey data and showed that the Muslim/Hindu fertility differential is much higher in West Bengal than it is in Bangladesh. Muslims in the state have at least one more child, whereas those in the country have higher fertility by only about half a birth. There was greater increase in the Muslim population in West Bengal between the 1991 and 2001 censuses than occurred in preceding decades. The higher growth rate among Muslims in West Bengal has been a function both of their higher fertility and of the increasing flow of migrants from Bangladesh. The Bangladeshi government needs to address the requirements of marginalized people (e.g. the landless and impoverished) in order to reduce outmigration to West Bengal (Weiner, 1978). The special needs of Muslims in West Bengal also have to be taken into account. Statistical analysis of survey data illustrates that the Muslim population of the state is less likely to adopt female sterilization than applies in Bangladesh. Accordingly, the methods-mix of the family planning programmes needs to be revised. A significant rise in the use of traditional methods in West Bengal indicates there is unmet need for reversible or temporary methods of contraception. The current family programme in the state is largely sterilization-based. In contrast, the oral contraceptive pill is the most prevalent method in Bangladesh. The method has a high rate of failure as well as a significant discontinuation rate due to side-effects. The plateauing of the fertility level in Bangladesh over the last decade or so is at least partly attributable to supply-side factors, namely deficiencies in the family planning programme.

Environmental changes like river erosion, an increase in water salinity, and the presence of arsenic in groundwater, are emerging trends that are likely to get worse over time. Climate change has serious implications for both the wings of Bengal. Already there has been migration of 'environmental refugees' from Bangladesh to West Bengal as a result of factors like an increase in the salinity of water and/or homes and livelihood lost due to river erosion. Migration carries the impact of economic problems across national borders (Findlay and Hoy, 2000). Climate change has affected the mangrove forest in the *Sundarbans* which is shared by both Bengals. The implications of climate change will have to be addressed.

8.3 Future research

Given that this study's reference period was the entire twentieth century, it was only feasible to present an overview, rather than an in-depth analysis of particular events. For example, the impact of the crises of the 1940s on the subsequent demography of Bengal requires further research. There is also a need to study the lives of marginalized migrants to West Bengal who have crossed the border since 1970. Unless their family planning requirements are met there is a danger that the fertility decline in the state could stall.

Naturally this study has not covered regional variations within both wings of Bengal in any detail. However, Chittagong and Sylhet districts in the east of Bangladesh have both experienced a relatively slow pace of fertility decline (Rashid and Ali, 1989; Rahman, Sabir and Latif, 2000). This phenomenon has been ascribed to greater levels of religiosity in these districts. It might also be useful to investigate if reproductive behaviour in these districts has been influenced by their socio-political histories. Thus Chittagong was under *Arakanese* (i.e. south Burma) rule, while Sylhet was a part of Assam for the greater part of history. In addition the needs of the underserved/marginalised groups like the *Rohingyas* (refugees from Myanmar); *Chakmas* (tribals in Chittagong) need to be addressed (Kharat 2003, Medecins Sans Frontiers, 2002).

The state of Kerala completed its demographic transition in the late 1970s. The main reason thought to account for its transition, in the absence of much economic development, is similar to the one given for West Bengal – namely an early exposure to western influences. Thus a comparative study of West Bengal and Kerala might be a worthwhile endeavour. And in relation to Bangladesh, the Matlab DSS has recorded senility as the second major cause of death; the rates among women being double those among men. This is another subject that needs to be addressed.

Finally, I emphasise that, while it is the first, it is not an exhaustive study of the demographic transitions of both Bangladesh and West Bengal. Quite a few questions remain unanswered, and at this stage there is necessarily an element of speculation. More formal quantitative analysis of the populations will take things forward and should be complemented by an anthropological dimension. The present work has

shown that the reasons for changes in reproductive behaviour are extremely complex and contextual, and they are inevitably shaped by matters of history, culture, religion, and the different life experiences of different populations.

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10 Appendix

10.1 Appendix A - Annual Vital Rates for East and West Bengal

Census population and registration data form the basis of the crude rates of births and deaths that I estimated for East and West Bengal for the period between 1900 and 1947. The denominator for the annual rates was adjusted assuming an exponential rate of population growth.

Table A1:Registered annual number of births and deaths in pre-Partition West Bengal: 1900-1947

	West Bengal		
	Annual Population	Reg. Births	Reg. Deaths
1900	15099794	493279	371322
1901	**15222388**	500447	473087
1902	15306341.8	517314	555583
1903	15390758.61	504766	511497
1904	15475640.99	568716	472273
1905	15560991.52	525921	539475
1906	15646812.76	487703	534718
1907	15733107.33	515034	588012
1908	15819877.82	495030	532142
1909	15907126.86	555839	410874
1910	15994857.09	571361	426402
1911	**16135390**	557375	465388
1912	16099931.16	534438	530760
1913	16064550.25	506404	510487
1914	16029247.08	518811	561504
1915	15994021.5	465858	548331
1916	15958873.33	499351	481630
1917	15923802.4	537827	453905
1918	15888808.54	480163	693221
1919	15853891.59	397187	670728
1920	15819051.37	453763	558498
1921	**15732706**	441248	524436
1922	15851144.89	454904	410723
1923	15970475.4	482303	400877
1924	16090704.26	452902	416198
1925	16211838.23	505861	411755
1926	16333884.12	471692	440412
1927	16456848.79	443609	430760
1928	16580739.16	482425	416931
1929	16705562.21	503113	387013
1930	16831324.94	447411	387096
1931	**16965527**	490471	394338
West			

Bengal

	Population	Reg. births	Reg. deaths
1932	17334235.24	464121	367058
1933	17710956.54	520210	406904
1934	18095865.05	489216	419191
1935	18489138.69	549561	378030
1936	18890959.26	563969	407321
1937	19301512.52	553393	398637
1938	19720988.24	507597	431263
1939	20149580.35	530871	398526
1940	20587486.95	559099	355921
1941	**21033010**	538587	358299
1942	21324637.8	502870	343937
1943	21620309.08	436063	620230
1944	21920079.93	375074	573331
1945	22224007.16	454593	445495
1946	22532148.43	524365	414687
1947	22844562.14	427755	387165
1948	23161307.55		
1949	23482444.71		
1950	23808034.51		
1951	**24139150**		

Table A2: Registered and adjusted vital rates for West Bengal: 1900-2001

	Reg. CBR	Reg. CDR	Adj. CBR	Adj. CDR
1900	32.67	24.59	48.68	36.64
1901	32.88	31.07	48.98	46.29
1902	33.80	36.30	50.36	54.08
1903	32.80	33.23	48.87	49.52
1904	36.75	30.52	54.76	45.47
1905	33.80	34.67	50.36	51.66
1906	31.17	34.17	46.44	50.92
1907	32.74	37.37	48.78	55.69
1908	31.29	33.64	46.62	50.12
1909	34.94	25.83	52.06	38.49
1910	35.72	26.66	53.23	39.72
1911	34.65	28.93	51.63	43.11
1912	33.30	33.07	49.61	49.27
1913	31.62	31.88	47.12	47.50
1914	32.47	35.14	48.38	52.36
1915	29.22	34.39	43.53	51.24
1916	31.39	30.27	46.77	45.11
1917	33.88	28.59	50.48	42.60
1918	30.31	43.77	45.16	65.22
1919	25.13	42.44	37.45	63.23
1920	28.77	35.42	42.87	52.77
1921	28.05	33.33	41.79	49.67
1922	28.70	25.91	42.76	38.61
1923	30.20	25.10	45.00	37.40
1924	28.15	25.87	41.94	38.54
1925	31.20	25.40	46.49	37.84
1926	28.88	26.96	43.03	40.18
1927	26.96	26.18	40.16	39.00
1928	29.10	25.15	43.35	37.47
1929	30.12	23.17	44.87	34.52
1930	26.58	23.00	39.61	34.27
1931	28.91	23.17	43.07	34.52
1932	26.77	21.17	39.89	31.55
1933	29.37	22.97	43.76	34.23
1934	27.03	23.16	40.28	34.51
1935	29.72	20.44	44.28	30.46
1936	29.85	21.56	44.48	32.12
1937	28.67	20.65	42.71	30.77
1938	25.74	21.87	38.35	32.58
1939	26.34	19.78	39.25	29.47
1940	27.15	17.29	40.46	25.76
1941	25.61	17.00	38.15	25.33
1942	23.52	16.08	35.04	23.97
1943	20.06	28.53	29.89	42.51
1944	16.97	26.20	25.29	39.04
1945	20.23	19.83	30.15	29.54
1946	22.96	18.15	34.20	27.05
1947	18.42	16.67	27.45	24.84
1948	21.1	17.9	31.44	26.67
1949	22.8	17.4	33.97	25.93

West Bengal	Reg. CBR	Reg. CDR	Adj. CBR	Adj. CDR
1950	20.70	16.60	30.84	24.73
1951	20.19	11.95	42.49	28.47
1952	23.1	10.8	44.81	23.76
1953	22.7	10.2	44.04	22.44
1954	23	9.3	44.62	20.46
1955	25.5	8.9	49.47	19.58
1956	25.2	8.8	48.89	19.14
1957	22.4	9.9	43.46	21.78
1958	22.4	9.3	43.46	20.46
1959	21.8	7.1	48.50	17.82
1960	19	7.5	36.86	16.5
1961	18.6	6.6	51.34	20.26
1962	18.9	6.7	52.16	20.57
1963	17.7	6.9	48.85	21.18
1964	15.4	6.1	42.50	18.73
1965	15	5.8	41.4	17.81
1966	15.5	6	42.78	18.42
1967	14.9	5.3	41.12	16.27
1968	13.8	5.3	38.09	16.27
1969	15.2	5.4	42.78	16.89
1970	16	6.3	41.95	18.11
1971	14.3	6.2	37.18	16.99
1972	12.2	6	33.8	16.2
1973	13.2	5.6	34.06	14.85
1974	12.5	5.6	32.5	15.12
1975	11.8	5.2	34.32	15.66
1976	13.3	4.8	35.62	13.5
1977	13.2	4.6	34.06	12.42
1978	12.6	4.7	32.5	12.42
1979	13.7	4.2	35.62	11.34
1980	31.7	10.9	31.7	10.9
1981	33.2	11	33.2	11
1982	32.3	10.4	32.3	10.4
1983	32	10.3	32	10.3
1984	30.4	10.7	30.4	10.7
1985	29.4	9.6	29.4	9.6
1986	29.7	8.8	29.7	8.8
1987	30.7	8.8	30.7	8.8
1988	28.4	8.4	28.4	8.4
1989	27.2	8.8	27.2	8.8
1990	28.2	8.4	28.2	8.4
1991	27	8.3	27	8.3
1992	24.8	8.4	24.8	8.4
1993	25.7	7.4	25.7	7.4
1994	25.2	8.3	25.2	8.3
1995	23.6	7.9	23.6	7.9
1996	22.8	7.8	22.8	7.8
1997	22.4	7.7	22.4	7.7
1998	21.3	7.5	21.3	7.5
1999	20.7	7.1	20.7	7.1
2000	20.6	7	20.6	7
2001	20.5	6.8	20.5	6.8

The registered vital rates for 1900-1950 for West Bengal were calculated by the author using decennial censuses and annual Sanitary Commissioner's reports for undivided Bengal. These rates were multiplied by a correction factor of 1.49 in order to account for under-registration. This correction factor was obtained through the application of the Growth Balance and Reserve Survival methods. For the post-1950 period, I have shifted the annual vital registration data by suitable correction factors assuming that the proposed decadal rates of birth and death in Tables 2-3 and 2-4 prevailed. I have used the adjusted rates of births and deaths for plotting my time series for the twentieth century.

Table A3: Registered annual number of births and deaths in pre-Partition East Bengal

East Bengal	Population	Births	Deaths
1900	24632003	946359	578919
1901	**24678870**	986304	737300
1902	24877864	1025111	862034
1903	25078463	945029	784928
1904	25280679	1050301	855476
1905	25484525	967924	923623
1906	25690015	918621	795176
1907	25897163	913379	769337
1908	26105980	1023526	766988
1909	26316481	1005335	838631
1910	26528680	929222	837155
1911	**26813744**	952273	748362
1912	26941682	1065897	819019
1913	27070230	990257	792730
1914	27199391	934745	817140
1915	27329169	975770	940236
1916	27459566	867704	709924
1917	27590585	1001749	685259
1918	27722229	923153	960441
1919	27854502	779819	898934
1920	27987405	837987	860668
1921	**28046514**	797516	831137
1922	28245647	769393	714231
1923	28446193	850143	735517
1924	28648164	854827	740911
1925	28851568	871236	746718
1926	29056417	739602	663249
1927	29262720	786099	712638
1928	29470488	823980	725509
1929	29679731	790598	662857
1930	29890459	727374	615236
1931	**29825801**	826816	673234
1932	30293217	864213	602699
1933	30767958	865399	731302
1934	31250139	876558	696200
1935	31739877	973931	690509
1936	32237289	998600	750951
1937	32742497	1043020	767985
1938	33255622	902785	807861
1939	33776788	958801	631118

East Bengal	Population	Births	Deaths
1940	34306122	1005045	693383
1941	**35166323**	939269	738719
1942	35366282	850578	797620
1943	35567379	654775	1137226
1944	35769619	532103	1047866
1945	35973008	760202	731292
1946	36177555		
1947	36383264		
1948	36590143		
1949	36798199		
1950	37007437		
1951	**37217854**		

The Public Health reports of former Bengal discontinued publishing registration data on East Bengal after 1945. Registration data on vital statistics continued to be published in the Public Health reports of East Bengal for the late 1940s up to 1958. But the vital rates published for this period were severely deficient. The registration data available for post-partition West Bengal for the same period was relatively better, requiring a lower correction factor than East Bengal.

Table A4: Registered and Adjusted Vital Rates for East Bengal: 1900-2004

CBR						CDR		
	Reg. CBR	Adj.CBR	Kabir	Matlab	BBS	Reg. CDR	Adj. CDR	BBS
1900	38.42	59.55				23.5	36.43	
1901	39.97	61.95				29.88	46.31	
1902	41.21	63.88				34.65	53.71	
1903	37.68	58.40				31.3	48.52	
1904	41.55	64.40				33.84	52.45	
1905	37.98	58.87				36.24	56.17	
1906	35.76	55.43				30.95	47.97	
1907	35.27	54.67				29.71	46.05	
1908	39.21	60.78				29.38	45.54	
1909	38.2	59.21				31.87	49.40	
1910	35.03	54.30				31.56	48.92	
1911	35.51	55.04				27.91	43.26	
1912	39.67	61.49				30.4	47.12	
1913	36.68	56.85				29.28	45.38	
1914	34.46	53.41				30.04	46.56	
1915	35.8	55.49				34.4	53.32	
1916	31.68	49.10				25.85	40.07	
1917	36.4	56.42				24.84	38.50	
1918	31.25	48.44				34.65	53.71	
1919	28.07	43.51				32.27	50.02	
1920	30.02	46.53				30.75	47.66	
1921	28.44	44.08				29.63	45.93	
1922	27.24	42.22				25.29	39.20	
1923	29.89	46.33				25.86	40.08	
1924	29.84	46.25				25.86	40.08	
1925	30.2	46.81				25.88	40.11	
1926	25.45	39.45				22.83	35.39	
1927	26.86	41.63				24.35	37.74	
1928	27.96	43.34				24.62	38.16	
1929	26.64	41.29				22.33	34.61	
1930	24.33	37.71				20.58	31.90	
1931	27.47	42.58				22.36	34.66	
1932	28.27	43.82				19.71	30.55	
1933	27.87	43.20				23.55	36.50	
1934	27.79	43.07				22.07	34.21	
1935	30.4	47.12				21.56	33.42	
1936	30.69	47.57				23.08	35.77	
1937	31.56	48.92				23.24	36.02	
1938	26.9	41.70				24.07	37.31	
1939	28.13	43.60				18.51	28.69	
1940	29.03	45.00				20.03	31.05	
1941	27.33	54.66		54.66		21.01	32.57	
1942	24.44	48.88		48.88		22.55	34.95	
1943	18.47	36.94		36.94		31.97	49.55	
1944	15.05	30.1		30.10		29.29	45.40	
1945	21.9	43.8		43.80		20.33	31.51	
1946	23.9	47.8		52.58		16.5	24.7	
1947	18.1	36.2		39.82		12.7	31.7	
1948	17.23	34.46		37.91		11.93	29.8	
1949	13.71	27.42		30.16		9.98	24.9	

CBR						CDR		
	Reg. CBR	Adj.CBR	Kabir	Matlab	BBS	Reg. CDR	Adj. CDR	BBS
1950	13.69	27.38		30.12		10.48	26	
1951	18	50.4				10	30	
1952	18.8	52.64	62.5			10.68	32.04	
1953	18.5	51.8	60			10.39	31.17	
1954	18.37	51.436	59.3			10.01	30.03	
1955	20.7	57.96	56.6			9.49	28.47	
1956	18.4	51.52	57.4			8.7	26.1	
1957	15	42	58.3			5.58	16.74	
1958	17.7	49.56	56.8			10.56	31.68	
1959		NA	57.3				NA	
1960		NA	50.1				NA	
1961		48.1	48.1		47		NA	
1962		47.1	47.1				NA	
1963		47.8	47.80		44		NA	
1964		48	48		42		NA	
1965		48.4	48.4		37		NA	
1966		47.1	48.8	47.1			15	
1967		45.4	49.4	45.4			16.6	
1968		46.6	50.1	46.6			15	
1969		45.3	50.7	45.3			14.9	
1970		43.5	51.3	43.5			14.8	
1971		44.6	51.7	44.6			20.6	
1972		42.1	51.6	42.1			16.3	
1973		47.9	49.6	47.9			14.2	
1974		42.9	48.9	42.9			16.5	
1975		29.4		29.4			20.8	
1976		43.3		43.3			14.8	
1977		46.4		46.4			13.6	
1978		37.7		37.7			13.8	
1979		47		47			15.6	
1980		45.5		45.5	33.40		14.9	13.1
1981		43.8		43.8	34.6		14.4	11.5
1982		44.6		44.6	34.8		15.9	11.9
1983		42.6		42.6	35		16.7	12.3
1984		37.3		37.3	34.8		17.3	12.3
1985		42.6		42.6	34.6		14.2	12
1986		39.6		39.6	34.4		12.2	11.9
1987		39.2		39.2	33.3		11.2	11.5
1988		40.4		40.4	33.2		11	11.3
1989		36.6		36.6	33		9.5	11.4
1990		37.8		37.8	32.8		9.4	11.3
1991		32.7		32.7	31.6		10.2	11.2
1992		31.1		31.1	30.8		9.8	11
1993		29.4		29.4	28.8		10.2	10
1994		29.4		29.4	27.8		9.2	8.6
1995		27.8		27.8	26.9		8.5	8.5
1996		26.7		26.7	25.4		7.9	8.2
1997		26.8		26.8	23.6		8	8
1998		28.3		28.3			8.1	
1999		25.9					7.4	
2000		27.7					7.2	
2001		27.1					7	

CBR						CDR		
	Reg. CBR	Adj.CBR	Kabir	Matlab	BBS	Reg. CDR	Adj. CDR	BBS
2002		25.3					7.3	
2003		25.1					7	
2004		24.8					7.4	

The rates for the period 1900-1945 were adjusted by multiplying the annual registered rates by the correction factor of 1.55. This correction factor was estimated for East Bengal using the Growth Balance and Reverse Survival methods. The registered rates for the period thereafter were adjusted by assuming the decadal rates presented in Chapter 2. I have used the Matlab data series from 1966 onwards. The columns for adjusted rates of births and deaths were used for the time series.

10.2 Appendix B – Indirect techniques to account for under-registration

Estimation for under-registration of deaths using Growth Balance method

This method, although far from perfect, is useful to estimate the extent of death registration. The two data input for this method are census age structures and registered death distributions by age. It was applied to the age structures of the 1901-1941 censuses of the former province of Bengal, along with the average registered death distributions of the three years around these census years. The method requires the calculation of partial birth and death rates, denoted by nx/px and dx/px. The greater the number of these partial vital rates, the better the results. The 1901 and 1911 censuses of Bengal only provided age breakdowns by broad groups, thus limiting the number of partial rates necessary to give reasonable estimates. The availability of further breakdown of age groups in the censuses of 1921, 1931 and 1941 enable the calculation of seven partial rates. As seen from the figures of the plots of the partial rates, the lines for these censuses are better fitted than the ones for 1901 and 1911. Brass (1975) suggests leaving out the younger age groups when fitting the line as these are most likely to be affected by age misreporting. This could not be implemented in my calculations as there were insufficient age groups and thus partial rates to fit a regression line. The slope of the line, which is the coefficient 'a' of x in the equation y=ax+b, is the value of the correction factor. Thus for West Bengal during 1900-1902, the registered deaths need to be shifted up by a factor of 1.55. In other words, a correction factor of 1.55 implies approximately 65 percent coverage level.

The technique assumes that completeness of death registration is uniform across all age groups, and the population is stable. The population of Bengal by no means met these conditions. Thus the estimates obtained using this method are not robust but nevertheless useful.

West Bengal

1901

Age Groups	Deaths	Population	Age:x	nx	px	dx	dx/px	nx/px
0-4	160989	1934611	5	403478.6	13287774	312098	0.023488	0.030365
(5-9)	33779	2100175	10	372504.5	11187599	278319	0.024877	0.033296
(10-14)	21142	1624870	15	303930.3	9562729	257177	0.026894	0.031783
(15-19)	25675	1414433	20	251368.2	8148296	231502	0.028411	0.030849
20-39	99456	4869771	40	183672.3	3278525	132046	0.040276	0.056023
40-59	74296	2477122	60		801403	57750		
60+	57750	801403						
							k=1.288	
	473087	15222385					**c=77.6%**	

East Bengal

1901

Age Groups	Deaths	Population	x	nx	px	dx	dx/px	nx/px
0-4	279610	3650230	5	761219.8	21028637	457679	0.021765	0.036199
(5-9)	66849	3961968	10	674462.5	17066669	390830	0.0229	0.039519
(10-14)	36355	2782657	15	499188.4	14284012	354475	0.024816	0.034947
(15-19)	41922	2209227	20	389210.2	12074785	312553	0.025885	0.032233
20-39	144129	7521029	40	272907.7	4553756	168424	0.036986	0.05993
40-59	94915	3395279	60					
60+	73509	1158477						
							k=1.17	
	737289	24678867					**c=85%**	

West Bengal

1911

Age	Deaths	Population	Age:x	nx	px	dx	dx/px	nx/px
0-4	177091	2070721	5	429067.3	14064669	288297	0.020498	0.030506
(5-9)	33969	2219952	10	391641.6	11844717	254328	0.021472	0.033064
(10-14)	18434	1696464	15	324940.9	10148253	235894	0.023245	0.032019
(15-19)	23642	1552945	20	274449.2	8595308	212252	0.024694	0.031930
20-39	89687	5308286	40	194786.8	3287022	122565	0.037288	0.059259
40-59	67206	2483187	60					
60+	55359	803835						
							k=1.51	
	465388	16135390					**c=66%**	

East Bengal

1911

Age	Deaths	Population	Age:x	nx	px	dx	dx/px	nx/px
0-4	288989	4046415	5	844450.7	22767329	417908	0.01836	0.03709
(5-9)	56723	4398092	10	733600.3	18369237	361185	0.01966	0.03993
(10-14)	27824	2937911	15	540097	15431326	333361	0.02160	0.03500
(15-19)	37435	2463059	20	427730.1	12968267	295926	0.02282	0.03298
20-39	135954	8230193	40	295000.2	4738074	159972	0.03376	0.06226
40-59	91917	3569814	60					
60+	68055	1168260						
							k=1.32	
	706897	26813744					**c=75%**	

West Bengal

1921

Age	Deaths	Population	Age:x	nx	px	dx	dx/px	nx/px
0-4	151491	1652053	5	374726.2	13172796	372942	0.028312	0.028447
(5-9)	36888	2095209	10	376604.9	11077587	336054	0.030336	0.033997
(10-14)	23655	1670840	15	314949.8	9406747	312399	0.03321	0.033481
(15-19)	30386	1478658	20	288057.9	7928089	282013	0.035571	0.036334
20-29	66868	2842210	30	251206.1	5085879	215145	0.042302	0.049393
30-39	59254	2181912	40	180697.2	2903967	155891	0.053682	0.062224
40-49	47238	1432031	50	112323.8	1471936	108653	0.073816	0.07631
50-59	41369	814445	60					
60+	67284	657491						
						k=1.31		
	524433	14824849				**c=76%**		

East Bengal

1921

Age	Deaths	Population	Age:x	nx	px	dx	dx/px	nx/px
0-4	278846	3875963	5	855325.8	24170547	552286	0.02285	0.035387
(5-9)	74661	4677295	10	791828.6	19493252	477625	0.024502	0.040621
(10-14)	40097	3240991	15	589188.9	16252261	437528	0.026921	0.036253
(15-19)	51115	2650898	20	507745.6	13601363	386413	0.02841	0.03733
20-29	102542	4965286	30	435283.1	8636077	283871	0.03287	0.050403
30-39	84360	3740375	40	306073	4895702	199511	0.040752	0.062519
40-49	64471	2381084	50	187452	2514618	135040	0.053702	0.074545
50-59	53983	1367956	60					
60+	81057	1146662						
						k=1.37		
	831132	28046510				**c=73%**		

Notes:

(1) The population size calculated above for West Bengal (14824849) is smaller than that in Appendix 2 (15737706) because Calcutta was not broken down in this kind of 10 year age-groups in the 1921 census report and thus is not included here. Calcutta constituted a little over five percent of the total population of West Bengal according to the 1921 census.

West Bengal

1931

Age	Deaths	Population	Age:x	nx	px	dx	dx/px	nx/px
0-4	136365	2329824	5	437569.4	14635703	257973	0.017626	0.029897
(5-9)	26511	2045870	10	387443.5	12589833	231462	0.018385	0.030774
(10-14)	15215	1828565	15	345234.9	10761268	216247	0.020095	0.032081
(15-19)	21311	1623784	20	335977	9137484	194936	0.021334	0.036769
20-29	44055	3415871	30	300249.2	5721613	150881	0.02637	0.052476
30-39	38068	2589113	40	210955.1	3132500	112813	0.036014	0.067344
40-49	32354	1629989	50	126764.9	1502511	80459	0.05355	0.084369
50-59	29916	905308	60					
60+	50543	597203						
							k=2.3	
	394338	16965527					**c=43%**	

East Bengal

1931

Age	Deaths	Population	Age:x	nx	px	dx	dx/px	nx/px
0-4	250755	4881514	5	907588.9	24944287	422918	0.016955	0.036385
(5-9)	51767	4194375	10	785735.9	20749912	371151	0.017887	0.037867
(10-14)	28142	3662984	15	653982.8	17086928	343009	0.020074	0.038274
(15-19)	37783	2876844	20	557938.5	14210084	305226	0.02148	0.039264
20-29	74267	5492234	30	471156.2	8717850	230959	0.026493	0.054045
30-39	60501	3930889	40	318847.5	4786961	170458	0.035609	0.066607
40-49	51253	2446061	50	190716.3	2340900	119205	0.050923	0.081471
50-59	45390	1368264	60					
60+	73815	972636						
							k=1.65	
	673673	29825801					**c=60%**	

West Bengal

1941

Age	Deaths	Population	Age:x	Nx	px	pxx	dx	dx/px	nx/p
0-4	127680	51692	5	10535.6	363833	18059469	230619	0.01277	0.028
(5-9)	22526	53664	10	9732.1	310169	15395766	208093	0.013516	0.031
(10-14)	12078	43657	15	8210.3	266512	13228776	196015	0.014817	0.030
(15-19)	14906	38446	20	7931.133	228066	11320444	181109	0.015998	0.034
20-29	36252	80521	30	7310.15	147545	7323647	144857	0.019779	0.049
30-39	33147	65682	40	5364	81863	4063409	111710	0.027492	0.065
40-49	30687	41598	50	3286.4	40265	1998622	81023	0.040539	0.081
50-59	32226	24130	60						
60+	48797	16135							
								k=2.65	
	358299	415525						**c=37%**	

East Bengal

1941

Age	Deaths	Population	Age:x	Nx	px	pxx	dx	dx/px	nx/p:
0-4	288697	101134	5	20621.2	594797	29523760	405297	0.013728	0.034
(5-9)	52532	105078	10	18550.4	489719	24308035	352765	0.014512	0.03
(10-14)	23595	80426	15	14453.4	409293	20315954	329170	0.016203	0.035
(15-19)	29506	64108	20	12858.27	345185	17133844	299664	0.01749	0.03
20-29	66103	128766	30	11266.2	216419	10742325	233561	0.021742	0.052
30-39	55479	96558	40	7847.7	119861	5949504	178082	0.029932	0.065
40-49	49895	60396	50	4747.7	59465	2951646	128187	0.043429	0.07
50-59	48284	34558	60						
60+	79903	24907							
								k=1.89	
	693994	695931						**c=52%**	

Notes :

(1) The 1941 census age-data was available on sample basis. The column pxx is px adjusted upwards by a factor of 49.3969 in order to calculate the dx/px values (see Maharatna, 1996).

(2) The 1940 death age-structure was used

Estimation for under-registration of births using Reverse Survival technique

In a stable population, those currently aged x are the survivors of the birth cohort that was born x years ago. Alternatively, the number of births occurring x years ago may be estimated by using life-table survival rates to quantify those who died among the population aged x today. While the growth balance method involves all age groups, this technique is applied to under-ten mortality only. I used the under-ten population distribution of the censuses of 1901, 1911, 1931 and 1941 and the average age-specific registered deaths for the three years around the census year. These death rates were adjusted for under-registration using the correction factors that I obtained for East and West Bengal using the Growth Balance method.

The age-specific death rates for 1900-02, derived by using corrected registered deaths and census population distribution of 1911 are the mx values in the life-table. These mx values can then be further manipulated to calculate other life-table qx, lx, dx and Lx values, respectively. The Lx values are needed to calculate the survivorship ratios. Reverse survival ratios are obtained using the formula: 5*l0/nLx. The product of these ratios and the census age distributions of 1911 are then summed up which gives the total number of births taking place in 1901.

Table B1: Reverse Survival using 1901 and 1911 censuses and 1900-02 registered deaths for West Bengal

Age-groups	Population	Deaths	mx*1.46	Qx	lx	dx	Lx	Survival Ratios	Total Births
0-1	476266	116380	.3636	.3782	1000	378	735	1.36	647722
1-4	1594455	67284	.0626	.226	622	140	2152	1.86	2965686
5-9	2219952	41051	.0275	.134	482	64	2250	2.22	4928293
10-14	1696464	23924	.021		418				
Total									8541701

The average person years lived is the average population of 1901 and 1911, which is 15, 605, 787. Thus, the CBR calculated for 1901 for West Bengal is roughly 53 per thousand population.

Table B2: Reverse Survival using 1901 and 1911 censuses and 1902-4 registered deaths for East Bengal

Age-groups	Population	Deaths	mx*1.55	qx	lx	dx	Lx	Survival ratios	Total births
0-1	728355	193495	.4123	.342	1000	342	760	1.32	961428
1-4	3318060	127331	.0595	.212	658	139	2298	1.74	5773424
5-9	4398092	72463	.0256	.025	519	13	2562	1.95	8576279
10-14	2937911	39673	.0209		506				
Total									15311131

The average person years lived is the average population of two consecutive censuses. In this case the average population of the 1901 and 1911 censuses of East Bengal is 25,593,872 which gives a decadal CBR of roughly 55 per thousand population (CBR=total births/average person years lived). This seems rather too high to be plausible given that the method usually gives the lower bound of the birth rate (Chowdhury, 1989). This may be explained by the fact that Indian censuses are plagued by severe age mis-statements and omissions of young children. Thus the estimates obtained using this method are not robust by any means.

10.3 Appendix C – Infant mortality rates in East and West Bengal

Table C1: Registered Infant mortality rates in East and West Bengal: 1900-45

	Infant Deaths (WB)	WestIMR	Infant deaths (EB)	EastIMR
1899	109487			
1900	105147	207.57	189251	197.93
1901	103745	208.21	170046	174.59
1902	120224	234.75	204849	202.19
1903	107931	212.27	180333	186.35
1904	112419	205.18	206501	203.18
1905	119309	221.74	205403	207.22
1906	113220	227.09	182749	195.9
1907	114361	225.78	164471	179.76
1908	105952	211.54	188912	191.25
1909	100984	188.37	192723	190.68
1910	113849	200.93	188254	197.99
1911	114898	204.63	180379	190.83
1912	122904	227.13	203544	197.8
1913	113948	221.47	193721	191.46
1914	104070	202.07	204356	214.95
1915	113213	235.58	189996	197.28
1916	101486	207.62	165584	184.49
1917	107793	205.06	180296	188.32
1918	159534	321.56	248808	263.18
1919	103983	248.23	168153	205.59
1920	100892	231.85	170381	207.87
1921	97016	218.05	162877	201.27
1922	86526	191.97	146244	188.07
1923	90377	190.77	155279	188.4
1924	87601	189.88	156766	183.69
1925	82636	169.09	148637	171.59
1926	96113	199.63	145818	188.22
1927	81642	180.75	139608	180.95
1928	84426	179.6	151629	186.68
1929	88301	177.77	147503	184.3
1930	86278	186.43	142880	191.72
1931	85700	179.77	147291	185.45
1932	81961	173.75	144462	169.43
1933	91661	182.59	189491	219.05
1934	90347	181.38	168017	192.42
1935	81977	154.69	162439	172.35
1936	90087	160.99	180199	181.82
1937	92727	166.62	190188	184.78
1938	90010	172.92	173604	184.54
1939	83035	158.56	139858	148.58

	Infant Deaths (WB)	WestIMR	Infant deaths (EB)	EastIMR
1940	81997	149	169574	171.16
1941	80172	149.87	152928	168.13
1942	76413	142.03	129017	160.11
1943	79802	194.27	134934	203.36
1944	66464	194.65	114676	226.93
1945	67750	148.18	110117	146.65

In estimating the infant mortality rate, the numerator was adjusted in order to match the cohort of the denominator. The formula that was used for estimating IMR was: (fD2/B1 +(1-f)D2/B2)K where f=0.3, D2=deaths this year, B1=births last year, and B2=births this year.