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# **Demography of the Koronadal B'la-an**

**A comparative study of child survival in the  
Tampakan Highlands, Southern Philippines**

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## Glossary

ARIC	Asia Recovery Information Centre
ASX	Australian Securities Exchange
CADC	Certificate of Ancestral Domain Claim
CFR	Case Fatality Rate
DHS	Demographic and Health Surveys
DOH	Department of Health
DPO	Data Processing Officer
FTAA	Financial and Technical Assistance Agreement
IBRD	International Bank for Reconstruction and Development
INS	Institut National de la Statistique
MI	Macro International Inc.
NDS	National Demographic Survey
NDHS	National Demographic and Health Survey
NLSA	National Land Settlement Administration
NPA	New People's Army
NSO	National Statistics Office
ORS	Oral Rehydration Solution
PNG	Papua New Guinea
SIA	Social Impact Assessment
SMI	Sagittarius Mines Inc.
SMILE	Sustainable Maternal and Child Health Initiatives through Local Governance and Education
TCP	Tampakan Copper Project
TF-IMR	Task Force on Infant Mortality Rate
UN	United Nations
UNCF	United Nations Children's Fund
US	United States
WFS	World Fertility Survey
WHO	World Health Organisation
WMC	Western Mining Corporation

## CHAPTER 1 – INTRODUCTION

### 1.1 Study aims and objectives

For the larger part of human history, survival rather than overpopulation has been the challenge. In the not too distant past, children who had reached adulthood were likely to have experienced the deaths of half of their siblings (Notestein 1983; Feeney 1994). The comparatively benign health status of children in today's developed world resulted from neither a spontaneous nor an inevitable process. The transition from high to low child mortality was achieved through multidimensional improvements in medico-scientific knowledge and technologies, material and sanitary conditions, and nutrition. Better child-rearing and health-care practices brought about by formal and public health education, as well as shifting societal statuses and roles of women and children, also contributed to survivorship gains (Ewbank and Preston 1990; Ruzicka and Kane 1990; Pearce and Falola 1994a).

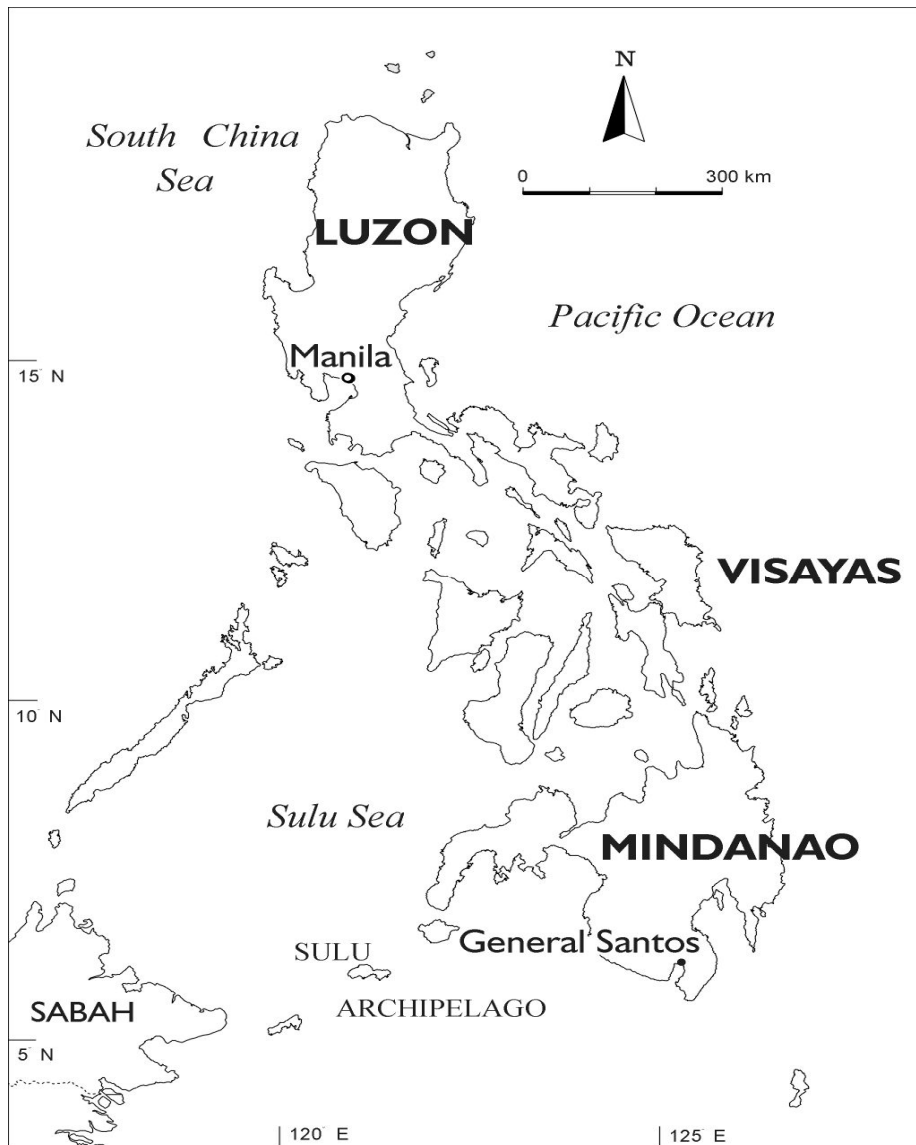
However, in spite of spectacular declines in child mortality throughout the course of the twentieth century, wide mortality differentials persist between and within the world's regions and nations (Behm 1991; Bicego and Ahmad 1996). Never before has there been the wealth of knowledge, expertise, and technical capability to redress child health problems in the developing world than exists today. Yet, the survival of children is contingent upon a complex set of interactions. To some unknown extent, these interactions are situationally specific, involving biodemographic, socioeconomic, and environmental variables at the micro-level, as well as macro-level factors as part of regional, national, and global political economies (Mosley and Chen 1984; Greenhalgh 1990; Mosley and Becker 1991; Pearce and Falola 1994b).

While demography seeks to identify universal influences on demographic change (Riley 1997), reality is always more 'complex, contradictory and elusive' (Scheper-Hughes 1997:204). No one population replicates the mortality experience of another. There is a 'multiplicity of stages and multiplicity of transits between them' (Palloni 1990:xvi). Even within one small, remote, and impoverished area of southern Mindanao, starkly different infant and child mortality trajectories are here documented by region of residence and ethnicity.

The broad aim of this study is to estimate and compare childhood mortality parameters of contiguous Highlands and Foothills regions in the Tampakan District of the Central Mindanao Cordillera, the Philippines (Figures 1.1 and 1.2). The Highlands region is one of the last refuges of a relatively unacculturated B'la-an population, pursuing a mixed economy of slash-and-burn agriculture and

hunting and gathering. The B'la-an comprise one of 18 non-Moslem groups, indigenous to Mindanao (Sal Naong Tribal Council 1996:1). The adjoining Foothills region is typical of many poor, rural areas across southern Mindanao. Its B'la-an and Visayan residents—the latter who are largely Cebuano and Hiligaynon speakers—are farmers, often indebted to absentee landowners.<sup>1</sup>

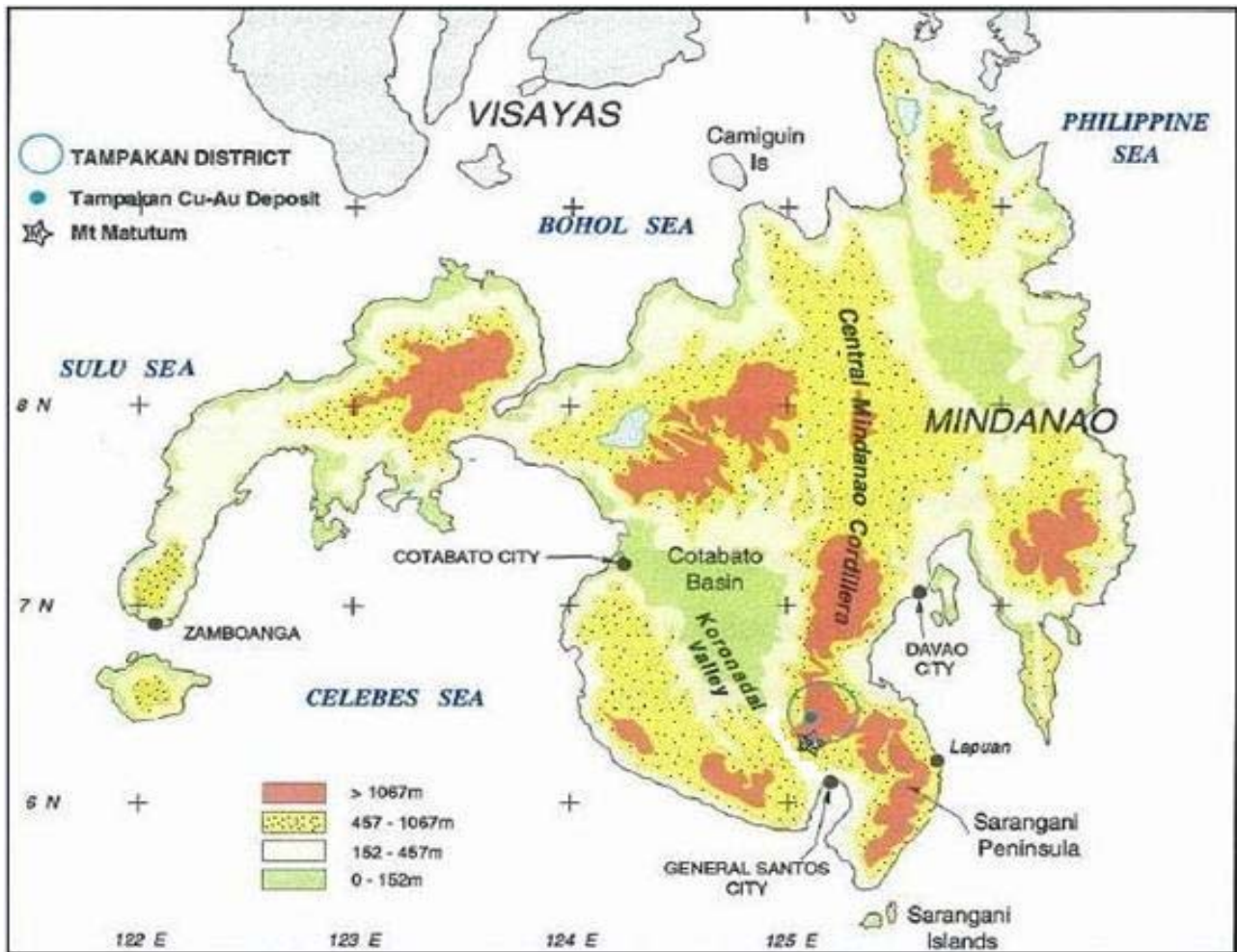
**Figure 1.1: Map of the Philippines**



Source: Lasen and Jackson 1998:8

<sup>1</sup> The Visayan Islands are Panay, Negros, Masbate, Cebu, Bohol, Leyte, and Samar. Hiligaynon is the dialect of the Western Visayan Ilongo people living in Panay and western Negros. Cebuano is spoken in the Central Visayas, primarily in Cebu and eastern Negros (Krinks 1970; Richardson 1989). In this study, Visayan peoples are not differentiated according to island of ancestral origin or household language due to insufficient numbers.

Figure 1.2: Map of Mindanao



Source: Rohrlach 2002

For the purposes of this study, ‘childhood’ is used to describe the life cycle phase that incorporates infancy (i.e. the first year of life) and the years between the first and fifth birthdays. The term ‘childhood mortality’ is used interchangeably with ‘infant and child mortality’. Further, as is standard practice, measures of the probabilities of dying between exact childhood ages are referred to as mortality ‘rates’. Hence, the probabilities of dying between birth and exact age one ( ${}_1q_0$ ), between exact ages one and five ( ${}_4q_1$ ), and between birth and exact age five ( ${}_5q_0$ ) are known as the ‘infant mortality rate’, ‘child mortality rate’, and ‘under-five mortality rate’ respectively. The under-five mortality rate captures the entirety of ‘childhood’ deaths.

Childhood mortality parameters serve many purposes. In high-fertility and high-mortality populations, childhood deaths often constitute the majority of all deaths. Therefore, childhood mortality measures

are critical to population projections and, when used in combination with model life tables, facilitate estimation of the entire age pattern of current mortality. Further, they are the most robust demographic barometers of health and development status, effectively communicating how well a society meets the needs of its people (Preston 1985; Bicego and Ahmad 1996). For this latter attribute, childhood mortality parameters are selected for investigation. Some explanation is required with respect to their use in this capacity.

In demography, the study of health is routinely equated with that of mortality. Indeed, it is easier to quantify mortality than ill-health (Cleland 1990). However, health and death are not two sides of the same coin. The leap between these states masks a pathology that is endemic in high-risk childhood mortality settings. In the developing world, childhood deaths are rarely the result of isolated disease episodes. Children are commonly exposed to a combination of multiple recurrent infections and nutritional deficiencies, leading to a cumulative deterioration in health. This erosion of health, referred to as 'growth faltering', compromises resistance to the extent that ordinarily minor illnesses result in death. Early and Headland (1998:108–109) explained:

Mother's milk usually provides sufficient nourishment for the first six months of life. If sufficient and proper supplements are not given after this, the synergism begins to build. An infant will suffer an infectious disease, frequently diarrhea. The infant will usually recover from the first such attack but if malnutrition is present, this is not a full recovery to good health. The infant remains in an undernourished state, and its general health continues to deteriorate, which leaves the child susceptible to another attack of infectious disease. Again, it may recover from the infectious disease, but its health condition has been weakened even more, and the malnutrition continues. Finally another attack of any kind of infectious disease may simply overwhelm the already weakened infant, with the resultant mortality.

This building synergism between malnutrition and infectious diseases has greater impact on mortality within the child years than within infancy. Due to the syndrome's amenability to broad-scale public health interventions and other environmental and socioeconomic changes, it is the child mortality rate then, that serves as a more sensitive development indicator than the infant mortality rate (Sembajwe 1981; Mosley and Chen 1984; van Norren and van Vianen 1986; Mosley 1989; Mosley and Becker 1991; Bicego and Ahmad 1996; Early and Headland 1998).

Growth faltering was specifically identified as the outcome of interest in Mosley and Chen's (1984) seminal model of childhood survival. The model's dependent variable recognised four degrees of

growth faltering, with death being the fourth and obviously most extreme degree – the final biological insult along a continuum of ill-health. The model provided a systematic way of organising the innumerable factors influencing childhood survival in developing countries. Its fundamental assertion was that all socioeconomic and cultural determinants of survival (referred to as ‘underlying’ factors) operated through a common set of biological and environmental mechanisms (or ‘proximate’ variables). Mosley and Chen (1984) identified socioeconomic variables at the level of the individual, household, and community that were potentially linked to broad classes of ‘proximate’ determinants, capturing aspects of environmental and dietary conditions, as well as mothers’ education and health-seeking behaviour.

According to Mosley and Chen (1984:25), these pathways of influence largely remained an unexplored and ‘unexplained black box’. By identifying orders of causality, Mosley and Chen’s (1984) framework effectively brought together the disparate interests of social and biomedical scientists. However, to address its principal facets, multidisciplinary methodologies calling upon the collaborative effort of highly skilled teams of researchers were required. Subsequent adaptations of Mosley and Chen’s original model have been developed according to the substantive interests of the researchers (van Norren and van Vianen 1986; Brisco et al. 1991; Mosley and Becker 1991; Obungu et al. 1994; Becker and Black 1996). Nonetheless, all adaptations retain its central paradigm and a ‘proximate determinants’ approach to mortality is now commonly used in demographic and public health research (Hill and Hurtado 1996).

In any given study, the ability to map important pathways of influence upon childhood mortality—or health if adopting Mosley and Chen’s (1984) broader framework—is restricted by the study’s scope, researchers’ expertise, and fieldwork time and budget. Further, some influences on mortality are not amenable to measurement. The literature calls for greater empirical investigation of the socioeconomic and cultural variables that serve to modify children’s chances of survival in varying environments, as well as at discrete ages of childhood (Bicego and Ahmad 1996).

This principal objective of this study is to comprehensively document childhood mortality levels, age patterns, and trends of the Foothills and Highlands regions and their constituent ethnic sub-populations, for the period 1983 to 1997. A single-round house-to-house survey was conducted in 1998 through which detailed reproductive history and other demographic data were collected from a total of 782 women. In order to identify all women eligible for interview, the first census of the study area was undertaken. Five thousand and forty-four people were enumerated across 916 households.

Women's reproductive histories are a very rich data source, yielding information regarding each live birth: the month and year of birth, child's survival status at the time of survey, and (if applicable) child's age at death. Such detailed data allow mortality levels of precise childhood age components to be directly calculated for periods up to 15 years before survey. Also, they can be converted into a format compatible with indirect mortality estimation (Hobcraft 1984; Preston 1985; Chidambaram et al. 1987, Hill 1991).<sup>2</sup>

A second objective of this study is to calculate indirect levels of infant and child mortality for Foothills and Highlands populations from data pertaining to women's ages and summaries of their reproductive events, in unison with model life tables. Several researchers are skeptical about relying on mortality models for estimation of small-population parameters (Early and Peters 1990, Hill and Hurtado 1996, Early and Headland 1998), given the paucity of high-quality mortality studies of populations 'not subsumed by modern nation states' (Hill and Hurtado 1996:192). A comparison of direct estimates with those derived indirectly, using Coale and Demeny (1966) and United Nations (UN) (1982) model life tables, allows an assessment of the ability of existing models to adequately capture the mortality experience of the study populations.

A third objective of this study is to employ logistic regression to identify infant and child mortality predictors for Foothills and Highlands populations. Reproductive histories yield data on a number of biodemographic classificatory variables (such as child's sex, birth order, and birth-interval length), labelled by Mosley and Chen (1984) as proximate factors. Multivariate analysis provides a means to assess the relative influence of these factors, in addition to socioeconomic variables related to the mother, father, and household, upon survival in childhood. The delineation of high-risk households and key causal pathways of mortality in the study area will be of considerable utility to health planners and programme implementors (Hobcraft 1984; Preston 1985; Hill 1991; Obungu et al. 1994).

A fourth objective is to document the causal structure of mortality at different childhood ages for the study population, ascertained from mothers' reported causes of deaths. Readily preventable causes of death are largely responsible for the persistence of heavy child death tolls among socioeconomically deprived populations. Certainly, much of the variance in under-five mortality across populations can be explained by differentials in child mortality. A fifth objective is to assess the study's principal findings so as to arrive at a comprehensive set of recommendations for the study area. Knowledge of the severity, risk factors, and causal structure of mortality, at different childhood ages, will best inform

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<sup>2</sup> Reasons for restricting analysis to periods of no more than 15 years before survey are given in Section 3.1.

health interventions (Behm 1991; Ewbank and Gribble 1993; Bicego and Ahmad 1996). While the overarching purpose of inquiry into childhood mortality predictors is to inform primary health-care policy and delivery in order to bring about sharp reductions in under-five deaths, the study's findings also will contribute to the anthropological demographic literature in terms of further understanding mortality among tropical forest populations in pre- and post-contact settings.

## 1.2 Sociopolitical context

From the perspective of the Philippine State, the B'la-an of this study inhabit a marginal world. The ancestral heartland of their forebears was the Koronadal Valley situated within the expansive Cotabato Basin (Figure 1.2). However, from the 1940s onwards, these fertile homelands were appropriated by a newly independent Philippine Republic striving for economic self-sufficiency (Pelzer 1948). Government resettlement and agricultural schemes, as well as spontaneous migration, saw thousands of Christian Filipinos primarily from the Visayan Islands move into what had been declared 'vacant public domain' (Bautista 1939:15). In the ensuing decades, the Koronadal B'la-an were inexorably forced into more mountainous and marginal areas (Pelzer 1948; Krinks 1970) and, for some generations, one enclave has lived directly to the north of Mt Matutum or what the B'la-an refer to as *Amtutung*, the navel of the earth (Photograph 1.1; see Figure 1.2).

### Photograph 1.1: *Amtutung*, the navel of the Earth





Having resisted Islamic and Christian proselytising, the Highlands B'la-an continue to hold animist beliefs and consult mediums attuned to the world of malevolent and benevolent spirits. The Highlands B'la-an remain under the jurisdiction of traditional power brokers—*fulong* or 'big men'—who command the flow of resources through a complex system of ritually bound and often conflict-ridden relationships of allegiance and indebtedness. Highland B'la-an marriages are parentally arranged and involve substantial brideprice payments. Men may have as many wives as they can afford or capture. With little State involvement, disputes over property and wives are resolved through elaborate conflict resolution processes (*kasfala*). Should these formalised attempts at reinstating peace be unsuccessful, the result may be small-scale war.

The Highlands B'la-an engage in subsistence agriculture, hunting and gathering, and cash cropping on ancestral land. While the Koronadal B'la-an traditionally grew lowlands rice on the Valley's floor, the Highlands enclave has adopted corn as their cash crop. Corn, a long-standing staple of the Visayan regions, produces superior yields to uplands rice in the Highlands environment and has the added advantage of maturing swiftly so that up to three crops can be produced annually (Krinks 1970).

Yet, a sustainable future for the Highlands B'la-an is far from guaranteed. Land resources in the study area have undergone substantial degradation. During the 1970s and 1980s, the Tampakan District was logged by commercial and illegal operators. Loss of forest habitat resulted in severely diminished numbers of large game such as deer and wild boar. This has greatly compromised the quality of the B'la-an diet, which is largely a protein-deficient mix of corn, sweet potato, bananas, and garden vegetables. Further, increasing population pressure due to steady in-migration of Visayan lowlanders has caused an intensification of land use patterns, including the slash-and-burn agricultural regime of the B'la-an (Photograph 1.2).

There remains a conspicuous lack of State services, infrastructure, and livelihood opportunities for the Highlands B'la-an. Even a well-intentioned government would face many challenges redressing these inadequacies. Aside from its geographical remoteness, the study area is at the convergence of two political administrative regions and three provinces; close to the easternmost extension of strong Islamic influence; and adjacent to one of the last areas of New People's Army activity (Jackson 1995).<sup>3</sup>

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<sup>3</sup> The New People's Army (NPA) was formed in 1969 as the armed force of the Communist Party of the Philippines. While it reached its maximum strength in the mid-1980s, defence officials claimed the NPA to be a resurgent force at the time of survey (Goodno 1991; Silliman and Garner Noble 1998; *Philippine Daily Inquirer* 1999).

It was within this politically charged landscape that Western Mining Corporation (WMC), an Australian mining company, identified a vast copper–gold deposit.

**Photograph 1.2: Highlands slash-and-burn agriculture, Sal Naong *bong banwu***



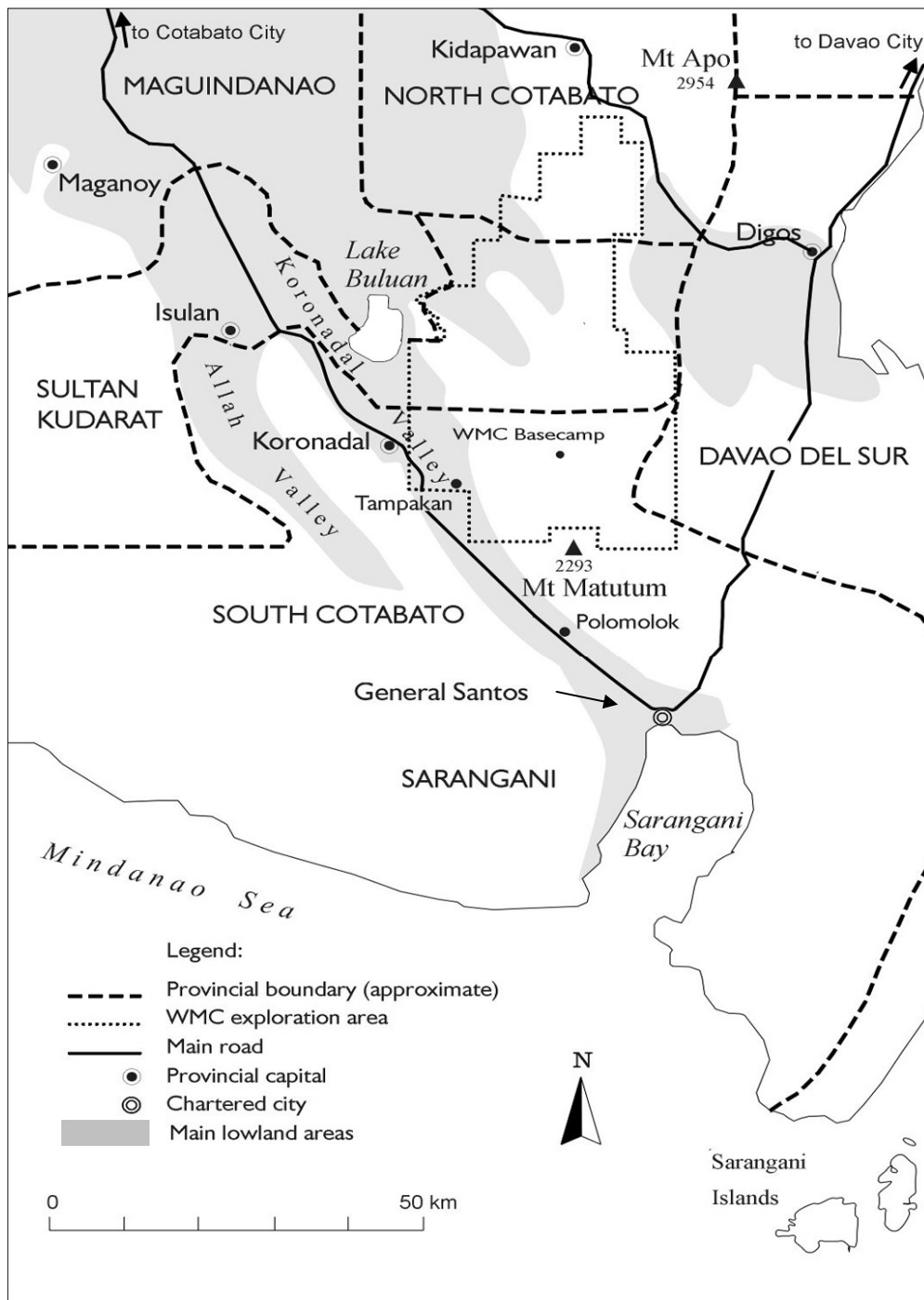
Western Mining Corporation first entered the Philippines in 1987. In the following year, the company established an office in Manila and registered WMC (Philippines) Inc., a wholly owned subsidiary of WMC Limited. Attracted by promising geological observations, WMC signed an option agreement over the Tampakan area with a Philippine company in 1991. In the ensuing years, WMC identified a copper–gold deposit, prompting an application to the Philippine government for a Financial and Technical Assistance Agreement (FTAA)<sup>4</sup>. In 1995, WMC was awarded a FTAA over an area of 89,669 hectares—broadly extending north of Mt Matutum in South Cotabato, east of Lake Buluan in Sultan Kudarat, south of Kidapawan in North Cotabato, and west of the South Cotabato–Davao del Sur border—within which the company was permitted to conduct exploration (Figure 1.3). WMC was

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<sup>4</sup> In the event that a mine is developed, an FTAA entitles the Philippine government to 60 per cent of pre-tax net revenue, once capital invested in the project’s initial development has been recouped by the company (WMC 1997).

obliged to relinquish at least 10 per cent of this area annually, with the further stipulation that, within five years of signing the FTAA, the area was to be reduced to not more than 5,000 hectares or a size appropriate to the development of a project (WMC 1997).

**Figure 1.3: Southern Mindanao**



Source: Lasen and Jackson 1998:8

Western Mining Corporation committed significant resources to exploring the geological parameters and economic viability of the deposit. Activities were formalised within the Tampakan Copper Project, administered largely from a General Santos City office and a Highlands base-camp (Figure 1.3). Five contiguous B'la-an geopolitical territories (*bong banwu*) were identified within the immediate impact area of the proposed development.<sup>5</sup>

Two of the *bong banwu* (Sal Naong and Bong Mal) are located in rugged Highlands terrain and adhere to the traditional B'la-an politico-economic system, which has been described. The three remaining *bong banwu* (Pula Bato, S'bangken, and Danlag) are in the Foothills. These *bong banwu*, primarily peopled by Christian Visayans, are incorporated into the political apparatus of the State wherein elected 'captains' represent the interests of designated *barangay*.<sup>6</sup> They are served by farm-to-market roads, public transport, elementary schools, and health clinics. These Highlands and Foothills communities largely constitute the study populations.

The principal author's initial research in the study area, undertaken throughout 1996 and 1997, was guided by two main objectives. The first was to capture baseline data from the Tampakan Copper Project's so-called 'host communities', against which sociodemographic change could be potentially measured at the local level. Baseline data were already being compiled by the company at the regional, provincial, and municipal levels. The second imperative, stemming from WMC's contractual obligation to implement community health and livelihood programmes among host communities, was to make pertinent data available to project planners. This early research (Lasen and Jackson 1998), based on a much smaller reproductive history database than that of the present study, documented infant and child mortality parameters for four selected villages within the Tampakan Copper Project area.<sup>7</sup>

As part of the Tampakan Copper Project, WMC negotiated Resource Development Agreements with multiple levels of the Philippine government, Foothills *barangay* captains, and indigenous Tribal

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<sup>5</sup> A *banwu*, the smallest B'la-an geopolitical unit, refers to both a parcel of land and the individual family grouping associated with that land. Within its boundaries, delineated by natural features, are the group's dwellings, farm clearings, hunting grounds, and ritual and burial sites. A *bong banwu* comprises *banwu* interconnected through family and political ties. This larger aggregation of communities is spread across villages and clusters of hamlets and is administered by a *bong fulong* (Sal Naong Tribal Council 1996).

<sup>6</sup> The largest political and administrative unit within the Philippine local government structure is the province, which is made up of municipalities and component cities, both of which in turn are subdivided into *barangay*. The *barangay* is constituted by a maximum of 500 families (Halligan and Turner 1995).

<sup>7</sup> Reproductive histories were collected from 149 women. The findings from this study are noted briefly in Sections 1.3 and 5.7.

Councils. The Tribal Councils were born out of the negotiation process to represent the interests of B'la-an residents in the five designated *bong banwu*, gaining official accreditation with the Philippine national government's Office of Southern Cultural Communities. Through these contractual agreements, WMC committed itself to a three-year period of investment in community development among Highlands and Foothills *bong banwu*, beyond which its obligations were to be reassessed according to the project's status. Western Mining Corporation thus assumed the role of a *de facto* government, from 1995 to 1998, in the absence of government will or capacity to provide even the most basic services.<sup>8</sup> The forging of roads, the building and staffing of several schools and health clinics, and the implementation of livelihood projects gave the company enormous local visibility. Such efforts became rather conspicuous markers of State neglect.

It is important to note that under the auspices of WMC's community health programme, the Highlands B'la-an had access to limited primary health care for the first time. Initiatives largely consisted of the establishment of a Highlands health clinic and child immunisation programme. Western Mining Corporation also augmented government health services in the Foothills. According to Caldwell (1986:200), 'improvements in the provision of health services where these have been otherwise unavailable can have a dramatic effect on the reduction of mortality'. In this study, an investigation of mortality trends and health service use by region of residence and ethnicity allows for an assessment of the impact of these pioneering primary health-care efforts.

At one stage, the future of the Koronadal B'la-an seemed inextricably tied to the Tampakan Copper Project. Through carefully negotiated Resource Agreements and continuing capacity building efforts on the part of the company, the B'la-an may have been able to acquire political and economic leverage for the first time. In an era of ever-increasing globalisation, contact with modern capitalist industry is often a crucial element in determining the future of indigenous populations (Young 1995). However, in February 2000, WMC declared that the Tampakan Copper Project was not economically viable, prompting the company's withdrawal from the Philippines.<sup>9</sup> Nonetheless, the negotiation process itself wrought considerable change.

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<sup>8</sup> During WMC's entire involvement in the Tampakan area, it expended approximately \$A10–12.5 million on community development projects (Gavan Collery 2001, personal communication).

<sup>9</sup> WMC officially stated that 'the Tampakan Copper Project was unable to satisfy investment criteria in terms of forecast return on the required investment' (WMC 2001). At the same time, WMC also withdrew from offshore projects in Uzbekistan and Cuba. These decisions followed a lengthy period of depressed commodity prices.

Western Mining Corporation's involvement in the Tampakan area created an alternative political structure, operating alongside the indigenous 'big men' system, within which emerged new institutions, leaders, alliances, and factions. At the negotiating table were indigenous, in-migrant, government, non-government, church, and corporate representatives. There was ongoing reshuffling of competing and coinciding interests. The establishment of B'la-an Tribal Councils facilitated a change in indigenous power relations, with a distinct undermining of the power bases of the *bong fulong*. Several B'la-an women seized upon this 'break with the old' as an opportunity to enter the arena of public politics and community decision-making. Moreover, it was the first time that the B'la-an were brought into formal relations with the Philippine State.

There are two noteworthy legacies of WMC's investment in the Tampakan area. Firstly, in order to enter into legal agreements regarding compensation for the use of ancestral land, the company facilitated the lodging of Ancestral Domain Claims, with the Philippine Department of Environment and Natural Resources, on behalf of the five B'la-an *bong banwu*. The compilation of the necessary data for these claims involved substantial and co-ordinated efforts between WMC personnel and B'la-an communities. B'la-an geopolitical territories were identified, surveyed and mapped, and ethnographies and heritage sites were recorded. The Ancestral Domain Claim lodged for the Sal Naong Tribal Council was made available by WMC to the principal author and has valuably informed this study.

The B'la-an claimants were awarded Certificates of Ancestral Domain Claims (CADC). A CADC does not grant title to ancestral land, which remains part of the public domain. Instead, it acknowledges priority over other claimants to ancestral land and the right to manage it according to customary law through existing traditional leadership (Abelardo 1996; Dumagat 1996).<sup>10</sup> The experience of indigenous minorities throughout the world has demonstrated that the preservation of ancestral land is often critical to the maintenance of functional community and family structures and a sense of personal and social identity, determining 'the collective's ability to cope with the exigencies of survival' (Lee

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<sup>10</sup> The Philippine *Land Registration Act (No. 496)* of 1902 instituted the Torrens System, first introduced in South Australia as the *Real Property Act of 1857–58*, requiring the registration and titling of privately owned lands whether by individuals or corporations (Rodil 1992; Abelardo 1996). Indigenous land rights were not recognised by Torrens title. Constitutional reform under President Aquino saw the 1987 Constitution—'the most idealistic, progressive and optimistic constitution in the nation's history' (Abueva 1997:10)—affirm commitment to the protection of indigenous rights to ancestral land (Section 5, Article XII). Pursuant to this constitutional mandate, a 1993 Department Administrative Order (No. 02) of the Department of Environment and Natural Resources established procedures for issuing Certificates of Ancestral Domain Claims (CADC) to indigenous groups (Abelardo 1996; Dumagat 1996).

1976; Eder 1987:17). This is well captured in Sal Naong's Ancestral Domain Claim wherein a B'la-an informant explained that, 'land is a dynamic and animate creation that must be looked after, cared for, and nurtured in order to ensure its continued survival and the continued survival of the life forms and spiritual essences that coexist within its realms' (Sal Naoang Tribal Council 1996:19).

In view of a contact history resulting in wholesale dispossession of land, government acknowledgement of B'la-an ancestral domain was a most significant milestone – one which may prove critical to the future viability of the Tampakan B'la-an. However, given the lack of government presence in the Highlands, it is likely that incursions into the region by lowland Filipinos will be ongoing. It is difficult to anticipate how ancestral domain title will be upheld in the study area, without the B'la-an resorting to violent resistance.

Secondly, as a final contribution to community development, WMC contracted Care Philippines to implement a three-year maternal and child health project within the five designated *bong banwu*. The project, known as the *Sustainable Maternal and Child Health Initiatives through Local Governance and Education* (SMILE), commenced in late 1998 – immediately after the completion of the fieldwork for this study. By this stage, WMC's own community health programme, which is fully detailed in Chapter 6, had ceased to operate. The SMILE project (administered from Marbel, the provincial capital of South Cotabato) engaged one doctor and five nurses who were all community-based, together with administrative, education, and support staff. The principal outcome sought by the project was a reduction in both childhood and maternal mortality rates through the provision of primary health-care services and education, community capacity building, and the establishment of a referral network of providers within municipal and provincial government health sectors. A comprehensive evaluation of the efficacy of SMILE was to be undertaken at the programme's completion by an external body in late 2001. However, a brief progress report by Care Philippines—made available to the principal author—highlights limitations of the SMILE project. These limitations, outlined in Chapter 8, have important implications for the future provision of community services in the study area.

### **1.3 Comparative framework**

While funded by WMC, this study was not commissioned by the company. It originated as and has remained an academic undertaking independent of WMC's agenda. The study area is of compelling interest purely from a demographic research perspective. Prior to Lasen and Jackson's study (1998), no demographic data existed for any B'la-an population. This may well have continued to be the case had

attention not been drawn to the Highlands enclave through WMC's entry into their remote and volatile homelands. Perhaps then, the most important contribution of this study is the capture of detailed demographic data for the comparatively unacculturated Highlands B'la-an who may well comprise the last enclave of B'la-an to remain separate from mainstream political and social structures.<sup>11</sup>

In spite of increased interest in anthropological demographic scholarship, detailed studies of small populations are still quite rare. Howell (1986:227), one of the pioneers of anthropological demographic methods, proposed that the 'most striking conclusion' to emerge from her classic study of !Kung hunter-gatherers (Howell 1979) was 'not a demographic one at all' but an appreciation of the time and energy required to document the population processes of a very small group. Even with necessary time and energy, it is challenging to obtain complete and reliable demographic data from non-literate populations due to lack of written records, lack of precise knowledge of years of birth and ages at death, and often lack of cultural freedom to discuss dead relatives (Neel and Chagnon 1968; Early and Peters 1990).

The only other comprehensive micro-demographic study of a Philippine hunter-gatherer population is that of the Agta Negrito of northeastern Luzon, undertaken by Early and Headland (1998). Agta population dynamics are documented over a 44-year period (1950–95) during which time the Agta became wholly incorporated into rural Philippine society as tenant farmers and wage labourers. Eder (1987) conducted earlier research among the Batak Negrito of Palawan Island. He provided some basic demographic parameters, together with results from anthropometric and anthropological investigations, in order to assess Batak capacity to respond to rapidly changing environmental and social conditions. The relevance of the findings of Early and Headland (1998) and Eder (1987) to this study will be highlighted shortly.

Firstly though, it is important to emphasise that a real strength of this study is its adoption of a comparative framework for analysis. The power of a comparative perspective is highlighted in Pennington and Harpending's (1993) micro-demographic study. They compared childhood mortality trends of in-migrant Herero cattle herders of Botswana's northwestern Ngamiland with those of indigenous !Kung hunter-gatherers, documented earlier by Howell (1979). The effect of nutritional status on early mortality was apparent. Herero survivorship rates were found to be higher than those of the !Kung. Dramatic improvement in !Kung survival, most notably among children aged 1–4 years, could be tied to a period of increased contact with the Herero and dependence upon their milk and food

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<sup>11</sup> Population figures pertaining to southern Mindanao's B'la-an peoples are provided in Chapter 2.



products. While Herero children also experienced survival gains over this period, they were modest and spread more evenly across childhood ages. By adopting a comparative perspective, Pennington and Harpending (1993) were able to investigate the effects of dietary differences in two co-resident populations, as well as to better interpret !Kung trends in childhood mortality.

Kunstadter and Kunstadter (1990:229) strongly endorsed comparative studies in micro-demographic research, proposing that aggregate data may obscure important differences. They demonstrated stark infant mortality differentials among four ethnic groups of northwestern Thailand's Mae Hongson Province – the Skaw Karen, Lua, Po Karen, and Hmong. These Highlands groups similarly pursued slash-and-burn economies, yet they followed different trajectories 'in the timing and amount of mortality decline, in causes of death and morbidity, and implicitly, in the relationship between behavioural changes, especially those related to health services, and observed changes in mortality' (Kunstadter and Kunstadter 1990:213). In one illustration of ethnic-based differences, Kunstadter and Kunstadter (1990) documented the effects of an infectious disease epidemic, most likely to have been measles, on neighbouring Lua and Karen villages. All residents under 18 years of age contracted the disease in the Lua village whereas only a few Karen children under the age of three did so. Unlike Karen children, Lua children rarely accompanied their parents to lowlands markets. According to Kunstadter and Kunstadter (1990:226), this simple behavioural difference contributed to the high proportion of non-immune Lua residents, which had 'major epidemiological' consequences.

In the aforementioned studies (Kunstadter and Kunstadter 1990; Pennington and Harpending 1993), the comparative perspective facilitated a better understanding of the significance of the demographic parameters revealed for the populations under investigation. In this study, interpretations of Highlands B'la-an demographic processes are informed by comparisons with corresponding parameters for acculturating B'la-an and peasant Visayan populations in the Foothills. In fact, the study area presents as a natural laboratory. The presence of a significant B'la-an population in the Foothills not only allows for ethnicity to be held constant in comparisons between B'la-an populations across the Foothills–Highlands divide but also for region of residence to be held constant in comparisons of parameters of indigenous (Foothills B'la-an) and in-migrant (Foothills Visayan) populations. Thus, the study combines the natural experiment approach of migration studies (same ethnic group in different environments) and intergroup comparisons in the same environment. Additionally, demographic parameters of the study populations are compared with those at the Philippine national level.

In an assessment of anthropometric measures of 19 Philippine Batak Negrito children aged 2–13 years, Eder (1987:145) found that close to two-thirds weighed less than 75 per cent of the standard Filipino lowlands weights-for-age. According to Eder (1987:157), the Batak ‘explicitly identify the past as a time of dietary plenty, of “fat Batak”, and compare it invidiously with the privation and hunger they claim to experience today’. As previously discussed, environmental degradation of the Tampakan Highlands has led to significant deterioration in the nutrient quality of the B’la-an diet. So too, environmental change was so rapid on the Philippine San Ildefonso Peninsula that the Agta Negrito were forced to abandon their traditional economy of large-game hunting within less than a decade (Headland 1988; Early and Headland 1998).

Early and Headland (1998) documented Agta population dynamics for three distinct phases: a Forager Phase (1950–64); a Transition Phase (1965–79) when the Agta increasingly turned to wage labour in the face of rapidly declining forest resources; and a Peasant Phase (1980–93). From the Forager to the Transition Phase, the Agta experienced a nine per cent reduction in under-five mortality (from 450 to 410 per 1000), which Early and Headland (1998) attributed to the impact of medical programmes initiated by the Headlands. However, during the Peasant Phase, when the Agta were largely without medical assistance, under-five mortality increased to 520 per 1000. Agta peasants were simultaneously exposed to a marked deterioration in the nutritional adequacy of their diet (due to the loss of big game) and to the complete spectrum of infectious diseases brought in by lowlanders. These changes were especially detrimental to children aged 1–4 years, reflected in a 50 per cent increase in child mortality (as opposed to a 10 per cent increase in infant mortality) over the latter interval (Early and Headland 1998:102). A different trajectory was described for the !Kung of southern Africa, among whom increased contact with (and dependence on the food products of) outsiders actually resulted in sizeable reductions in child mortality (Howell 1979).

The age pattern of Agta under-five mortality is also notable during the aforementioned phases. In stark contrast to the Forager Phase when Agta infant mortality was approximately three times child mortality, the Peasant Phase saw a level of child mortality (342 per 1000) that was 29 per cent higher than the corresponding infant mortality estimate (266 per 1000). A mortality pattern similar to that of Agta peasant children was found by Lasen and Jackson (1998) among a 1981–90 cohort of Highlands B’la-an children. Highlands B’la-an child mortality (288 per 1000) was shown to exceed infant mortality (250 per 1000) (Lasen and Jackson 1998:25). Indeed, children are rendered particularly vulnerable to malnutrition and infectious diseases when weaned in settings characterised by poor weaning paps, sanitation, and immunisation coverage (Caldwell 1996).

Eder (1987:147) recorded the effect of a measles epidemic on a Batak village. While ‘every child, the majority of teenagers and four adults who had previously escaped the disease’ contracted measles, four deaths were all to children aged 1–3 years. Early and Headland (1998:110) stated that in populations where the synergistic process between malnutrition and infectious diseases is active, mortality generally peaks at around 12–17 months in non-epidemic years and 24–35 months in epidemic years. Thus, one imagines that significant predictors of the mortality peak are the mean age of weaning (in non-epidemic years) and the amount of time that has elapsed between epidemics (defining the age range of the susceptible population in epidemic years).

At the national level, this childhood mortality pattern and pathology is exhibited only by the poorest nations in the world – those in sub-Saharan Africa, especially in West Africa. The ‘West African pattern’ is now well documented in the literature, most notably in Demographic and Health Surveys (DHS) comparative reports on infant and child mortality (Sullivan et al. 1994; Bicego and Ahmad 1996). However, as early as 1968, Clairin (1968:199–200), in an assessment of all existing African childhood mortality data, concluded:

A striking characteristic of most, if not all, mortality patterns in African countries is that the probability of death between the first and fifth birthday is extremely high and usually of the same order of magnitude as the infant mortality rate. This behaviour deviates considerably from the standard life tables. The explanation of the high level of child mortality seems to lie mainly in the weaning.

In the ensuing decades, findings from a series of Senegalese studies remained consistent with Clairin’s (1968) conclusions. Senegal was one of the few sub-Saharan countries that at the time had comprehensive demographic data from surveys and surveillance projects. As a consequence, it attracted much mortality research (Cantrelle et al. 1986). An annually updated follow-up survey was conducted from 1963–81 among Serer residents in the Siné-Saloum region of western Senegal. Cantrelle and Leridon (1971) demonstrated mortality among Serer children in the second year of life alone to be of the same magnitude as that within infancy. They noted a strong association between weaning and mortality, especially for Serer children weaned very early due to a mother’s subsequent pregnancy. Garenne’s (1982:135) data revealed Serer mortality rates pertaining to the weaning age (18–35 months) to be up to 3.5 times higher than model life estimates at the same level of under-five mortality.<sup>12</sup>

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<sup>12</sup> Ninety per cent of Serer children were still breastfed at 18 months whereas that figure fell to only five per cent at 36 months (Cantrelle et al. 1986:109).

Pison and Langaney (1985:399–404) identified strong seasonal and periodic features as characteristic of under-five mortality trends for Bandafassi, eastern Senegal. They documented major measles epidemics occurring during the dry season four to five years apart, which resulted in the deaths of approximately one-quarter of all children under age five in affected villages. Even though reliable cause-of-death data remained scanty for sub-Saharan Africa, the emerging picture from rural African studies showed malnutrition, infectious and communicable diseases (primarily diarrhoea, malaria and measles), and respiratory diseases (such as pneumonia) to be responsible for the majority of deaths in the one-to-four-year age range (Sembajwe 1981; Garenne 1982).

Relative levels of socioeconomic deprivation go far in explaining excess child mortality estimated for sub-Saharan African and, in particular, West African populations. Mortality in the one-to-four-year age range is known to be sensitive to variation in mother's education levels, household economic status, and modern health-care coverage (Hobcraft et al. 1984; Rutstein 1984; Cleland and van Ginneken 1989; Bicego and Ahmad 1996). Blacker (1991) cited the much lower levels of education among West African mothers as an underlying cause of childhood mortality differentials within sub-Saharan Africa. It has been found that West African children are less likely to be adequately nourished and vaccinated than children in the rest of Africa (Bicego and Ahmad 1996; Sommerfelt and Piani 1997). Across sub-Saharan Africa, large proportions of households do not have electricity, safe drinking water, and flush toilets. Large proportions of sub-Saharan women remain in rigidly hierarchical polygynous marital systems and without access to reproductive and child health services (Adams and Castle 1994; Ayad et al. 1997). The relative influence of such factors on both infant and child mortality rates, as cited in the literature and as estimated for the study populations, will be documented in this study. Due to the similarity in childhood mortality patterns exhibited by B'la-an and sub-Saharan African populations, the comparative framework of the present study further extends to include the sub-Saharan mortality experience. Childhood mortality estimates for sub-Saharan African nations, together with those for the Philippines, are drawn from DHS publications for comparable reference periods.

The scope for comparing B'la-an childhood mortality parameters with those of the Agta (Early and Headland 1998) or other transitional populations is limited. Anthropological demographic studies (Howell 1979; Wood 1980; Eder 1987; Early and Peters 1990; Kunstadter and Kunstadter 1990; Pennington and Harpending 1993; Hill and Hurtado 1996; Lautenbach 1999) generally only present very broad childhood mortality parameters for populations under investigation. Childhood mortality is not the exclusive focus of any of these studies and hence analysis is most often restricted to the two age groups of the abridged life tables: 0–11 months and 1–4 years. Comprehensive investigation of

constituent components of infant and child mortality is generally prohibited in these studies due to reliance on mortality models or small numbers of birth and death events. Agta childhood mortality estimates for the 14-year Peasant Phase were based on a cohort of 169 children (Early and Headland 1998:111). In contrast, estimates for the 15-year reference period of this study are calculated from 2,568 birth events (1,507 in the Foothills and 1,061 in the Highlands). This allows the presentation of the most comprehensive set of childhood mortality parameters (levels, patterns, trends, and predictors) ever assembled for a Philippine indigenous population.<sup>13</sup>

Knodel et al. (1988:41) described anthropological demographic research as ‘eclectic and ambitious, combining ethnographic field research with surveys and even censuses of small areas in an attempt to arrive at a holistic understanding of demographic behaviour within a broad historical and sociobiological perspective’. It must be clearly stated that this study is largely based on data from a single-round survey. The principal author was afforded considerable insights into B’la-an sociocultural practices through three extensive field seasons in the area, as well as access to unpublished ethnographic data compiled by WMC employees. Most notable among these documents are Sal Naong’s Certificate of Ancestral Domain Claim (Sal Naong Tribal Council 1996) and Buenavista’s (1995) fieldnotes – both will be referred to extensively in forthcoming chapters. Alan Buenavista, a Filipino exploration geologist, was one of the first WMC employees to make contact with the Highlands B’la-an enclave. He spent lengthy field seasons in the study area, befriending leaders and becoming well respected within the communities. The ethnographic notes he compiled on the B’la-an during this period are very thorough and of notably high quality for someone not formally schooled in social science.

Unlike demographic studies of the !Kung and the Yanomamo, populations which attracted considerable scholarly interest through multi-disciplinary research projects, this study of the B’la-an stands alone. Data were not collected, analysed, and interpreted by a team of ethnographers, nutritionists, clinicians, human behavioural ecologists, and the like. The principal author was neither a long-term resident among the B’la-an—as was Kim Hill among the Ache (Hill and Hurtado 1996) and Thomas Headland among the Agta (Early and Headland 1998)—nor able to speak the B’la-an language. Nonetheless, this did not preclude the training of a highly competent field team of B’la-an women in demographic survey

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<sup>13</sup> Childhood mortality regimes of South American hunter-gatherers—the Yanomama of the Mucajai River in northern Brazil (Early and Peters 1990), and the Ache of Eastern Paraguay (Hill and Hurtado 1996)—are less relevant to this study due to the high incidences of infanticide (and child homicide in the case of the Ache) among these populations. Early and Peters (1990:79) attributed 44 per cent of Yanomama infant mortality during 1958–87 to infanticide. Infanticide is not a feature of B’la-an society.

techniques and the collection of a robust data set. It does explain, however, why emphases in this study may be different to those in other anthropological demographic studies.

## **1.4 Chapter outline**

Chapter 2 seeks to document the tumultuous contact history of the Koronadal B'la-an. An historical perspective allows a better understanding of the underlying reasons for differences in the sociodemographic profiles of the B'la-an and Visayan study populations. Given that the published ethnographic record pertaining to the B'la-an is scant, B'la-an contact history has been distilled through investigation of two important themes in the historical literature. The first theme is the nature of long-standing power and trade relations—predating and persisting throughout the Spanish colonial period—between Muslim coastal dwellers and animist hinterland populations (including the B'la-an). The second theme is the rupturing of southern Mindanao's sociopolitical fabric, which occurred over the twentieth century as a result of American colonial and post-independent Philippine governments seeking to exploit this 'last frontier'.

Chapter 3 focuses on key aspects of the collection, processing, and analysis of the study data. It begins with a broad overview of standard childhood mortality data sources and estimation techniques used in developing countries where vital registration systems, if they exist, are commonly defective. Issues surrounding the development and piloting of the survey instrument, the training and supervision of the interviewers, age-estimation techniques, coverage and logistics of the survey exercise, and selection of appropriate analytical methods are afforded considerable attention. Additionally, findings are presented from internal consistency checks undertaken to broadly ascertain the quality of the study data.

The literature continues to highlight the paucity of childhood mortality studies that adequately characterise the socioeconomic and cultural contexts in which mothers live (Dargent-Molina et al. 1994, Bicego and Ahmad 1996). In view of this gap, and given that there are no previous data for the Koronadal B'la-an, Chapter 4 comprehensively builds sociodemographic profiles of the study populations, households, and respondents. Population age–sex structures and household sizes and compositions are compared by region of residence. Respondents' education levels, marital patterns, reproductive behaviour, and economic activities are detailed for each of the regional ethnic sub-populations under investigation. Sociodemographic indicators at the Philippine national level provide a broader comparative context for this chapter.

Chapter 5 presents an overview of childhood mortality levels and patterns in the developing world. This is followed by documentation of infant and child mortality levels, patterns, and trends (1983–97) for the Foothills and Highlands regions and their resident ethnic sub-populations. These parameters, directly estimated from reproductive-history data, are compared with measures derived indirectly, together with corresponding estimates for the Philippines, other DHS-countries, and small populations of hunter–gatherers and horticulturalists.

Chapters 6 and 7 draw extensively on the sub-Saharan childhood mortality literature in order to guide discussion of causes of death and predictors of infant and child mortality in areas of extreme socioeconomic disadvantage. Chapter 6 looks to factors that potentially explain the wide mortality differentials exhibited by regional and ethnic sub-populations. The availability of health services in the study area is outlined. The broader sociocultural context, addressing B’la-an attitudes and practices associated with pregnancy and childbirth, is explored as a precursor to a comparison of prenatal and postnatal health service use among the study populations. Children’s vulnerability to the epidemiological environment is further examined by comparing household material and sanitary conditions in the Foothills and Highlands regions. Finally, the causal structure of mortality, constructed through mothers’ reported causes of children’s deaths, is documented. Chapter 7 identifies significant predictors of infant and child mortality in the Foothills and Highlands regions. The models are built from assessment of the relative influence of an extensive range of biodemographic, environmental, and socioeconomic variables upon survivorship.

Chapter 8 looks to a broader understanding of pre-contact mortality regimes and outlines a set of recommendations for health policy makers and programme planners. Chapter 9 serves as a postscript to inform the reader of the most recent developments of the Tampakan Project subsequent to WMC’s withdrawal in 2000.