

# INFANT MORTALITY IN NUAULU AND NON-NUAULU COMMUNITIES IN MALUKU TENGAH: Social Exclusion And Ethnicity In Indonesia<sup>1</sup>

By: Lusia Peilouw\*

## Abstrak

Nuauulu adalah salah satu komunitas adat di Maluku. Secara geografis komunitas ini tidak terisolasi seperti yang diasumsikan secara umum bahwa masyarakat adat biasanya hidup terisolasi di daerah terpencil. Mereka tinggal hanya beberapa kilometer dari ibukota kabupaten Maluku Tengah, di antara desa-desa yang jauh lebih berkembang. Sebuah penelitian demografis menggunakan kematian bayi dirancang untuk menerangkan fenomena sosial pada komunitas Nuauulu dan bukan Nuauulu. Ditemukan bahwa kematian bayi pada Nuauulu di Rouhua lebih tinggi dari pada bukan Nuauulu di Makariki. Faktor-faktor sosial yaitu pendidikan dan kesehatan dan ekonomi keluarga merupakan faktor determinan yang saling mempengaruhi satu dengan lainnya, sebagaimana dianalisa dengan menggunakan *Mosley and Chen framework* (1984). Secara kritis studi ini menemukan bahwa praktek-praktek budaya yang masih dipelihara oleh komunitas Nuauulu tidak akan menjadi masalah apabila kebutuhan sosial lain dan kebutuhan ekonomi terfasilitasi. *Political will* dan kepedulian pemerintahlah yang menjadi masalah dalam konteks ini. Mengabaikan komunitas adat dalam kebijakan pembangunan sosial menyebabkan masyarakat dalam komunitas ini rentan. Komunitas Nuauulu di Rouhua hanyalah satu dari sekian banyak komunitas adat di negeri ini, dan terletak di daerah yang mudah dijangkau namun selama ini mereka hidup dalam keprihatinan dan kerentanan yang luar biasa. Bagaimana lebih buruknya kondisi komunitas-komunitas adat yang memang secara geografis tidak mudah dijangkau.

---

Nuauulu is a tribal community in Maluku. Geographically this community is not isolated as is commonly assumed tribal communities living in remote areas are. Located among non-tribal communities, it is only a few kilometres from the centre of the Maluku Tengah District. However, these communities differ in social provisioning entitlements. This study uses infant mortality to explain social phenomena in the communities. Through a structured survey and literature study, it has found that infant mortality in the Nuauulu population in Rouhua is higher than in the non-Nuauulu population in Makariki. Social factors such as education, health and

---

<sup>1</sup> I am grateful to Dr Bridget O'Laughlin and Prof Ben White from the Institute of Social Studies, The Hague in The Netherlands, for their help during my research work period

\*Coordinator of the Center for Children and Development Studies. E-mail: [Lusiapeilouw@yahoo.com](mailto:Lusiapeilouw@yahoo.com).

culture are considered determinants of the mortality together with household economic resources. None of these socio-economic factors works alone but through links among them as analysed using Mosley and Chen's framework (1984). Therefore, I argue that different availability of and access to social services and economic resources are the major reasons for the different trends. Cultural practices are not a problem if social and economic needs are properly satisfied. Political will and the concern of the Government are the crux of the matter in this context. Excluding ethnic communities from social policies makes people within those communities vulnerable.

**Keywords:** Nuaulu; Ethnicity; Social Policy; Social Exclusion

## **INTRODUCTION**

During the six decades since independence, Indonesia has experienced impressive economic growth and improvements in development indicators. However, the improvements are not equally spread since some social groups, including the so-called indigenous communities, remain underdeveloped.

Social and economic inequality can be revealed through demographic studies focusing on, among other factors, mortality. The United Nations lists three benefits of such studies. Firstly, they provide information for assessing inequalities among people with respect to longevity and health; Secondly, data on mortality differentials help to identify those underprivileged segments of the population which experience higher mortality levels; and. Lastly, studies of mortality can be the basis on which proper policy measures for reducing mortality are developed, selected and improved (United Nations 1986). We can also be more specific in focusing on infant mortality since it relates to accessibility to maternal medical care, health care systems more generally, educational services, the kinds of economic activities people engage in and how they manage their natural resources in order to have household food security, etc. Many of these factors are shaped and affected by government policies. Therefore, if there are major differences between indigenous and non-indigenous communities, there must be something wrong in the development policies of the Indonesian Government at least at district level.

This paper presents the findings of fieldwork carried out in 2005, aimed at exploring the nature of the causes of infant and child mortality differentials between the Nuaulu<sup>2</sup> and non-Nuaulu populations in Maluku Tengah District, Maluku, Eastern Indonesia. Those findings were used to criticise Government policies regarding the needs of human development of indigenous groups, look at what the Government has done and at what the Government has to do.

---

<sup>2</sup> Nuaulu is one of the indigenous clans in Maluku .

There is a common belief that infant mortality among the Nuaulu is higher than among the non-Nuaulu communities. Some think that the maintained traditional lifestyles and cultural beliefs of the Nuaulu are the reasons for the higher level. Others argue that differences in infant mortality reflect social inequality and political discrimination. I was triggered to investigate the truth of these public opinions. Two major questions to be answered included: *what are the trends of infant and child mortality in the Nuaulu and non-Nuaulu populations?* and *what determines differences in mortality between the Nuaulu and the non-Nuaulu communities?*

In order to answer those questions, demographic fieldwork was conducted in the village of Rouhua as representative of the Nuaulu community and in Makariki as a non-Nuaulu community both are in Maluku Tengah District. Rouhua consists of 538 people in 90 households while Makariki has approximately 1476 people in 342 households.

Using the Mosley and Chen framework (Mosley and Chen 1984) this study found different trends in infant mortality between the studied communities. Unavailability of (and inaccessibility to) social services and lack of capacity to profit from the economic resources were indicated as the major reasons for infant mortality. It is emphasised here that cultural practices that are still practiced by the Nuaulu people, would be of no consequence if they could gain advantage from development programs.

#### **SOCIO-ECONOMIC DETERMINANTS OF INFANT MORTALITY: THE MOSLEY AND CHEN FRAMEWORK**

Mortality discourse must be connected to health services provided at individual, household and community levels. However, this is not a solitary factor because mortality is also affected by economic and other social measures, such as education. Moreover, for certain populations, like tribal ones, a study of mortality inherently cannot be separated from cultural aspects. Accordingly, analysing pattern and determinant variables of infant mortality among tribal populations needs a framework that covers social (including cultural) and economic variables. For this, Mosley and Chen offer a good framework<sup>3</sup> (ibid.).

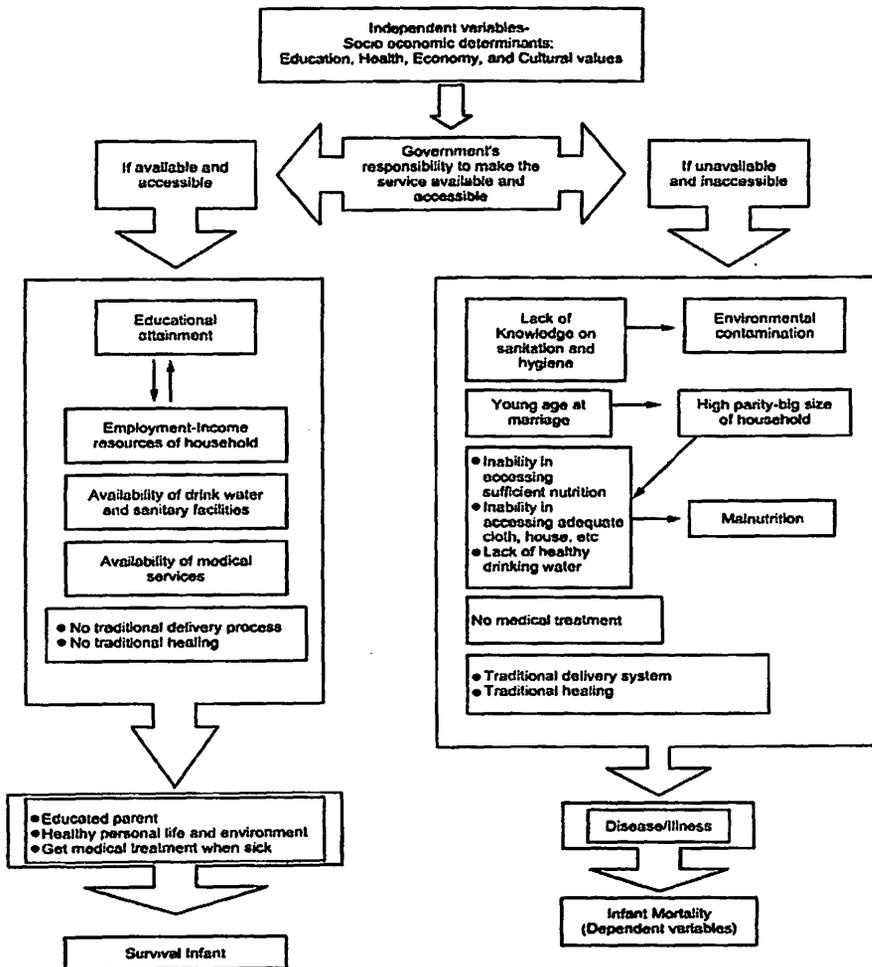
They come up with socio-economic factors as independent variables and infant mortality as a dependent variable and in between the two groups of variables there are some proximate determinants divided into five categories: *Maternal factors* like age, parity, birth intervals; *Environmental contamination* affecting air, food/water/fingers; skin/soil/inanimate objects; insect vectors; *Nutrient deficiency*: calorie, protein, micronutrients; *injury* accidental or intentional and *personal illness* control consisting of personal preventive measures and medical treatment.

---

<sup>3</sup> Their concept is addressed to child mortality but I adapted it, for the purpose of this study, to analyse infant mortality.

Those determinants are distinguished at individual, household and community levels. Variables at individual level are individual productivity; at household level there is household income affecting household welfare and the variables at community level are the ecological setting and political, economic and health care systems.

Additionally, the proximate determinants are general intermediate variables that give possibility to include other significant aspects within a studied community. Therefore I utilise the analytical work of Gebremariam Woldemicael (1999:134) that specifically puts traditional treatments and cultural beliefs in personal illness control as other determinants of infant mortality. In the Nuaulu community the restriction of



**Figure 1.** The Government's role in socio-economic determinants, proximates and infant mortality among the Nuaulu and the non-Nuaulu populations; Developed from the Mosley and Chen framework

baby delivery at home and traditional healing practices are seen as the reasons for infant mortality. However, in the light of the Mosley and Chen framework, I suggest that cultural practice does not work as a single variable since it links to others (Figure 1). Cultural practice will not impinge on infant mortality if other variables are available and accessible.

## ETHNICITY AND EXCLUSION IN INDONESIA

Gerry van Klinken starts his paper 'Ethnicity in Indonesia' with an interesting phrase: '*ethnicity is nowhere but everywhere*' (van Klinken 2003: 64). He criticises government policy especially in the New Order Government under Soeharto (1966-1998) when there were no real or direct policies relating to the huge numbers of ethnic groups within the country<sup>4</sup>. He cites the census as an example, saying that in the censuses conducted during the Soeharto era no single census considered ethnicity. In 1930, during the Dutch colonial times, the census included ethnicity; not to be included again until 2000.<sup>5</sup> Max Weber (as cited in van Klinken *ibid.*: 72) critically condemns this by stating: 'ethnic groups have no fundamental reality of their own but are created for quite a political reason: it is primarily the political community, no matter how artificially organized, that inspires the belief in common ethnicity.' The notion of modernity as a parameter of development has shaped Government policy. Ethnic groups must be 'physically' developed since the groups with their primitiveness and conventionality are not relevant in the context of a modernising state. Consequently, for the sake of development (and modernity) people lose their ethnic identity. Younger generations will not recognise their ancestors, where and how they lived, what had been their livelihood, what kind of language they used, etc. Additionally, since the nineteenth century, many governments have been engaged in a concept of nation building, creating a single national culture, based on the idea that only a culturally homogenous national population could become a modern nation (Rodolfo Stavenhagen in Young 1998: 140). This notion of nation building in Indonesia, especially in the Soeharto era, hid ethnic groups behind the notion of economic development. They were on their land but, again, for the sake of development, with their primitiveness they were hidden somewhere and nobody knew them. A hidden or invisible community, I would call them. Using Benedict Anderson's thought from his influential book 'Imagined Communities' we can criticise the political tendency of the Indonesian Government to make minority ethnic communities imagined communities excluded from development programs. These ideas frame my analysis of the Government policies.

---

<sup>4</sup> World Watch Institute recognises Indonesia as the country with the highest cultural diversity and the highest biological diversity (IUCN 1997)

<sup>5</sup> Colin Mackerras, *Ethnicity in Asia*, pp. 64-87

## **ETHNICITY OF THE NUAULU IN ROUHUA AND NON-NUAULU IN MAKARIKI**

The Nuaulu is one of the traditional clans in Seram which used to live as one community in the centre of Seram Island but is now divided into a number of groups and settled separately in several parts of the Island. One of these groups occupies the vicinity between Sepa and Tampilouw, called Rouhua, on the coast of Seram. Administratively Rouhua is a sub-village of Sepa headed by a *kepala dusun* who is a Government official, structured under the head of Sepa village and *kepala Adat*, the cultural leader.

This traditional community still practices its culture and is strictly regulated by a powerful unwritten traditional law. Some of the restrictions relating to this paper are restrictions on men and women who are not yet recognised as mature enough to get married and prohibition on delivering babies at home. Language, as well as cultural festivals like maturity recognition for men and women, is still maintained. Apart from that, a mature man can be easily recognised since he ties a piece of red cloth on his head like a hat.

Although there are some people from other ethnic backgrounds, who because of a marriage relationship live in Rouhua, I assume that the Rouhua population is homogenous. The reason for this assumption is the fact of cultural assimilation of non-Nuaulu women (I did not find any non-Nuaulu men) married to Nuaulu men being now totally integrated in the Nuaulu life style.

Makariki used to be a purely tribal community practicing strict cultural restrictions until great changes happened, starting in the Dutch colonial period. One of the perpetuated cultural practices is a village governance system. In terms of ethnic composition, Makariki is different from Rouhua. The Makariki population is more heterogynous with people from different ethnic backgrounds in Maluku including Ambon, Kei, Tanimbar and Teon, Nila and Serua. Some of them migrated to this village permanently but others only temporarily because of jobs such as of teachers and paramedics.

## **SOCIO-ECONOMIC CONDITIONS IN ROUHUA AND MAKARIKI**

Rouhua and Makariki have different socio-economic situations. In the educational sector, the Rouhua population is very poor in educational achievement. 45.9% of the population has never attended school with approximately 13.4% currently being primary school age children. There are also many cases of drop out, mostly in the first three years of primary school (see Annexe II for details).

When I was working with the data, I divided the current population into two groups: the first, consisting of those who were born before 1950 or before the Government established a school in this village and the second, of those who were born after 1950. The data show that nobody from the first group attended any school

since there was no school during their primary school age time (there was a primary school only in Sepa). In the late 1950s the Government built a primary school in Rouhua so since then those from the second group could have primary education. However, I found that 46% of this generation still did not go to school and some of them had left school before completion. There are many reasons for this but the major reason is economic inability to afford the school fees. Officially, the Government provides free primary education but there are many additional charges, including indirect payments such as for clothes or uniforms, stationary, food, etc. Nevertheless, some children are able to go to junior high school even though the completion rate is not one hundred per cent. The higher the educational level, the smaller the number of Nuauulu children involved.

Meanwhile in Makariki I found a different situation. School enrolment and completion in Makariki is higher than in Rouhua. Indeed some of those born before the 1950s completed primary schooling. Historically, education in Makariki has been influenced by Dutch colonialism. The older generation could attend primary and higher levels of school through which some of them gained good jobs allowing them to send their children and other family members to school. This improved as the Indonesian Government, just after independence, established national primary schools and later junior high schools. Some people migrated to towns and cities to study, then worked there to send remittances to their families or to pay for the studies of other family members. This kind of social support enables Makariki villagers to achieve better educational attainments.

In the health sector, I also have different figures for both the communities. In Rouhua, drinking water is a serious problem. There are many water resources but no proper system for safe drinking water. Originally, people collected water for all daily needs directly from the spring but later an NGO built a water pool now used for bathing, washing dishes, washing clothes, etc.

Most of the Nuauulu still have traditional houses called *rumah panggung*, literally meaning a tall house that is built of wood and bamboo on stilts about 2 metres above the ground. The empty space at the bottom is mostly used for animals. There is prohibition on using any modern materials, even nails, in house construction. Some of them have no beds to sleep on. However, some people, especially of the new generation, after getting married, build their own houses, using different (let me say, modern) styles, not that of a *rumah panggung*. But still they do not use nails or other modern materials as this is prohibited. Several houses are cement-floored but some only use bamboo.

Sanitary facilities like latrines, are unavailable in the houses, therefore, the area near the beach is used to defecate in. Garbage is thrown down in coastal areas or around houses. Even though this is only green garbage, it can create community health problems as a heap of garbage can host media for vectors of disease. Physically, the people look dirty, both their skins and clothes. Children play on the ground without

slippers or shoes. Dirty mothers, who do not bathe very often or do so without soap, breastfeed babies. Some of them even do not have soap for washing their clothes. Lack of economic resources thus makes them live an unhealthy life, apart from their lack of knowledge on sanitation and hygiene.

The medical service is dramatically poor. There is no public health centre (PUSKESMAS), subsidiary medical post (PUSKESMAS PEMBANTU) or paramedics<sup>6</sup>. PUSKESMAS, medical doctors and paramedics are based in adjoining villages, Sepa and Tamilow<sup>7</sup>. To get to the PUSKESMAS in Sepa people must walk for 5 kilometres or for 6 kilometres to PUSKESMAS Tamilow. If in urgent need of medical help, it is difficult to see a doctor or paramedic due to the distance and lack of means of transportation and communication.

All villagers have *kartu sehat* to get free medical attention but the distance becomes an obstacle to access the services. The only Government program available for them is POSYANDU<sup>8</sup>, once a month, when a doctor from the PUSKESMAS Tamilow comes to this village at POSYANDU time and this is the only way sick people can access medical services. There is a dependence of people on the POSYANDU program.

Meanwhile, in Makariki, potable water is available through the water pool, wells and pump wells around the village. Some households, indeed, have piped water at home. The villagers have modern 'permanent' houses with latrines, which are totally different from those of the Nuaulu people. But Makariki villagers treat garbage exactly the same as Rouhua villagers, by throwing it out in the coastal area, in the river or in the backyard under the trees or burning it. In terms of medical services, this village has a PUSKESMAS PEMBANTU: some paramedics, one nurse and two trained midwives. They play an important role in educating people on sanitation and hygiene as well as family planning. Medical services here are not only available but also accessible since all families, here too, hold a *kartu sehat*.

In terms of economic livelihood, people in Rouhua mostly depend on what nature and the environment provide. Hunting, collecting, fishing and conventional farming are the way to earn a living. The food from such activities is firstly used for household consumption and only if there is anything left over, will it be sold for household income.

---

<sup>6</sup> A few years ago, the Government sent a trained midwife to this village but she did not stay long because she was never given the opportunity to help women in birth deliveries because the villagers preferred their traditional midwife; People prefer to use and keep their traditional recovery system.

<sup>7</sup> Rouhua is located in between these two villages

<sup>8</sup> POSYANDU is the acronym of *Pos Pelayanan Terpadu* or integrated health service. Officially, this program offers integrated health services ONLY to pregnant women, newly born infants and children (under five); not to others. But other Nuaulu, because this is the only medical service available for people in this community, visit it also to meet medical personnel.

Besides the conventional means of subsistence, there are also some cash crops for income generation, such as coconuts, cloves and nutmeg, planted by older people of some generations back. These plants, especially cloves, were the most profitable commodities at least till the mid 1990s, when economic disaster hit Indonesia. Now people cannot rely on them anymore. Alternatively, for the last 10 years, the Nuaulu people have grown coffee and cocoa. However, people perceive these crops as unprofitable. The problem is market integration. People do not sell the crops directly to the market but through middle traders, sometimes at a very low price. The distance between Rouhua and Amahai or Masohi where the markets are located, with the consequence of a high cost of transportation, impedes them from reaching the markets. We can say that the livelihood of the Nuaulu people is meagre<sup>9</sup>. Sometimes, for months, they earn nothing. They have difficulty in fulfilling all the needs of household members especially those of growing children. They have to decide on the most important needs to meet and ignore others, preferring to allocate the limited income for cultural needs and events rather than other social needs.

Basically, the means of subsistence of Makariki villagers are similar to those of Rouhua: farming, fishing and hunting. However, Makariki villagers have good access to the market in Masohi since it is located closer to the administrative centre of the Maluku Tengah District. For 3.000 rupiah<sup>10</sup> Makariki villagers can reach the market, while Rouhua villagers need 20.000 rupiah to reach the same market. Apart from that, people have adopted new farming and fishing technology and knowledge which support household economic development.

The economic activity of the Makariki villagers is more diverse, ranging from selling at a small kiosk at home or establishing smallholder businesses in the village to working in the city of Masohi as housekeepers, shop keepers, drivers of public transportation and Government officials. While these people prefer to stay in the village, a number of villagers have been migrating to other cities like Ambon, the capital of Maluku Province, to study or work. Some of those who move temporarily for study, mostly at teacher training college, return home after finishing college and work as teachers. While the working migrants send their remittances to their families in Makariki. These all constitute social and economic support systems for better standards of living at household, family and community levels.

## DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

**Mother's level of education** is the first characteristic to be discussed. Most of the Nuaulu women have never attended school while in Makariki only 2.6 % of the female population did (Annexe II). The percentage of Nuaulu women who completed

---

<sup>9</sup> It is difficult to standardise the household incomes to measure their poverty levels using, for example, the BKKBN standard of 10.000 rupiah income per day.

<sup>10</sup> Rupiah is Indonesian currency. 3.000 rupiah equals 0.15 US dollar. 20.000 is equal to 1 US dollar

any level of education is lower than among Makariki women with the percentage of the Nuaulu women who could not complete their school levels higher than of the Makariki women. Makariki women can continue their study up to higher education (Academy or University) levels, although some of them cannot achieve it. Meanwhile, none of my respondents in Rouhua reached such an educational level. Generally speaking, the educational level of the Nuaulu women is lower than that of the Makariki women.

**Maternal care**<sup>11</sup> among the Nuaulu is carried out traditionally. The antenatal care (ANC), aimed at a safe and secure pregnancy, is supervised by the untrained village midwife.

However, there has been a slight improvement in the last two years since a doctor from the PUSKESMAS Tamilouw has regularly visited Rouhua at POSYANDU time. According to her, the pregnant women, especially young expectant mothers, have the awareness to use the maternal care at the POSYANDU and their visits have increased since she came. Some old women, predominantly, believe in their own experience rather than that of the medical personnel.

In Makariki, the ANC, especially at the early stage of pregnancy, is primarily administered by a medical midwife. At the advanced stage (after 28 weeks) women prefer to consult the village midwife, considering the experience of the aged traditional midwife important.

**Assistance during delivery** in both Rouhua and Makariki is rendered by the village midwives. However, in Rouhua birth attendance is purely traditional without the use of any modern equipment. Traditional midwives help the mother during delivery and her baby in his/her first days. To cover a baby's umbilical stump the traditional midwife uses the customary mixture of mashed turmeric and cooking oil. Later, I found that this practice has been found to have a connection with infant death.

In Makariki, even though medical midwives exist, people prefer the traditional one to help them in view of her experience. However, this is not a problem since the village midwife has been medically trained by paramedics from the PUSKESMAS so that she has knowledge of medical principles in birth attendance. Usually for taking care of a baby after delivery, including the covering of the umbilical cord stump, the mother and family prefer to ask the medically trained midwife.

**Place of birth** in the Nuaulu community is restricted by cultural norms. Women are not allowed to deliver at home as blood from a woman's body is considered dirty which will bring misfortune to the village or be an obstacle to the blessing of the villagers. The villagers believe, and it seems to happen very often, that violation of this restriction causes death or other calamity within the household. Following that restriction, a hundred per cent of the Nuaulu women delivered at a shelter called a

---

<sup>11</sup> I focus only on Antenatal Care (ANC)

*posune*<sup>12</sup>. Some days prior to the advent of the new family member, the family has to build a *posune* and bring the mother and midwife there.

There is a payment requirement to be fulfilled by the family before bringing the new baby home. The payment goes to the midwife and the ‘treasurer’ of kinship. Normally the father of the baby has to prepare everything prior to his/her birth. But economic factors may make it difficult for the family to afford it. The longer the family needs to pay, the longer the baby must stay in the *posune*. Mostly the newborn baby and the mother need at least 2 weeks before going home, which in fact is not a short time, because during this time the newborn is prohibited from having contact with anyone/anything outside the *posune*, even with the sun which is good for his/her health or with a medical person if he/she has a medical problem.

Meanwhile, 99.6% of the 251 respondents in Makariki delivered at home and the rest delivered at Masohi Hospital. The Government has provided a POLINDES<sup>13</sup>, but the women feel more comfortable delivering at home.

**Fertility rate** will be discussed by presenting the average age of the mother at the time of the first delivery, birth interval and parity which affect one another. The majority of the Nuauulu women give their first birth at a young age, younger than that of the Makariki women. In the Nuauulu tradition, women are allowed to have a child

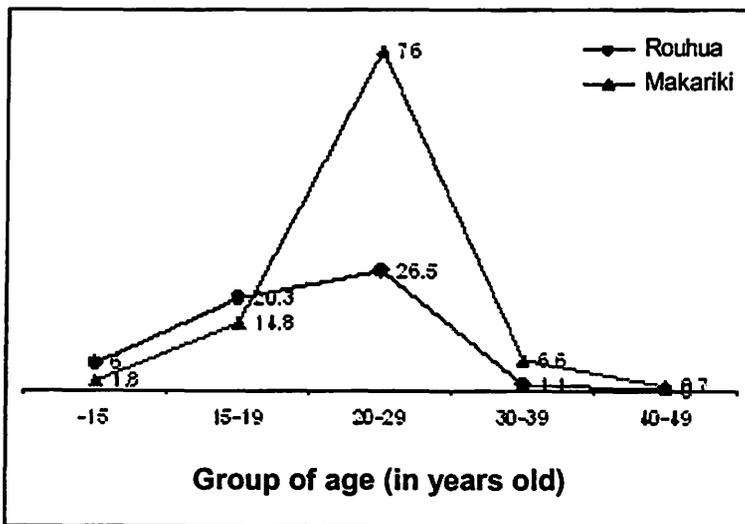


Figure 2. Percentage of women who deliver their first baby at the grouped ages

<sup>12</sup> A *Posune* is a special shelter built outside the settlement area of the Nuauulu to isolate a woman who is menstruating or delivering her baby. This is indeed an isolated place which men and non-Nuauulu women are not allowed to enter.

<sup>13</sup> POLINDES is an acronym of *pondok bersalin desa* which literally means village birth delivery post. At this post a medically trained midwife can help in the birth delivery process.

after marriage and a woman is allowed to marry after being tribally recognised as a mature woman<sup>14</sup> through a traditional ceremony called the *pinamou*. Mostly Nuaulu women get married after the *pinamou*, and start to have a child at a young age. For different reasons, a Makariki woman is also allowed to have a child after getting married. Figure 2, shows that the youngest age of first delivery for the Nuaulu women is 13 years while for the Makariki it is 18 years. This means that the Nuaulu women marry at younger ages than the Makariki women and consequently start to have children at a younger age.

The majority of women give birth between the ages of 20 and 29<sup>15</sup> with different percentages among each community with 76% in Makariki and 26.5% among the Nuaulu. This means that three quarters of the female population in Makariki deliver their first baby at the age of 20-29 and in Rouhua only about one quarter of the female population do so.

**Average Birth intervals** can be seen in Figure 3. It shows that the number of births with an interval of less than 2 years is higher for the Rouhua than for the Makariki population. There are some Makariki women with birth intervals of more than 5 years but none in Rouhua. Mostly Rouhua women have children within a narrow interval. This trend affects the parity within each population.

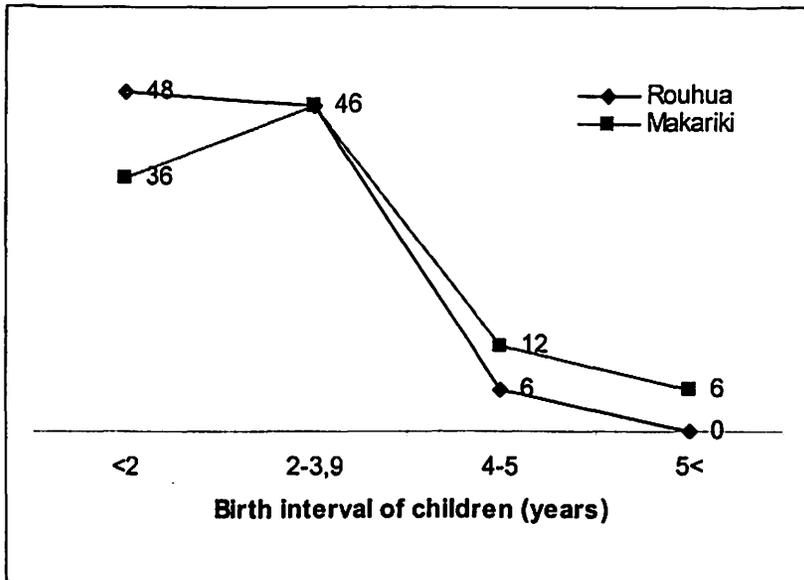


Figure 3. Percentage of births within intervals of births in Rouhua and Makariki

<sup>14</sup> Maturity of a woman is recognised through biological maturity indicated by menstruation.

<sup>15</sup> Grouping the ages of mothers follows the DHS as presented by Mahy 2003: 11-13

A small interval between births results in a high parity. Figure 4 shows that parity among the Nuauulu is higher than among the Makariki population over the groups of mothers' years of fertility. This also shows that fertility is higher within Rouhua. The result of Total Fertility Rate (TFR) calculation (Annexe III) indicates a higher TFR of Rouhua with 5.4, than of Makariki with 2.9. Comparing the numbers to the national benchmark, the TFR of the Nuauulu is higher than the national TFR which is 2.6.

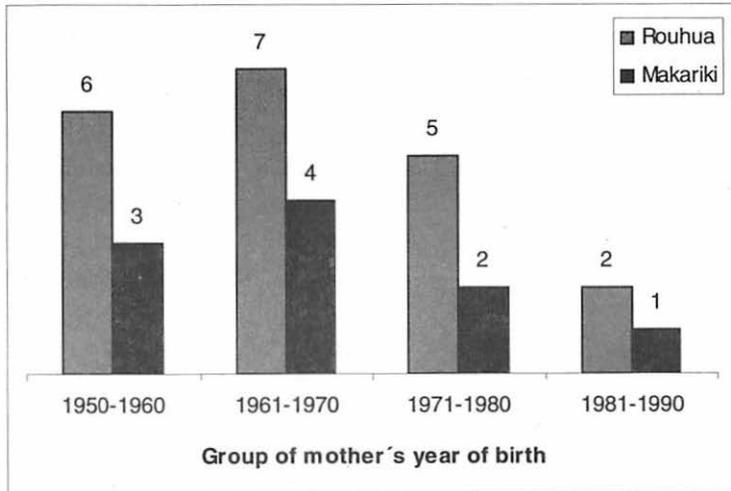


Figure 4. Parity in Rouhua and Makariki

The small interval between births, high parity and TFR which are also affected by the absence of family planning,<sup>16</sup> has an impact on household size. It was found that the household size of the Nuauulu population is bigger (5.98) than of the Makariki population (4.3).

**Health status of mother and her baby at birth** in the Nuauulu population is risky. The delivery process at an isolated place puts the mother and her baby at a distance from primary maternal care after delivery. When baby or mother have health problems and need the help of a medical practitioner, they cannot access it even if it is available. Once, a doctor at Tamilow PUSKESMAS told the story of a baby in the *posune* who was really sick and the traditional healer was unable to help her. The father of the baby went to see the healer and asked for medicine which she would not

<sup>16</sup> Family planning is not acceptable in the Nuauulu community because the people believe that children are given by the Almighty and can only be limited naturally. Meanwhile, in Makariki, family planning is successful as indicated by the increasing number of acceptors over the years, according to Makariki paramedics.

give because she considered that giving medicine without any diagnosis was risky for her professionalism. The baby died.

A baby can meet a medical person after leaving the *posune* and the health status of both mother and baby can be recorded. But they have to wait till the father or family can afford the required payment and then wait for the POSYANDU time. The important point here is that the family has to bring the newborn baby home quickly, to make contact with outsiders. For most of the Nuaulu this is not easy for reasons of economics. For the Makariki, recording the health status of mother and baby is no problem.

### TRENDS IN INFANT MORTALITY: WHAT DO THE NUMBERS SAY?

Figure 5 shows that the infant mortality rate (IMR) in Rouhwa in 2000-2005 was higher than the IMR in the Makariki population. The differences between them are incredibly significant especially in 2001 and afterwards where the IMR of Rouhwa was approximately three-fold that of Makariki. If we compare the rates to provincial and national benchmarks we find that the IMR in Rouhwa is higher than the national IMR while that in Makariki is lower. Muhidin (2002:40) claims that IDHS 1997 found the IMR of the Maluku Province was 29.5 during 1987-1997 and at the same time Indonesia had 52.2 infant deaths per 1000 births. The latest Indonesian DHS, 2003, shows that Indonesian IMR 2002/2003 was 34.7 per 1000 live births per year.

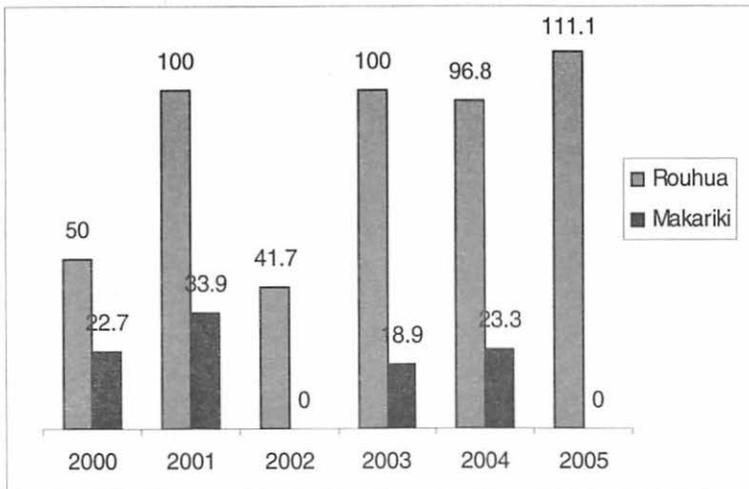


Figure 5. Infant Mortality Rates in Rouhwa and Makariki 2000-2005

## NATURE OF INFANT MORTALITY: CAUSES OF DEATH

Infant mortality within both communities was mostly caused by diarrhoea, malnutrition<sup>17</sup> and malaria. There was also a case of Tetanus in Rouhua.

**Tetanus** was suffered by a young baby, less than 14 days old, caused by a kind of bacterium called clostridium. Some literature indicates neonatal tetanus is the main killer for other tribal groups in Indonesia such as the *To Bungsu*<sup>18</sup> tribe in South Sulawesi. Mustamin Alwi argues that most infant mortality is caused by tetanus. This group practices the same system of birth delivery assistance as the Nuaulu, by a traditional midwife using no modern equipment. For cutting the umbilical cord the traditional midwife also uses a piece of bamboo (Mustamin Alwi in Swasone 1998). However, it is not clear whether the presence of tetanus was the result of traditional practices. It is also not clear how the *To Bungsu* people treat the umbilical cord stump of their newborn babies. Nevertheless, it is important to note that tribal communities are vulnerable to tetanus.

Sari Pratiwi (in Swasone 1998) reports that the Sasak tribe on Lombok Island, Nusa Tenggara Barat Province, also uses a piece of bamboo for cutting the umbilical cord. But whether this practice relates to infant mortality in the Sasak community is not reported. Infant mortality within this tribal community, she says, other researchers found, is related to maternal factors<sup>19</sup>.

The Nuaulu's traditional midwife argued that it is *pamali*<sup>20</sup> to use modern tools because they bring bad luck to the baby and mother or family. However, one conclusion derived from my literature study, is that using a conventional tool like a piece of bamboo in child delivery is practiced in many tribal communities but it is not compulsory for any specific community. This practice is formed by the situation in the old days when there were no 'stainless steel' scissors or knives, as we have now. The only option was bamboo and that practice is maintained till now.

Among the Nuaulu, clostridium can contaminate the newborn by two means. Firstly, by non-sterilised bamboo as a cutter and secondly, by turmeric, taken from the soil, used to cover the stump. It can happen that before the turmeric is taken the spores of clostridium bacteria have been growing there.

---

<sup>17</sup> Malnutrition always accompanies diarrhoea and people have difficulty in differentiating one from the other.

<sup>18</sup> The *To Bungsu* tribe lives in the mountain areas of South Sulawesi. Mustawin Alwi says that living in a mountainous area means that the people cannot be reached by development programs. Till 1997-1998 when he did his research there, Alwi found this community was isolated geographically and not developed.

<sup>19</sup> Syahrudin Seman reports that it is caused by parity and Yamada reports the strong correlation between infant mortality and fertility because of the mother's age at giving birth to her first baby and intervals between births (Pratiwi in Swasone 1998).

<sup>20</sup> *Pamalii* means not allowed to do. If you do it, you will meet with misfortune or disaster.

A mother with tetanus antibodies can prevent her baby from getting contaminated by the bacterium. The antibodies result from immunisation. The death due to neonatal tetanus shows that the Nuaulu woman had no antibodies because she was never immunised. On the other hand, since the 1970s, the Government has programmed to immunise all citizens, especially for tetanus and diphtheria. (Unfortunately I could not find out whether the Nuaulu were excluded from that program.)

**Malaria** is a parasitic disease caused by protozoa (*plasmodium spp.*), spread by mosquitoes, circulating in the blood stream (Takken *et al.* 1990). Because the mosquitoes prefer to deposit their eggs<sup>21</sup> on water or in a watery environment, stagnant water and unprotected water pools as well as garbage landfill could be a good habitat for them. This habitat could be created by human action. Foong Kin emphasises that Malaria is associated with human behaviour. Kin also quotes Bruce-Chawatt (1985) that control efforts directed at human hosts generally include three broad areas: chemoprophylaxis, chemotherapy and house and individual self-protection. The last relates to the context of Rouhua and Makariki. If people can manage the environment in order to limit or remove breeding places and life stages of the mosquito, they can protect themselves from malaria.

This requires good sanitation, proper houses and proper clothing. The Nuaulu environment provides a good habitat for mosquitoes through unhealthy garbage landfill and unprotected water pools. 'Proper houses' relates to evading the insects or protecting people from mosquito bites. It means windows should be screened and bed nets used, etc. Meanwhile in the Nuaulu context with their type of houses, people are not protected from mosquitoes. The environmental problem, non-protective clothing and beds without nets expose people to the disease. Even though houses of the Makariki villagers are more protective, the unhealthy treatment of household garbage exposes people to contamination by the vector of malaria.

**Diarrhoea**, which happens when people are contaminated with the bacteria called *salmonella spp.* was found in both communities. Among the Nuaulu, according to a doctor from the Tamilow PUSKESMAS, diarrhoea occurred in some situations. First, it is an impact of malnutrition or a baby's not getting adequate nutrients which later disturbs her/his digestion. Distribution of limited household resources among household members is also connected to the presence of malnutrition. The data show, malnutrition was experienced in households with more than 4 children. Second, some cases were caused by dehydration due to lack of water. Third, it happened as a consequence of an unhealthy environment. Flies, which are the vectors of this disease, like to live in dirty places like rubbish disposal areas. This becomes worse with the open defecation areas along the beach that potentially create habitats for the *salmonella spp.* As people cannot afford to build private latrines at home, this is a problem in

---

<sup>21</sup> The mosquitoes require a water surface on which to deposit their eggs. Even under suitable climatological circumstances, areas free of any stagnant water are usually free of malaria (Takken *et al.* 1990).

Rouhua. However, an international NGO has built one public toilet for them but it is rarely used.

Lastly, the play activities of children have potential for diarrhoea. All children in Rouhua play on the ground with unhealthy toys, often no longer usable things that have been thrown out by adults. Sometimes the toys are collected from a rubbish disposal area. It is not impossible that 'disposed' toys have been the hosts of bacteria and when the children play they sometimes put the unhealthy toys in their mouths. In these ways, children may be exposed to diarrhoea.

The cases of diarrhoea in the Makariki population were connected with sanitation, especially with waste management. People have good types of houses, with good toilet infrastructure and water availability for their daily needs, better than of the Nuaulu, but they do not have any rubbish disposal infrastructure. This creates media for the growth of *salmonella spp.* and also flies, as the agents to deliver the bacteria to the bodies of children through their food.

**Malnutrition** among the Nuaulu is different from that in Makariki. The 14 cases of malnutrition or 47% of the total Nuaulu deaths were caused by the lack of nutrition, meanwhile in Makariki where I found 1 case of malnutrition or 12.5% of the total deaths, it was caused by maternal factors. The mother was very sick and unable to give adequate nutrition to her baby.

Lack of nutrition for the Nuaulu children is not a matter of shortage of food since their arable land produces abundant food naturally. The problem is that they have to share the food for direct household consumption and for making money to satisfy other needs. In some households, food for direct consumption is limited because it must be shared among a number of household members.

This reality can be clearly seen as a crucial fact within big households consisting of more than 6 members where the dependency ratio on the limited household resources is high. The higher the dependency ratio, the more limited food the children consume, consequently the more the children are exposed to malnutrition.

Additionally the causes of infant death among the Makariki people are more various than among the Rouhua. Five deaths during 2000-2005 were caused by malnutrition, diarrhoea, fever and premature birth (low weight at birth). Most of the cases happened in the period of conflict in the Maluku Tengah District when the PUSKESMAS was malfunctioning and no paramedic was in the village. Additionally, food was inadequate because people had no access to the market.

## **THE DETERMINANTS**

If we fit the nature of infant death into the theoretical thinking of Mosley and Chen (op. cit.), we will find that education and health services are social factors and household income resources are economic factors. However, the economic factors do not work independently but as counterparts of each of the social factors. All of

them relate to infant mortality through intermediate factors: environmental contamination, nutrient deficiency, personal illness control and maternal factors.

Lack of education, especially of women, is the main determinant of infant mortality, occurring through some possibilities. **Firstly**, because people have no adequate educational attainment, they cannot have good jobs to earn money even in the informal sectors<sup>22</sup>. All of them depend on conventional livelihoods. The limited household income creates inability to afford a healthy life such as by having soap for bathing, laundry soap, milk as supplementary food for baby, a good bedroom at least for the children, etc.

**Secondly**, lack of education limits people's ability to understand sanitation and hygiene information<sup>23</sup> which diminishes the possibility of personal control of illnesses. **Thirdly**, education affects infant mortality through other demographic characteristics. Unavailability and high cost of higher levels of schooling causes mostly young people, to not continue their studies and get married at a young age. Salahudin Muhidin finds in his study that less educated women tend to marry earlier than their counterparts who are more highly educated (Muhidin 2002:32). Because they married at a young age and the intervals between children are close, they have many children. People who can access higher education, tend to get married later and have longer birth intervals that result in smaller households. Contribution of the household size to the mortality rate can be clearly seen in the data indicating that some households with high dependency ratios have more than one death.

By having easy access to a medical post or medical personnel, people can readily get medical help especially immediate help and the number of deaths can be reduced. The Makariki experience in the period of conflict when the PUSKESMAS PEMBANTU was dysfunctional and some cases of death occurred, is a good example of the importance of medical services.

The absence of medical facilities and medical personnel affects the ANC. The more advanced the pregnancy the greater need for more frequent ANC, like once every two weeks. For the Makariki women it is not a problem because midwives are available but for the Nuaulu women it is a matter of importance because the ANC is only available once a month at the POSYANDU.

Lack of sanitation infrastructure in homes or in public spaces such as the rubbish disposal area, sewage hook-ups, piped water, etc. exacerbate the situation in Rouhua. In this situation the Nuaulu people are more exposed to bacteria or disease vectors and there is the potential to suffer from the killing diseases such as diarrhoea and malaria. Put simply, environmental components contribute positively to the high IMR.

---

<sup>22</sup> No parents in Rouhua at the research time had any occupation outside the village even in the informal sector unlike the Makariki villagers.

<sup>23</sup> As a medical doctor from the PUSKESMAS at Tamilow said, it was difficult to transfer information or explain something regarding personal hygiene and sanitation to the villagers, especially older women.

Economic constraints create inability in villagers to afford healthy lives as discussed in the section on education. We can also see that such economic constraints make people unable to afford cultural requirements. Separate cultural practices and beliefs, such as isolated places of birth and birth attendants, become the determinants when they limit the ability of people to control disease or to access medical services.

### **IS CULTURE AN ISSUE?**

It cannot be denied that cultural practices have impact on deaths in the Nuaulu community. Nevertheless, we have to be careful in explaining the impact of cultural issues on mortality. In the context of the Nuaulu, the cultural practice does not work as an individual factor but in association with other factors. We can start to explain it from an educational viewpoint. Education is needed to acquire good jobs and useful knowledge of hygiene and sanitation.

By having good jobs, people have enough economic resources to pay for the education of other household or family members, pay for health requirements and for cultural needs enabling people to practice their culture without creating problems in other aspects. With adequate economic resources people can afford the required payments and bring their newborn babies home quickly after birth and subsequently the babies can have medical check-ups and treatment. The faster the baby leaves the *posune*, the better he or she is. This means if they have enough money, they can avoid the increasing amount of neonatal mortality.

The common belief that infant mortality among the Nuaulu is higher than among the non-Nuaulu is proven by this study but the cultural practices and beliefs, such as delivering babies at the *posune* with traditional birth attendants, is not the reason, as by improving social and economic conditions, the cultural practices will not be an issue. Government policies and approaches are the problem.

### **DEMOGRAPHIC AND SOCIAL DEVELOPMENT STUDIES**

Comparing the levels of mortality in infants between the two populations with different characteristics has been a useful tool to analyse the political will of the Government. The low infant survival in Rouhua reveals a lack of social provisioning by the Government for this population, while the high infant survival in Makariki discloses good social services for them.

Medical services available for the Nuaulu ANC should be provided regularly as needed, not only at POSYANDU time so that baby and his/her mother does not need to wait for the POSYANDU to access medical help. In the Makariki population with different social, economic and demographic characteristics, infant mortality is low. This indicates that if social provisioning is available and accessible and livelihood is

improved, the Nuaulu people will have good educational levels, good jobs and healthy lives.

We can further look at how social policies can benefit all citizens in need of development intervention. This demographic study lead us to justify that this country has been free from colonialism for decades but still there are some groups of people who live without substantive freedom as argued by Amartya Sen<sup>24</sup>. These groups, like the tribal communities, are not free from poverty and inequality.

## **CONCLUDING REMARKS: SOCIAL INEQUALITY AND ETHNICITY IN INDONESIA**

This study found different trends in infant mortality which explains that the Government does not equally provide social provisioning throughout Indonesia. Some communities are included but others are not. It is apparent in Rouhua where public sanitary infrastructure (public latrines) and water pools were established by NGOs and religious organisations. The Government did nothing.

Administratively Rouhua is integrated in Sepa as the main village. Here, perhaps, the problem is rooted since development programs might be terminated in the main village and never reach Rouhua. If it so, I would argue that the small community is hidden behind the main community.

Rouhua is only one tribal community in Indonesia. The interesting thing is that Rouhua is located in a reachable area. There are so many tribal communities in unreachable areas, for example, Alune, another indigenous community in Manusela in the centre of Seram Island that can only be reached after at least a 2-day walk through a mountainous area. If in Rouhua people are vulnerable due to social inequality, how much worse is the situation in Manusela?

The use of geographical terms in defining a tribal community makes the reality of such a community in reachable areas invisible. The Government has to change the way it names tribal communities; always linked to the geographical context. For example, currently they are called: *Komunitas Adat Terpencil* (KAT) meaning Traditional Remote Community (Ministry of Social Affairs 2003a and 2003b). The word *remote* relates to an unreachable geographical area. In fact the underdeveloped tribal community also exists in reachable areas like that of the Nuaulu in Rouhua.

From now, Local Government has to play a role to create the changes. Decentralisation that has blown out since 2001, should give a good chance to local governments to specifically address the needs of the communities that were invisible during the time of centralisation. The excluded communities must be included to gain benefits from development programs for their better futures.

---

<sup>24</sup> As Amartya Sen says: lack of substantive freedoms relates to satisfying hunger, achieving sufficient nutrition, obtaining remedies for treatable illnesses, opportunities to be adequately clothed and sheltered and to enjoying clean water or sanitary facilities. Lack of freedom links closely to inadequate public facilities and social care... (Amartya Sen 1999:4)

## REFERENCES

- Anderson, B. 1991. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, (Revised edition), Verso, London; New York.
- Asian Development Bank. 1998. *The Bank's Policy on Indigenous People*, retrieved from [www.adb.org/document/reports/](http://www.adb.org/document/reports/) 31 May 2005.
- Asian Development Bank. 2002. *Indigenous Peoples/Ethnic Minorities and Poverty Reduction, Indonesia*, retrieved from [www.adb.org/document/reports/](http://www.adb.org/document/reports/) 2 November 2005.
- Barnes, R.H. 1995. *Being Indigenous in Eastern Indonesia*. Association for Asian Studies, Ann Arbor.
- Biro Pusat Statistik. 1990—1997. *Maluku Dalam Angka*, Kantor Statistik Provinsi Maluku.
- Biro Pusat Statistik. 2002. *Maluku Tengah Dalam Angka*. Kantor Statistik Propinsi Maluku.
- Biro Pusat Statistik. 2003. *Maluku Tengah Dalam Angka*, Kantor Statistik Propinsi Maluku.
- Brauns, L. W. 1989. *Pusaka Huinelo*. Verborgen Erfenolton.
- Bolton, R.A. 1990. "A Preliminary Description of Nuaulu Phonology and Grammar", *Thesis*. University of Texas,. Bell and Howell, Michigan.
- Demography Health Survey. 2003. *Country Statistics of Indonesia*, retrieved from [http://www.measuredhs.com/pubs/search\\_results.cfm](http://www.measuredhs.com/pubs/search_results.cfm) 1 July 2005.
- Ellen, R.F. 1977. "Resources and commodity: Problems in the Analysis of the Social Relations of Nuaulu Land Use", *Journal Anthropological Research*, vol. 33 no.1, the University of New Mexico, Albuquerque, pp. 50—72.
- Ellen, R.F. 1978. *Nuaulu Settlement: an Approach to the Environmental Relations of an Eastern Indonesian Community*. Koninklijk Institute voor Taal, Land en Volkenkunde (KITLV), Leiden.
- Frankenberg, E. 1992. "Infant and Early Childhood Mortality in Indonesia: the Impact of Access to Health facilities and Other Community characteristics on mortality". *Thesis*. Bell and Howell, Michigan.
- Hidayati, D. 1999. *Population and Environment Issues in Maluku: the Case of Western and Northern Seram*. Jakarta: Indonesian Institute of Sciences.
- Indonesia Demography and Health Surveys (Country Report 2002-2003)*. 2003. Ministry of Health, Jakarta, Indonesia; retrieved from [www.measuredhs.com](http://www.measuredhs.com) 1 July 2005.
- Indonesia Demography and Health Surveys (Country Report 1997)*. 1998. Ministry of Health, Jakarta, Indonesia, retrieved from [www.measuredhs.com](http://www.measuredhs.com) 1 July 2005.
- IUCN Intercommission Task Force on Indigenous Peoples. 1997. "Who is indigenous peoples". Chapter 1 in *IUCN Intercommission Task Force on Indigenous Peoples. Indigenous Peoples and Sustainability: Cases and Actions*. Utrecht: International Books.

- Kin, F. 2000. *Social and Behavioural Aspects of Malaria Control: a Study Among the Murut of Sabah*. Borneo Research Council, Philips USA.
- Lautenbach, H. 1999. "Demography Survey Research in Irian Jaya, Population Dynamic in the Teminabuan Area of the Bird's Head Peninsula of Irian Jaya Indonesia." *Thesis*. Publication, Amsterdam.
- Mahy, M. 2003. *Child Mortality in the Developing World*. HDS Comparative Reports, no. 4, ORC Macro, Calverton, Maryland USA.
- Marhaeni, A. A. Istri. 1993. *Analisa Perkembangan Kependudukan Menurut Sensus Penduduk 1990: Dinamika Mortalitas Maluku - Irian Jaya*. Yogyakarta: Pusat Penelitian Kependudukan, Universitas Gadjah Mada.
- Masset, E and Howard White. 2003. *Infant and Child Mortality in Andhra Pradesh: Analysing Changes Over Time and Between States*. Institute of Development Studies University of Sussex.
- Ministry of Health. 1993. *Posyandu and Primary Health Care in Indonesia*. Jakarta: Department of Health Affairs.
- Ministry of Social Affairs. 2003a. Decree of Director General of Social Empowerment, no. 020.A/PS/KPTS/VI/2002 concerning the implementation guidelines of Traditional Remote Communities, Directorate of Traditional Remote Community Empowerment, Ministry of Social Affairs, Indonesia.
- Ministry of Social Affairs. 2003b. The standardisation guidelines of counselling and evaluation on traditional remote communities empowerment policy, Directorate of Traditional Remote Community Empowerment, Ministry of Social Affairs, Indonesia.
- Muhidin, S. 2002. *The Population of Indonesia: Regional demographic scenarios using a multiregional method and multiple data sources*, Rozenberg, Amsterdam.
- Nuryadin, La Ode T. 2004. KAT: Riwayatmu Nanti! Pemberdayaan yang Terdistorsi; KAT: sebuah Fenomena, article in KAT-CENTER, retrieved from <http://www.katcenter.info> 2 November 2005
- Sen, A. 1999. *Development as Freedom*, Oxford: Oxford University Press.
- Shryock, H. S, Jacob S. Siegel and Associates. 1976. "Racial and Ethnic Composition", Chapter 9 *in Studies in Population - The Methods and Materials of Demography*, Academic Press, Inc.
- Shryock, H. S., Jacob S. Siegel and Associates. 1976. "Mortality", Chapter 14 *in Studies in population - The Methods and materials of demography*, Academic Press, Inc.
- Stavenhagen, R. 1998. "Indigenous Peoples: Emerging International Actors". In Crawford Young (ed), *Ethnic Diversity and Public Policy, a Comparative Inquiry*. UNRISD, Antony Rowe Ltd, Chippenham, Wiltshire, pp. 133—152.
- Swasono, M.F. 1998. *Kehamilan, Kelahiran, Perawatan Ibu dan Bayi Dalam Konteks Budaya*. Jakarta: University of Indonesia.

- Taken, W., W.B. Snellen, J.P. Verhave, B.G.J. Knols and S. Atmosoedjono. 1990. *Environmental Measures for Malaria Control in Indonesia – an Historical Review on Species Sanitation*. Agricultural University, Wageningen, The Netherlands.
- United Nations. 1986. “Determinants of Mortality Change and Differentials in Developing Countries: the Five-Country Case Study Project”. *Populations Studies*, no. 94, United Nation Publications.
- van Klinken, G. 2003. “Ethnicity in Indonesia”. In Colin Mackerras (Ed) *Ethnicity in Asia*, Routledge Curzon, pp. 64–87.
- Woldemicael, G. 1999. *Infant and Child Mortality in Eritra: Levels, Trends and Determinants*, Demography Unit Stockholm University, Akademitryck AB, Edsbruk.

## Annexes

### Annexe I: School enrolment of Nuaulu.

Enrolment	Number	Precentage
PS	115	21.4
DO PS	32	5.9
JHS	41	7.6
DO JHS	10	1.9
SHS	9	1.7
HE	5	0.9
Never	247	45.9
Not Yet	79	14.7
Total (n)	538	

### Annexe II: Educational attainment of respondents (women) in Rouhua

Level of education	Rouhua	
Primary School	Complete	9.4
	Not complete	23.5
JHS	Complete	8.2
	Not complete	2.4
SHS	Complete	2.4
	Not complete	0
HS/academic/University	Complete	0
	Not complete	0
Never		54.1
Total respondents		85

### Annexe III: Data and Calculation for Demographic characteristic of respondents

#### a. Birth Interval

Interval of birth	Numbers of births	Percentage of birth in the interval of age (n= 85)
<2	41	48
2-3,9	39	45
4-5	5	6
5<	0	0

#### b. Parity

Mother's year of birth	Numbers of women (a)	Numbers of babies (b)	Parity : (b) / (a)
1950-1959	9	55	6.11
1960-1969	30	209	6.97
1970-1979	25	137	5.48
1980+	18	40	2.22

#### c. Total Fertility Rate

Mother's year of birth	Numbers of women	Numbers of birth	Birth per 1000 women
1950 - 1959	9	55	6.11
1960 - 1969	30	209	6.97
1970 - 1979	25	137	5.48
1980+	18	40	2.22
<b>TFR</b>	<b>82</b>	<b>441</b>	<b>5.38</b>

#### Annexe IV: Infant Mortality Rate

Infant mortality rate is the number of infant who died before first birthday per 1000 birth. IMR for Nuaulu is come from:

Year	Births	Deaths	IMR*
2000	20	1	50
2001	20	2	100
2002	24	1	41.7
2003	30	3	100
2004	31	3	96.8
2005	9	1	111.1

$$*IMR_x = (Death_x / Birth_x) 1000$$

x = year