CHAPTER VII

DISCUSSION, CONCLUSION AND RECOMMENDATION

7.1 Discussion

7.1.1 Methodology

The targeted group of this research was children aged 6 to 17 months. The starting point of 6 months of age is also the starting time of complimentary feeding. As seen in the Growth Monitoring Chart, it is during this period of time that the child grows the most. Further more, according to National Nutrition Survey 2000 in Vietnam among this age the prevalence of child malnutrition increases most sharply. Therefore, this time is the most important time for the process of child growth.

This research uses WHO reference population for calculating child anthropometric indices. Many feel that the reference population is not appropriate for Asians. However, it is appropriate in my research for the following reasons. Firstly, some countries in the region have approached the reference population e.g. Japan, South Korea, and Singapore. The prevalence of underweight of children under 5 in Singapore in the year 2000 was less than 3.3 per cent [53], compared with 2.5 per cent of reference population. Therefore, the reference population is a goal that Vietnam could achieve in the future. My research aims to provide evidence for making long-term policies. As almost all child nutrition surveys in Vietnam has been done using WHO reference population for calculating child anthropometric indices, to compare the results I had to use the same methodology.

For analysing the association between child nutritional status and other variables, this research performed multilevel modeling analysis. This is a new development statistic method and very complicated in calculating. However, the development of computer statistics software (MLwiN, SAS, STATA) helps us execute the analysis very quickly and easily. This method can be applied in many kinds of research to avoid errors when analysing hierarchical data. As seen, almost all public health research creates data hierarchies such as subjects grouped by geographic characteristics. Many designed experiments also create hierarchical data, for example clinical trials carried out in several randomly chosen centres or groups of individuals. Not only observation studies but also longitudinal studies also can apply this method.

7.1.2 Nutritional status of children

Among the five surveyed provinces, the research found that child nutrition status in DaNang was best in terms of all three anthropometric indices. The middle group was HungYen an BenTre. PhuYen and LaoCai were the lowest group. DaNang is a big city, where every characteristic is much better than the others. HungYen and BenTre located in Red river delta and Mekong delta are in the most favourable agriculture areas of Vietnam. LaoCai, a mountainous province, is the one of poorest and most difficult provinces in Vietnam. PhuYen is half mountainous half coastland. The mountainous part has conditions similar to those in LaoCai, the coastland suffers severe natural disasters each year. Therefore, findings are as was expected.

There were no figures of child malnutrition reported for the age group (6 to 17 months) in the selected provinces. However compared with the figures of children aged under two years in Vietnam in 2000, the findings in this research are consistent with what was found in the Vietnam Nutritional Survey 2000 [54], namely that the prevalence of stunting, underweight and wasting was 30 per cent, 25 per cent and 9 per cent respectively.

This research found that there were apparent differences of nutritional status among girls and boys in the surveyed sample. That was also reported in some national surveys like Vietnam National Protein Energy Malnutrition Survey 1998, Vietnam Household Living Standard Survey 1998 [13] and international analysis [1].

Regarding child age, the findings show that the child nutritional status decreased rapidly from 6 to 17 months of age. This has been observed in every research study undertaken at both a local and international level. In detail, compared with height-for-age, weight-for-age reduced much more in the age interval 6 to 11 months. After that, the two indices decreased at a similar velocity. This result shows that the period 6 to 11 months is the time when children start to lack protein energy. As usual, the effect is seen in child weight first, then child height. The findings confirm that this interval of age (6 to 17 months) is the one of most important time for intervention on reducing prevalence of child malnutrition.

7.1.3 Contributing factors to child nutritional status

The multilevel modeling analysis found the association between some community characteristics and child nutritional status in the targeted provinces beside child, caregiver and household characteristics. The association of child characteristics (sex, age, birth weight, and antenatal care), caregiver characteristics (age, education,

and ethnicity), and household economic status and child nutritional status that was reported in previous research was confirmed in this research in the five provinces. The community characteristics found to have association with child nutritional status were location of the commune, commune basic service index and commune health care index.

The first community characteristic associated with child height-for-age was *location of the commune*. The analysis shows that the plain communes had the advantage over the mountainous commune. This is consistent with what was found by Stefanie, et al [13]. It is easy to recognize the difference between mountainous areas and lowland areas in Vietnam in almost every aspect (economics, education level and infrastructure). Therefore, it is also easy to explain the association of the location of the commune and child nutritional status.

The second community variable involved in the multilevel modeling analysis was the *commune basic service index*, a proxy variable. This index was combined from dummy variables: *having any shop selling basic provisions*, *available public telephone system*, *piped water system*, *available daily market inside commune variable.* The findings show that children living in the commune having more basic services tended to have higher height-for-age Z-scores. These services show the development level of the commune. Therefore, they are strongly associated with child nutritional status.

The last community variable was *commune health care service index*. This was also a proxy variable combined from the variables: *distance to the nearest public hospital*, *commune health centre provided fee reduction services for children, commune health centre provided fee reduction services for the poor, having any on-going child health programme (*not including Expanded Programme on Immunization programme), *number of private clinics inside the commune, number of pharmaceutical stores inside the commune.* All of these characteristics represent the ability to access health care services of the people living in the commune. The findings reveal that the higher ability to access health care services, the better child nutritional status is. This evidence confirms the role of health care on child growth.

7.2 Conclusions

This research examined the nutritional status of children in five provinces (PhuYen, BenTre, LaoCai, HungYen and DaNang) and its potential contributing factors based on a representative sample of 1994 children aged 6 to 17 months. Nutritional status was assessed on the basis of three anthropometric measures, namely weight-for-height, weigh-for-age, and height-for-age. Potential contributing factors were examined by multilevel modeling analysis. Below are conclusions drawn from the results of the analyses.

Overall child nutritional status in all of the five provinces was lower than that of the WHO reference population. In detail, the prevalence of stunting of children aged 6 to 17 months in DaNang, BenTre, HungYen, PhuYen and LaoCai was 9 per cent (95%CI[8.3-9.9]), 11 per cent (95%CI[10.4-11.3]), 14.3 per cent (95%CI[13.9-14.8]), 18.7 per cent (95%CI[17.6-19.8]) and 32 per cent (95%CI[31-33]) respectively. The prevalence of underweight of children aged 6 to 17 months in DaNang, BenTre, HungYen, PhuYen and LaoCai was 15.4 per cent (95%CI[14.7-16.1]), 24.8 per cent (95%CI[24.1-25.5]), 20.6 per cent (95%CI[19.9-21.4]), 31.7 per cent (95%CI[30.5-33.0]) and 30.6 per cent (95%CI[30.0-31]) respectively. The prevalence of wasting of children aged 6 to 17 months in DaNang, BenTre, HungYen, PhuYen and LaoCai was 4.6 per cent (95%CI[4.4-4.8]), 13.7 per cent (95%CI[13.0-14.3]), 3.3 per cent (95%CI[3.3-3.6]), 9.4 per cent (95%CI[8.6-10.2]) and 2.2 per cent (95%CI[2.1-2.3]) respectively.

Female children had the nutritional edge over male children in the surveyed provinces. The other characteristic of child nutritional status in the provinces is that it continuously decreased by a considered magnitude the higher the age. As expected, prevalence of malnourished children in poor families was much higher than that in the rich families.

There was evidence of a strong association between some community characteristics and child nutritional status in the five provinces. Geography (mountainous or plain), available basic services and the health care environment significantly associate with child nutritional status.

7.3 Recommendations

Based on the findings of this research, some recommendations below are given for controlling child malnutrition in the five provinces as well as other parts of Vietnam:

- Child malnutrition still remains a major public health problem in the five provinces. Because of its serious consequences, the government and NGOs should pay more attention and resources to reduce the prevalence of malnourished children.
- Prevalence of stunting and underweight children although varying across provinces remains sufficiently high to justify programmes to prevent childhood malnutrition in all provinces. However, mountainous areas should receive special attentions because of the severity level in these areas.
- Intervention programmes on changing child nutritional status should be directed toward preventing early growth retardation that occurs in children under 2 years of age.
- Intervention by providing basic services and adequate health care at community level could affect child nutritional status strongly. Such intervention at a community level usually has more beneficiaries and remains more sustainable than the interventions at an individual level.

7.4 Research in the future

The findings of this research are interesting. However, the research has also raised some more questions below which could be the subject of future studies:

- Why does the prevalence of malnutrition increase so rapidly from 6 to 17 months?
- Why is the prevalence of malnutrition in male children higher than female children?
- Is it more cost effective to intervene by improving health care and basic services at a community level to improve child nutritional status compared with intervention at an individual level?

This kind of research (examining the role of community factors on child nutritional status) should be done at the national level. The data of some national surveys like Vietnam Household Living Standard Survey, Vietnam Demographic and Health Survey, Notational Health Survey could be used to do this research.