THESIS TITLE : COMPARISON OF EFFICIENCY AMONG PROVINCIAL HEALTH SURVEY AND CASE STUDY SAMPLING DESIGNS AT VARIOUS PREVALENCE OF DISEASE FOR A HEALTH SURVEY AT THE PROVINCIAL LEVEL.

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ABSTRACT

This study is a descriptive simulation research for comparing the efficiency of three provincial level sampling designs: Provincial Health Survey (PHS), Non-stratified Provincial Health Survey (NPHS) and Stratified two-stage 40-cluster sampling (40-Clu). The comparison was made at three different disease prevalences

A sampling frame was set up using demographic structures of Kalasin province in 1997 and using relevant records from the village disease surveillance system in 1997. The sampling frame composed of 25 communities , 5,079 households and 1,656 children under five years of age in monopolitain areas, and 1420 villages , 172,344 households and 62,439 children at the same ages in rural areas was achieved. Prevalences of diarrhea , pneumonia and Dengue haemorrhagic

fever (DHF) in the children were also obtained with 0.135 , 0.030 and 0.003 respectively.

Children were randomly selected using three sampling designs. The PHS is a stratified two-stage cluster sampling design by which the existing criteria used for classified area into monopolitain and rural areas were used as stratification factors. With probability proportional to size (PPS) three villages were selected from monopolitain areas and 57 villages were selected from rural areas. From these 60 sampled villages, 15 households per village were randomly selected and all children in the households were studied. The NPHS is a two-stage cluster sampling design by which all villages were ranked according to their population densities before 60 villages were randomly selected with PPS. In each sampled village, 15 households were randomly selected and all children in the households were studied. The 40-Clu is a stratified two-stage cluster sampling design by which all villages were ranked according to their population densities as same as the NPHS. Forty strata of villages were formed with nearly equal population sizes. One village was randomly selected from each stratum and 16 children were randomly selected from each village.

For each sampling designs, 100 samples were obtained. Prevalences(p's) of diarrhea , pneumonia and Dengue haemorrhagic fever and their variance (var(p)) were estimated from each sample. Efficiency of the sampling designs were compared according to precision of the estimates and costs spent in the surveys. Mean square errors (MSE) of the estimates and mean cost were used for the comparison.

This study revealed that for prevalence of 0.135, precision from 40-Clu is lower than that from NPHS and PHS (MSE were 14.18×10^{-4}, 9.75×10^{-4} and 4.59×10^{-4} respectively). However, for prevalences of 0.030 the former design yielded higher precision (MSE were 1.09×10^{-4}, 1.24×10^{-4} and 1.37×10^{-4} respectively). For the

prevalence of 0.003 the precision from the three sampling designs were not much differ (MSE were $0.08x10^{-4}$, $0.10x10^{-4}$ and $0.11x10^{-4}$ respectively). Cost spent in the three sampling designs were rather similar. However cost related to the 40-Clus was about 1,500 baht higher than the total 100,000 baht of PHS and NPHS