

Methods

The study was carried out in 2000 by surveying unused medications at home in Songkla Province located in southern part of Thailand. Sample size of households having unused medication was calculated with Multi-stage Random Sampling to be 400 in selection the households to study.⁶ Following the study, all 931 households were surveyed, 558 of them located in rural area and 373 in urban area. Only unused medications in 453 households (48.7%) were investigated and drug owners were interviewed. For the rest of 478 households, the owners informed that they had no unused medication because they used all received medications or dumped all of them before this survey.

The questionnaire contained 22 numbered questions, and 8 of which were related to demographic and other general data, 14 of which directly concerned reasons of not using the medications as {yes, no, not sure}. The data stated as "not sure" were treated as missing data. The questionnaire was designed for adults. Where the drug owner was less than 12 years of age, the parents were invited to assist. Each questionnaire was used for only one medication item. If the owner had more than one, more questionnaires would be used. The surveying form and questionnaire were standardized by practicing 4 surveyors to interview 10 persons who had unused medication and making the scripts for further interview. The questionnaire was tested by surveying 30 homes in Songkla Province, which were not in the sampling area, and 67 medication owners were interviewed. The reliability of the questionnaire was 0.97 when calculated by Kuder-Richardson Formula 20.⁷

All unused medications were identified for their names by two researchers together with a hospital pharmacists and two community pharmacists although their name were stated on the label. The amount of unused medications were recorded as the number for tablets or capsules, the volume as milliliter for liquid preparations and gram for ointment, cream and powder. The percentage of unused medication could be not determined in this study because the number of dose dispensed was hardly stated on the label. The numbers of oral medication doses were calculated to demonstrate the magnitude of compliance. It was difficult to determine how many doses were left for other dosage forms. To standardize the difference of medication costs from many sources, the set-up prices per unit by Thai Public Health Ministry in the year of 2001 that used for buying medications from drug companies in Thai government hospitals

were used in this study. This cost did not include packages and other indirect costs for medication dispensing. The unused medication costs were calculated by multiplying the unused amount with the set-up price per unit. Logistic regression analysis was carried out to investigate any relationship between background factors and the main reasons for not taking all prescribed medication. Multiple regression analysis was also used to test the factors affecting to the number of unused oral medication doses and unused medication costs. The exclusion method was backward elimination procedure.⁸ Logarithm of the doses and costs of unused medications were used because their raw data were not normally distribution ($p < 0.001$ for both number of dose and cost of unused medications, using Kolmogorov-Smirnov test), but its behaviour is better described by log-normal distribution, i.e., p-value of 0.012 for log(number of unused doses) and 0.072 for log(cost of unused medications). The log(number of unused doses) has abnormal spikes in its histogram, but its show bell-shape behavior (graph not shown).