

## Acknowledgements

My PhD journey would not have been complete without the generous support of my supervisor, Emeritus Prof. Dr. Don McNeil, and Asst. Prof. Dr. Apiradee Lim. Their helpful guidance, support and encouragement me to accomplish the hard work. Also thanks to staff in Research Methodology at Department of Mathematics and Computer Science, Faculty of Science and Technology, Prince of Songkla University, Pattani Campus consist of Asst. Prof. Dr. Chamnein Choonpradub, Asst. Prof. Dr. Phattawan Tongkumchum, Asst. Prof. Dr. Metta Kuning, Asst. Prof. Dr. Nittaya McNeil and Dr. Suwich Thammapalo (Director of Office of Disease Prevention and Control 12, Songkhla) for their encouragement and suggestions. Many thank to Matthew Kelly (National Centre for Epidemiology and Population Health, The Australian National University) for proof-reading this thesis. Thanks to my friends whose names are not listed here for their encouragement me in the study.

This thesis would never be completed without the essential data from the Bureau of Health Policy and Strategy, Thai Ministry of Public Health, Thailand and the National Statistical Office of Thailand. I would like to acknowledge financial support from the Graduate School, Prince of Songkla University for the research, authorship and publication of manuscripts.

Finally, I would like to express my heartfelt thanks to my parents and my aunt for all of the benefits arising from this study, for their encouragement and always being by my side. Similarly I wish to thank my sister, brother, niece and nephew who have never ending encouragement in all aspects, and for keeping me hopeful.

Nuntaporn Klinjun