

**UNIVERSITI TEKNOLOGI MARA**

**COST-EFFECTIVENESS DATA OF  
TRASTUZUMAB AND ECONOMIC  
BURDEN ASSOCIATED WITH  
BREAST CANCER TREATMENT IN  
MALAYSIA**

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**MSc**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

**Introduction:** The marked increase in the number of economic studies on adjuvant use of trastuzumab over the last five years is clear acknowledgement of the usefulness of economic evaluations in healthcare decision making. These economic evaluations included in the previous systematic reviews, however, were mainly from the developed Western countries and none of these reviews had performed quality assessment on the methodological aspects of the included economic evaluations. No systematic review focusing on economic evaluations of trastuzumab as adjuvant therapy for patients with early breast cancer in Asia countries has ever been conducted. Of note, most economic evaluations in this setting were from the healthcare provider perspective and does not include indirect cost. In order to perform a cost-effectiveness analysis (CEA) from the societal perspective, indirect cost associated with breast cancer is required. However, little is known about the indirect cost associated with breast cancer in Malaysia as well. Therefore, this thesis was geared towards investigating (i) the cost-effectiveness data of trastuzumab as adjuvant therapy for patients with early breast cancer in the Asian setting and (ii) the economic burden of breast cancer, in particular the indirect cost, associated with different states stages of breast cancer in Malaysia. **Method:** Literature search was performed using six electronic databases (PubMed, Scopus, Ovid, MEDLINE, EconLit, National Health Service Economic Evaluation Database, and ISI Web of Knowledge) and final search was performed in October 2018. The reporting and methodological qualities of each study were independently assessed using the Consolidated Health Economic Evaluation Reporting Standards, Drummond, and Philips checklists. All costs were converted into US dollars (2016). A cross-sectional observational study was conducted from November 2018 until March 2019 at two main oncology cancters. The breast cancer states were divided into 4 states, first year after primary breast cancer (P state), second and following years after primary breast cancer (S state), first year after recurrence (R state) and metastasis (M state). The data on breast cancer state and direct cost were retrieved retrospectively from the hospital record while self-administered questionnaires were distributed among the patients and caregivers to collect data on indirect costs and quality of life. All cost data were reported in 2019 Malaysian Ringgit and then were analysed using SPSS version 25 and R programme. **Results:** A total of six economic studies conducted mainly from healthcare provider perspective were included and the studies generally sensitive to the changes in trastuzumab drug acquisition cost and discount rate, as well as its clinical effectiveness. For the quality assessment, all studies fulfilled more than 50% of the requirements in the checklists. The mean annual direct cost was the highest in the P state (RM25,072.43). The informal care cost (RM5,946.25) and out-pocket-expense (RM289.71) was the highest in the M state and R state, respectively. In M state, patients and caregiver have the highest productivity loss compared to other states. The quality of life of patient deteriorated upon advancement of breast cancer. **Conclusion:** From the systematic review it can be conclude that adjuvant trastuzumab therapy is considered a cost-effective option for early breast cancer in Asian countries including China, Iran, Japan, Singapore, and Taiwan and all were generally well conducted. In the systematic review, majority of the economic evaluation were conducted from a healthcare provider. The cost data obtained from this study will provide the important input for future studies and allow cost-effectiveness study of trastuzumab as adjuvant therapy from the societal perspective in the Malaysian setting to be performed.

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