# EVALUATION OF AWARENESS, PERCEPTION, ATTITUDE AND BEHAVIOUR AMONG GENERAL PUBLIC TOWARDS SMOKE-FREE POLICY IN THE STATE OF MELAKA, MALAYSIA

**NUR HANANI BINTI JASNI**

**UNIVERSITI SAINS MALAYSIA**
**2015**

# EVALUATION OF AWARENESS, PERCEPTION, ATTITUDE AND BEHAVIOUR AMONG GENERAL PUBLIC TOWARDS SMOKE-FREE POLICY IN THE STATE OF MELAKA, MALAYSIA

**By**

**NUR HANANI BINTI JASNI**

**Thesis submitted to fulfillment of the requirements for the degree of Master of Science (Pharmacy)**

**April 2015**

## DEDICATION

I dedicate this research work to my beloved husband Khairul Anuar Ahmad, my mother Maznah Omar, my father Jasni Ismail, my sister Nurul Aimi, my brother Mohd Husaiff, Ahmad Ikram, Muhammad Syamim, Muhammad Syathir and to my princess
Nur Khaira Marissa.

Thank you for your sincere love, sacrifices, time, patience and *Duaas*.
May Allah Subhanahu Wa Ta'ala Shower you with His Blessings.

## ACKNOWLEDGMENTS

*Alhamdulillah*. I am humbled with gratitude and utmost acknowledgement to *Allah Subhanahu Wa Ta'ala* for His Guidance and Blessings and the successful completion of this research work.

Firstly, I would like to thank my supervisor, Associate Professor Dr. Maizurah Omar for her unlimited advice, guidance, mentoring, support and encouragement throughout my research study. I greatly appreciate her intellectual capabilities and constructive criticisms which she used to enhance my work.

My appreciation also goes to The Hon. Chief Minister of Melaka, Datuk Seri Hj. Mohd Ali Bin Mohd Rustam. I would also like to express my thanks to the staff of the Melaka State Health Department, with special mention of Y.B. Datuk Dr. Teoh Siang Chin, Y.B. Datuk Dr. Azmi Hashim, Dr. Hj. Ismail Ali and Dr. Noraryana Hassan.

I would also like to thank the Coalition of Melaka Smoke-Free NGOs' (GanMBAR) and the Clearinghouse Smoke-Free Melaka for providing me with all the inputs and information on the Smoke-Free Melaka project. My special thanks go to Y.B. Datuk Dr. Hj. Ghazali Othman and Datuk Hjh. Hasnah Salam.

I wish also to acknowledge the Malaysia Health Promotion Board (*MySihat*), the funding agency of the Smoke-Free Melaka project, in particular, Y.B. Datuk Dr Yahya Baba.

I am grateful to the staff of the National Poison Centre's Research Call Centre for their assistance with the data collection. My special thanks go to Juliani Hashim, Noor Adila Johari, Izyani Binti Mohammad Marican, Mohamed Nazri Mohamed Tahir, Kamarul Azhar Abdul Malek, Halimatun Hanita Hamid and Nazirah Nazari. I am also indebted to Mr. Ahmad Shalihin Mohd Samin for his guidance, advice and support throughout my study. I also appreciate all assistance given to me, technical or morale, from my colleagues at the National Poison Centre who never did hesitate to offer any possible help. For this, I am particularly thankful to Associate Professor Razak Lajis, the Centre's Director, Professor Rahmat Awang, Lucie, Noor Afiza Abdul Rani, Haslina Hashim, Nooreha Md Salehen and Sherrilaida Aidarus.

I would also like to acknowledge the assistance I received from the University of Waterloo, in particular, from Professor Mary Thompson for her expertise in statistics and Dr. Anne C.K. Quah for her invaluable information and suggestion.

I would like also thank to the staff of the School of Pharmaceutical Sciences Universiti Sains Malaysia and the Institute for Postgraduate Studies (IPS) for all assistance rendered to me during my postgraduate study tenure.

Finally, I would like to acknowledge with gratitude the financial support from MyBrain15 and the National Poison Centre for my research study.

May Allah Subhanahu Wa Ta'ala Bless all of you who have contributed directly or indirectly to the success of my research study.

*Nur Hanani Binti Jasni*

**TABLE OF CONTENTS**

## LIST OF TABLES

## LIST OF FIGURES

## LIST OF ABBREVIATIONS

| Abbreviation | |
|---|---|
| CI | Confidence Interval |
| CTPR | Control of Tobacco Product Regulations |
| C-Tob | Clearinghouse for Tobacco Control |
| FCTC | Framework Convention for Tobacco Control |
| GANMBAR | Gabungan Melaka Bebas Asap Rokok |
| ITC | International Tobacco Control Policy Evaluation Project |
| IARC | International Agency for Research on Cancer |
| MAS | Malaysia Airline System |
| MITC | Melaka International Trade Centre |
| MyWATCH | Malaysian Women's Action for Tobacco Control and Health |
| NGO | Non-Governmental Organization |
| NHMS III | The Third National Health and Morbidity Survey |
| OR | Odds Ratio |
| RM | Ringgit Malaysia |
| SEATCA | Southeast Asia Tobacco Control Alliance |
| SFMC | Smoke-Free Melaka City |
| SHS | Secondhand smoke |
| SPSS | Statistical Package for the Social Sciences |
| USM | Universiti Sains Malaysia |
| US | United States |
| WHO | World Health Organization |

## LIST OF PUBLICATIONS

1) **Nur Hanani Jasni**, Maizurah Omar, Noraryana Hassan, Yahya Baba, Rahmat Awang, Anne Chiew Kin Quah, Haslina Hashim, Ahmad Shalihin Mohd Samin, Noor Afiza Abdul Rani, Pete Drieze, Mary Thompson, Geoffrey T Fong. Impact of Smoke Free Melaka City Project on Perception, Attitude and Behaviour of People In Melaka. International Social Work Conference 2012, Crafting Symbiotic Partnership & Collaboration In The Asia Pacific Region, 28th - 30th November 2012: Penang, Malaysia. (Accepted).

2) Yahya Baba , Maizurah Omar, Rahmat Awang, Noraryana Hassan, **Nur Hanani Jasni**, Ahmad Shalihin Mohd Samin, Anne Chiew Kin Quah, Pete Driezen, Mary Thompson, Geoffrey T Fong. Awareness of advertisement and campaign of Smoke-Free Melaka policy among people in Melaka: Findings from evaluation of Smoke- Free Melaka intercept study. The 10th Asia Pacific Conference on Tobacco or Health (APACT), 18th – 21th August 2013: Makuhari Messe, Chiba, Japan. (Accepted).

3) Rahmat Awang, Noraryana Hassan , Maizurah Omar, Azmi Hashim, Ghazali Othman, Ban Attan @ Talib, Nur Aishah Buang, Mazuin Mohd, **Nur Hanani Jasni**, Anne C.K. Quah. Impact of Smoke-Free Melaka City (SFMC) policy on future visit to places within smoke-free zones among adult smokers: Findings from Intercept Study of the SFMC Policy. The 10th Asia Pacific Conference on Tobacco or Health (APACT), 18th – 21th August 2013: Makuhari Messe, Chiba, Japan. (Accepted).

4) Yahya Baba, Maizurah Omar, Rahmat Awang, Noraryana Hassan, **Nur Hanani Jasni**, Ahmad Shalihin Mohd Samin, Anne Chiew Kin Quah, Pete Driezen, Mary Thompson, Geoffrey T Fong. Impact of Smoke-Free Melaka city project on smoking attitudes among adult smokers in Melaka: Findings from evaluation of Smoke Free Melaka intercept study. The 10th Asia Pacific Conference on Tobacco or Health (APACT), 18th – 21th August 2013: Makuhari Messe, Chiba, Japan. (Accepted).

5) Noraryana Hassan, Maizurah Omar, Azmi Hashim , Ghazali Othman, Rahmat Awang, Ban Attan @ Talib, Nur Aishah Buang, Mazuin Mohd, **Nur Hanani Jasni**, Anne C.K. Quah. What effects of smoking ban in indoor public places has on smokers' perception, their attitude of smoking around children and implementation of Smoke-Free in their homes and private vehicles?: Findings from Intercept Study of Smoke- Free Melaka City (SFMC) Policy. The 10th Asia Pacific Conference on Tobacco or Health (APACT), 18th – 21th August 2013: Makuhari Messe, Chiba, Japan. (Accepted).

6) Yahya Baba, Maizurah Omar, Rahmat Awang, Noraryana Hassan, **Nur Hanani Jasni**, Noor Afiza Abdul Rani, Anne Chiew Kin Quah, Pete Driezen, Mary Thompson, Geoffrey T Fong. Do Smoke-Free policy influence perceived smoking norms: Finding from evaluation of Smoke-Free Melaka Intercept study 2012. International Union for Health Promotion and Education (IUHPE) 2013, 25 – 29 August 2013: Pattaya, Thailand. (Accepted).

7) Yahya Baba , Maizurah Omar, Rahmat Awang, Noraryana Hassan, **Nur Hanani Jasni**, Ahmad Shalihin Mohd Samin, Anne Chiew Kin Quah, Pete Driezen, Mary Thompson, Geoffrey T Fong. What impact of Smoke-Free Melaka city policy on smokers' attitude towards Smoke Free homes: Findings from evaluation of Smoke Free Melaka Intercept Study 2012. International Union for Health Promotion and Education (IUHPE) 2013, 25 – 29 August 2013: Pattaya, Thailand. (Accepted).

**Publication 1: International Social Work Conference 2012**

## Impact of Smoke Free Melaka City Project on Perception, Attitude and Behaviour of People in Melaka

Nur Hanani Jasni[1], Maizurah Omar[1], Noraryana Hassan[2], Yahya Baba[3], Rahmat Awang[1, 3], Anne Chiew Kin Quah[4], Haslina Hashim[1], Ahmad Shalihin Mohd Samin[1], Noor Afiza Abdul Rani[1], Pete Driezen[5], Mary Thompson[6], Geoffrey T Fong[4]

[1] Clearinghouse for Tobacco Control, National Poison Centre, Universiti Sains Malaysia
[2] Melaka State Health Departments
[3] Malaysian Health Promotion Board
[4] Department of Psychology, University of Waterloo, Canada
[5] Propel Centre for Population Health Impact, University of Waterloo, Canada
[6] Departments of Statistics and Actuarial Science, University of Waterloo, Canada

***Introduction:*** Globally, **s**econdhand smoke (SHS) is responsible for 600,000 deaths in 2011, 75% of these affecting women and children. SHS is responsible for causing harm to the cardiovascular and respiratory systems. The only effective way to protect people from SHS is to provide a 100% smoke-free environment. In Malaysia, Melaka is the first state that has implemented a 100% smoke-free city since 15th June 2011. This article examines the impact of awareness, perception, attitude and behavior of smoking among people in Melaka following the Smoke-Free Melaka city (SFMC) policy and association of the awareness of the policy with perception of the social desirability of smoking and attitude towards smoking among adults. ***Methodology*:** A total of 1,039 adult surveys from face- to-face interview was carried out in June 2012 within six zones in Melaka. Respondents were recruited using systematic intercept sampling. They were asked if they have noticed advertisements on SFMC and their perception about the social desirability of smoking. Changes of behavior of smokers were recorded. Descriptive analysis, univariate and multiple logistic regressions were applied by using SPSS version 18. Odd ratio and 95% CI were computed for each corresponding variable. ***Results*:** More than 70% of the respondents have noticed the Melaka Smoke-Free advertisements, namely, on posters/signage (92.5%), digital billboards (77.0%), newspaper/magazines (72.8%) and inside shop/store windows (73.8%). Multivariate analysis revealed that noticing the advertisements had significantly influenced discussion with family and friends (OR=1.21; 95%1.12, 1.31, p<0.000) and implementation smoke-free homes and vehicles (OR= 1.09; 95% CI 1.01, 1.18, p<0.022 and OR=1.19; 95% CI 1.09, 1.30, p<0.001 respectively). In addition, significant association was found between discussion with family/friends and implementation of smoke free vehicles (OR=1.51; 95% 1.09-2.09, P=0.014). Following the implementation of the policy, most smokers said that they would not smoke in the presence of the children (83%), non-smoking family members (76.7%), older non-smoking person (78.2%) and policy officers (86.6%). ***Conclusion*:** The implementation of the SFMC project has resulted in positive impact on perception, attitude and behavior of smoking on people who live or visiting the Melaka city. This project has shown the potential to reduce exposure to secondhand smoke in both workplaces and home.

## Publication 2: The 10th Asia Pacific Conference on Tobacco or Health (APACT)

# Awareness of advertisement and campaign of Smoke-Free Melaka policy among people in Melaka: Findings from evaluation of Smoke- Free Melaka intercept study

Yahya Baba[1] , Maizurah Omar[2], Rahmat Awang[1, 2], Noraryana Hassan[3], Nur Hanani Jasni[2], Ahmad Shalihin Mohd Samin[2], Anne Chiew Kin Quah[4], Pete Driezen[5], Mary Thompson[6], Geoffrey T Fong[4]

[1] Malaysian Health Promotion Board
[2]Clearinghouse for Tobacco Control, National Poison Centre, Universiti Sains Malaysia
[3] Melaka State Health Departments
[4] Department of Psychology, University of Waterloo, Canada
[5] Propel Centre for Population Health Impact, University of Waterloo, Canada
[6] Department of Statistics and Actuarial Science, University of Waterloo, Canada

***Background:*** In many countries around the world, smoke-free legislation is being implemented to protect people from health dangers of secondhand smoke. Following the Article 8 from World Health Organization Framework Convention on Tobacco Control (WHO-FCTC), Melaka has implemented a 100% smoke free city beginning 15th June 2011 with the aims to protect non-smokers especially women and children living with smokers. Awareness of the project can possibly be influenced by means of well-designed advertisement and campaign. In this Smoke-free Melaka city project, the advertisement and campaign of Smoke-Free Melaka city project was made widely visible to people in Melaka through numerous medium, i.e., radio, posters/signage, billboards/digital billboards, newspaper/magazines, in shop/store windows, on side buses, on trishaws and on t-shirts. ***Objectives:*** To determine the level of awareness of advertisement and campaign of Smoke-Free Melaka city project as reported by people in Melaka with respect to demographic characteristics. ***Methodology:*** Data were collected in June 2012 by using systematic intercept sampling. A total of 1039 adult within smoke-free zones were interviewed through face-to-face in this study. Awareness of Smoke-free Melaka advertisement and campaign were measured by the following question: 1) in the last six months, have you seen or heard something about Smoke-free Melaka campaign, and 2) in the last six months, have you noticed Smoke-free Melaka advertising or information that talks about the dangers of smoking, or encourages quitting in any of the following places (i.e.: radio, posters/signage, billboards/digital billboards, newspaper/magazines, in shop/store windows, on side buses, on trishaws and on t-shirts). Descriptive analysis, univariate and multiple logistic regressions were applied by using SPSS version 18. Odd ratio and 95% CI were computed for each corresponding variable. ***Results:*** Smoke Free Melaka advertisement and campaign has resulted in high salience among people in Melaka. Noticing to these advertisements and campaigns were very high among smokers (93.6%), non-smokers (95.6%), resident (97.7%), temporary resident (91.4%) and visitors (86.1%). Various media channels utilized in the advertisements and campaigns were noticed by people in Melaka. The most frequent channel where advertisement caught their attention was from posters or signage (92.5%) followed by billboards/digital billboards (77.0%), shop windows/inside of shops (73.8%), newspapers/magazines (72.8%), on side buses (63.3%), radio (60.8%), on t-shirts (32%) and on trishaws (27.6%). Logistic regression showed that malay people, local resident and those that have higher education level reported significantly higher noticing of the campaign and advertisement of Smoke-free Melaka city project. ***Conclusion:*** Smoke-free Melaka advertisement and campaign achieved high level of awareness into the people in Melaka. The information delivered from campaign and advertisement was received positively by both smokers and non-smokers.

**Publication 3: The 10th Asia Pacific Conference on Tobacco or Health (APACT)**

## Impact of Smoke-Free Melaka City (SFMC) policy on future visit to places within smoke-free zones among adult smokers: Findings from Intercept Study of the SFMC Policy

Rahmat Awang[1, 5] , Noraryana Hassan[2] , Maizurah Omar [1], Azmi Hashim [4] , Ghazali Othman [5], Ban Attan @ Talib[3] , Nur Aishah Buang[3], Mazuin Mohd[6], Nur Hanani Jasni[1], Anne C.K. Quah[7]

[1] Clearinghouse for Tobacco Control, National Poison Centre, Universiti Sains Malaysia
[2] Malaysian Health Promotion Board
[3] Melaka State Health Department
[4] Insaniah College, Kedah
[5] Perlis State Health Department
[6] Clearinghouse Smoke Free Melaka
[7] Department of Psychology, University of Waterloo, Canada

***Background*:** Since Jun 15, 2011, the state of Melaka in Malaysia has implemented a 100% smoke-free (SF) city (indoors and outdoors). One of the concerns of implementing SF policy especially among business owners is the potential economic impact in terms of frequency of patrons/customers visiting to restaurants, cafés, clubs, and other recreational centers such as children playground and zoo. ***Objective:*** To examine the impact of SFMC Policy on smokers' perception and their future visits to places within smoke free zones after the implementation of the SF policy. ***Methodology*:** Data were collected in June 2012 using systematic intercept sampling. A total of 601 adults smokers within smoke-free zones were recruited through a face- to-face interview. Smokers' awareness and their perception about smoking ban and impact on future visit to places (such as shops, restaurants, cafés, and recreation places such as children play ground and zoo) within smoke-free zones were assessed. Descriptive analysis, univariate and multiple logistic regressions were applied by using SPSS version 18. Odd ratio and 95% CI were computed for each corresponding variable. ***Results*:** After the implementation of the SFMC policy, most smokers (65.5%) in Melaka stated that they would visit more often and this restriction would not affect their future visits to those places which were gazette by the state regulation as smoke-free zones. Awareness of the SFMC advertisements and information was significantly associated with smokers' perception that indoor and outdoor smoking ban in all public places in Melaka was a good thing (OR= 1.21; 95% CI 1.11, 1.31, $p<0.01$). Awareness of these advertisements and information as well as perception that a ban on smoking indoor and outdoor in all public places in Melaka was a good thing were significantly associated with smokers who said they would visit more often places within the smoke-free zones in Melaka (OR= 1.09; 95% CI 1.01, 1.18, p=0.02, OR= 1.68; 95% CI 1.05, 2.69, p=0.030 respectively). ***Conclusion*:** SFMC policy has shown the frequency of visits to places within Smoke-Free Zones by smokers were high especially among those smokers who are aware of the policy and have positive perception on indoor and outdoor smoking ban. Thus, refuting the claim that the Smoke-Free Policy would have a negative impact for businesses owners.

## Publication 4: The 10th Asia Pacific Conference on Tobacco or Health (APACT)

### Impact of Smoke-Free Melaka city project on smoking attitudes among adult smokers in Melaka: Findings from evaluation of Smoke Free Melaka intercept study

Yahya Baba[1] , Maizurah Omar[2], Rahmat Awang[1, 2], Noraryana Hassan[3], Nur Hanani Jasni[2], Ahmad Shalihin Mohd Samin[2], Anne Chiew Kin Quah[4], Pete Driezen[5], Mary Thompson[6], Geoffrey T Fong[4]

[1] Malaysian Health Promotion Board
[2]Clearinghouse for Tobacco Control, National Poison Centre, Universiti Sains Malaysia
[3] Melaka State Health Departments
[4] Department of Psychology, University of Waterloo, Canada
[5] Propel Centre for Population Health Impact, University of Waterloo, Canada
[6] Department of Statistics and Actuarial Science, University of Waterloo, Canada

***Background*:** Tobacco use is a risk factor for six of the eight leading causes of death in the world. Secondhand smoke is responsible for 600,000 deaths in 2011, 75% of these affecting women and children. Article 8 from World Health Organization Framework Convention on Tobacco Control (WHO-FCTC) specifically focused on protecting people from exposure to tobacco smoke in all indoor workplaces and public places as well as all public transports. Melaka is the first Malaysian state that took effort into implementing a comprehensive smoke free in its few cities beginning 15th June 2011 with aims to reduce harmful secondhand smoke exposure to the non-smokers especially women and children living with smokers. ***Objectives*:** To evaluate the impact of smoke-free Melaka city project towards smoking attitudes within the one year of implementation. ***Methodology*:** A total of 1,039 adult smokers, 18 years old and above were interviewed through face- to-face in June 2012 within six smoke free zones in Melaka. Respondents were recruited using systematic intercept sampling. Attitude of smoker before and after implementation were measured by similar question: I will describe some situations and if you think you would not smoke, please tell me. Changes of attitudes reported by smokers were recorded before and after the implementation of Smoke-free Melaka city project in different social settings. SPSS version 18 was used for all analyses. McNemar test were applied to see the difference of attitudes among people in Melaka prior and after implementation of the policy. ***Results*:** Implementation of the Smoke Free Melaka policy resulted in significantly higher number of smokers committing to not smoking after the implementation of Smoke free policy in many of the situations listed below: if non-smokers are present (from 44% before the implementation of Smoke Free policy to 60% after the implementation of Smoke Free policy) , if a non-smoking family member is present (from 67% before the implementation of Smoke Free policy to 77% after the implementation of Smoke Free policy) , if an older non-smoking person is present (from 69% before the implementation of Smoke Free policy to 78% after the implementation of Smoke Free policy), if a policy officer or by-law officer is present (from 83% before the implementation of Smoke Free policy to 87% after the implementation of Smoke Free policy), if other smokers are present (from 14% before the implementation of Smoke Free policy to 27% after the implementation of Smoke Free policy) and if there is visible signage reminding you that it is a smoke-free area (from 70% before the implementation of Smoke Free policy to 75% after the implementation of Smoke Free policy). The number of smokers not smoking in the presence of children continues to be high before (81%) and after (83%) the implementation of this policy. ***Conclusion*:** Smokers' attitudes improved after the implementation of Smoke-free Melaka city project by not smoking in front of children and other non-smokers in public places. This project has shown the potential to reduce exposure to secondhand smoke in public places thus protect the non-smokers.

**Publication 5: The 10th Asia Pacific Conference on Tobacco or Health (APACT)**

## What effects of smoking ban in indoor public places has on smokers' perception, their attitude of smoking around children and implementation of Smoke-Free in their homes and private vehicles?: Findings from Intercept Study of Smoke- Free Melaka City (SFMC) Policy.

Noraryana Hassan[1] , Maizurah Omar[2], Azmi Hashim[3] , Ghazali Othman[4], Rahmat Awang[2, 5], Ban Attan @ Talib[1] , Nur Aishah Buang[1], Mazuin Mohd[6], Nur Hanani Jasni[1], Anne C.K. Quah[7],

[1] Melaka State Health Departments
[2] Clearinghouse for Tobacco Control, National Poison Centre, Universiti Sains Malaysia
[3] Insaniah College, Kedah
[4] Perlis State Health Departmen
[5] Malaysian Health Promotion Board
[6] Clearinghouse Smoke Free Melaka
[7] Department of Psychology, University of Waterloo, Canada

***Background*:** Globally, exposure to secondhand smoke is responsible for 600,000 deaths in 2011. Unfortunately, 75% of these deaths were affecting women and children. Article 8 of the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) specifically focused on protecting people especially the non-smokers from exposure to tobacco smoke in all indoor workplaces and public places as well as all public transports. In Malaysia, Melaka has implemented a 100% smoke-free city since 15th June 2011 with aims to protect the non-smokers especially women and children living with smokers. ***Objective*:** To examine the effects of Smoke-Free Melaka City (SFMC) Policy on perception, attitudes of smoking around children and implementation of smoke-free homes and private vehicles. ***Methodology*:** Data were collected in June 2012 using systematic intercept sampling. A total of 1039 adults within smoke-free zones were recruited through a face- to-face interview of which 601 were smokers. Smokers' perception and attitudes about the policy and awareness of smoke-free advertisements or information that talks about dangers of smoking and encouraged quitting were assessed. Descriptive analysis, univariate and multiple logistic regressions were applied by using SPSS version 18. Odd ratio and 95% CI were computed for each corresponding variable. ***Results*:** Awareness of Smoke-Free Melaka City (SFMC) advertisements and information was significantly associated to perception that smoking ban was a good thing (OR= 1.21; 95% CI 1.11, 1.31, p<0.01). This perception was significantly associated with attitude would not smoke when children are present (OR= 1.80; 95% CI 1.04, 3.11, p=0.035). This positive attitude was significantly associated with implementation of total smoke-free homes (OR= 3.64; 95% CI 2.17, 6.15, p<0.001) and private vehicles (OR= 1.81; 95% CI 1.11, 2.95, p=0.017). Awareness of SFMC advertisement and information was also directly associated with implementation of total smoke-free homes (OR= 1.09; 95% CI 1.01, 1.18, p<0.022) and private vehicles (OR= 1.19; 95% CI 1.09, 1.30, p<0.01). ***Conclusion*:** Awareness of Smoke-free advertisements and information has both direct and causal effects on perception, attitude and implementation of smoke-free homes and private vehicles among smokers in Melaka. Thus, the implementation of smoking ban in public places has the potential to reduce exposure to second hand smoke among children in public places and who are living with smokers.

**Publication 6: International Union for Health Promotion and Education (IUHPE)**

## Do Smoke-Free policy influence perceived smoking norms: Finding from evaluation of Smoke-Free Melaka intercept study 2012

Yahya Baba[1] , Maizurah Omar[2], Rahmat Awang[1, 2], Noraryana Hassan[3], Nur Hanani Jasni[2], Noor Afiza Abdul Rani[2], Anne Chiew Kin Quah[4], Pete Driezen[5], Mary Thompson[6], Geoffrey T Fong[4]

[1] Malaysian Health Promotion Board

[2]Clearinghouse for Tobacco Control, National Poison Centre, Universiti Sains Malaysia

[3] Melaka State Health Departments

[4] Department of Psychology, University of Waterloo, Canada

[5] Propel Centre for Population Health Impact, University of Waterloo, Canada

[6] Department of Statistics and Actuarial Science, University of Waterloo, Canada

***Background*:** Implementing and publicizing the local regulation may help shape perception of community smoking norms. Strong regulations have resulted and associated with perceiving community norms to be significantly more anti-smoking. In Malaysia, Melaka is the first state that has implemented a 100% smoke-free city since 15th June 2011 in order to reduce number of the smokers and protecting the non-smokers from secondhand smoke exposure. ***Objective*:** This article examines the impact of Smoke-free Melaka city (SFMC) policy on perception of smoking norms and whether smoke-free advertisements and campaigns are associated with perception of smoking norms among people in Melaka. ***Methodology*:** Data were collected in June 2012 using systematic intercept sampling. A total of 1039 adults within smoke-free zones were recruited through face- to-face interview. Respondents were asked whether the SFMC advertisements and campaigns have made smoking less socially desirable and their overall opinion about a ban on smoking indoors in all public places in Melaka. Multiple logistic regressions tested the association between perceived norms and the presence of the SFMC policy by using version 18. Odd ratio and 95% CI were computed for each corresponding variable.***Results*:** Many of the smokers and non-smokers perceived that smoke-free Melaka policy has made smoking less socially desirable (68% and 74% respectively). Hence, they also perceived a smoking ban indoors in all public places is a good thing (80% and 90% respectively). Multivariate analyses showed that noticing the SFMC advertisements and campaign had significantly influenced the overall opinion about a ban on smoking indoors in all public places in Melaka is a good thing (OR=1.21; 95% CI 1.11, 1.31, $p<0.01$). ***Conclusion*:** The implementation of the SFMC project has resulted in positive impact on perception among people in Melaka. This smoke-free policy has the potential for the reduction in tobacco use due to changes in social norms regarding smoking.

**Publication 7: International Union for Health Promotion and Education (IUHPE)**

## What impact of Smoke-Free Melaka city policy on smokers' attitude towards Smoke Free homes: Findings from evaluation of Smoke Free Melaka intercept study

Yahya Baba[1] , Maizurah Omar[2], Rahmat Awang[1, 2], Noraryana Hassan[3], Nur Hanani Jasni[2], Ahmad Shalihin Mohd Samin[2], Anne Chiew Kin Quah[4], Pete Driezen[5], Mary Thompson[6], Geoffrey T Fong[4]

[1] Malaysian Health Promotion Board
[2]Clearinghouse for Tobacco Control, National Poison Centre, Universiti Sains Malaysia
[3] Melaka State Health Departments
[4] Department of Psychology, University of Waterloo, Canada
[5] Propel Centre for Population Health Impact, University of Waterloo, Canada
[6] Department of Statistics and Actuarial Science, University of Waterloo, Canada

***Background*:** Globally, exposure to secondhand smoke (SHS) remains one of the world's most critical environmental health hazards, and it is responsible for 600,000 deaths in 2011, 75% of these affecting women and children. Sudden Infant Death Syndrome (SIDS), respiratory issues, and behavioral and learning problems can result when infants and children are exposed to secondhand smoke. In Malaysia, the data from Global Adult Tobacco Survey 2011 reported that 4 for every 10 adults (7.6 million) are exposed to secondhand smoke at home. The only effective way to protect people from SHS is to provide a 100% smoke-free environment. In Malaysia, Melaka is the first state that has implemented a 100% smoke-free city since 15th June 2011 with aims to reduce the number of smokers, thus protect the non-smokers especially women and children living with smokers. ***Objective*:** To assess attitudes towards making home to be completely smoke-free among people in Melaka following the Smoke-Free Melaka city (SFMC) policy and association on awareness of advertisement and campaign with attitude towards smoking in home. ***Methodology*:** Data were collected in June 2012 using systematic intercept sampling. A total of 1039 adults within Melaka smoke-free zones were recruited through a face-to-face interview. Respondents were asked if they have noticed advertisements and campaign on SFMC and the changes of attitudes of smoking inside home were recorded. Demographic characteristic included household factors such as having children was also recorded. Descriptive analysis, univariate and multiple logistic regressions were applied by using SPSS version 18. Odd ratio and 95% CI were computed for each corresponding variable. ***Results*:** Number of smokers made their home totally smoke-free increased (38%-48%) after the implementation of the SFMC. 37% of smokers and 63% of non-smokers reported they have intention to make their homes totally smoke-free within the next year. Of all people in Melaka, more than 40% people who having children under the age of 18 years currently living in their household had intention to make their home totally smoke-free within the next year. There was also evidence for awareness of SFMC advertisement and campaign significantly influenced people to make their home totally smoke-free (OR= 1.09; 95% CI 1.01, 1.18, p<0.022). ***Conclusion*:** This smoke-free policy seems to stimulate adoption of smoke-free home among people in Melaka. Therefore, this smoke-free policy has shown the potential to reduce exposure to secondhand smoke among women and children who living with smokers and protect children or teenager exposed to smoking role model.

**PENILAIAN POLISI BEBAS ASAP ROKOK TERHADAP KESEDARAN, PERSEPSI, SIKAP DAN TINGKAHLAKU DALAM KALANGAN ORANG AWAM DI NEGERI MELAKA, MALAYSIA**

## ABSTRAK

Secara umumnya, asap rokok basi telah mengakibatkan 600,000 kematian pada tahun 2011, dengan 75% daripadanya adalah melibatkan wanita dan kanak-kanak. Di Malaysia, pendedahan asap rokok basi seringkali berlaku di tempat-tempat awam, tempat kerja dan di rumah. Lebih daripada 8 orang dalam setiap 10 orang dewasa (8.6 juta) dianggarkan terdedah kepada asap rokok basi semasa melawat ke tempat-tempat awam seperti kafe, kedai kopi, restoran, bistro dan bar. Dilaporkan, seramai 4 daripada 10 orang dewasa (7.6 juta) yang bekerja di dalam bangunan telah terdedah kepada asap rokok basi di tempat kerja. Seramai 4 daripada 10 orang dewasa (7.6 juta) telah terdedah kepada asap rokok basi di dalam rumah mereka. Kaedah yang paling berkesan untuk melindungi orang awam daripada pendedahan asap rokok basi adalah dengan menyediakan persekitaran 100% bebas daripada asap rokok. Di Malaysia, Melaka merupakan negeri yang pertama melaksanakan 100% bandar bebas asap rokok sejak 15 Jun 2011. Tujuan kajian ini adalah untuk menilai keberkesanan perlaksanaan polisi Melaka Bebas Asap Rokok berkaitan kesedaran, persepsi, sikap dan tingkah laku merokok dalam kalangan penduduk di Melaka. Seramai 1,039 orang dewasa telah terlibat dalam tinjauan secara bersemuka pada bulan Jun 2012 di enam zon Melaka Bebas Asap Rokok. Responden telah dipilih menggunakan persampelan sistematik rentas. Antara elemen yang telah di soal kepada responden adalah seperti terpandang iklan polisi Melaka Bebas Asap Rokok, persepsi terhadap tabiat merokok, pematuhan terhadap polisi, sikap merokok, tingkah laku, pendapat tentang polisi bebas asap rokok dan maklumat demografi. Analisis data yang dijalankan adalah analisis deskriptif,

univariat dan regresi logistik dengan menggunakan Pakej Statistik Sains Sosial (SPSS) versi 15. Nisbah ganjil dan 95% selang keyakinan di kira bagi setiap pembolehubah yang sepadan. Hasil kajian mendapati iklan dan kempen Melaka Bebas Asap Rokok sangat menonjol (94.5%) dalam kalangan penduduk di Melaka dan poster serta papan tanda merupakan saluran yang paling berkesan untuk menarik perhatian mereka. Tambahan daripada itu, iklan dan kempen Melaka Bebas Asap Rokok juga telah mencetuskan perbincangan dalam kalangan ahli keluarga dan rakan-rakan yang menjadikan mereka berasa merokok adalah kurang di terima oleh masyarakat. Selepas pelaksanaan polisi Melaka Bebas Asap Rokok, sikap perokok bertambah baik dengan situasi mereka tidak merokok di hadapan kanak-kanak dan bukan perokok di tempat awam, di dalam rumah dan kenderaan. Pematuhan kepada polisi bebas asap rokok adalah tinggi di tempat-tempat tertutup di Melaka seperti di dalam restoran, kedai cenderamata , pusat membeli-belah, muzium dan hotel. Namun, pematuhan kepada polisi bebas asap rokok masih rendah di Jalan Jonker dan Jalan Kota. Analisis multivariat menunjukkan bahawa kesedaran mengenai iklan bebas asap rokok adalah signifikan dalam mempengaruhi perbincangan dengan ahli keluarga dan rakan-rakan (OR = 1.21 ; 95% 1.12, 1.31 , $p < 0.000$) dan pendapat bahawa Melaka Bebas Asap Rokok adalah sesuatu yang baik (OR = 1.23 ; 95% 1.11, 1.36, $p < 0.000$). Di samping itu, terdapat hubungan yang signifikan antara pendapat bahawa Melaka Bebas Asap Rokok adalah sesuatu yang baik dengan sikap tidak merokok di hadapan kanak-kanak, bukan perokok , pegawai penguatkuasa dan tempat yang mempunyai papan tanda bebas asap rokok. Kajian ini juga mendapati bahawa perokok yang mempunyai persepsi merokok adalah kurang di terima oleh masyarakat lebih cenderung untuk tidak merokok di hadapan kanak-kanak dan ahli keluarga yang tidak merokok. Lanjutan daripada

pelaksanaan polisi tersebut, perokok yang tidak merokok di hadapan kanak-kanak, bukan perokok, pegawai penguatkuasa dan jika terdapat papan tanda didapati lebih cenderung dan signifikan untuk membuat rumah dan kenderaan mereka bebas daripada asap rokok. Pelaksanaan polisi Melaka Bebas Asap Rokok telah membawa impak yang positif ke atas kesedaran, pematuhan, persepsi, sikap dan tingkah laku merokok pada orang yang menetap atau melawat bandar Melaka. Projek ini mempunyai potensi untuk mengurangkan pendedahan terhadap asap rokok basi di tempat-tempat kerja, di dalam rumah dan kenderaan. Oleh itu, kajian penilaian polisi Melaka Bebas Asap Rokok ini boleh di jadikan model yang baik sebagai panduan untuk menggubal serta melaksanakan polisi dan program-program bebas asap rokok yang lebih berkesan bagi Melaka dan negeri-negeri lain di Malaysia.

**EVALUATION OF AWARENESS, PERCEPTION, ATTITUDE AND BEHAVIOUR AMONG GENERAL PUBLIC TOWARDS SMOKE-FREE POLICY IN THE STATE OF MELAKA, MALAYSIA**

## ABSTRACT

Globally, **s**econd-hand smoke is responsible for 600,000 deaths in 2011, 75% of these affecting women and children. In Malaysia, exposure to **s**econd-hand smoke occurs mainly in public places, workplaces and homes. It is estimated that more than 8 in 10 adults (8.6 million) are exposed to second-hand smoke in a public environments, e.g. cafes, coffee shops, restaurants, bistros and bars. For indoor workers, four in 10 (7.6 million) are reportedly exposed to second-hand smoke at their workplace. Exposure to second-hand smoke in homes affects 4 in every 10 adults (7.6 million). The only effective way to protect people from **s**econd-hand is to provide a 100% smoke-free environment. In Malaysia, Melaka is the first state that has implemented a 100% smoke-free city since 15$^{th}$ June 2011. The aim of this study is to evaluate the impact of the Smoke-Free Melaka City policy in relation to awareness, perception, attitude and behaviour of smokers in Melaka. One thousand and thirty-nine adults were involved in the study survey in a face- to-face interview carried out in June 2012 in six smoke-free zones in Melaka. Respondents were recruited using systematic intercept sampling. They were asked about their awareness on advertisements relating to Smoke-Free Melaka policy, perception of smoking norms, compliance to the policy, attitude of smoking, behaviour, opinion about the smoke-free policy and demographic information. Gathered data was analysed using descriptive analyses, univariate and multiple logistic regressions on Statistical Package for the Social Sciences (SPSS) version 15. Odd ratio and 95% CI were computed for each corresponding variable. Findings from the study showed that

the Smoke-Free Melaka advertisements and campaign have resulted in high salience (94.5%) among people in Melaka and posters and signs are the most effective channel to capture attention. Additionally, the Smoke-Free Melaka advertisements and campaign have also stimulated related discussions among family and friends including making smoking less socially desirable. Smokers' attitude improved with not smoking in front of children, other non-smokers in public places, homes and vehicles after the implementation of the Smoke-Free Melaka policy. Compliance to smoke-free policy was high in indoor places in Melaka, such as in restaurants, souvenir shops, shopping malls, museums and hotels. However, compliance to smoke-free policy was noted relatively low at Jonker Walk and Jalan Kota. Multivariate analysis revealed that awareness of the smoke-free advertisements had significantly influenced discussions with family and friends (OR=1.21; 95%1.12, 1.31, p<0.000) and is of the opinion that the Smoke-Free Melaka City policy is a good thing (OR=1.23; 95%1.11, 1.36, p<0.000). In addition, there is significant association between the opinion that the Smoke-Free Melaka City policy is a good thing and the attitude of not smoking in the presence of children, other non-smokers, policy officer and places with visible smoke-free sign. The study found that smokers with perception that smoking is less socially desirable were significantly more likely not to smoke in the presence of children and non-smoking family members. Following the implementation of the policy, smokers with improved attitude of not smoking in the presence of children, other non- smokers, policy officers and in places where smoking is prohibited are significantly more likely to make their homes and vehicles smoke-free. The implementation of the Smoke-Free Melaka City policy has resulted in positive impact on awareness, compliance, perception, attitude and behaviour of smokers who are residing or visiting the Melaka city. This project has shown the

potential to reduce exposure to second-hand smoke in workplaces, home and private vehicles. Hence, the Smoke-Free Melaka policy evaluation is a good model to guide the formulation and implementation of even more effective smoke-free policies and programs for Melaka and other states in Malaysia.

# CHAPTER 1

# INTRODUCTION

## 1.1 TOBACCO ISSUE

Since the past and up to present day, tobacco has grasped the attention of the world and has become an important topic of discussion. The use of tobacco has raised great concern among health professionals, scientists, politicians and the public for its health, social and economic reasons (Fathelrahman, 2010). The Chief Medical Officer of Health Canada, Arlene King, in 2010, had this to say about tobacco, "W*hen you strip it down to what matters, there is really one thing anyone needs to know about tobacco; it kills people*" (Michael Eriksen, 2012). Today, mounting evidence has proved that tobacco use, i.e. smoking is responsible for the global death of thousands of people annually. Thousands of hazardous chemicals and toxic compounds besides nicotine identified and isolated from tobacco products have been linked to tobacco-related deaths (Haustein, 2003).

According to smoking facts, tobacco in a single cigarette consists of 7,000 chemical compounds, of which 69 are known carcinogenic and another 400 are toxic (Winters, 2010). When a cigarette is lighted, the burning temperature reaches nearly 2,000 degrees Fahrenheit, thousands of chemical compounds are released into the air, most of them are inhaled by the smoker as well as those around the smoker (Winters, 2010).

Three of the main chemicals in cigarettes smoke that cause health problems are nicotine, tar and carbon monoxide (Tony Blakely, 1998).

Nicotine is the biggest factor in cigarettes because nicotine encourages the body to become addicted to it. Nicotine causes the release of the hormone adrenaline, giving the smoker instant pleasure and energy (IARC, 1986). Because this stimulation passes quickly, it makes a smoker wants to light up again and again thus leading to dependence

(IARC, 1986). Once a person is addicted to the nicotine in cigarettes, the possibilities for diseases such as lung cancer, throat cancer, respiratory problems as well as a host of other issues increases (US Department of Health and Human Services, 1996). Tar is a hazardous substance that attaches itself to the inner linings of the lungs. It destroys cilia, hair-like projections inside the lungs, which promote the trapping of harmful particles. This leads to the need for the lungs to pump harder to get oxygen throughout the body of smoker (Tony Blakely, 1998). Carbon monoxide is another oxygen depletory. Carbon monoxide binds to the haemoglobin, which is what normally carries oxygen from the lungs via the bloodstream, and therefore reduces the amount of oxygen reaching body tissues (Tony Blakely, 1998).

### 1.1.1 Tobacco-Related Morbidity and Mortality

Tobacco use is a serious threat to public health and the first single leading cause of preventable disease and that contributes to significant morbidity and mortality (Bergen and Caporaso, 1999). Worldwide, tobacco is responsible for almost 6 million deaths, with more than 15% of deaths among men and 7% of deaths among women (Michael Eriksen, 2012). By 2020, worldwide tobacco-related deaths are estimated to reach 10 million every year, two-thirds of which will be in the developing countries (Michael Eriksen, 2012).

Smoking potentially produces harmful effects to almost all organs and system in the human body by causing numerous diseases and reducing health in general (U.S. Department of Health and Human Services, 2004). Research report by the US Surgeon General, "The Health on Consequences of Involuntary Exposure to Secondhand Smoke" has shown the effects of smoking on the brain, eyes, mouth and throat, lungs, heart,

stomach, kidneys, bladder and pregnant women and their babies (National Center for Chronic Disease Prevention and Health Promotion, 2004). It is estimated that smokers have 40% higher rate of cataracts, a clouding of the eye's lens that block light which could lead blindness. Smoking also weakens the immune system, leaving the body more vulnerable to disease which can cause hair loss, ulcerations in mouth and rashes on the face (World Health Organization, 1997).

In a cohort study from the United Kingdom, the mortality rates among middle-aged smokers compared to non-smokers was two time higher during the first twenty-year follow-up period and three times higher during the second twenty-year period. This describes that the risk of smoking-related deaths increases dramatically among smokers as the years of smoking increases (Gajalakshmi et al., 2000).

Worldwide, 80% of male smokers and nearly 50% of female smokers die of a lung cancer (Michael Eriksen, 2012). Data from the United States showed that the ratio of deaths from lung cancer among smokers compared to non-smokers between the 1960s and the 1980s increased significantly in both gender (Gajalakshmi et al., 2000).

Research in Australia has confirmed that smoking is one of the major risk factors for heart attack. The risk of developing coronary heart disease increases with length and intensity of cigarette smoking. Among people less than 65 years old, it is estimated that 36% of coronary heart disease in men and 33% in women is attributable to cigarette smoking. In all cases, risk increase with increased consumption (Ridolfo B and Stevenson C., 2001).

### 1.1.2 Tobacco Use in Malaysia

Cigarette smoking is the main form of tobacco use in Malaysia. Annually, about a quarter of all deaths in Malaysia (almost 10,000) are attributed to smoking-related diseases. Coronary heart disease (25%) and lung cancer (25%) were the top leading causes of smoking-related death followed by stroke (20%), chronic obstructive pulmonary disease (15%), other cancers (5%) and others (10%) (Clearinghouse for Tobacco Control, 2005).

In 1996, the second National Health and Morbidity Survey (NHMS II) used for measuring smoking prevalence revealed that overall adult smoking prevalence was 24.8% (3.25 million smokers) (NHMS II, 1997). A decade later, the third National Health and Morbidity Survey (NHMS III) estimated a prevalence of 21.5% (3.51 million smokers) in 2006 (NHMS III, 2007). By gender, over the ten year period, male smoking prevalence decreased from 49.2% to 46.4% while for women the prevalence decreased from 3.5% to 1% (NHMS II, 1997, NHMS III, 2007).

In 2011, 23.1% or 4.75 million Malaysian adults aged 15 years or older are smokers with 43.9% (4.64 million) male and 1.0% (0.10 million) female (GATS, 2011). Overall, 22.9% of them are current cigarette smokers which include manufactured cigarettes, hand-rolled cigarettes or kreteks (GATS, 2011).

## 1.2 TOBACCO CONTROL POLICIES

Tobacco control is a field of public health science, policy and practices dedicated to controlling the growth of tobacco use and thereby reducing the morbidity and mortality it causes. Tobacco control is a priority area for the World Health Organization (WHO).

The WHO aims to reduce the global burden of disease and death caused by tobacco, thereby protecting present and future generations from the devastating health, social, environmental, and economic consequences of tobacco consumption and exposure to tobacco smoke. Research findings have proven the beneficial impact of tobacco control activities in curbing the epidemic of tobacco use and its subsequent health consequences (Abedian et al., 1998, WHO, 2004, Levy et al., 2004, Fathelrahman et al., 2010). In June 2003, the WHO launched its Framework Convention on Tobacco Control, FCTC (WHO, 2004). Currently, 170 countries have ratified the convention including Malaysia in September 2005. To ensure that the FCTC function realistically, the WHO introduced the MPOWER measures which correspond to one or more articles in the FCTC to reduce the demand for tobacco products. The six components of MPOWER are (WHO 2003, 2004):

1. Monitor tobacco use and prevention policies
2. Protect people from tobacco smoke
3. Offer help to quit tobacco use
4. Warn about dangers of tobacco
5. Enforce bans on tobacco advertising, promotions and sponsorship
6. Raise taxes on tobacco

The core demand reduction provisions in WHO FCTC are contained in articles 6 to 14 (WHO 2003, 2004):

Article 6 –Price and tax measures to reduce the demand for tobacco

Article 7 –Non-price measures to reduce the demand for tobacco

Article 8 – Protection from exposure to tobacco smoke

Article 9 – Regulation of the contents of tobacco products

Article10 – Regulation of tobacco product disclosures

Article 11 – Packaging and labelling of tobacco products

Article 12 – Education, communication, training, and public awareness

Article 13 – Tobacco advertising, promotion, and sponsorship

Article 14 – Demand reduction measures concerning tobacco dependence and cessation

The core supply reduction provisions in WHO FCTC are contained in articles 15 to 17:

Article 15 – Illicit trade in tobacco product

Article 16 – Sales to and by minors

Article 17 – Provisions of support for economically viable alternatives activities

### 1.2.1 History of Tobacco Control in Malaysia

In 1993, Malaysia enacted the country's first tobacco control legislation, the Control of Tobacco Product Regulations (CTPR) under Section 36 of the Food Act 1983 (Malaysia, 18 November 1993). This legislation came into force in 1994. Previous to this, there was no specific legislation except the prohibition of smoking in cinemas and the requirement for health warning label on cigarette packs and on advertisement provided under the Trade Description Act 1972. This legislation, which aimed to discourage tobacco use through environmental reformation and stricter control on the industry, was recently amended to tighten current provisions. The new regulations of 2004 imposed a prohibition on tobacco product advertisement and sponsorship, control of sale of tobacco product, restricted smoking places, restrictions on cigarette access to minors and standardising cigarette packaging (Food Act 1983, 2004). Another significant tobacco-

control initiative was observed in 1996 when Malaysia's national carrier, the Malaysia Airline System (MAS) banned smoking in all its domestic flights. Four years later in October 2000, all MAS flights, domestic and international, became smoke-free.

Malaysia as one of the signatory countries of FCTC are required to adopt Article 8 by implementing a 100% smoke-free policy with the aim to reduce second-hand smoke exposure and improve health outcomes (WHO 2003, 2004). The Control of Tobacco Product Regulations has named 21 public places where smoking is prohibited. They are, stadium or sport complexes, places of worship, inside school buses, internet cafes, hospitals or clinics, public lifts or toilets, air-conditioned eateries or shops, library, educational institutions, public transport and transport terminals, government buildings specified by the Ministry by notification under Regulation 22, private buildings, National Service Centres, service counters, entertainment centres and areas within a building used for assembly activities (Food Act 1983, 2004).

Currently, Malaysia does not have a comprehensive national legislation to protect non-smokers from exposure to second-hand smoke, although sub-national jurisdictions have the authority to implement laws that ban smoking in public places. Some workplaces and public areas have partial smoking area such as designated smoking section (some enclosed and some are not) in an air-conditioned restaurant, public transport terminals, and airport. An estimated 7 in 10 adults (8.6 million) in Malaysia are exposed to second-hand smoke in public environment and 4 in 10 adults (7.6 million) are exposed to second-hand smoke at home (GATS, 2011). In 2011, the Melaka state, took the smoke-free policy to new heights with the decision to make Melaka a smoke-free city to support tobacco control initiatives in Malaysia. It became the first state in the country to implement a 100% smoke-free policy in a few of its

townships from 15th June 2011. Melaka aims to reduce the number of smokers significantly to protect the health of non-smokers especially women and children living with smokers.

## 1.3 SMOKE-FREE MELAKA

Melaka is the third smallest state in Malaysia after Perlis and Penang. It is located in southern peninsular Malaysia with a size of 1,683 square kilometer. The state has three administrative districts namely Melaka Tengah, Alor Gajah and Jasin. Its population stood at 823,660 in 2010 of which 59% are Malay, 31% Chinese, 6% Indian and others 4% (Jabatan Perangkaan Malaysia, 2010).

Tourism contributes significantly to the state's economy. Famed by a promotional slogan "*Visit Melaka Means Visit Malaysia*" has made Melaka one of the best tour destinations in Malaysia. Its unique cultural heritage, historical sites and well-known traditional foods has attracted many tourists to this city. In fact, the United Nations Educational, Scientific and Cultural Organization (UNESCO) named Melaka as a World Heritage City in 2008 (Melaka State Goverment, 2012).

In line with the state's aspiration "Advancing Melaka Towards 2010" (Melaka Maju 2010) and its effort to achieve a smoke-free state in 2013, the Melaka state government began the initiative by gazetting five prominent areas in the state as smoke-free zones. A smoke-free zone is defined as an overall locality or a section of a town or city which is free of cigarette smoke (smoke-free cities).

On 15 June 2011, five areas totalling 338 hectares in the state were declared as smoke-free zones. They are: i) 4.2 km radius of Bandar Warisan Dunia including Jonker Walk and Jalan Kota, ii) Melaka Raya, iii) Melaka International Trade Centre (MITC),

iv) Bandar Alor Gajah, v) Bandar Jasin (Malaysia, 18 November 1993). It is the first state that has gazetted the widest smoke-free zones (Melaka State Health Department, 2010a)

The gazette of the smoke-free zone fulfils the requirement of Article 8 of the FCTC. But more significantly, the move is evident of the Melaka State government's commitment to prioritise public health with the creation of a cleaner, fresher and more comfortable environment for its people. Smoke-Free Melaka, or *Melaka Bebas Asap Rokok* (MBAR) in Malay, is classified as being in a smoke-free zone and protected from the dangers of second-hand smoke inside work places and public areas including restaurants, bars and other hospitality places.

As an added support to the Smoke-Free Melaka initiative, a "Clearinghouse for Smoke-Free Melaka" was created to serve as a 'nerve and information centre' for the project's various programs. The Clearinghouse for Smoke-Free Melaka is a smart collaboration between the Melaka State Government, the Melaka State Health Department (JKNM) and *MySihat* (Health Promotion Board of Malaysia (Melaka State Health Department, 2010b). The Clearinghouse plays a major role in highlighting and disseminating information on tobacco control activities, progress and outcomes of related activities of the Smoke-Free Melaka program to the government, NGOs and the general public. The Clearinghouse currently operates at the Kota Fesyen MITC (Melaka State Health Department, 2010b).

### 1.3.1 Objectives of Smoke-Free Melaka

The objectives for the creation of the smoke-free zones are (Melaka State Health Department, 2010b):

i. To protect the rights of non-smokers from inhaling tobacco smoke pollutants and cigarette smoke-contaminated air;

ii. To encourage the community in Melaka to lead a healthy lifestyle and not to smoke;

iii. To induce and encourage smokers to quit smoking;

iv. To support the efforts of the Melaka State Government towards achieving and maintaining the status of a developed state through the implementation of a smoke-free environment in order to protect the health of the population;

v. To contribute and support the efforts of the Melaka State Government to maintain its "Melaka World Heritage City" status by keeping Melaka healthy and smoke-free. A smoke-free city will also help Melaka preserve its priceless historical artefacts and heritage buildings.

### 1.3.2 Strategic Planning for Smoke-Free Melaka

Five key strategies were incorporated into the planning of the Smoke-Free Melaka Policy in order to ensure its effectiveness and success (Melaka State Health Department, 2010b). These are:

1. **Promotion and Advocacy**

   The objective of this strategy is to raise public awareness and disseminate knowledge about the implementation of the Melaka Smoke-Free Policy. This include the promotion of smoke-free environment and smoking cessation

services by relevant parties. Billboards and no-smoking signages were displayed in public premises and all non-smoking areas. Publicity regarding the Quitline and Infoline that aid smokers quit through reminders sent via SMS, as well as information of activities related to Smoke-Free Melaka were video taped and disseminate in the mass media and the official websites. Briefings and dialogue sessions related to the Smoke-Free initiatives to be held between government agencies, NGOs, proprietors and operators of hotels and business premises, state and community leaders, corporate body and private companies.

2. **Capacity-building and networking between government and non-governmental agencies**

   The involvement of various government agencies, private companies, organizations and institutions of learning within the State as partners with the State Government will boost the successful implementation of the Smoke-Free Zones policies. Cooperation and collaborations among the various NGOs will also ensure the success of Smoke-Free Melaka at all community levels. The setting up of an alliance NGO specific for Smoke-Free Melaka (i.e. GANMBAR) and its collaboration with similar NGOs will help in the successful implementation of a number of Smoke-Free Melaka activities. These include making available training modules and programs and the conduct of training-of-trainee (TOT) to further enhance the Smoke-Free Melaka activities.

3. **Quit-Smoking Services**

   The quit smoking services were expanded to include clinics and government hospitals. Corporate bodies were encouraged to be involved in providing smoking cessation programs designed for their employees and make available

the Quitline services as well as coaching program for smokers who are planning to quit the habit. Currently, quit smoking assistance and services are available in three government hospitals and 26 health clinics in Melaka. Telephone contact for the Infoline and Quitline at the Clearinghouse for Smoke-Free Melaka is +606-231 6755. The Infoline at the Ministry of Health is +603-8883 4400.

4. **Laws and Enforcement**

   The law and enforcement strategy identifies areas for enhancing effective legal implementation of smoke-free laws within the zones of Smoke-Free Melaka Policy.

5. **Monitoring and Assessment**

   The effectiveness of implementing Smoke-Free Melaka Policy will continiously monitored and assessed periodically through relevant studies. One such example is the cohort study on health impact and psycho-social at the Melaka Smoke-Free Zones, interior air quality research and studies monitoring the depletion of high risk diseases in hospitals.

### 1.3.3 Vision

The vision for Smoke-Free Melaka is "*Melaka Maju – Bebas Asap Rokok*". This vision was recognized by the World Health Organisation on 2013 (Melaka State Health Department, 2010b).

### 1.3.4 Mission

The mission for Smoke-Free Melaka is to empower the community towards Smoke-Free Melaka (Memperkasakan masyarakat ke arah Melaka Bebas Asap Rokok, MBAR) (Melaka State Health Department, 2010b).

### 1.3.5 Smoke-Free Melaka Logo

The Smoke-Free Melaka logo is a replica of the Melaka state as geographically outlined on the map (see Figure 1.1.) The *Bunga Kesidang* (bread flower) depicted on the top right-hand side of the logo is the official flower of the state. The flower, white in colour, symbolises a fresh and clean environment. The stencilled outline of the various architectures at the top of the logo represents Melaka's famous landmarks such as the Melaka palace, the Stadhuys, Kota A-Famosa and clock tower. The Smoke-Free Melaka logo is prominently displayed in places where smoking is prohibited (Melaka State Health Department, 2010a) .


Figure 1.1: The Smoke-Free Melaka Logo (Melaka State Health Department, 2010a)

### 1.3.6 Timeline of Smoke-Free Melaka

The concept of creating a Smoke-Free Melaka was originally mooted by the Malaysia Women's Action for Tobacco Control and Health (MyWATCH) and the Southeast Asia Tobacco Control Alliance (SEATCA) back in December 2008. Its prime objective is to protect the health of non-smokers, especially women and children, living with smokers. On 30 March 2010, a proposal to implement the Smoke-Free Melaka program received formal approval at the Meeting of the Melaka State Council. The announcement was made by The Honourable Chief Minister of Melaka on 11 April 2010. Thereafter, a series of meetings and strategic planning sessions were carried out involving a number of government departments and agencies, the Clearinghouse for Tobacco Control, (C-Tob) of the National Poison Centre, Universiti Sains Malaysia and the Malaysia Health Promotion Board (*MySihat*). The meeting outcomes were later presented to the State's Secretary. To ensure that the project was also participated by the State's NGOs, an alliance known as GaNMBAR was set up. Its role in the smoke-free program was clearly spelt out in the report of the strategic planning. Two MOUs relating to the program were executed: I) Between MySihat, the funding agency of the Smoke-Free Melaka program, and GaNMBAR, and, II) Between GaNMBAR, the Melaka State Health Department and Universiti Sains Malaysia (USM), in relation to the evaluation of the impact of the smoke-free program. Enforcement of non-smoking zones in the Melaka state came into effect on 15 June 2011 (Clearinghouse for Melaka Bebas Asap Rokok, 2010).

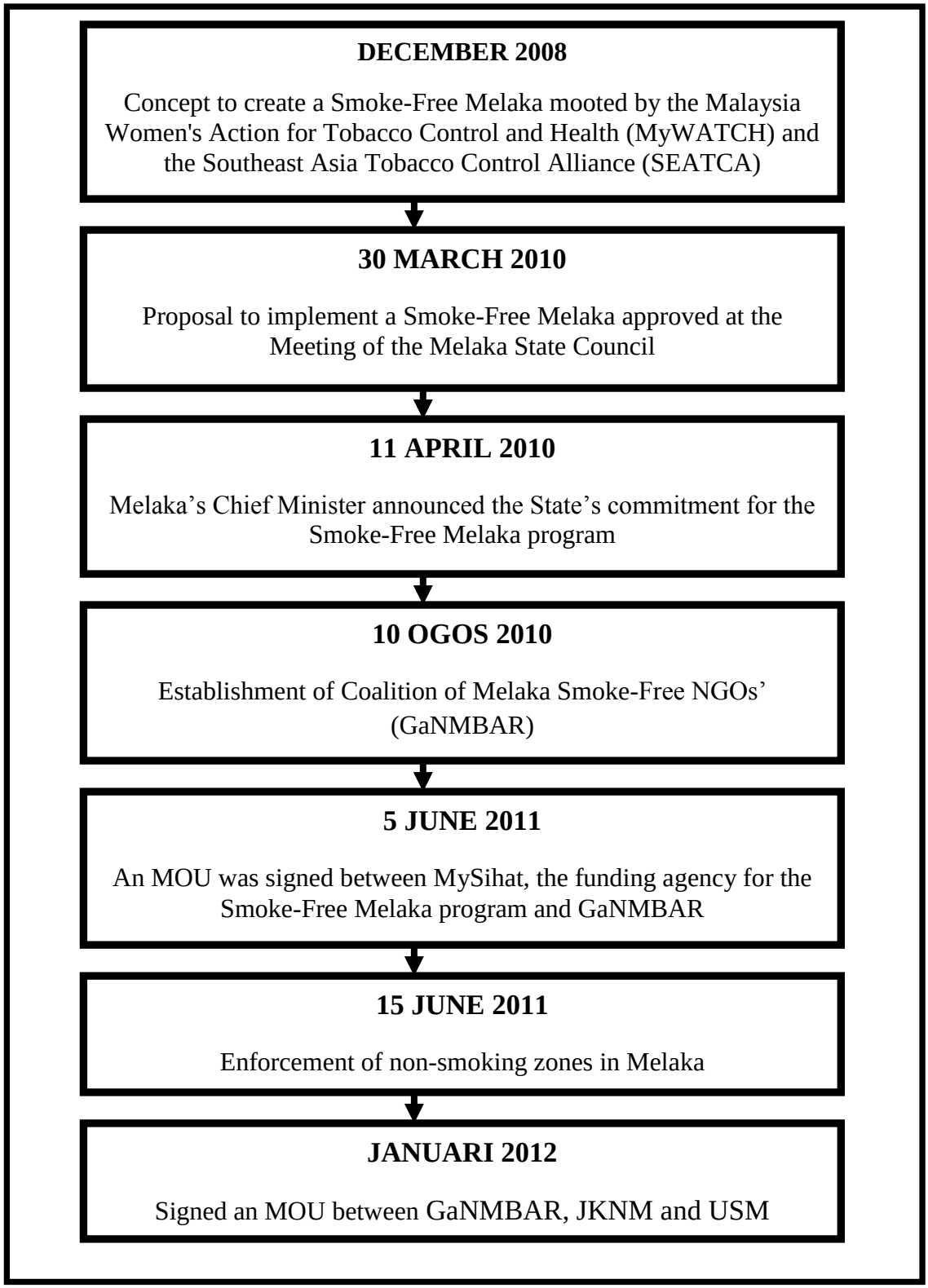


Figure 1.2: Timeline of Smoke-Free Melaka (Clearinghouse for Melaka Bebas Asap Rokok, 2010)

## 1.4 CONCEPTUAL FRAMEWORK FOR THE EVALUATION OF THE MELAKA SMOKE FREE POLICY

The planning of this study was based on the conceptual framework for the evaluation of smoke-free policies from the IARC Handbooks of Cancer Prevention (IARC, 2007). The ultimate goal of implementing smoke-free policies is to reduce second-hand smoke exposure thus protecting the health of non-smokers. Several factors were considered for the evaluation on the effectiveness of the Smoke-Free Melaka Policy. These include those that might influence how the policy could contribute to the reductions of second-hand smoke exposure, as well as more distal outcomes in relation to second-hand smoke beliefs, attitudes and practices. Additionally, there could also be potential incidental effects of the smoke-free regulations, such as possible business losses or gains, adoption of smoke-free homes and vehicles, and optimistically, an increase of smoking cessation (Figure 1.3)

Compliance to the policy is crucial at this point in the framework, as poor compliance could weaken the public health benefits of the smoke-free policy. Compliance behaviour or adherence to the policy could immediately observed or reported as soon as the policy being implemented. In this study, evaluation of effectiveness includes compliance, awareness, perception, attitudes and behaviours of people, all of which are the key proximal and distal variables in the process of achieving the ultimate goal or outcome of implementing a smoke free policy.

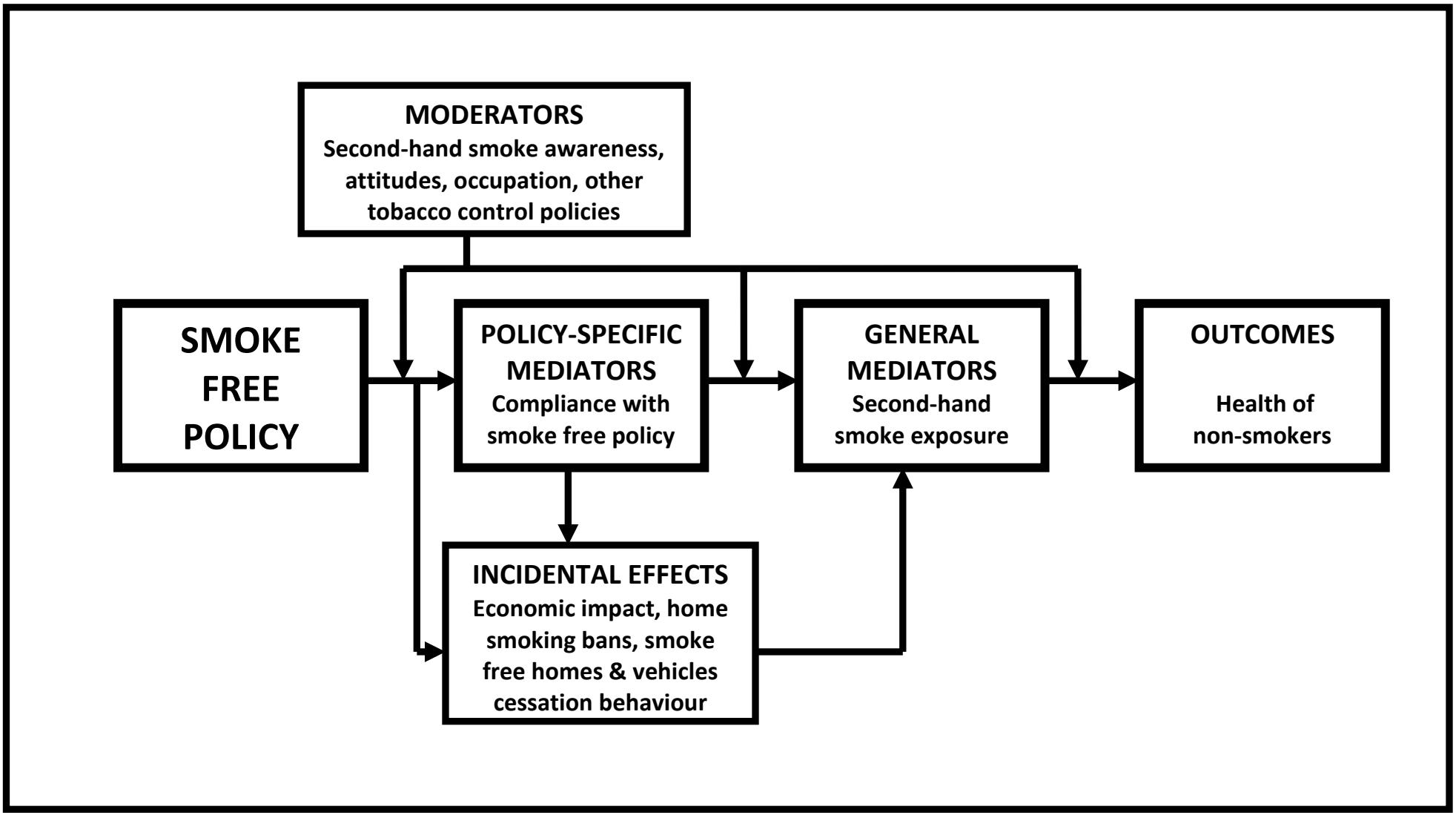


Figure 1.3: Conceptual framework for the evaluation of the Melaka Smoke-Free policy (IARC, 2007)

## 1.5 STUDY RATIONALE

1. Since the Smoke-Free Melaka policy had been formulated and implemented, it was important that an evaluation be carried out thereafter to assess the policy's effectiveness.
2. The evaluation was to observe the immediate impact of the Smoke-Free Melaka policy, principally, compliance among the smokers and non-smokers living and visiting the Melaka state.
3. To guide the formulation and implementation of a more effective smoke-free policy and programs for Melaka and other states in Malaysia.
4. The findings are important to serve as documented evidence and a research model for other states to follow and implement a similar policy.

## 1.6 RESEARCH OBJECTIVES AND RESEARCH QUESTION

### 1.6.1 Research objectives

The objectives of the study are:

1. To develop a conceptual framework for the evaluation of the Smoke-Free Melaka City policy;
2. To develop standardised survey instruments for evaluating smoke-free program;
3. To develop a study design for fieldwork data collection, and;
4. To evaluate the impact of Smoke-Free Melaka in relation to awareness, perception, attitude and behaviour on different categories of people in Melaka.

### 1.6.2 Research questions

Based on objective No. 4, there are seven key research objectives. Each of them has additional questions such as detailed below:

1. To examine if the smoke-free campaign and advertised program will affect self-reported awareness and perception on the smoking norms of the Melaka people?
    a. Have people seen or heard about the ads and campaign?
    b. Which type of media is most viewed by the people?
    c. Are there differences in locations where those media were viewed?
    d. Are people aware of the information delivered by the ads and campaign?
    e. Are there discussions amongst people on the ads and campaign?
    f. What are the perceptions regarding smoking norms among the people?
    g. What demographic factors are associated to the differences in awareness, perception, attitude and behaviour towards the ads and campaign?

2. To examine if the policy will affect reported smoking attitude and behaviour
    a. What impact has the policy on the attitude of smokers in different social settings?
    b. Has the policy enhanced smoke-free home and smoke-free private vehicles?
    c. What group of children living with smokers are associated with smokers' intention to have their homes and vehicles 100% smoke-free?
3. To assess the levels of compliance at key venues in gazetted smoke-free zones
    a. Level of compliance for the Melaka smoke-free policy in several key indoor and outdoor venues.
4. To assess the level of support for smoke-free venues and Melaka smoke-free policy
    a. Frequency of future visits to venues in smoke-free areas.
    b. Level of support from the people for the policy.
    c. Characteristics factors of people associated with support to the policy.
5. To examine whether the effects of policy in relation to awareness, perception, attitude, behaviour, compliance and support are moderated by situational and individual different factors (a) Demographic factors: age, gender, race, education, occupation (b) environmental context: number of children under 18 years [under 1 year, between1-5, 6-12, 13-17], permanent residents, visitors, (c) smoking history of the individual i.e. smoking status and number of cigarette smoked.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 EXPOSURE OF SECOND-HAND SMOKE IN MALAYSIA

In Malaysia, exposure to second-hand smoke (SHS) occurs mainly in workplaces, homes and public places (GATS, 2011). In a report prepared for the Ministry of Health (GATS, 2011) the following statistics indicated the magnitude of exposure to SHS among non-smokers in Malaysia in 2011:

- 4 out of every 10 adults (2.3 million) are exposed to SHS at workplaces;
- 4 out of every 10 adults (7.6 million) are exposed to SHS at home; and,
- 7 out of every 10 adults (8.6 million) are exposed to SHS in a public environment.

The statistics demonstrate that SHS exposure is at a relatively high level. It is already a known fact that SHS exposure has an adverse effect on the health. It is thus irrefutable that SHS is a critical health hazard affecting the Malaysian population. Creating and enacting smoke-free environments are optionally the most effective way to reduce SHS exposure among people, especially the non-smokers (IARC, 2007).

## 2.2 EFFECTS OF SECOND-HAND SMOKE

These days the harmful effects of smoking have become an important topic of discussion. This is because smoking not only directly affects the smokers' health but also on non-smokers' as well. An estimated 600,000 individuals die from exposure to SHS in 2011 with 75% occurring in women and children (Michael Eriksen, 2012).

The health of non-smokers are equally threatened because they involuntarily inhale SHS which is the cigarette smoke that enters the environment as a result of 1) mainstream smoke and 2) side-stream smoke (Michael Eriksen, 2012). Mainstream

smoke refers to the smoke which are inhaled and exhaled by smokers directly from tobacco products. Side-stream smoke refers to a mixture of smoke emitted from smouldering tobacco, contaminants emitted during puffs and contaminants through the cigarettes paper and the mouth end of the cigarette between puffs. These emissions contain both particulate and vapour contaminants. Side-stream is the major components of SHS, contributing over half of the particulate matter and nearly all of the vapour phase. Particles emitted from burning cigarettes are in fine to ultrafine particle size range of 0.02 micrometer to 2 micrometer (Klepeis et al., 2003) and have been shown to be inhaled deep into the lungs and causes an array of adverse health effects (US Department of Health and Human Services, 2006a).

SHS is a complex mixture of over 4000 chemicals compounds, including carcinogens such as polycyclic aromatic hydrocarbons (PAH), aromatic amines, and tobacco specific nitrosamines and various toxics, including carbon monoxide (CO), petrol, ammonia ($NH_3$), formaldehyde (HCHO), hydrogen cyanide (HCN), formic acid (HCOOH), nicotine, nitrogen oxides (NO), acrolein ($C_3H_4O$) and respirable suspended particles (IARC, 1987).

The adverse effects of smoking on health are well established and in recent years, research has started to look at the effects of SHS exposure. Evidence of a link between SHS exposure and serious health effects among people was officially recognized in the mid-1980s when several scientific committees and national organizations concluded that exposure to SHS is a cause of lung cancer (National Research Council, 1986, Australian National Health and Medical Research Council, 1987, UK Department of Health and Social Security, 1988). Since then, numerous studies have shown that SHS exposure increases the risk of developing a range of other