

INTERNATIONAL

E-Journal

Of Science, Medicine And Education

JULY 2019 | IeJSME 2019 Vol 13 (2)

ISSN 2231-8194



EDITORIAL

INTERNATIONAL E-JOURNAL OF SCIENCE, MEDICINE AND EDUCATION (IEJSME)

INTERNATIONAL ADVISORS

PROFESSOR JAMES A. DICKINSON

*Professor of Medicine,
University of Calgary,
CANADA*

PROFESSOR RON HARDEN

*General Secretary,
Association of Medical Education in Europe (AMEE),
UNITED KINGDOM*

EDITOR-IN-CHIEF

PROFESSOR PATRICIA LIM KIM CHOOI

DEPUTY EDITOR-IN-CHIEF

DR MAI CHUN WAI

EDITORIAL BOARD

PROFESSOR MAK JOON WAH (EMERITUS PROFESSOR, IMU, MALAYSIA)

PROFESSOR TRUDIE ROBERTS (PROFESSOR [CLINICAL], UNIVERSITY OF LEEDS, UNITED KINGDOM)

PROFESSOR DATUK DR LOKMAN HAKIM BIN SULAIMAN (PRO-VICE CHANCELLOR, RESEARCH, IMU, MALAYSIA)

PROFESSOR IAN SYMONDS (DEAN OF MEDICINE, UNIVERSITY OF ADELAIDE, AUSTRALIA)

PROFESSOR DATO' JAI MOHAN (PROFESSOR OF HEALTH INFORMATICS & PAEDIATRICS, IMU, MALAYSIA)

PROFESSOR DATO' SIVALINGAM NALLIAH (CLINICAL SCHOOL, IMU, MALAYSIA)

PROFESSOR GERARD FLAHERTY (PROFESSOR OF MEDICAL EDUCATION, NATIONAL UNIVERSITY OF IRELAND GALWAY, IRELAND)

PROFESSOR DATO' KANDASAMI PALAYAN (CLINICAL SCHOOL, IMU, MALAYSIA)

PROFESSOR PAUL CHEN (MALAYSIA)

DR BALVINDER SINGH GILL (CENTRE HEAD, MEDICAL RESEARCH RESOURCE CENTRE, INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR, MALAYSIA)

PROFESSOR TENG CHEONG LIENG (CLINICAL SCHOOL, IMU, MALAYSIA)

DR SHEAMINI SIVASAMPU (ASSISTANT DIRECTOR, HEALTH STATISTIC UNIT, CLINICAL RESEARCH CENTRE, MINISTRY OF HEALTH MALAYSIA)

PROFESSOR DR LIM KEAN GHEE (CLINICAL SCHOOL, IMU, MALAYSIA)

PROFESSOR RAY WILKS (SENIOR ASSOCIATE [PSYCHOLOGY], RMIT UNIVERSITY, AUSTRALIA)

PROFESSOR DATO' DR MAIMUNAH BT A HAMID (ASSOCIATE DEAN, SCHOOL OF MEDICINE, IMU, MALAYSIA)

DR ROZITA HALINA TUN HUSSEIN (SENIOR DEPUTY DIRECTOR, FINANCING PLANNING, INFORMATICS AND HEALTH ACCOUNTS, MINISTRY OF HEALTH MALAYSIA)

EDITORIAL ADDRESS

PROFESSOR DR PATRICIA LIM KIM CHOOI

Editor-in-chief

International e-Journal of Science, Medicine and Education

126, Jln Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, MALAYSIA

E-mail: iejsme@imu.edu.my

EDITORIAL

- The emergence and re-emergence of arboviruses: Transmission and disease burden** 1
Nur Alia Johari

REVIEW ARTICLE

- Impact factor and other citation metrics: The impact on scholarly writing** 4
Pei Kuan Lai, Sivalingam Nalliah, Cheong Lieng Teng, Nicole Lee Ping Chen
- Developments in the implementation of sugar-sweetened beverage tax in Malaysia -
A narrative review** 12
Sangeetha Shyam, Snigdha Misra, Megan Hueh Zan Chong, Rokiah Don

ORIGINAL ARTICLE

- Pre-independence medical journals in British Malaya: A content analysis** 23
*Cheong Lieng Teng, Kean Ghee Lim, Chun Yiing Ang, Soo Yin Chan, Edwin Keat Song Sam,
Jason Chee Siang Wee, Yee Chiing Ong*

RESEARCH NOTE

- Community awareness and perception of smoking ban at eateries in Pedas, Negeri Sembilan** 27
Wei Fern Siew, Davasooria Selvamani, Umair Memon, Xiaoxuan Liu, Sze Shian Wee

The emergence and re-emergence of arboviruses: Transmission and disease burden

Nur Alia Johari

The viruses and their vectors

Arthropod-borne viruses, or arboviruses, as the name suggests, are transmitted by arthropod vectors including mosquitoes and ticks. Of particular concern are the three arboviruses viz. dengue, chikungunya and Zika that have emerged with increasing disease incidence and geographical distribution. Over the last decade we have been faced with the emergence of the Zika virus (ZIKV) in Latin America and Asia¹, along with the resurgence of the dengue (DENV) and chikungunya (CHIKV) viruses that have plagued tropical and subtropical regions from as early as the 18th century^{2,3}. The spread of these arboviruses is inherently linked to the presence of the *Aedes* vector population. The fact that all three viruses are transmitted primarily by the *Aedes aegypti* mosquito is alarming, as this means that their transmission is subject to the same extrinsic and intrinsic factors involving the vector itself, the human host and the surrounding environment. *Ae. albopictus* is also capable of transmitting these arboviruses, and along with *Ae. aegypti* are active feeders in the daytime, rendering insecticide-treated bednets that have been instrumental in the battle against malaria useless in this scenario. Furthermore, unlike *Ae. aegypti*, *Ae. albopictus* possesses a wider geographical distribution due to its characteristically stronger ecological plasticity, dominance in resource competition and resilience in a range of environmental conditions^{4,5}.

The *Aedes* vector typically thrives in warm, tropical climates that are characterised by periodic patterns of rainfall, and exhibit a preference for urban and semi-urban environments as their habitat⁶. Thus, developing countries in tropical and subtropical regions are at the greatest risk. These regions are home to a population of over 2 billion individuals, and therefore the countries affected are subject to significant health and socioeconomic burden. In 2016, the Philippines and Malaysia contributed to over 100,000 dengue cases each out of 375,000 suspected cases reported in the World Health Organization (WHO) Western Pacific (WPRO) region. In the Americas, out of over 2.38 million cases, Brazil was singlehandedly responsible

for approximately 1.5 million cases⁷. The presence of the *Aedes* mosquitoes in both rural and urban areas places these populations at risk of CHIKV and ZIKV infections as well. The epidemiology of these infections will therefore be greatly influenced by vector ecology; with cyclical patterns of outbreaks occurring based on interactions between the mosquito vector, the infecting viruses and the immunity and behaviour of susceptible human populations.

To complicate matters, dengue, chikungunya and Zika infections result in febrile illnesses with similar presenting symptoms that generally include rashes, joint and muscle pain, headache and nausea. Misdiagnosis, especially in dengue-endemic countries, is highly common. Co-infections with two or more of these diseases have also been reported, but the clinical and public health implications of such infections are still unclear, as are the mechanisms of interactions between these viruses in both the vector and the human host. As discussed by Vogels and colleagues⁸, the interactions between these viruses may determine whether co-infections within the vector and/or human host result in one of four scenarios – virus inhibition, competition, enhancement or no effect (neutral). Thus far there are limited studies on cases of clinical co-infections, with available reports indicating that disease severity in co-infected patients does not appear to be any more common than those with single infections.

The dengue virus (DENV) is a single-stranded, positive strand RNA flavivirus. The virus is in the same family as ZIKV as well as other well-known human pathogens, namely the Japanese encephalitis virus (JEV), West Nile virus (WNV) and Yellow Fever virus (YFV). DENV is divided into four different serotypes, each capable of causing infections of varying degrees of severity³. Many countries in the Western Pacific Region, including Malaysia, are dengue hyperendemic, with all four serotypes co-circulating at any one time. This poses a major challenge in its control as patients that have recovered from one DENV serotype are still susceptible to infection with another with a possibility of immune enhancement of disease⁹. Compared to DENV, CHIKV

Institute for Research, Development and Innovation, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, MALAYSIA

Corresponding Author:

Nur Alia Johari, Institute for Research, Development and Innovation, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, MALAYSIA
E-mail: nuraliajohari@imu.edu.my

and ZIKV are less antigenically diverse, with CHIKV patients possessing life-long immunity post-infection.

CHIKV is an alphavirus that was first isolated in the 1950s in Tanzania from both mosquitoes and human serum. The virus has since spread across Asia, resulting in outbreaks in Southeast Asia as well as India, and more recently in Italy and the Indian Ocean islands between 2005 and 2007². The greatest burden CHIKV poses, besides the immediate effects of severe outbreaks and acute infections, is its long-term effect on patients' quality of life. CHIKV infections have a relatively low mortality rate but often result in severe arthralgia and myalgia amongst patients¹⁰, as well as long-term symptoms akin to rheumatoid arthritis that last for months, or in some cases years, post-infection. In Latin America, DENV is still responsible for the vast majority of arboviral disease incidence and mortality. However, based on CHIKV infections in 2014 in the region, analyses have estimated that approximately 50% of all patients who were infected would subsequently develop chronic inflammatory rheumatism¹¹. Following the emergence of ZIKV mid-2015, there were approximately 1.5 million confirmed cases of all three arboviruses by the following year¹².

ZIKV is the least well understood out of the three arboviruses. The virus was first isolated in 1947 from a sentinel monkey in Uganda, with sporadic infections across Africa and Asia and eventually causing the major outbreaks in the Yap State in 2007¹³ and subsequently in French Polynesia in 2013¹⁴. Infections by ZIKV were reported as generally mild, with minimal complications and fatalities, until the major outbreak in 2015 where the unprecedented spread of the disease across the Americas were associated with far more severe disease pathogenicity and neurological complications¹⁵. Out of all flaviviruses, ZIKV is the only one known to cause congenital infections amongst humans, resulting in microcephaly and birth defects in babies following symptomatic ZIKV infections in the mother¹⁶.

Disease control and international travel

The dramatic geographical expansion of the

arboviruses has been associated with the emergence of global trends driven by population and economic growth. Characteristic globalisation, urbanisation and international mobility following such developments have enabled the rapid cross-border travel of people, animals and goods, along with the exchange of various strains of DENV and importation of CHIKV and ZIKV. Travel-associated cases have been reported across the USA and in 16 countries in Europe, with Croatia, France and Portugal experiencing autochthonous dengue transmission⁵. In Malaysia, the Klang Valley is subject to high rates of population movement between other states across the country. Frequent population movement would contribute to disease incidence through the transport of different DENV serotypes and changing susceptibility of the resident population. Furthermore, continuous expansion into new habitats for development and dwelling through activities such as deforestation have resulted in changes in land cover, increasing human exposure to mosquitoes carrying different DENV strains, as well as the other arboviruses CHIKV and ZIKV¹⁷. Frequent and extensive construction activities occurring in dengue endemic countries may also be a potential contributor to disease transmission¹⁸. In Singapore, a study reported a significantly higher burden of dengue at construction sites, as well as the establishment of a transmission link between specific sites and neighbouring residential housing areas. Construction projects provide conducive environments for mosquito breeding, with large numbers of foreign labour facilitating the cross-border exchange of DENV serotypes between their home countries and place of work¹⁸. The noted geographic variations in dengue incidence are therefore inherently linked to differences in population distribution, rates of urbanisation and population growth and land use especially between rural and urban areas¹⁹.

Despite a variety of interventions and control measures undertaken, dengue epidemics, alongside increasingly frequent reports of CHIKV and sporadic ZIKV outbreaks, have persisted with a rising pattern of incidence and mortality. The understanding of disease burden both in

Malaysia and globally is crucial for the formulation of appropriate health policies for prevention and control of these diseases. Unfortunately, there has been a growing difficulty in quantifying the true global burden of these arbovirus infections, and the ongoing co-circulation of these viruses have posed a significant public health challenge in affected countries. The alarming resurgence of disease in recent years emphasises the need for a more in-depth understanding of the various social and ecological factors that influence the transmission of these arboviruses and the burden of these diseases worldwide. Besides the three arboviruses discussed here, a number of other arboviruses and pathogens may potentially emerge over time, with increasingly common spillover infections and heightened risk of severe epidemics. Integrated and targeted efforts in vector control, and the effective management of these diseases will be crucial in years to come.

Keywords: Arboviruses, Aedes, dengue, Chikungunya, Zika, vector control

REFERENCES

- Baud D, Gubler DJ, Schaub B, Lanteri MC, Musso D. An update on Zika virus infection. *The Lancet*. 2017;390(10107):2099-109.
- Weaver SC, Lecuit M. Chikungunya Virus and the Global Spread of a Mosquito-Borne Disease. *New England Journal of Medicine*. 2015;372(13):1231-9.
- Vasilakis N, Cardosa J, Hanley KA, Holmes EC, Weaver SC. Fever from the forest: prospects for the continued emergence of sylvatic dengue virus and its impact on public health. *Nat Rev Microbiol*. 2011;9(7):532-41.
- Medlock JM, Hansford KM, Schaffner F, Versteirt V, Hendrickx G, Zeller H, et al. A review of the invasive mosquitoes in Europe: ecology, public health risks, and control options. *Vector Borne Zoonotic Dis*. 2012;12(6):435-47. Epub 2012/03/28.
- Leta S, Beyene TJ, De Clercq EM, Amenu K, Kraemer MUG, Revie CW. Global risk mapping for major diseases transmitted by *Aedes aegypti* and *Aedes albopictus*. *Int J Infect Dis*. 2018;67:25-35. Epub 2017/12/03.
- Kraemer MUG, Sinka ME, Duda KA, Mylne AQN, Shearer FM, Barker CM, et al. The global distribution of the arbovirus vectors *Aedes aegypti* and *Ae. albopictus*. *Elife*. 2015;4.
- WHO. Dengue and severe dengue [Internet]. World Health Organization. 2018 [cited 2018 Jul 23]; Available from: <http://www.who.int/en/news-room/fact-sheets/detail/dengue-and-severe-dengue>.
- Vogels CBF, Rückert C, Cavany SM, Perkins TA, Ebel GD, Grubaugh ND. Arbovirus coinfection and co-transmission: A neglected public health concern? *PLoS biology*. 2019;17(1):e3000130.
- Messina JP, Brady OJ, Scott TW, Zou C, Pigott DM, Duda KA, et al. Global spread of dengue virus types: mapping the 70 year history. *Trends Microbiol*. 2014;22(3):138-46.
- Schilte C, Staikovsky F, Couderc T, Madec Y, Carpentier F, Kassab S, et al. Chikungunya virus-associated long-term arthralgia: a 36-month prospective longitudinal study. *PLoS Negl Trop Dis*. 2013;7(3):e2137.
- Rodriguez-Morales AJ, Cardona-Ospina JA, Villamil-Gomez W, Paniz-Mondolfi AE. How many patients with post-chikungunya chronic inflammatory rheumatism can we expect in the new endemic areas of Latin America? *Rheumatol Int*. 2015;35(12):2091-4. Epub 2015/06/06.
- Rodriguez-Morales AJ, Villamil-Gomez WE, Franco-Paredes C. The arboviral burden of disease caused by co-circulation and co-infection of dengue, chikungunya and Zika in the Americas. *Travel Med Infect Dis*. 2016;14(3):177-9. Epub 2016/05/26.
- Duffy MR, Chen TH, Hancock WT, Powers AM, Kool JL, Lanciotti RS, et al. Zika virus outbreak on Yap Island, Federated States of Micronesia. *N Engl J Med*. 2009;360(24):2536-43. Epub 2009/06/12.
- Cao-Lormeau VM, Roche C, Teissier A, Robin E, Berry AL, Mallet HP, et al. Zika virus, French polynesia, South pacific, 2013. *Emerging Infectious Diseases*. 2014;20(6):1085-6. Epub 2014/05/27.
- WHO. Epidemiological alert: neurological syndrome, congenital malformations, and Zika virus infection. Implications for public health in the Americas [Internet]. World Health Organization. 2015 [cited 2019 Sep 24]; Available from: http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=32405&lang=en.
- Teixeira MG, da Conceição N, Costa M, de Oliveira WK, Nunes ML, Rodrigues LC. The epidemic of Zika virus-related microcephaly in Brazil: detection, control, etiology, and future scenarios. *American journal of public health*. 2016;106(4):601-5.
- Kilpatrick AM, Randolph SE. Drivers, dynamics, and control of emerging vector-borne zoonotic diseases. *Lancet*. 2012;380(9857):1946-55.
- Liang S, Hapuarachchi HC, Rajarethinam J, Koo C, Tang C-S, Chong C-S, et al. Construction sites as an important driver of dengue transmission: implications for disease control. *BMC Infect Dis*. 2018;18(1):382.
- Gubler DJ. Dengue, Urbanization and Globalization: The Unholy Trinity of the 21(st) Century. *Trop Med Health*. 2011;39(4 Suppl):3-11. Epub 2012/04/14.

Impact factor and other citation metrics: The impact on scholarly writing

Pei Kuan Lai¹, Sivalingam Nalliah², Cheong Lieng Teng², Nicole Lee Ping Chen³

ABSTRACT

The impact factor (IF) of a journal, first proposed by Garfield has evolved over the years as an evaluation tool for comparing scholarly journals. Over the past few decades, the utilization of IF has extended beyond the tool for acquisition of journals in libraries and proxy for quality and importance of published journals. Nowadays, IF has been widely used as a surrogate for article quality, assessment of individual researcher's achievement, criteria to secure tenure and job promotion, as well as evaluation tool for the application of research grant or funding. This review addresses the historical perspective of IF and its evolution, the controversial issues leading to the manipulation by journal editors or authors, and followed by some of the interventions to overcome the manipulations and controversies. IF itself has many drawbacks and shortcomings worth addressing as they will lead to bias as a citation index. The scientific community should pay attention to call for a better citation metric which will prove to be an improved yardstick of science. This paper also covers on other citation metrics and their emerging usages as parameter for evaluation of scientific publication quality.

Key words: Impact factor, bibliometry, citation metrics.

INTRODUCTION

Conceived from the seed of an innocent idea for a simple method to compare journals in 1955, Dr Eugene Garfield devised the concept of impact factor (IF)¹. He firstly referred to the concept of citation index for sciences in his paper *Citation Indexes for Science: A New Dimension in Documentation through Association of Ideas* published in *Science*². He was the founder of the Institute for Scientific Information (ISI) in Philadelphia, Pennsylvania which is today part of Clarivate Analytics^{3,4}.

The IF was first used to select journals for the Science Citation Index (SCI) in 1961. Commencing in 1975, the IF was incorporated into the newly developed Annual Journal Citation Reports (JCR)⁵⁻⁷ which has since been

drawing information from the Web of Science database with close to 150 million records from 33,000 journals from 2014⁵.

This paper attempts to depict the IF and its impact, specifically to highlight the uses and misuses of IF, the limitations and drawbacks arising from the utility of IF, the condition of "impactitis" (obsession with IF) and interventions in overcoming it, as well as other emerging citation metrics and their usage in evaluation of relative importance and quality of published articles.

The derivation of impact factor

Fundamentally, IF depicts the average number of citations in a particular journal over a specific period⁶. It consists of a group of numerical digits and is a measure of frequency with which the articles in a journal have been cited during the previous two years divided by the number of published articles⁸⁻¹⁰.

By calculation, the impact numbers are derived from the total number of citations a journal receives in a given year to all articles published in that journal for the preceding two years (numerator) divided by the total number of substantive articles the journal published in those previous two years (denominator)⁸⁻¹⁰.

For example, suppose that Journal X has published 30 and 20 source items in the years 2015 and 2016 respectively. These source items have received respectively 40 and 60 citations in 2017¹¹. The calculations are summarised as follows:

$$\begin{aligned} & \text{The impact factor of Journal X for 2017} \\ &= \frac{\text{Total citations in 2017 to articles published in} \\ & \quad \text{2015-2016 for Journal X}}{\text{Number of total citable articles published in} \\ & \quad \text{2015-2016 for Journal X}} \\ &= \frac{40 + 60}{30 + 20} \\ &= 2 \end{aligned}$$

¹Institute for Research, Development, and Innovation, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur.

²Clinical Campus Seremban, International Medical University, Jalan Dr Muthu, Bukit Rasah, 70300 Seremban, Negeri Sembilan.

³School of Medicine, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur.

Received 27 May 2019; received in revised form 5 June 2019; accepted 10 June 2019

Corresponding Author:

Ms Lai Pei Kuan, Institute for Research, Development, and Innovation, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur.

Tel: 03-27317044 Fax: 03-86567299 Email: LaiPeiKuan@imu.edu.my

As the number of published articles increases in leaps and bounds over the years, IF is now calculated with integers displayed up to three decimal places, e.g. 2.588. This was justified by Garfield as a crucial move to create a unique system¹² to overcome the issue of journals listed with identical IFs¹³. The IF portrays some interesting features. It is a pure number but not a constant and does not have any unit. It is not only year-specific, but also database- and subject-specific.

Utilization of the impact factor

Although IF was originally designed to provide information about the citation performance of a journal⁵, IF has gradually evolved for use as a proxy for the relative importance and measure of scientific quality of research in an article^{6,13}. Basically, to sum it up, the IF has become an important metrics for authors, researchers, universities, funding agencies, grantsmanship, decision-making bodies, editors, and publishers. Besides, IF is also increasingly used for tenures and promotions of academics as well as for budget and resource planning within universities, research institutions, and colleges.^{9,14}

Currently IF is used as a benchmark to select and deselect journals for acquisition in a library based on a ranked IF list^{6,12,15,16}. The journals at the top of the ranked list will be included in a library database whilst those at the bottom of the list usually will be deselected considering budget constraints and various other factors¹⁷.

Due to the impact of IF on scholarly writing, it is a common practice for the academics to select high IF journals to publish their treasured works¹⁷. In a report by Wang¹⁸, most of the researchers opined that they would prefer to publish their papers in SCI journals for various reasons which included: better curriculum vitae, indicator of their scientific activity, deemed prestigious, and indicator of greater scientific merit¹⁹.

There are concerns when young researchers especially graduate students, post-doctoral fellows and junior faculty clamouring to move up the academic ladder and seeking to be visible in their institutions, choose to

publish papers that draw attention to a greater readership in view of the subject of interest rather than where their traditional strength lies¹⁸. For instance, an engineering faculty may desire to do research and publish in the area of biomedical sciences! This emerging trend leads to low quality of research and publication as the subject of interest is not his area of expertise.

Having said that, some senior tenured researchers were ready to compromise with this practice and still valued their papers being published in non-SCI journals¹⁸. Publications of even good research material in non-indexed journals were assumed acceptable if they were included in PubMed and searchable¹⁸. Some researchers who have been relatively established in their academic career would welcome publishing in non-SCI journals but voiced their concern for students who were still struggling to get a job or promotion¹⁸.

In spite of the good reputation that IF has gained since its conceptualisation, there are increasing concerns of its inappropriate use and in ways not originally envisaged by its developer^{20,21}. Sadly, many scientists have also acquiesced in such misuse of IF. The misuse warrants closer attention with an increasing number of articles appearing in the media addressing concerns of “manipulation” of the original intention of using metrics to rank scholarly journals¹².

IF is also one of the impetuses behind the “Publish or Perish” culture plaguing the academia today. Many researchers particularly those from the academia are pressured to publish papers in high-impact, peer-reviewed journals in order to meet the institutes’ Key Performance Indicators (KPIs). To quote an example, in September 2017, a prestigious university in Malaysia had unethically forced their academicians to cite their colleagues in their research papers to raise the university ranking resulting in the phenomenon “citation stacking”^{22,23}. Some institutions such as Sifa University in Turkey have started implementing a reward system to reward the researchers with prizes for publishing in high IF journals¹⁸. In South Korea, China, and Pakistan, the scientists are rewarded with cash if their papers

get published in high impact journals such as Nature, Science, and Cell¹⁶. For instance, Zhejiang Chinese Medical University awards papers published in Nature or Science with 100,000 RMB²⁴.

In many institutions such as Nizam's Institute of Medical Sciences in India, academic performance of a researcher is assessed with publications in indexed journals being the minimum requirement for appointment as faculty as well as for promotion¹⁸. Meanwhile, governmental research funds and institutions in Moscow, Russia, also used journal IF and ISI citation as a criterion to evaluate the quality of the project and individual researcher outcome¹⁸. This practice may cause adverse academic consequences. Faculty from fields like Forensic Medicine may be disadvantaged during job promotions for clinicians in one institute in India who have publications appearing in Lancet as opposed to that appearing in reputed journal of Forensic Medicine like *American Journal of Forensic Medicine and Pathology* with impact factor of 39.06 vs 0.883²⁵.

Researchers who achieve higher IF appear to have a better chance to obtain research grants^{18,26,27,28}. In addition to that, a journal's IF has also become a surrogate and proxy for the relative quality of published articles. Using the journal's average citation impact instead of the actual article impact means that the article is graded by the prestige of the journal involved²⁹. Opinions vary as to how the quality of each paper should be evaluated. Clearly the quality of each paper should be evaluated by its contents and not by the name of the journal publishing the papers. One should not give credit to a low quality paper because it is published in top journals like IEEE Trans Med Imaging¹⁸.

Limitations of impact factor

IF has its own limitations and drawbacks that are worth addressing¹⁶. When Garfield first mooted the idea of IF, it never dawned on him that it would become a subject of widespread controversy^{1,30}. The usage of IF as a bibliometric indicator has stirred debates amongst the scientific community whether its usage is appropriate.

Since IF is derived from the total citations to the articles of a journal, it cannot serve as a statistical representative of individual journal articles^{31,32} and all articles in the same journal are assumed to be of a similar quality. Moreover, the IF does not reflect how well read or discussed a journal is outside the core scientific community and the impact of the paper on health policy³³.

Besides that, IF does not necessarily reflect the true contribution of each researcher in their individual field. Maurea S remarked that Web of Science may be merely an approximate method and it works in such a way that the significance of IF evaluation is not absolutely related with the major or minor role of an author in a research group¹⁸. Hence, it can only depict the scientific value of a paper, but not the individual value of the single author.

IFs, when used in the ranking of medical and biological research journals, portray strong favouritism towards high-profile disciplines with rapid turnovers such as molecular biology or biochemistry but do injustice to low-profile disciplines such as anatomy and histology¹⁹. Within medical research itself, basic research in medicine is cited three to five times more than clinical medicine³⁴. Biochemistry and molecular biology articles were cited about five times more often than pharmacy articles³⁵. Similarly, basic science research tends to be cited more often than applied science as applied science is heavily dependent on basic science³⁶. On the contrary, journals in the field of Forensic Medicine have fairly low IF due to smaller size of the field, fewer active researchers, and less pressure to publish²⁵. Therefore, it is rather difficult to compare achievements of medical researchers in different disciplines.

Oei¹⁸, who is a radiologist from Erasmus University Medical Center Rotterdam, The Netherlands, related his experience of comparison of IF across disciplines. Journals in radiology usually have a lower IF than those of their clinical counterparts. Therefore, the radiologists will normally end up with lower scores than the clinical specialists when they apply for a cross-disciplinary grant such as The Netherlands Organisation for Scientific

Research (NOW), the Dutch equivalent. In addition, articles published in non-radiological journals will not be counted as it is considered “outside their own discipline”¹⁸.

Language is another factor affecting the IF as journals that are published in English reportedly have higher IFs than those in other languages¹⁹. Study by Paiva et al.³⁷ remarked that the likelihood of English articles being published in a high IF journal was 2.85 factors higher (95% CI, 1.24-6.54, $p=0.014$; CI: confidence interval). As English dominates international research and clinical literature¹, domestic papers such as those in Japanese are even excluded in ISI journals¹⁸.

Open access journals tend to be cited more and have higher IFs as well³⁸. In a randomised controlled trial conducted by Davis et al., it was reported that as compared to the subscription-based journals, open access journals had 89% more full text downloads and 42% more PDF downloads in the first six months after publication³⁹, and are twice as likely to be cited 4 to 10 months after publication and almost three times as likely between 10 and 16 months^{40,41,42}.

Playing the impact factor game

The concept of ‘playing’ the impact factor game has slowly crept into publications with editors ‘massaging’ the IFs or artificially raising its value³⁴ as the ‘impact factor game’ takes place. In fact, Georg Franck saw it coming that scientists will find ways to game the IF system when their ‘success’ depends too heavily on citation count⁴³.

One of the manipulations is self-citation whereby some editors may request the authors to cite other papers published in the previous two years in the same journal to increase its own IF^{11,16,32,40}. Nonetheless, self-citation up to a rate of 20% is acceptable by Thomson Reuters but beyond 20% is considered as suspect of abuse^{7,44}.

Another strategy to increase the value of IF is to publish as many review articles as possible, which sum up the current state of research on a particular topic

from different studies^{6,32}. Review articles generally have higher or inflated IFs due to its higher possibilities to be cited, having compilations of large numbers of citations, and being used as a substitute for earlier literature^{7,18,45,46}. Similarly, articles on methodology or procedures and protocols also get more citations than other papers⁴⁷.

Some journals also try to increase the IF by including non-source items in the journal including editorials, correspondence, letters to the editors, perspectives, news items, abstracts, commentaries, interviews, tributes, and even obituaries¹³. Unlike the ‘source items’ or ‘citable items’ like original articles, editorials, letters, short communications, reviews, and proceedings, the ‘non-source items’ are non-substantive source articles and should not be included in the denominator of the IF ratio calculation. Nonetheless, it is worth noting that all citations of these non-source articles are eligible for inclusion in the numerator which ultimately increases the value of IFs⁶.

Timing is also another factor that could affect the IF. As the IF has a period of 2-year citation window⁴⁵ or simply put, the IF only measures the influence of an article during the first two years after publication⁴⁸, many researchers actually target to get their papers published in the early months of the year. Just imagine, a good paper published in January has 11 months longer to be cited compared to the papers published in December of the same year^{7,49}. The 2-year period was chosen as it was perceived to reflect peak citation activity for high-impact articles⁵⁰. In addition, journals in rapidly growing research fields, such as systems biology and bioinformatics, tend to publish papers within a short time interval thus achieving higher IF³⁴.

Furthermore, it is preferable for journals to publish long articles because longer articles tend to have higher citation rate⁵¹. Besides, journals from research fields which are dynamic and having literature that rapidly becomes obsolete are also favoured^{32,46}. This group of journals tend to record higher IF owing to higher publication activity and short publication lags. Short publication time lag also leads to many short term

journal self-citation contributing to higher journal IF³². Examples are biochemistry and molecular biology journals.

Some researchers encourage the tactic of “salami slicing”, whereby separate yet similar pieces of single dataset are published across multiple papers⁵². Research data and manuscripts are broken into many “least publishable units” so that more articles can be published out of a single study. This method also encourages self-citations which ultimately also increases the IF⁷. On a single project for a research fellowship from the Boehringer Ingelheim Fonds (BIF), the applicants had published from 1 to 16 articles and the results of a regression model showed the multiple publications of research findings led to higher total citation counts⁵³.

These ‘manipulation games’ have unwelcome results in the academic world which result in too much emphasis on IF of publications. Journal is designed for citing rather than reading leading to everything readable and entertaining is cut in favour of citable materials⁵⁴.

Interventions to overcome obsession with IF

Over time, the scientific community has portrayed the obsession with IF as a medical condition, sometimes referred to as “impactitis” or “IF mania”. The consequence of this “medical disease” is that scientists are too focused on high-impact academic works leading to misuse which will adversely affect or even impede scientific progress. Clearly there is a need for some remedial measures.¹⁰

As English language has become the lingua franca in science and papers published in English language have dominated high-impact journals, the modern academic researchers should rectify this situation so that language would not pose as a barrier for the journals to achieve high IF. The scientific community has been urged to find more ways to include more non-English language journals in the SCI such as translating non-English articles⁵⁵. However, this issue warrants the editors to look into the cost-effectiveness of getting the translations done.

Besides, some editors from the non-English-speaking countries have made the strategic decision to publish bilingual editions of articles in both the native language of their country and English⁵⁶. For instance, editors from journals such as Clinical Medicine in Europe and Latin America have widely adopted this strategy⁵⁶. On top of that, journals such as the Public Library of Science (PLOS) have also adopted the use of open systems allowing authors of non-English-speaking countries to send a version of the articles in their native language as complementary material (supporting material) in addition to the English version⁵⁶.

Albeit IF is relatively vital in depicting the importance and impact of a publication, scientists should really stop judging science based on the publication venue¹⁰. Academic institutions should also reduce emphasizing on journal citation metrics for employment and career advancement. Journal club members should diversify the articles selections by including the low-IF yet interesting articles to facilitate discussions.¹⁰

Some research institutions have set up journal clubs typically involving review, discussion, and critique of selected scientific papers. It is believed that journal clubs help to train young scientists and provide information to the participants about new developments in science. Most of the time, journal clubs are dominated by articles from high impact journals. The journal club members should diversify the journal club selections by including also the interesting articles from more specialised society journals which might help to improve journal club discussions.¹⁰

Perhaps the scientific community should be more educated and well-informed about the misuse of the IF by incorporating IF in the curriculum of ethics courses as well as seminars on publication ethics for established scientists, postdoctoral fellows, and research staff. Topics which should be discussed include the rampant misuse of IF, the calculation of IF, the limitations of IF as indexing metrics, the influences of IF in scientists’ behaviours, and the manipulation of IF in the gaming system.

Some debates on the impact factor

The scientific community has the majority voice that the benefits of IF outweigh the harms it brings and it is nonetheless still the best available tool currently¹⁸. Egorov V.I and Choi Y¹⁸ strongly agreed that IF serves as an objective tool and explicit evaluation criterion to evaluate a researcher's achievements. Chung H-W opined that papers published in the absence of IF can conveniently come with hidden truth as compared to papers published with IF which often entails an entire team increasing the transparency to the public¹⁸.

Nevertheless, some suggestions have been given by the researchers on how the IF can be improved¹⁸. Wang remarked that a more comprehensive approach with some conversion factors and other complementary measurement methods should be developed to allow cross-discipline comparisons¹⁸. Kuyumcu S advised that some kind of per paper statistical evaluation tool should be used as evaluation method so that every paper can have its own score¹⁸. On top of that, there has been suggestion to use Google citation as a tool for per paper evaluation¹⁸.

Other bibliometric indicators

Owing to the controversies and limitations of using a single metric alone, many other alternative bibliometric indicators have been proposed⁵⁷. To name a few, the list includes cites per doc. (2 years), CiteScore, citation analysis, H-index, Article Influence Score (AIS), PageRank algorithm, SCImago Journal Rank (SJR), Source Normalized Impact per Paper (SNIP), and Eigenfactor Score.

CiteScore was created by Scopus and launched by Elsevier in 2016⁵⁸. CiteScore is derived from the number of citations received by a journal in one year to documents published in the three previous years, divided by the number of documents indexed in Scopus published in those same three years⁵⁸. In comparison with IF, the calculation of CiteScore is based on Scopus data while IF is based on Web of Science data. CiteScore is based on a

3-year citation window while IF adopts a 2-year citation window. Last but not least, CiteScore incorporates all document types indexed by Scopus including articles, reviews, letters, notes, editorials, conference papers and etc. while IF only includes source items which are citable, namely articles and reviews. In addition, CiteScore is well-received amongst the scientific community due to its user-friendliness, comprehensive coverage of more than 22,000 titles on Scopus, transparency of underlying data, as well as its free-access status.

Besides, *H-index*, also known as Hirsch index, was invented by Jorge E. Hirsch who was a physicist at University of California (UCSD) in 2005^{45,59,60}. This index corresponds to the number 'h' of articles by an author that have been cited 'h' times⁹. For instance, a researcher with an h-index of 5 would have published 5 papers with each cited by others at least 5 times⁶⁰. Compared to IF, H-index does not take into account of outlier publications which contribute to a skewed picture of a researcher's impact. Also, H-index helps the non-experts to evaluate other researchers in their field due to its transparency nature. It is noteworthy to highlight a limitation of H-index in which the indicator does not discriminate between the impact of principal authors and co-authors⁶¹. This is because a researcher who has never been a principal author may appear in many papers as co-author and thus, may have a very high H-index.

Apart from CiteScore and H-index, there are many other alternative bibliometric indicators for active consideration. Another indicator, for instance, that can be used to evaluate the impact of a researcher is the Total Citations received for the past 5 or 10 years based on Google Scholar. However, it is not the focus of this paper to discuss each and every one of the indicators.

CONCLUSIONS

The value of IF and its position as the dominant metric cannot be denied despite its drawbacks and shortcomings. Essentially, it is not the IF itself, but

how the researchers and other stakeholders including grant bodies as well as university tenure and promotion committee utilise it judiciously. Users of IF should bear in mind the limitations of IF and do not over-interpret data from their analyses. There are also emerging trends to ‘manipulate’ its significance and this ‘manipulation game’ should be stopped. Researchers should consider the vital factors or alternatives as well as the language involved. Lastly, academic promotions should take note of the factors as mentioned and not solely rely on IF alone. The scientific community should focus on the quality and contents of the articles and not on judging an author by the journal’s impact factor. Conclusively, impact factor should not be used as a yardstick to define the success of a journal.

REFERENCES

1. Garfield E. Interview with Eugene Garfield, chairman emeritus of the Institute for Scientific Information (ISI). *Cortex* 2001;37(4):575-7.
2. GARFIELD E. Citation indexes for science; a new dimension in documentation through association of ideas. *Science* 1955 Jul 15;122(3159):108-11.
3. Garfield E. “Science Citation Index”-A New Dimension in Indexing. *Science* 1964;144(3619):649-54.
4. Garfield E. Citation analysis as a tool in journal evaluation. *Science* 1972;178(4060):471-9.
5. Zupanc GK. Impact beyond the impact factor. *J Comp Physiol, A* 2014;200:113-6.
6. Cross J. Impact factors—the basics. *The E-resources management handbook* 2009;10: 9552448-50.
7. Mavrogenis AF, Ruggieri P, Papagelopoulos PJ. *Self-citation in Publishing* 2010.
8. Eliades T, Athanasiou AE. Impact Factor A Review with Specific Relevance to Orthodontic Journals. *Journal of Orofacial Orthopedics/ Fortschritte der Kieferorthopädie* 2001;62(1):74-83.
9. Baethge C. Impact factor—a useful tool, but not for all purposes. *Dtsch Arztebl Int* 2012 Apr;109(15):267-9.
10. Casadevall A, Fang FC. Impacted science: impact is not importance. *MBio* 2015 Oct 13;6(5):e01593-15.
11. Elsaie ML, Kammer J. Impactitis: the impact factor myth syndrome. *Indian J Dermatol* 2009;54(1):83-5.
12. Vanclay JK. Impact factor: outdated artefact or stepping-stone to journal certification? *Scientometrics* 2012;92(2):211-38.
13. Garfield E. The history and meaning of the journal impact factor. *JAMA* 2006;295(1):90-3.
14. Rawat S. How is impact factor impacting our research? *Biomed J* 2014;37(6).
15. Saha S, Saint S, Christakis DA. Impact factor: a valid measure of journal quality? *J Med Libr Assoc* 2003 Jan;91(1):42-6.
16. Kumar V, Upadhyay S, Medhi B. Impact of the impact factor in biomedical research: its use and misuse. *Singapore Med J* 2009;50(8):752-5.
17. Sen B. Normalised impact factor. *J Documentation* 1992;48(3):318-25.
18. Wang YX, Arora R, Choi Y, Chung HW, Egorov VI, Frahm J, et al. Implications of Web of Science journal impact factor for scientific output evaluation in 16 institutions and investigators’ opinion. *Quant Imaging Med Surg* 2014 Dec;4(6):453-61.
19. Coleman R. Impact factors: use and abuse in biomedical research. *Anat Rec* 1999;257(2):54-7.
20. Garfield E. How can impact factors be improved? *BMJ* 1996 Aug 17;313(7054):411-3.
21. Adler R, Ewing J, Taylor P. Joint committee on quantitative assessment of research: citation statistics. *Australian Mathematical Society Gazette* 2008;35(3):166-88.
22. Mahat R. Gerak appalled by enforced citation stacking in Universiti Malaya. 2017; Available at: <https://www.malaysiakini.com/letters/394746>. Accessed Aug/8, 2018.
23. Marr B. Measurement Mistakes: When KPIs Drive Bad Behaviour - The Case of Citation Stacking. 2018; Available at: <https://www.bernardmarr.com/default.asp?contentID=1339>. Accessed Aug/8, 2018.
24. Jufang S, Huiyun S. The outflow of academic papers from China: why is it happening and can it be stemmed? *Learned Publishing* 2011;24(2):9597.
25. Shekhawat RS, Setia P, Awasthi D. Higher impact factor: better journal? Not a necessity. *J Indian Acadf Forensic Med* 2014;36(2):199-202.
26. Experiences with a bibliometric model for performance based funding of research institutions. *Book of Abstracts*; 2008.
27. A bibliometric model for performance based budgeting of research institutions. *Proceedings of the 9th International Conference on Science & Technology Indicators*, 7-9 September 2006, Leuven, Belgium; 2006.
28. Schneider JW. An outline of the bibliometric indicator used for performance-based funding of research institutions in Norway. *European Political Sci* 2009;8(3):364-78.

29. Wróblewski AK. A commentary on misuses of the impact factor. *Arch Immunol Ther Exp (Warsz)* 2008;56(6):355-6.
30. Garfield E. Journal impact factor: a brief review. *CMAJ* 1999 Oct 19;161(8):979-80.
31. Radder RS, Yankanchi SR, Gramapurohit NP. Imperfect impact factor. *Curr Sci* 2008;95:813.
32. Guerrero R. Misuse and abuse of journal "impact factors". *Nowotwory. Jf Oncol* 2002;52(2):93.
33. PLoS Medicine Editors. The impact factor game. *PLoS Med* 2006;3(6):e291.
34. Dong P, Loh M, Mondry A. The "impact factor" revisited. *Biomedical digital libraries* 2005;2(1):7.
35. Narin F, Hamilton KS. Bibliometric performance measures. *Scientometrics* 1996;36(3):293-310.
36. Punjabi PP. Editorial 25: 1: The Impact of the Impact Factor. *Perfusion* 2010;25(1):3.
37. Paiva CE, Araujo RL, Paiva BS, de Padua Souza C, Carcano FM, Costa MM, et al. What are the personal and professional characteristics that distinguish the researchers who publish in high- and low-impact journals? A multi-national web-based survey. *Ecancermedicalscience* 2017 Feb 7;11:718.
38. Kumar A. Is "Impact" the "Factor" that matters...? (Part I). *J Indian Soc Periodontol* 2018;22(2):95-6.
39. Davis PM, Lewenstein BV, Simon DH, Booth JG, Connolly MJ. Open access publishing, article downloads, and citations: randomised controlled trial. *BMJ* 2008 Jul 31;337:a568.
40. Eysenbach G. The open access advantage. *J Med Internet Res* 2006 May 15;8(2):e8.
41. MacCallum CJ, Parthasarathy H. Open access increases citation rate. *PLoS Biol* 2006;4(5):e176.
42. Eysenbach G. Citation advantage of open access articles. *PLoS Biol* 2006;4(5):e157.
43. Franck G. Scientific communication--a vanity fair? *Science* 1999;286(5437):53-5.
44. Epstein D. Impact factor manipulation. *The Write Stuff* 2007;16(3):133-4.
45. Shanta A, Pradhan AS, Sharma SD. Impact factor of a scientific journal: Is it a measure of quality of research? *J Med Phys* 2013 Oct;38(4):155-7.
46. Alfonso F, Bermejo J, Segovia J. Impactology, impactitis, impactotherapy. *Revista española de cardiología* 2005;58(10):1239-45.
47. De Granda Orive J. Reflections on the impact factor. *Archivos de Bronconeumología (English Edition)* 2003;39(9):409-17.
48. Frank M. Impact factors: arbiter of excellence? *J Med Libr Assoc* 2003 Jan;91(1):4-6.
49. Kurmis AP. Understanding the limitations of the journal impact factor. *JBJS* 2003;85(12):2449-54.
50. Jang DH, Rusyniak DE. Hard impact: journal impact factor and JMT. *J Med Toxicol* 2011 Dec;7(4):256-8.
51. Seglen PO. Evaluation of scientists by journal impact. *Representations of science and technology* 1992:240-52.
52. Spielmans GI, Biehn TL, Sawrey DL. A case study of salami slicing: pooled analyses of duloxetine for depression. *Psychother Psychosom* 2010;79(2):97-106.
53. Bornmann L, Daniel H. Multiple publication on a single research study: does it pay? The influence of number of research articles on total citation counts in biomedicine. *J Am Soc Inf Sci Technol* 2007;58(8):1100-7.
54. Smith R. Commentary: The power of the unrelenting impact factor—Is it a force for good or harm? *Int J Epidemiol* 2006;35(5):1129-30.
55. Garfield E. The meaning of the impact factor. *International Journal of Clinical and Health Psychology* 2003;3(2).
56. González-Alcaide G, Valderrama-Zurián JC, Aleixandre-Benavent R. The impact factor in non-English-speaking countries. *Scientometrics* 2012;92(2):297-311.
57. Smith R. Beware the tyranny of impact factors. *J Bone Joint Surg Br* 2008 Feb;90(2):125-6.
58. Zijlstra H, McCullough R. CiteScore: a new metric to help you track journal performance and make decisions. Elsevier 2016:8.
59. De Groot S. Measuring your impact: Impact factor, citation analysis, and other metrics: Citation analysis. 2015.
60. Sangam S, Savanur K. Eugene Garfield: A Scientometric Portrait. *Collnet Journal of Scientometrics and Information Management* 2010;4(1):41-51.
61. Vavryuk V. Fair ranking of researchers and research teams. *PloS one* 2018;13(4):e0195509.

Developments in the implementation of sugar-sweetened beverage tax in Malaysia - A narrative review

Sangeetha Shyam, Snigdha Misra, Megan Hueh Zan Chong, Rokiah Don

ABSTRACT

The high and growing prevalence of obesity in Malaysia is a public health concern. There is a growing effort towards creating an environment that supports healthy lifestyles through instituting appropriate public health policies. The Sweetened Beverages Excise Duty is a recent initiative in this direction that was enforced on July 1st, 2019. In this status update, we trace the developments in the implementation of the tax. This paper collates the preparatory considerations preceding the implementation of the tax, the proposed objectives of the tax, its format as reported in the media. The early sentiments expressed by the stakeholders in the duration leading to the implementation and immediately after (10 days' post-implementation) the enforcement of the duty are also presented here. This preliminary information will be useful to evaluate the effectiveness of this newly introduced Sweetened Beverages Excise Duty in Malaysia.

Keywords: Sugar tax, obesity, Malaysia, sugar sweetened beverages, policy

Introduction

Malaysia's primary public health concern is the high prevalence of overweight and obesity. In terms of prevalence rates of overweight and obesity Malaysia ranks first in South East Asia and the sixth in Asia.¹ The series of Malaysian National Health and Morbidity Surveys (NHMS) document a drastic rise in the prevalence of obesity and overweight between 1996 to 2006. The NHMS 2015 showed that the national prevalence of overweight, obesity and abdominal obesity had increased by 0.6%, 2.6% and 2.0% respectively as compared to the previous findings of NHMS 2011.² In 2015, the prevalence of overweight and obesity in Malaysian adults has remained just below 30 and 18% respectively. Findings from the recent National Health and Morbidity Survey (NHMS) 2015, estimated that 5.6 million adults aged 18 and above were overweight and another 3.3 million were obese. According to NHMS 2015, the prevalence of obesity in Malaysia is also higher

than the reported world prevalence of 13.0%.²

Furthermore, the prevalence of overweight and obesity among primary school children is equally alarming and was reported to be around 25% in 2008. The more recent NHMS 2015 reported a national prevalence of obesity (BMI for age >+2SD) of 11.9% among children.³ NCD is also increasingly prevalent among Malaysian children.⁴

This rising prevalence of overweight and obesity are paralleled by consequent rises in non-communicable diseases (NCD) including coronary disease, type II diabetes mellitus, and cancers. The number of patients hospitalized due to diabetes in Peninsular Malaysia had increased by 56% from 1991 to 2001.⁵ The findings from the NHMS series and WHO/IDF country statistics similarly document the increasing prevalence of diabetes mellitus in Malaysia. Malaysian Diabetic Association reports that type II diabetes accounts for 90% of adult diabetes cases in the country and is often associated with obesity.⁶

The Malaysian Institute of Public Health's Second Burden of Disease Study in 2012, identified overweight/obesity and associated metabolic risks such as high blood pressure, diabetes, hypercholesterolemia as the biggest contributors to disability and death.² Obesity-linked diseases reduce six to 11 productive years in Malaysian males and seven to 12 years in females.⁷

The arising public health challenges pose a staggering economic burden as the Malaysian healthcare system tries to cope with the increasing demand for treatment. The total (direct and indirect) costs of obesity of Malaysia are the highest in South-East Asia, accounting for 10-19% of national healthcare spending.¹ In 2017, overweight and obesity accounted for 13.3% of total health costs, 0.54% of GDP or USD 1.7 billion, and this did not account for the indirect costs of lost labour productivity due to absenteeism or medical leave.⁸ Hence there is an increased focus towards health promotion and preventative care.⁴ It has been proposed that stemming the obesity epidemic in Malaysia "does not only require immediate revision of public health

Division of Nutrition and Dietetics, School of Health Sciences, International Medical University, Kuala Lumpur, MALAYSIA

Received 22 July 2019; received in revised form 20 September 2019; accepted 23 September 2019

Corresponding author:

Dr Sangeetha Shyam, Division of Nutrition and Dietetics, School of Health Sciences, International Medical University, Kuala Lumpur, MALAYSIA

Email: SangeethaShyam@imu.edu.my

Contact: +603 2731-7600

policies, but (the provision) of supportive environment and communities for Malaysians to work towards practising healthier lifestyle”.²

Over-consumption of sugar is a major contributor to obesity and diabetes and sugary drinks are a major source of sugar in the diet and its consumption is increasing in most countries. Thus the World Health Organization (WHO) has been promoting taxes on sugary drinks, as a way to curb obesity and associated non-communicable diseases.⁹ In line with the proposed strategies for health promotion and improving the food environment to encourage healthy eating, Malaysia has also recently introduced the soft drinks tax. In this review, we aim to provide a status update on the announcement of the tax, details of the tax structure, early reactions to the imposition of the tax which came into force on July 1st, 2019, as reported in the popular print and digital media and information available in the public domain, from an unbiased stance.

This review collates three aspects with respect to Sweetened Beverages Excise Duty in order to furnish a holistic understanding of the context and content of its implementation in Malaysia. First, information relating to international, SE Asian and national events and positions preceding and leading to the introduction of the tax. Information regarding these elements was collated from the World Health Organization’s (WHO) Nourishing database and a search of secondary sources listed in the database and academic journals. Second, information on the proposed duty’s structure, format and objectives were collated from preliminary announcements on the introduction of the tax in the country as reported in major print and digital media published in the English language and government documents available in the public domain. Third, early sentiments expressed on the implementation of the tax were collated from reports published in the print and digital media from the time of announcement of the tax in the parliament on November 18, 2018, until ten days post- implementation of the tax (July 12, 2019) using google news alerts. The structure of this review is presented in figure 1.

Section 1

The sequence of Events Preceding the Introduction of the Sugar-Sweetened Beverage (SSB) Tax in Malaysia

On 21 – 22 September 2016, the World Health Organization (WHO) Regional Office for the Western Pacific convened a technical workshop in Manila to share updates on recent evidence and experiences on implementing taxes on SSBs and to identify specific actions for the Western Pacific Region. Malaysia was among the delegation represented in this convention. The workshop was reported to be “the first in a series of activities to support countries and areas in the region with respect to advocacy, development and strengthening of SSB tax policies”. Key elements critical to the successful implementation of an SSB tax were emphasized in the workshop. These included: the socio-political context, essential data for advocacy and action, the importance of strategic partnerships, the evaluation of the tax, and responses to political and industry opposition. Brief situational and stakeholder analyses were performed to identify necessary stakeholders and assess the capacity of their country in five key areas. The assessment was done on a scale from 1 to 10, with 1 denoting not ready/no action and 10 being very ready/good implementation.¹⁰ The scores for Malaysia from this workshop are shown in Table 1.

The overall readiness score for Malaysia and Samoa were the highest for the WHO Region at 8 out a maximum possible score of 10, with scores for other countries in the region ranging between 3 and 7.¹⁰

The plan to introduce sugar-sweetened beverage (SSB) tax in Malaysia from April 1, 2019, was announced by the Finance Minister Lim Guan Eng during the tabling of the 2019 budget on November 2nd, 2018. The Malaysian government has since then decided to postpone the implementation of the sugar tax on soft drinks and juices to July 1, 2019. The Customs Department director-general Datuk Seri Subromaniam Tholasy has said the decision was made after taking into account feedback from stakeholders.¹¹ It has been reported that

the postponement would “give manufacturers and the Customs Department ample time to make the necessary preparations”. Furthermore, the postponement was thought to enable the Customs Department “to conduct roadshows and issue licenses to sugar-based beverage manufacturers.”^{11, 12} It was added that they (the Customs Department) “are now at the stage of educating consumers to drink less coloured, sugary drinks”. The minister expressed that this (the tax?) “is the only way at the moment that we can discourage consumers from these drinks.”¹²

Section 2

Implementation of Sugar-Sweetened Beverage (SSB) Tax in Malaysia

The Malaysian Customs Department in a statement issued on June 30th announced that the import and manufacturing of sugary drinks were subject to excise duty effective July 1st 2019.¹³ The sugar tax is officially known as the Sweetened Beverages Excise Duty.¹⁴ The statement of the Customs Department also outlined the procedures involved in the implementation of the excise tax on sugary beverages during the two-month transition period. The guidelines and implementation procedure of the excise duty on sugary drinks for the transition period are available at www.customs.gov.my¹³. It is learnt that the new tax falls under the responsibility of the Domestic Trade and Consumer Affairs Ministry, as the latter is privy to prices of goods in the country.¹⁴

The department requires that licensed importers of sweetened beverages are required to submit a letter of undertaking and lab reports disclosing the sugar contents of their products. If the total sugar content of their drinks exceeds the threshold or if the reports are not submitted, the importers will need to make payment of the duties involved. The lab reports have been mandated as compulsory for exempted goods and importers have been granted until 31st August 2019 to submit the required lab reports. Furthermore, the procedure mandates that the import of sugary drinks must be declared in Form

K1 (declaration of goods imported) in-line with the requirement for other imported products and the lab reports are required to be submitted within 30 days from the date of the K1 clearance.¹³

The Customs Department also has declared that for domestic sales of dutiable sugary drinks, licensed manufacturers would be required to declare the same using the Excise Form No.7 and the declaration will be for one calendar month. The declaration is to be made “no later than the last date of the following month”. “Declaration for the local sales of products exempted from the duty will also use the Excise Form No.7,” it said.¹³

Objectives of the SSB tax

The government is said to have proposed the idea to impose the sugar tax as part of its efforts to promote a healthy lifestyle.¹¹ In his keynote address at the 15th edition of Invest Malaysia (IMKL2019) on March 19th, 2019, Prime Minister Tun Dr Mahathir Mohamad outlined the objective of the proposed SSB tax as “primarily to meet our (nation’s) health objectives.”¹⁵ The Malaysian Prime Minister has divulged that “beginning next year, the government will use the revenue collected from this tax to provide free and healthy breakfast programme for all primary school children. We want our kids to be strong and healthy to perform in school.”¹⁵

However, the Customs Department assistant director-general (internal tax division) declined to comment on the suggestion that the funds could be used for food programmes for schoolchildren. He positioned that revenue was not the main purpose of this tax.¹⁴

The finance minister has reiterated post-implementation of the tax that the “goal of the sugar tax was to create awareness among manufacturers and consumers on the global trend of reducing sugar intake.” He also added that this was a “preventive measure to help curb the rise in obesity, diabetes and related non-communicable diseases.”¹⁶

Coverage of the SSB tax

The proposed tax in Malaysia would apply to carbonated drinks, or flavoured and other non-alcoholic beverages. Categories of beverages that will be affected by the imposition of SSB tax in Malaysia is shown in Table 2.

A report on June 12th 2019 quotes the Health Minister Dzulkefly Ahmad as saying that the “proposed sugar tax will be limited to manufacturers for the time being, and that there are no plans to extend it to eateries and restaurants selling sugary drinks.”¹²

The same message has been reiterated by the Customs Department assistant director-general (internal tax division) who has said that a new tax, which involves duties that needed to be paid by manufacturers and importers of beverages, would not affect the price of teh tarik or kopi-o served at eateries and also would not affect alcoholic beverages, cordials and unsweetened milk products. He said the list of drinks that would be affected by the tax would include non-alcoholic beverages, fruit or vegetable juices as well as sweetened dairy-based beverages.¹⁴

When answering the parliament on July 11th, the Finance Minister Lim Guan Eng suggested that “Small and medium enterprises (SMEs) involved in beverage manufacturing should lower the sugar content in their products to avoid paying sugar tax”. He opined that the tax “should not be a big problem for SMEs as they are able to make adjustments (to sugar content). He also added that it “is more of a problem for producers of the larger branded beverages as they have requirements to meet for their drinks.”¹⁶

Sugar and sugar-sweetened beverage consumption in Malaysia

Though the sugar tax is identified as a medium to stem the growing epidemic of obesity in Malaysia, it is interesting to note that national data on sugar consumption is far from robust. A review was undertaken in 2016 “to present the best available

evidence regarding consumption of ‘free’ or ‘added’ sugars in Malaysia” collated data from the Food and Agricultural Organization (FAO) Food balance sheets, nationally representative Malaysian Adult Nutrition Survey (MANS) and other smaller studies.¹⁷ Presently, this review provides the most comprehensive data on sugar consumption pattern in Malaysia. The FAO food balance sheet data showed that total per capita supply of sugar (from sugar crops comprising cane and beet sugar, and sugar and sweeteners comprising raw sugar, honey, other sweeteners) available for consumption in Malaysia increased from 297 kcal/day in 2005 to 385 kcal/day in 2009, representing 10.5 and 13.3 percent of total available calories for the two periods.¹⁸ The authors of the review additionally deduced from the 2003 Malaysian Adult Nutrition Survey (MANS) data that on an average, Malaysian adults consumed 30 grams of sweetened condensed milk (equivalent to 16 grams of sugar) and 21 grams of table sugar per day¹⁹, and these amounts, when summed together, were still below the WHO recommendation of 50 grams of sugar for every 2000 kcal/day to reduce risk of chronic disease (< 10 en %).²⁰

However, the authors also pointed out that evidence among children aged 3-6 years was more disturbing with the reported mean sugar consumption of 94.7 ± 65.1 grams per child daily, contributing to approximately 29% to total energy intake. They further note that 91% of schoolchildren aged 9 to 10 years in Selangor state consumed canned/bottled drinks weekly, with approximately 10% of these consumers ingesting these drinks more than 4 times a week.¹⁷ More recently the NHMS (2017) reported that 47% of rural and 34% of urban adolescent consumed carbonated soft drinks, with one in three Malaysian schoolchildren consuming soft drinks at least once a day (NHMS 2017).³

The major sources of sugar in Malaysian diets differ considerably from those reported for the western countries. Sugar-containing foods that contributed most to energy intakes of Malaysian adults were beverages to which sugar is added (cordial syrup, tea, coffee, chocolate flavoured beverages), condensed milk (added

to beverages) and local kuih (starchy traditional cakes). Interestingly, less than 1.2% of the daily caloric intake was obtained from jam, carbonated drinks, and “ABC ice” (shaved ice topped with syrup, nuts and beans). In Malaysia, both adults and elderly frequently consumed sweetened foods, in the form of beverages (tea or coffee) with sweetened condensed milk and added sugar.¹⁷ These findings are in-line with the Euromonitor International 2017 report that produced similar estimates. This report estimated the overall daily per capita sugar consumption (from packaged and fresh foods, soft drinks and alcoholic drinks) in Malaysia to be 75.6 g, while the amount that came solely from soft drinks was restricted to 10.04 g.²¹ Thus soft drinks account for less than 10% of the total sugar intake. However, the need for robust data on the national average intake for added and total sugar has been expressed by experts’ time and again.^{10,17}

Current SSB Pricing and Proposed Tax amount

Malaysia has amongst the lowest price(USD) per litre for soft drinks among the south-east Asian countries. A comparison of the pricing of SSB across South-East Asian nations is presented in Figure 2.

It had been widely reported before July 1st 2019 that a tax of 40 Malaysian sen (approx. USD 10 cents) per litre would be imposed on soft drinks with more than five grams of sugar or sugar-based sweetener per 100ml. For juice or vegetable-based drinks, a tax of 40 Malaysian sen per litre will be imposed on drinks with more than 12g of sugar per 100ml.

Post-implementation of the tax, Finance Minister Lim Guan Eng Lim has acknowledged in the parliament on July 11th 2019 that the “sugar tax would see an increase in prices for manufactured beverages by 40 sen per litre, 20 sen for 500ml and 10 sen for 250ml drinks.”¹⁶

Section 3

Early Sentiments Post-implementation of SSB Tax

The opinion of consumers, public health researchers and professionals expressed in print media has been

divided on the impact of the tax. Before the imposition of the tax, the Secretary-general, Federation of Malaysian Consumers Associations (Fomca), supported the move in a letter featured in the New Strait Times dated January 21st, 2019. The letter discussed the impacts of such a tax. It was expressed that apart from reducing sugar consumption among consumers, the measure would also encourage food manufacturers to reduce sugar content in their food and drinks, and provide healthier food choices to consumers. The letter documented that in April 2018, the year preceding the implementation of the tax, some food manufacturers changed recipes ahead of the tax so that the sugar content would be below the threshold. Additionally, the impact of such measures on healthcare cost savings was also used to justify the tax. Yet, the letter also argued that a more comprehensive approach apart from the taxation was needed to promote healthy living and change eating behaviours.²² For instance, the need for stricter regulation to reduce the marketing of unhealthy products, especially, to children who are the high-end consumers of SSB was recognized. The letter also expressed the need for the ban on marketing and sale of sugary drinks in schools, government offices and hospitals. The organization also put forth the need for simplified nutrition information and food labels that could help with healthier food choice. Finally, the letter argued for “campaigns to highlight the risks of unhealthy food” and “to promote healthy eating habits and healthy lifestyle”. Fomca expressed hope that the taxes collected from the sugary tax will be channeled to healthy living campaigns.²²

The Malaysian Association of Tax Accountants (MATA) has expressed that the implementation of the sugar tax in Malaysia “will not generate significant revenue for the government but will help in reducing the medical cost arising from the unhealthy habits of consuming excessive sugar”. The President of the Association, Datuk Abdul Aziz Abu Bakar has said that “the government will not get much revenue from the manufacturers because in any country that introduced soda tax, (as) the manufacturers will change their product mix so that they can produce products that

can avoid from having to pay the sugar tax,” He has urged “people to understand that the government has considered this possibility and has provided ample time for the business community to strategise their products and production methods.”²³

While cautioning that the price of sugar-related products would increase following the implementation of the tax, he opined that the manufacturers would not absorb the additional cost due to the tax and would pass the same on to the retailers and consumers. He emphasized that though the sugar tax may have a negative impact it would be “positive in the perspective of preventive medical cost”. He predicts this as leading to the creation of a healthy society practising a healthy lifestyle, with an acute reduction in individuals spending on sugar but as accruing long term savings to the government in terms of hospitalisation cost. He expressed that it was important that the government would do well to communicate this move as an “alternative way to reduce sugar consumption” rather than as meaning to “generate a significant income for the country”.²³

Two opinion articles one in the South Morning China Post²⁴ and another in the New Strait Times²⁵ expressed concern for the lack of evidence for such state-initiated regulation in changing consumer behaviour and adoption of a healthy lifestyle. An alternative solution this paper suggested was “to give manufacturers room to come up with solutions to health problems, and to ensure consumers can access information that enables them to make informed choices”. Interestingly both these opinion articles were penned by the same author. However, a few days since then, an academic opined in the same news portal that “sugar tax is a blessing” as it safeguards a healthier lifestyle.²⁶

Early Reactions from the Industry and Small and Medium Enterprises

Nestle Malaysia Bhd, Fraser & Neave Holdings Bhd and Dutch Lady Milk Industries Bhd recorded losses in the Malaysian stock exchange (Bursa) a day after the tax was introduced. However, MATA president expressed

confidence that “the impact of the sugar tax on the capital market would be for the short to medium term as it is an adjustment period”.²³

Kuching Coffee Shop and Restaurant Owners Association Chairman Teo Giat Liew has expressed that it was “too early to tell if the new tax on sugary drinks would affect both beverage manufacturers and consumers”. He said that the association would not be able to control price increases embraced by its members to deal with increased costs.²⁷

Business opinion from Sibuluan, Sarawak has also been cautious. It has been expressed that “under the current economic climate, businesses and consumers would be hard-pressed by this tax”. The implementation of excise tax on sweetened beverages it has been opined would bring about “domino effects” as it would have a “direct impact on consumer spending” and its impact on the business community. He has gone on to express that taxes are “burdensome to the people” and the need for the Ministry of Domestic Trade and Consumer Affairs to conduct an in-depth study on the impact on the market as a result of the tax imposition. He suggested that “goods be repackaged into smaller packets to reduce cost.”²⁸

Nestle Malaysia has conveyed that most of its products will not be hit by the sugar tax as they “are within the threshold limits for most of our products”. Their chief executive officer Juan Aranols has expressed confidence in that they would “find a way to absorb it”, “so that the largest possible number of consumers can benefit from them” and at this point they don’t see a price hike on their products as the financial consequence of the tax “within the limits” of what they could “absorb without impacting the consumers”. Furthermore, he has conveyed that Nestle “will continue to work to bring the remainder products that are impacted by the sugar tax to be within the (non-taxable) limit”. Commenting on its outlook moving forward, Aranols said that there were still ample growth opportunities within the Malaysian market for the company.²⁹

Expected outcomes and way forward

UNICEF and WHO subsequent to their preliminary analysis in Malaysia have expressed confidence that the existing proposal should reduce SSB consumption and raise significant revenue that can be re-invested in programmes to improve nutrition and health.⁸

The chief executive officer Lim Yew Hoe of Fraser & Neave Holdings Bhd (F&N), 90% of whose product range would become taxable with the implementation of the SSB tax in Malaysia, has publically disclosed that about 70% of their products would be reformulated. He pointed out that “while it was still early to quantify the tax implications, there would be an additional cost when it reformulated its products”. But it is interesting to note that he has also mentioned that “the increase in prices, however, will be the last resort.”³⁰ Hence the actual impact of the proposed SSB tax on retail SSB price remains to be seen.

More recently, the CEO of the Galen Centre for Health and Social Policy in Kuala Lumpur pointed to the similarity between the SSB tax system proposed for Malaysia and that of UK and foresees efforts by the food industry to reformulate. He has opined that taxing at the manufacturing level rather than at retail, increases the tax system’s effectiveness. This is thought to intentionally result in “manufacturers taking the initiative and being incentivized to reformulate, reduce the sugar content, reduce portion sizes and even introduce healthier alternatives to avoid being taxed”. Furthermore, it was thought to be “by far a better and sustainable approach.”¹²

However, the need for additional measures to tackle public health issues have been felt and widely expressed in Malaysia. Several media reports have quoted that the Health Ministry and other related agencies have welcomed the tax as a step towards addressing issues such as obesity, though critics argue that it will not be enough to make a difference.¹²

In the short-term, UNICEF and WHO recommend that the Government explores extending a special

excise taxes to other sugar-sweetened drinks and review the sugar content thresholds for taxable goods as, in some cases, these may still be too high. Milk-based drinks and fruit juices that contain high amounts of sugar also contribute to overweight and obesity and consumption of these also needs to be limited. They have also proposed that in the long run, the adequacy of the tax may need to be reviewed to achieve at least an RM1 per litre tax rate, which would be more in line with international benchmarks and the available evidence on the effectiveness of SSB taxes.¹⁰

Other measures that could be beneficial in Malaysia are thought to include: providing high-quality, healthy school meals, compulsory nutrition labelling on food and drink products, health communication campaigns, and more stringent regulation of food and drinks marketed to children.¹⁰

Concluding Remarks

Evaluation of media reports is an efficient way to evaluate public discourse with respect to governance and policy issues. While this review is an effort to capture the discourse with respect to the implementation of the Sweetened beverage Excise duty in Malaysia, it is acknowledged that information is predominantly collated from available media reports may be subject to bias arising from misreporting and misrepresentation. Another limitation of this review in evaluating stakeholder perspectives is that it only collates available information from English language print and online media. Thus, any unique views expressed in the vernacular press may not be captured by this review. Views expressed in social media are also not documented here, However, it is noted that the media included in this review represent the narrative from agencies that have the maximal reach in the country across Malay and English Language readers. It also includes reporting from alternative media sources that do not align to the ideologies subscribed to by the majority media. Therefore, the review is likely to document perspectives from media catering to a few different segments of the society.

The Malaysian sugar consumption sources vary from that of the countries that have proven the effectiveness of an SSB tax. Furthermore, the level of tax proposed and the current pricing may not cause a considerable impact on the price. Thus, an evaluation of the impact of Sweetened Beverages Excise Duty is imperative. A sub-analysis of the impact of the tax among children and adolescents who are frequent consumers of SSB and for whom the price hike may affect their affordability is also required. This evidence collated here may also be useful to conduct such evaluations of the Malaysian Sweetened Beverages Excise Duty in due course, as it records the objectives proposed prior to the implementation of the Duty in the public domain. By doing so, the review identifies the goals of the initiative against which an evaluation can be conducted.

REFERENCES

1. Milton L, 14 August 2018. Malaysia is Asia's fattest country. <https://www.star2.com/health/2018/08/14/fat-state-of-affairs/> Accessed: 18 Jan 2019.
2. Institute for Public Health (IPH), 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health Problems.
3. Institute for Public Health (IPH), 2017. Adolescent Nutrition Survey, National Health and Morbidity Survey (NHMS).
4. Mansor M, Harun NZ. Health issues and awareness, and the significant of green space for health promotion in Malaysia. *Procedia-Social and Behavioral Sciences*. 2014;153: 209-20.
5. Ministry of Health Malaysia (2011). Annual report Ministry of Health Malaysia 2011. Retrieved June 28, 2019, from <http://www.moh.gov.my>
6. Hussein Z, Taher SW, Singh HK, Swee WC. Diabetes care in Malaysia: Problems, new models, and solutions. *Annals of Global Health*. 2015 Nov 1;81(6):851-62.
7. The Economist Intelligence Unit, 2017. Tackling obesity in ASEAN. Prevalence, impact, and guidance on interventions. An Economist Intelligence Unit report commissioned by the Asia Roundtable on Food Innovation for Improved Nutrition. <http://www.eiu.com/industry/article/605525844/white-paper---tackling-obesity-in-asean/2017-06-12> Accessed: 18 Jan 2019.
8. WHO/UNICEF Malaysia, 3 May 2019. Sugary drinks tax important first step, but obesity in Malaysia demands further action. <https://www.unicef.org/malaysia/press-releases/sugary-drinks-tax-important-first-step-obesity-malaysia-demands-further-action> Accessed: 3 May 2019.
9. Datuk Dr Paul Selva Raj, Secretary General, Federation of Malaysian Consumers Associations, 18 Jan 2019. Healthier with less sugar. <https://www.thestar.com.my/opinion/letters/2019/01/18/reducing-lifestyle-diseases-through-reduction-of-sugar-consumption/#ujGHqSu8kSkuA03g.99> Accessed: 18 Jan 2019.
10. WHO Regional Office for the Western Pacific. 2016. Technical workshop on taxing sugar-sweetened beverages. Meeting report. Report series number: RS/2016/GE/42(PHL). Manila, Philippines.
11. New Strait Times (NST), 7 March 2019. Customs Dept: Sugar tax for beverages postponed to July 1. <https://www.nst.com.my/news/government-public-policy/2019/03/466993/customs-dept-sugar-tax-beverages-postponed-july-1> Accessed: 7 March 2019.
12. Free Malaysia Today, 12 June 2019. Good start but long way to go, experts say ahead of sugar tax. <https://www.freemalaysiatoday.com/category/nation/2019/06/12/good-start-but-long-way-to-go-experts-say-ahead-of-sugar-tax/> Accessed: 12 June 2019.
13. Star Online, 1 July 2019. Sugar tax kicks off today. <https://www.thestar.com.my/news/nation/2019/07/01/sugar-tax-kicks-off-todaycustoms-sweetened-beverage-importers-must-submit-lab-reports/#qGH2wm5RyEjODcVk.99> Accessed: 1 July 2019.
14. New Strait Times, 3 July 2019. Sugar tax not so bad after all, says Customs. <https://www.nst.com.my/news/nation/2019/07/501076/sugar-tax-not-so-bad-after-all-says-customs> Accessed: 3 July 2019.
15. New Strait Times (NST), 19 March 2019. Sugar Tax revenue to provide for free breakfast for primary school children. Available at: <https://www.nst.com.my/news/nation/2019/03/470787/sugar-tax-revenue-provide-free-breakfast-primary-school-children> Accessed: 19 March 2019.
16. New Strait Times, 11 July 2019. Lower sugar content to avoid sugar tax, SMEs told. <https://www.thestar.com.my/news/nation/2019/07/11/lower-sugar-content-to-avoid-sugar-tax-smes-told/#qvcPRBc7VhWYjGu8.99> Accessed: 11 July 2019.
17. Amarra MS, Khor GL, Chan P. Intake of added sugar in Malaysia: a review. *Asia Pacific Journal of Clinical Nutrition*. 2016; 25(2):227-40.

18. Food and Agricultural Organization of the United Nations. <http://www.fao.org/faostat/en/#data/FBS/report>
Accessed: 7 March 2019.
 19. Norimah AK, Safiah M, Jamal K, Siti Haslinda, Zuhaida H, Rohida S, Fatimah S3, Siti Norazlin, Poh BK, Kandiah M, Zalilah MS, Wan Manan WM, Fatimah S2 and Azmi MY. (2008). Food Consumption Patterns: Findings from the Malaysian Adult Nutrition Survey(MANS). *Mal J Nutr* 14 (1): 25 - 39, 2008
 20. World Health Organization, 2015. Guideline: Sugars intake for adults and children.
 21. Strait Times, 11 February 2018. Taxman leads the charge in South-east Asia's war on sugar. 2018. <https://www.straitstimes.com/asia/taxman-leads-the-charge-in-south-east-asias-war-on-sugar>
Accessed: 18 Jan 2019.
 22. New Strait Times, 21 January 2019. Can sugar tax stop us from getting fatter? <https://www.nst.com.my/opinion/letters/2019/01/453017/can-sugar-tax-stop-us-getting-fatter>
Accessed: 7 March 2019.
 23. (Bernama) Malay Mail, 1 July 2019. Sugar tax implementation poised to reduce medical costs. <https://www.malaymail.com/news/malaysia/2019/07/01/mata-chief-sugar-tax-implementation-poised-to-reduce-medical-costs/1767217>
Accessed: 2 July 2019.
 24. South China Morning Post, 1 July 2019. Sugar tax and other punitive measures won't help Malaysians become healthier. <https://www.scmp.com/comment/opinion/article/3016674/sugar-tax-and-other-punitive-measures-wont-help-malaysians-become>
Accessed: 2 July 2019.
 25. New Strait Times, 4 July 2019. Sugar tax doesn't work. <https://www.nst.com.my/opinion/letters/2019/07/501601/sugar-tax-doesnt-work>
Accessed: 4 July 2019.
 26. New Strait Times, 10 July 2019. Sugar tax is a blessing. <https://www.nst.com.my/opinion/letters/2019/07/502985/sugar-tax-blessing>
Accessed: 10 July 2019.
 27. Borneo Post, 2 July 2019. Too early to know impact of new sugar tax on manufacturers, consumers. <https://www.theborneopost.com/2019/07/02/too-early-to-know-impact-of-new-sugar-tax-on-manufacturers-consumers/>
Accessed: 2 July 2019.
 28. Borneo post, 2 July 2019. Excise tax on sweetened beverages will have domino effects-Businessman. <https://www.theborneopost.com/2019/07/02/excise-tax-on-sweetened-beverages-will-have-domino-effects-businessman/>
Accessed: 2 July 2019.
 29. The Star Online, July 4th 2019. Nestle to absorb sugar tax. <https://www.thestar.com.my/business/business-news/2019/07/04/nestle-to-absorb-sugar-tax/#xGm0ATwBMT1PoRdi.99>
Accessed: 4 July 2019.
 30. New Strait Times (NST), 3 May 2019. F&N executes plan to mitigate risk of sugar tax. 2019 May 3. <https://www.nst.com.my/business/2019/05/485149/fn-executes-plan-mitigate-risk-sugar-tax>
Accessed: 3 May 2019.
 31. Blecher E, Liber AC, Drope JM, Nguyen B, Stoklosa M. Peer Reviewed: Global Trends in the Affordability of Sugar-Sweetened Beverages, 1990–2016. Preventing chronic disease. 2017;14.
-

Key area	Scores for Malaysia (Max =10)
Availability of data (economic and epidemiologic);	8
Support from the Ministry of Health	10
Support from the Ministry of Finance	8
Implementation of other obesity/NCD prevention measures;	9
Public support; and	9
Strategic partnerships.	8

Table 1: Malaysia’s scores for the readiness of SSB implementation

Source: WHO Regional Office for the Western Pacific. 2016.¹⁰

Table 2: Categories of beverages that will be affected by the imposition of SSB tax in Malaysia

	Beverage category	Available No of products	Sugar Content (g/100 ml)			No of products taxable	Products taxable (%)*
			Min	Max	Average		
1.	Herbal beverages	16	0	20	7	11	68.8
2.	Coffee drinks	14	4.1	8.9	6.4	11	78.6
3.	Flavoured carbonated drinks	42	0	13.5	10.3	40	95.2
4.	Flavoured drink non-carbonated	54	5	22.5	9.9	53	98.1
5.	Fruit drinks	72	2.9	16.3	10	69	95.8
6.	Isotonic drinks	9	6.6	6.9	6.8	9	100.0
7.	Malted Chocolate ready to drink beverages	5	6.9	11	8.2	5	100.0
8.	Tea drinks	39	0	11.4	7.7	36	92.3
9.	100% fruit juice without added sugar*	37	5.05	17.7	12	19	51.4

Source: Unpublished data

Legend: *Fruit and vegetable based drinks and other soft drinks are taxed based on different cut-offs for sugar content.

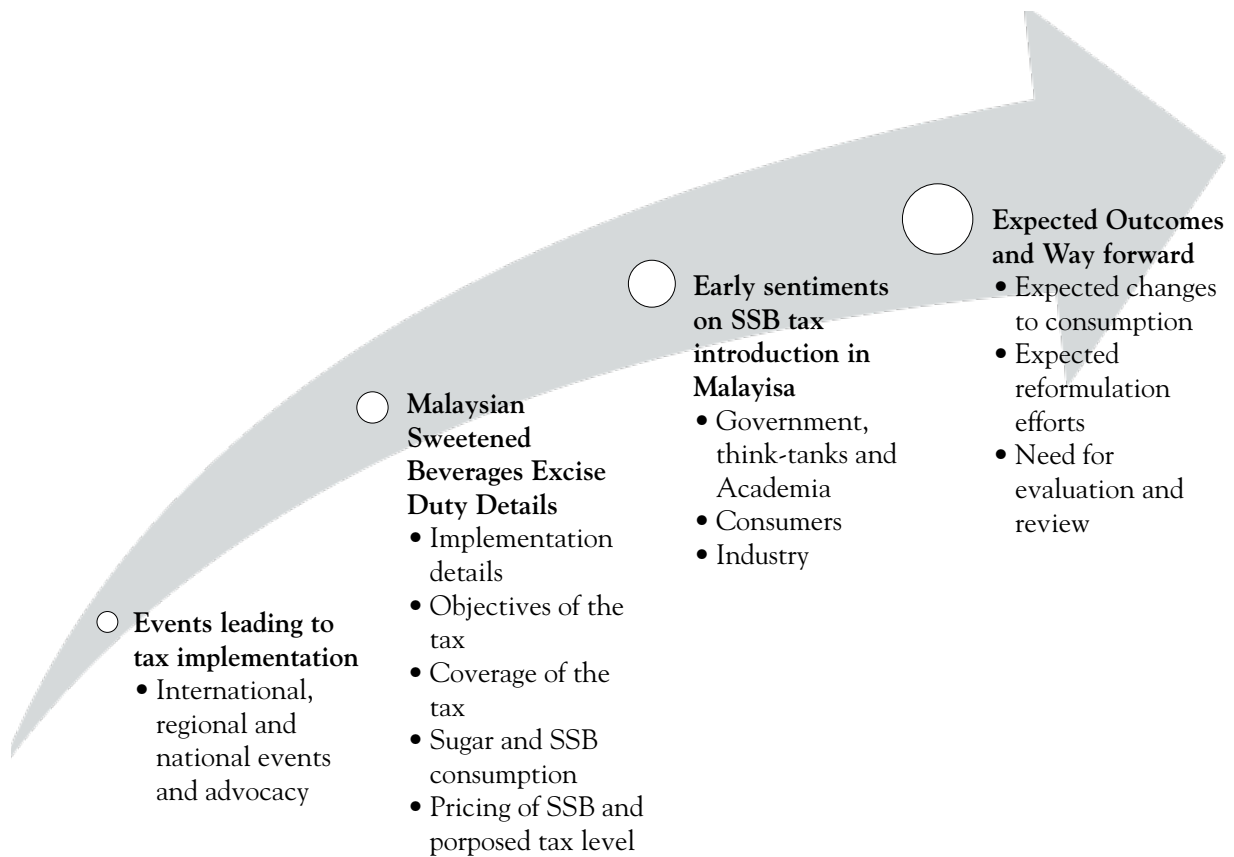


Figure 1: Framework of the review

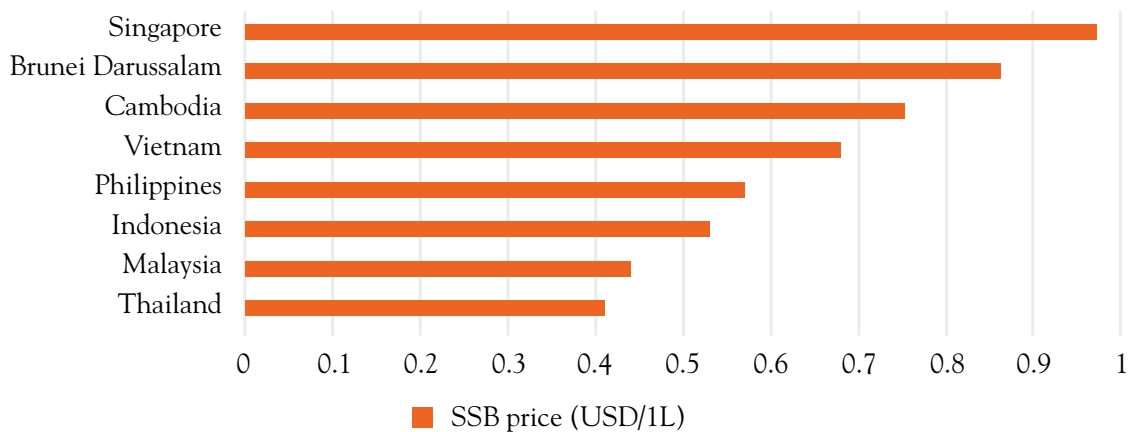


Figure 2: Comparison of SSB soft drink pricing among SE Asian countries

Source: Blecher et al., 2017³¹

Pre-independence medical journals in British Malaya: A content analysis

Cheong Lieng Teng¹, Kean Ghee Lim¹, Chun Yiang Ang², Soo Yin Chan³, Edwin Keat Song Sam², Jason Chee Siang Wee⁴, Yee Chiing Ong⁵

ABSTRACT

Introduction: This study aims to describe the content of several pre-independence medical journals published in British Malaya.

Methods: The content of five journals were retrieved from National Library of Singapore e-resources and print collection of the Reference Library, Institute for Medical Research, Kuala Lumpur, Malaysia. The content of these journals was classified and descriptive analysis performed.

Results: The five journals identified were Journal of the Straits Medical Association, Journal of the Malaya Branch of the British Medical Association, Malaya Medical Journal, Malayan Medical Journal and Journal of the Malaya Branch of the British Medical Association (new series). A total of 81 issues with 873 articles were retrieved. Almost one-third of articles were concerned with these topics: malaria, mosquito control, beri-beri, tuberculosis, sexually transmitted diseases, helminthiasis, leprosy and cholera. One-fifth of the articles were case reports and 95% of the articles were written by single authors.

Discussion: The content of these journals is a good resource for those who are interested in the history of medicine – it provided substantial details on the state of public health and chronicled the medical writings of medical workers in British Malaya. It illustrates well the introduction of Western medicine to tackle health problems that arose from the interplay of immigration, poor environmental sanitation and economic exploitation.

IeJSME 2019 13(2): 23-26

Keywords: British Malaya; Health care; History of medicine; Journals;

INTRODUCTION

The availability of digital archives of old journals via PubMed Central, Internet Archive and commercial publishers has been a boon to researchers looking for back files. However, searching for old medical references from Malaysia and Singapore usually requires one to locate a print bibliography, e.g. Bibliomed-SM,¹ then visit the reference library and attempt to locate the print content. This laborious process deterred many researchers from citing old local journal references. It is gratifying to note that the recent availability of digitized contents from the National Library of Singapore has facilitated the retrieval of old local medical journals.

This study aims to describe the content of several pre-independence medical journals published in British Malaya; historically this included several British-controlled political entities within the Malay Peninsula and Singapore between 18th to early 20th century. It is hoped that greater awareness of these journals and their content will stimulate interest in our past and increase their citations in future historical and clinical research.

METHODS

The pre-independence medical journals were identified from a review written by Lim VKE.² For the current analysis, we have decided to exclude Medical Journal of Malaya (publication years 1946-1971). The electronic full text of most issues of pre-independence medical journals were retrieved from the website of the Singapore Library Board (<http://search.nlb.gov.sg/>).

We cross-checked the above citation data by accessing IndexCat (<https://www.nlm.nih.gov/hmd/indexcat/aboutcatalogue.html>), an online catalogue of printed bibliography from the Library of the Surgeon-General, US Army. This catalogue contained materials dated from 1400s to 1950. Manual check was also done using library collection of the Institute for Medical Research, Kuala Lumpur.

¹International Medical University, Jalan Rasah, 70300, Seremban, Negeri Sembilan, MALAYSIA

²University Malaya Medical Centre, 59100 Kuala Lumpur, MALAYSIA

³Queen Elizabeth Hospital, 13A, Jalan Penampang, 88200 Kota Kinabalu, Sabah, MALAYSIA

⁴Hospital Melaka, Jalan Mufti Haji Khalil, 75400 Melaka, MALAYSIA

⁵Hospital Umum Sarawak, Jalan Hospital, 93586 Kuching, Sarawak, MALAYSIA

Received 17 September 2019; received in revised form 23 September 2019; accepted 25 September 2019

Corresponding author:

Dr CL Teng, Professor, Department of Family Medicine, International Medical University, Jalan Rasah, 70300, Seremban, Negeri Sembilan, Malaysia.
Tel: (+60)06-7677798 ext 153; Fax: (+60)06-7677709; Email: cheonglieng_teng@imu.edu.my

The following citation data were manually entered into the Endnote citation manager: author name, article title, keywords, author's affiliation, article summary (where available). Where possible, we identified the relevant Medical Subject Headings (MeSH terms) using the United States National Library of Medicine MeSH database (<https://www.ncbi.nlm.nih.gov/pubmed>).

RESULTS

We identified five medical journals published in the period 1892 to 1941, with a total of 81 issues and 873 articles (see Table 1). The Malayan Medical Journal published 59.5% of the articles in the pre-independence medical journals.

We counted 181 case reports (20.7% of all articles), highlighting the frequent use this publication type to educate their readers. It is notable that several

clinical trials were published, almost all of them were experimental use of new antimalarial agents. As shown in Table 2, malaria and mosquito control were common themes (14.1% of all articles). Beri-beri was also a common topic, as were various infectious diseases especially tuberculosis, helminthiasis, diarrhoeal disease, leprosy and sexually transmitted diseases (see Table 2).

Out of 873 articles, 86 items do not have authors (these are mostly editorials or short commentaries). Among articles with named authors (n=786), 745 articles have only one author, 39 articles have two authors, and only one article has three authors. The total author count is 361. Eight authors published ten or more articles (n=109), see Table 3. Most of the authors were expatriate British doctors working for the colonial medical service or in private practice. The most prolific author was Sir David James Galloway.

Table 1: Names of journals and number of issues/articles

Year	Journal	Editors	Issues	Articles
1890–1894	Journal of the Straits Medical Association	Max Simon (Volumes 1, 2, 5) Gilmore Ellis (Volume 3) TS Kerr (Volume 4)	5	44
1903–1906	Journal of the Malaya Branch of the British Medical Association	J Kirk (Volumes 1-3)	3	48
1911–1912	Malaya Medical Journal	Gilbert Edward Brooke (Volumes 9-10)	8	47
1926–1937	Malayan Medical Journal	GH Macalister	50*	519
1937–1941	Journal of the Malaya Branch of the British Medical Association (new series)	G V Allen	15	214
Total			81	872

*Excluding five supplements which containing only news and notices, content not extracted.

Table 2: Selected topics in pre-independence medical journals

Content	Number (%)
Malaria & mosquito control	123
Beri-beri	31
Tuberculosis	29
Sexually transmitted diseases	25
Helminthiasis	24
Leprosy	19
Cholera	15

Table 3: Authors with ten or more articles

Authors	Number of articles
Galloway DJ	24
Scharff JW	21
Haridas G	12
Barrowman B	11
Monteiro ES	11
Hoops AL	10
Kanagarayer K	10
O'Connor MP	10

DISCUSSION

This content analysis of five pre-independence medical journals revealed an interesting collection of scientific articles covering the medical problems that posed diagnostic and management challenges in late 19th century and early 20th century British Malaya. In the late 1800s and early 1900s, beri-beri was a major cause of mortality, with 2,287 deaths in the Straits Settlements attributed to it in the year 1904 alone.³ The discovery of thiamine deficiency as the primary cause of beri-beri and the subsequent commercial production of this “anti-beriberi factor” made possible the use of

megadoses of this vitamin to produce a dramatic cure for cardiac beri-beri.⁴ Malaria took its toll among the rubber plantation workers and severely affected British Malaya’s economic productivity;⁵ thus, not surprisingly, this disease and its control was prominently covered in the pre-independence medical journals. In fact, the earlier issues of the Malayan Medical Journal had a subheading “Estate Sanitation” to emphasize this special focus.⁶ It is of note that malaria received substantial mention in David Galloway’s Presidential Address, which appeared in the inaugural issue of the Journal of the Straits Medical Association in 1890.⁷ The pages of the pre-independence medical journals also documented many medical discoveries and engineering feats contributed by researchers in British Malaya to control malaria.⁸⁻¹⁰ Besides malaria, other infectious diseases were also major causes of morbidity and mortality and has been the subject of historical research.^{11,12}

Judging from the authors’ names and their affiliations, most of the contributors in the pre-independence medical journals were British workers in the colonial medical service, researchers in the Institute for Medical Research and, later, clinical teachers from the King Edward College of Medicine. Sir David Galloway was the most prolific contributor even though he was in private practice (in Singapore); he published a total of 24 articles spanning a period of 42 years from the year 1890. His achievements and contributions in medicine and the socio-political arena were documented by Scharff JW (another prolific contributor focusing on mosquito control).¹³ There were several notable local contributors, they include AA Sandosham, Benjamin Sheares, Chen Su-Lan, ES Monteiro, Gopal Haridas, K Kanagarayer, and Wu Lian-Teh.

The content of some articles of the pre-independence medical journals was skewed to the needs of the local British doctors, e.g. control of malaria in the European owned plantations,⁹ and health of the European child.¹⁴ As pointed out by Harun, the colonial medical service was set up initially to provide care for the European administrators and their dependents, and subsequently

to support the economic activities of British Malaya.¹⁵ However, on closer inspection, there were also health surveys of the local population that provided useful data for health planning and public health interventions.^{16,17}

In conclusion, the pre-independence medical journals provide a glimpse of the state of public health in British Malaya and illustrate well the introduction of Western medicine to tackle health problems that arose from the interplay of immigration, poor environmental sanitation and economic activities.

Appendix: An appendix containing the content pages, lists of authors and list of topics is available in Researchgate. URL: https://www.researchgate.net/publication/329962739_PRE-INDEPENDENCE_MEDICAL_JOURNALS_IN_BRITISH_MALAYA_CONTENTS_AUTHORS_AND_TOPICS

DOI: 10.13140/RG.2.2.17164.36486

REFERENCES

1. Anonymous. *Bibliomed - SM*. Tokyo: South East Asia Information Center; 1976.
2. Lim VKE. A short history of the Medical Journal of Malaysia. *Med J Malaysia*. 1995;50 Suppl A:S11-3.
3. Anonymous. Beri-beri references from some Straits Settlements medical reports. *Malaya Medical Journal*. 1911;9(4):48-51.
4. Hawes RB, Monteiro ES, Smith CE. The treatment of acute cardiac beri-beri or 'shoshin' with massive doses of vitamin B1. *Journal of the Malaya Branch of the British Medical Association*. 1937;1(2):87-96.
5. Liew KK. Planters, estate health & malaria in British Malaya (1900-1940). *Journal of the Malaysian Branch of the Royal Asiatic Society*. 2010;83:91-115.
6. McAlister GH. The Malayan Medical Journal as the official organ of the British Medical Association Malaya branch. *Malayan Medical Journal*. 1926;1(4):15-7.
7. Galloway DJ. Introductory address: Read May 3rd, 1890. *Journal of the Straits Medical Association*. 1890;1:11-24.
8. Gater BAR. Notes on Malayan mosquitoes. I. The genus *Anopheles*. *Malayan Medical Journal*. 1933;8(1):39-42.
9. Hoops AL. A review of published results obtained with atebirin in the treatment of malaria in Malaya. Including a record of one year's treatment of malaria with atebirin on the European owned estates served by the Malacca agricultural medical board. *Malayan Medical Journal*. 1933;8(4):219-35.
10. Williamson KB, Scharff JW. Anti-larval sluicing. *Malayan Medical Journal*. 1936;11(3):124-50.
11. Manderson L. *Sickness and the State: Health and Illness in Colonial Malaya, 1870-1940*. Cambridge; New York: Cambridge University Press; 1996.
12. Warren JF. Prostitution and the politics of venereal disease: Singapore, 1870-98. *Journal of Southeast Asian Studies*. 1990;21(2):360-83.
13. Scharff JW. The life and times of Sir David Galloway. *Singapore Med J*. 1960;1(3):84-6.
14. Gordon GAC. The health of the European child in Singapore and Malaya. *Malayan Medical Journal*. 1928;3(1):32-40.
15. Harun H. *Medicine And Imperialism: A History of Colonial Medicine, Health Policy and Medical Research in British Malaya*. Kuala Lumpur: Hairudin Harun; 2017.
16. Grey JCP. Roundworm and hookworm infection among malay school-boys - A survey of the Krian district, with a note on mass treatment in the schools. *Malayan Medical Journal*. 1929;4(4):138-41.
17. Oliveiro CJ. A survey of Singapore children in regard to their weight, height and nutrition. *Malayan Medical Journal*. 1937;12(1):9-17.

Community awareness and perception of smoking ban at eateries in Pedas, Negeri Sembilan

Wei Fern Siew, Davasooria Selvamani, Umair Memon, Xiaoxuan Liu, Sze Shian Wee

ABSTRACT

Malaysia has enforced a nationwide smoking ban to the public at all eateries on the 1st of January 2019. A survey on the awareness and perception towards this ban among adults was carried out in Pedas, Negeri Sembilan. Preliminary findings were assuring. A total of 91.3% (n = 347, N = 380) of the respondents were aware of this ban. Among the respondents, a low percentage of them were smokers, 29.2% (n = 111). A median of 285.5 respondents (75.1%, IQR = 58.25), including the smokers, perceived that this ban brings about health benefits to self and their family when environmental tobacco smoke exposure is curbed.

Key words: passive smoking; smoke exposure; legislation; adults; rural area.

Today, smoking not only contributes to around one-fifth of hospitalisations in Malaysia, but also possesses a threat to the general wellbeing of its surrounding society and nation, irrespective of its citizens' ethnicity, religion, economical status and cultural background.¹ Given that around 20% of Malaysians are smokers, it is an undeniable fact that this habit is injurious not only to the health of smokers themselves, but to the general public too, as a consequence of secondhand smoking. Exposure to secondhand smoking has become a detrimental risk factor that exposes the remaining 80% of non-smokers in Malaysia to respiratory illnesses, such as asthma. Secondhand smoke has also been a factor that has been the cause of non-communicable diseases such as cardiovascular diseases, and lung cancer, as well as elevating the risks of acquiring strokes. It is estimated that about 7.6 million Malaysians are exposed to second hand smoke in their homes, around 2.3 million Malaysian adults are exposed to indoor second hand smoke at their workplace, and almost 8.6 million people are exposed to second hand smoke in eateries. There are reports that imply individuals frequently exposed to second-hand smoke are 25–30% more likely to develop heart diseases than individuals who are not exposed to secondhand smoke.² In addition, it has led to the deaths of around twenty-seven thousand Malaysians

each year, from a statistical study conducted by the American Cancer Society. It was during this time that the Malaysian government became a party of the World Health Organisation (WHO) Framework Convention on Tobacco Smoking (FCTC) in 2005, which protects the public from exposure to cigarette smoke.³

On 1st of January 2019, Malaysia has enforced a nationwide smoking ban to the public at all eateries. This ban was part of the Ministry of Health's strategies to fight against non-communicable diseases, protect Malaysians against passive smoke and encourage them to practice healthy lifestyles, reduce the consumption of cigarettes and tobacco products in Malaysia, which indirectly convinces smokers to quit the nicotine habit, in hopes that Malaysia becomes a smoke-free nation by 2045. Previously, the Control of Tobacco Product Regulations in 2017 restricts the areas where smoking is allowed, which includes public parks, air-conditioned shops and work offices. The control of tobacco is regulated under the Food Act of 1983 that reinforces the presence of smoke free environments. Currently, the Ministry of Health has issued the Declaration of Non-Smoking Area 2011, 2012, 2015, which declares additional specified buildings and places as smoke free.⁴ This ban, however, is not new as there are many other countries worldwide which have implemented it. In accordance with the WHO Non Communicable Diseases Global Target, Malaysia is required to reduce its smoking prevalence to about 15% by the year 2025.⁵ The nationwide smoking ban to the public at all eateries could be a good start to augment the previous and current measures imposed. A team of Semester 5 MBBS students from International Medical University (IMU) decided to conduct a preliminary study on the awareness and perception towards this newly implemented ban among adults in the rural community of Pedas, Negeri Sembilan as part of their community health survey project.

A cross-sectional survey was carried out from 14th to 15th February, 2019. Pedas is one of the 17 mukims in the district of Rembau, Negeri Sembilan which borders the state of Melaka in the south. Sampling was conducted within a quadrant of 3.5km radius with Klinik Kesihatan

Community Medicine Department, School of Medicine, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, MALAYSIA.

Received 29 July 2019; accepted 3 August 2019

Corresponding Author:

Dr Wei Fern Siew, Community Medicine Department, School of Medicine, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000, Kuala Lumpur, MALAYSIA
E-mail: weifern_siew@imu.edu.my

(KK) Pedas as the centre. The sampling size was calculated with Raosoft software, basing on a margin error of 5% and confidence level of 95%. The estimated population size (N) was 14,000. The calculated sample required was 380, with an attrition rate of 20%. The inclusion criteria for this study were Malaysian adults, aged 18 years and above, both sexes of all ethnicities, as well as both smokers and non-smokers. Respondents must also be able to answer to the survey questions in Bahasa Melayu or English. The exclusion criteria were respondents who were mentally incompetent and houses which were locked with no occupants during the survey period. The survey questions to measure the awareness on smoking ban was done with dichotomous questions, whilst the perception towards the smoking ban was measured using the Likert-type scale questions. The independent variables were the demographics of the adults of Pedas Community, aged 18 years and above, as well as gender, educational levels and smoking and non-smoking status.

The percentage of awareness of the community in Pedas, Negeri Sembilan towards the enforcement of the new smoking ban in eateries is high at a 91.3% (n = 347). Possible explanation may be due to the heavier media coverage and the compulsory display of warning signs at eateries in Malaysia. There is however, less awareness, 77.1% (n = 293) on the 3 metre distance from eateries where smoking is allowed. This could be due to the 'No Smoking' signs and warnings at eateries not displaying that specific information. A little more than half the respondents, 59.2% (n = 225) agree that they would spend more time in eateries since the introduction of the ban. This depicts the respondents appreciating a smoke free ambience. On the overall perceptions on the ban, a median of 285.5 respondents (75.1%, IQR

= 58.25), including the smokers, are agreeable that this ban brings about health benefits to self and their family when environmental tobacco smoke exposure is curbed. The positive perceptions of the ban by the respondents may be due to their belief that secondhand smoking is a serious threat to health or presumably the respondents have a generally negative attitude towards passive smoking and that it is hazardous towards one's health. Interestingly, 72.1% (n = 274) of the respondents agreed to the fact that this smoking ban would lead to a decrease in obtaining non-communicable diseases. It is a fair assumption of the population of Pedas to agree to the fact that disease prevalence would be lower as the effects of smoking can usually be detrimental. This could also be linked to the good level of awareness shown by respondents regarding the effects of smoking on the environment and their health.

In conclusion, it is widely known and an agreed fact that smoking poses a grave threat to the current and future health implications of the Malaysian population. It is assuring that this preliminary survey found that there was a widespread knowledge of the smoking ban across the Pedas adults' community regardless of an individual's socioeconomic background. However, the distance enforced by the ban was not as widely known by the respondents. Perhaps, this could be addressed in the future awareness campaigns of the ban. While the ban has shown promising results in population awareness, it has only been introduced in the last few months thus, the effects of it are yet to be seen. Future studies could investigate the correlation between the number of fines and number of smokers to assess the effectiveness of the newly implemented law. However, that being said, it can be concluded that the aim of this preliminary survey was achieved.

Table 1: Awareness questionnaire (N = 380)

Questions	No		Yes	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Do you usually eat out?	113	29.7%	267	70.3%
Are you aware of the smoking ban in eateries which took effect from 1 st January 2019?	33	8.7%	347	91.3%
Are you aware that there is an enforced distance around eateries in this ban?	86	22.6%	294	77.4%
It is important to have a smoke-free environment.	37	9.7%	343	90.3%
The environment seems cleaner after enforcing smoking ban. (e.g. less cigarette butts)	64	16.8%	316	83.2%
Secondhand smoke is a serious threat to health.	29	7.6%	351	92.4%
The fine of RM10,000 for the public and RM2,500 for eatery owners are heavy enough.	82	21.6%	298	78.4%

Table 2: Perception questionnaire (N = 380)

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
The recent smoking ban will force smokers to reduce the number of cigarettes they smoke.	34	8.9%	55	14.5%	38	10.0%	135	35.5%	118	31.1%
The recent smoking ban reduces exposure to passive smoking in eateries.	15	3.9%	17	4.5%	29	7.6%	172	45.3%	147	38.7%
The current smoking ban is able to create a healthier environment.	17	4.5%	15	3.9%	33	8.7%	131	34.5%	184	48.4%
The smoking ban is not a violation of the smokers' right.	34	8.9%	43	11.3%	50	13.2%	98	25.8%	155	40.8%
There is a need for more notices in place for the smoking ban in eateries.	18	4.7%	29	7.6%	48	12.6%	130	34.2%	155	40.8%
The introduction of signboards (public place warning) of smoking ban will be helpful (e.g. No Smoking)	17	4.5%	31	8.2%	42	11.1%	144	37.9%	146	38.4%
Eating in eateries has become more pleasant with smoking ban in place.	23	6.1%	23	6.1%	53	13.9%	119	31.3%	162	42.6%
The time spent at eateries will be longer after the smoking ban.	33	8.7%	40	10.5%	82	21.6%	119	31.3%	106	27.9%
The smoking ban will have long-term benefits to the general public's health.	12	3.2%	15	3.9%	24	6.3%	141	37.1%	188	49.5%
Smoking is a habit that causes financial burden.	25	6.6%	23	6.1%	32	8.4%	126	33.2%	174	45.8%
The smoking ban encourages smokers to quit smoking.	44	11.6%	49	12.9%	62	16.3%	105	27.6%	120	31.6%
Smoking ban in eateries (together with other public places) lower your chance of getting non-communicable diseases (such as heart problems, diabetes, high blood pressure, etc,) over time.	21	5.5%	31	8.2%	54	14.2%	115	30.3%	159	41.8%

Acknowledgements

We would like to thank the lecturers from the Community Medicine Department of International Medical University (IMU) and the Staff from Klinik Kesihatan Pedas, Negri Sembilan for their support, guidance and facilitation in overseeing the smooth execution of this community survey study project of ours. Lastly, not forgetting the great teamwork put in by Group AA1 ME1/17 students for rendering this project a success.

REFERENCES

1. Health and Fitness. PressReader.com - Connecting People Through News [Internet]. 2019 [cited 17 February 2019]. Available from: <https://www.pressreader.com/>
2. Ooi JX, Teh KX, Tam CL, Sadasivan S, Kadirvelu A. Passive smoking: Perceptions and practices among urban working adults. *International Journal of Collaborative Research on Internal Medicine & Public Health*. 2014 Jun 1;6(6):160.
3. Baharom N. The Smoking Ban Helps Smokers Help Themselves | Star2.com [Internet]. 2019 [cited 17 February 2019]. Available from: <https://www.star2.com/health/2018/10/05/moking-ban-helps-smokers/>
4. Malaysia Details | Tobacco Control Laws [Internet]. 2019 [cited 17 February 2019]. Available from: <https://www.tobaccocontrolaws.org/legislation/country/malaysia/summary>
5. Institute for Public Health (IPH). National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health Problems. [Internet]. 2019 (cited 17 February 2019). Available from: <http://iku.moh.gov.my/images/IKU/Document/REPORT/nhmsreport2015vol2.pdf>