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 研究課題名(英文) Disparities, dynamic changes, and controls of burden of cardiovascular diseases and cancer in Japan, China, and Taiwan
 研究代表者
 馬 恩博 (Ma, Enbo)
 福島県立医科大学・公私立大学の部局等・准教授
 研究者番号：00590770
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研究成果の概要(和文)：脳卒中死亡率については、過去30年間の年平均減少した寿命(YLL)は、日本と台湾で類似していた。日本人集団の脳卒中死亡率の著しい減少が出血で見られましたが、梗塞のわずかな減少。癌による死亡によるYLLの減少は他の原因と比較してゆっくりと始まった。今や癌による死亡および虚血性心疾患YLLは、日本の脳卒中および糖尿病におけるそれらより高かった。1991年から2009年までの日本の人口と比較した、中国の虚血性心疾患死亡率の増加傾向は、より高い食事性脂肪、より高い血中脂質、および体重増加を伴うライフスタイルを反映しています。

研究成果の学術的意義や社会的意義
 人々の健康的なライフスタイルを維持することは、心血管疾患やがんの負担を減らすために非常に重要です。中国人人口のより高い食事性脂肪および太りすぎは虚血性心疾患の主な危険因子であり、そして2010年の負担は約20年前の日本の状況と同様でした。健康日本21(第二次)の目標を達成するために、全員が責任を持っています。

研究成果の概要(英文)：Due to the stroke mortality, the years of life lost (YLL), average of YLL per year, and YLL rates in the past 30 years were similar between Japan and Taiwan. Prominent decline of stroke mortality was seen in the hemorrhagic stroke, but not in the cerebral infarction in Japanese populations. The decline of YLLs due to cancer mortality was started late and slowly comparing with other causes, and currently YLLs of death of cancer and ischemic heart disease were higher than those of stroke and diabetes in Japan. The increased trends of ischemic heart disease mortality in China between 1991 and 2009 comparing with Japanese populations reflected the lifestyle with higher dietary fat, higher blood lipids, and increased body weight. In total, two articles were published in peer-reviewed journals, and five presentations were done in the international conferences. Several presentations for related epidemiological studies in the domestic conferences were conducted with supported by this grant.

研究分野：疫学と公衆衛生

キーワード：year of life lost burden of disease trend cardiovascular disease cancer Japan China Taiwan

研 究 成 果 報 告 書

1 . 研 究 開 始 当 初 の 背 景

Japanese have the highest life expectancy in the world and are suffering the huge cost in health care system (Ikeda, et al. *Lancet* 2010). China is in the process of high economic development, epidemiologic transections, and population ageing, which may have and follow the similar scenarios of chronic diseases in Japan. Taiwan with Chinese ethnic has a similar health status of Japan. In 2012, the life expectancy of men and women at birth were 80 and 87 years in Japan, 74 and 77 years in China (WHO. *World Health Statistics* 2014), and 76 and 83 years in Taiwan (Ministry of Health. *Taiwan Health and Welfare Indicators* 2014), respectively. The non-communicable diseases will be greatly responsible for the total deaths in the next decades, and about 12.3 million deaths in the Western Pacific areas in 2020 has been projected (WHO. *World Health Technical Report* 2010). Effective clinical treatments of cardiovascular disease (CVD) and cancer make the prolongation of patients' survivals, which increase the burden of CVD and cancer resulting from the impairment or disability other than deaths. Public health policies should be emphasized not only the continuous higher mortality but also the chronic status of CVD and cancer. As the new global economic environment changes, although the lifestyles are similar in Eastern Asian areas, the disease patterns and the policy of control and prevention of CVD and cancer, the top two disease burden in these areas, are different (Ohira T, Iso H. *Circ J* 2013). In the north-eastern Asia, even in Chinese populations, the mortality of CVD and cancer and their related risks are variant because of the different social determinants such as the environment and healthcare systems (Kim J. *Int J Stroke* 2014; Iketa N, et al. *PLOS One* 2012). The evidence-based policy needs to be updated in timely way. To learn the strategies among neighborhood countries is important, and also the sub-country strategies for control of CVD and cancer need to be reviewed and seriously considered.

2 . 研 究 の 目 的

The study aims to apply the World Health Organization (WHO) methods for estimation of the loss of life-expectancy and healthy life-expectancy in the Eastern Asian areas, particularly in Japan, China, and Taiwan, to clarify the disparity and dynamic changes of CVD and cancer patterns and to identify the leading risk factors of CVD and cancer attributable to the loss of life-expectancy, therefore to highlight the interventions for control and prevention of CVD and cancer.

3 . 研 究 の 方 法

This study mainly computed the years of life lost (YLL) due to types of CVD and cancer, leading attributable risk factors, and thus the increase of life-expectancy by specific interventional programs to map out the patterns, disparities, and the dynamic changes in study areas during the past decades. The WHO methods in 2014, including standardized life tables and modifications of the global burden of disease study method, had been applied.

4 . 研究成果

FY2015-16

The trends of YLLs, average of YLL per year, and YLL rates in the past 30 years were similar between Japan and Taiwan. And these declined trends were similar to the estimations from the global burden of disease study in 2013. More prominent declines were seen in hemorrhagic stroke mortality, but slightly decline was shown in cerebral infarction in Japanese populations (**Figure 1**). This finding reflects the current burden of stroke in Japanese populations through YLLs with corresponding to profiles from the mortality estimation as a whole.

Two oral presentations were done in the international conferences.

FY2016-17

The trends of the burden of ischemic heart disease (IHD), stroke, and cancer, comparing with diabetes, unintentional accidents and all-cause mortality, were conducted for Japanese populations. Age-standardized Years of Life Lost per 1000 population (ASYLL) were estimated by using vital statistics and life-tables in each year. Trends of segments and average annual percent change (AAPC) were identified and analyzed by Joinpoint regression models. The decline of YLLs due to cancer mortality started late and slowly comparing with the declines of other causes. Currently, YLLs due to the death of cancer and IHD were higher than those of stroke and diabetes.

An oral presentation about gastric cancer research was given.

FY2017-18

The principle investigator had presented the study results on burden of chronic diseases of Japanese in the symposium of The 21st International Epidemiological Association (IEA) World Congress of Epidemiology (WCE2017), Satama, Japan, in 2017. The declined trend of leading chronic diseases attributed to the lifestyle changes in Japanese populations were clearly explained, and the potential increase of heart disease in young adults was highlighted (**Figure 2**).

As a co-author with Chinese collaborators, the principle investigator had completed an article published in BMC Public Health. This study described the decline of IHD mortality in China during 1995 and 2005, which showing the different pattern comparing with it in Japanese populations. The increased trends of IHD mortality in China between 1991 and 2010 reflected the lifestyle with higher dietary fat, higher blood lipids, and increased body weight. The current mortality pattern in China is similar to it in Japan twenty years before (**Figure 3**).

FY2018-19

In the last year (FY2018) of this study, as the first author, one article on all-causes of death had been published. This study described that higher dietary intakes of antioxidant vitamins reduced the risk of all-cause mortality in middle-aged Japanese women, especially female non-smokers.

By using the data of Fukushima Health Management Surveys, a poster presentation for the analysis of the stability about the dietary patterns in Fukushima obtained the best award from

'The 3rd World Congress on Nutrition, Dietetics and Nutraceuticals', in Prague, Czech Republic, February 25-26, 2019.

5 . 主な発表論文等

〔雑誌論文〕(計 2 件)

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2. 高橋秀人、**馬恩博**. 全国 47 都道府県の周産期死亡率の経年変化. 第 29 回日本疫学会学術総会・東京・日本. 2019 年 1 月(Poster)。
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7. **Ma E**, Sasazuki S, Shimazu T, Sawada N, Yamagi T, Iwasaki M, Inoue M, and Tsugane S. Excessive Reactive Oxygen Species and the Gastric Cancer Risk: the JPHC Study. The BIT's 9th World Cancer Congress 2016. Shanghai, 2016 May 13-16 (Oral).
8. **Ma E**. Lifestyle Factors and Burden of Cardiovascular Diseases in Japan. The 1st World Public Health and Nutrition Congress. Madrid, 2016 March 10-13 (Oral).
9. Wan X, **Ma E**, Zhang Y, Iso H, Yamagishi K, Takahashi H, Wagatsuma Y, and Yang G.

〔図書〕(計0件)

なし

〔産業財産権〕

出願状況(計0件)

なし

取得状況(計0件)

なし

〔その他〕

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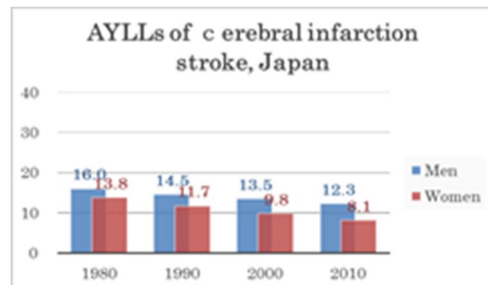
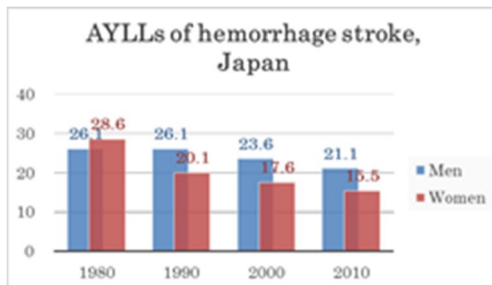
6. 研究組織

(1)研究分担者

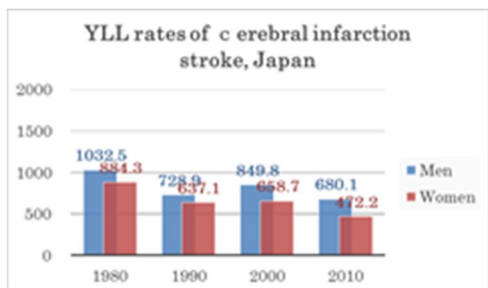
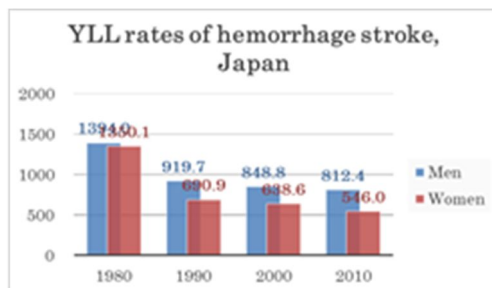
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(2)研究協力者

なし



F1-a



F1-b

Figure 1. Average years of life lost (AYLL) per person and rates of year of life lost (YLL rate) per 100,000 of stroke in Japanese men and women. i) Years of Life Lost estimated by the World Standard Life Expectancy, the Global Burden of Disease study (GBD 2013). ii) $AYLL = \text{total YLLs} / \text{total deaths from the cause}$. iii) $YLL \text{ rates} = \text{total YLLs} / \text{total population} * 100000$.

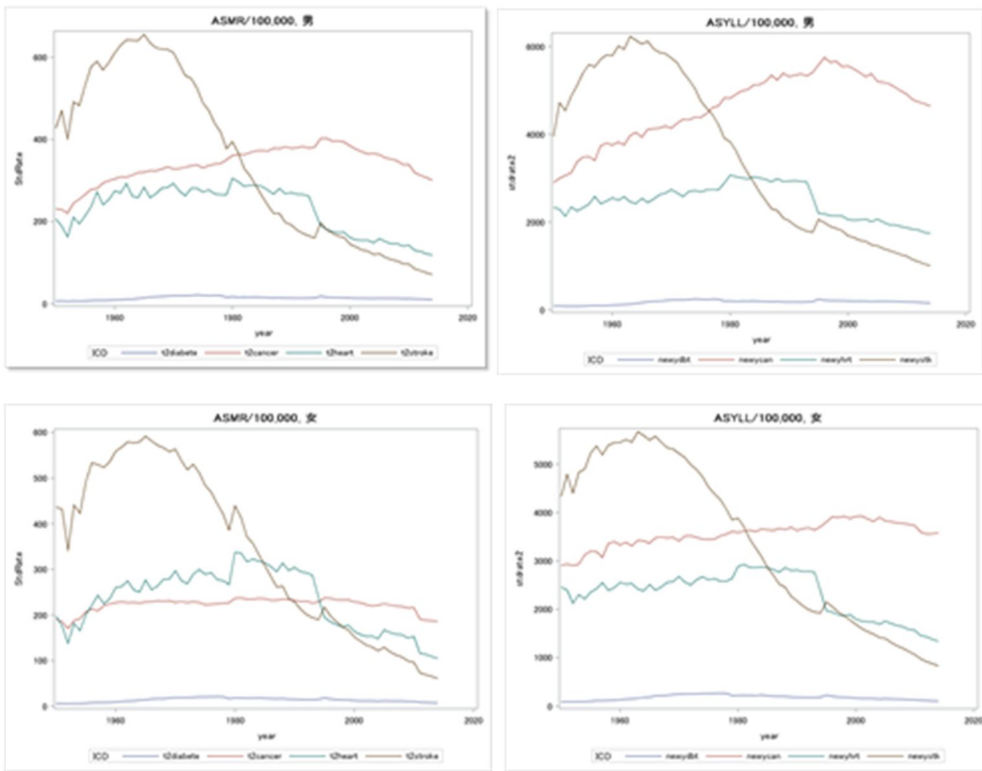


Figure 2. Comparison between age-standardized mortality rates (ASMR) and age-standardized years of life lost (AYSSL) per 100,000 of cancer, ischemic heart disease, stroke, and diabetes in Japanese men and women.

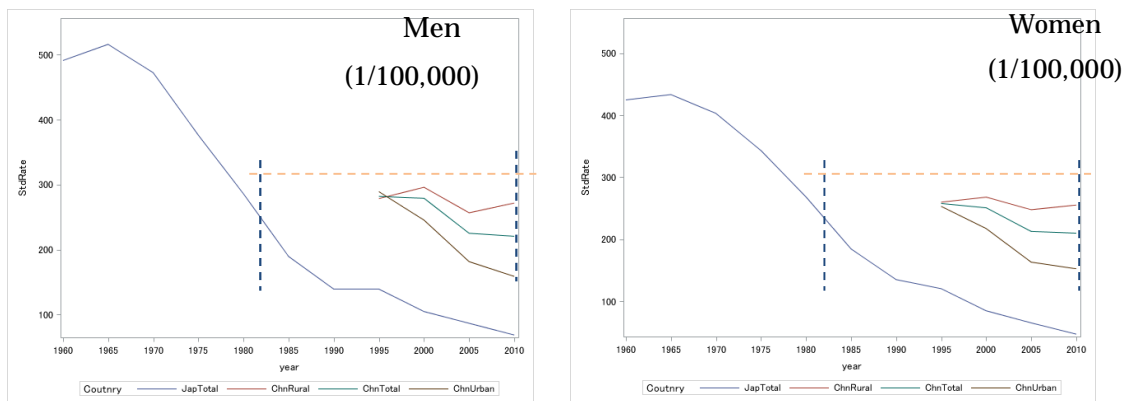


Figure 3. Comparison of age-standardized mortality (by the world population 2010) of stroke in Japan (vital statistics) and China (102 disease surveillance points).