



Effectiveness of various health insurances in tackling health problems of the 21st century: a systematic review

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Abstract

One of the key factors in reaching ‘healthy lives’ based on the Goal 3 of Sustainable Development Goals is the access to medical care. Many countries have been implementing their own health insurance in order to facilitate access for good quality medical care. Some studies indicated that health insurance has a positive effect on improving the health quality especially in terms of mortality rates. However, several other studies revealed that there is an inverted effect of owning health insurance and health quality. Therefore, this systematic review aims to investigate about the research regarding the relationship of health quality and health insurance. The keyword for this review was "Insurance, Health"[Mesh] AND "Health Care Quality, Access, and Evaluation"[Mesh] on the database of Pubmed. By using this keyword, we found 6 papers related to our topic. Then, we evaluated it by using STROBE method. From six papers we reviewed, all of them state that ownership of health insurance may indicate better prognosis of the patient, regardless of the disease. Furthermore, the government of countries may consider administering a social insurance system, or at least the government may increase people’s participation in health insurance. Future studies must be conducted due to the fact that the paper we review are varies in term of research location and population target

Key words: *health insurance, health care, health care quality, health care access, health care evaluation*

Introduction

Health insurance can be said to have a strong relation in achieving Goal 3 of Sustainable Development Goals (SDGs), “Ensure healthy lives and promote well-being for all at all ages”.¹ One of the key

factors in reaching ‘healthy lives’ is the access to medical care. Health insurance has been implemented across many countries in order to facilitate access for good quality medical care. Risk-sharing mechanisms such as social insurance is said to provide resources to access healthcare and to promote health. On the other hand, social insurance protects individuals and

households against while the potentially devastating direct financial costs of illness.²

The ultimate aim of health insurance is to improve the quality of health.³ The impact of health insurance on health care utilization is said to be closely associated with the characteristics of the system, such as premiums, benefits, location of healthcare services, and for whom the services are intended.⁴ Some health insurance programs, for example, the one in Indonesia which is called Jaminan Kesehatan Nasional, raise debate about its effectiveness in increasing the utilisation of health services, especially among the poor.⁵

Some studies indicated that health insurance has a positive effect on improving the health quality of patients. A study showed women managed under national health insurance scheme of Nigeria had better maternal and perinatal indices.⁶ Insurance coverage also associated with decreased in-hospital mortality.¹ Another study indicated there is inverted effect between ownership of health insurance and health quality, where enrollees of Ohio Appalachian Medicaid were more likely to have health problems such as hypertension, cardiovascular disease, and overall poorer health than non-Medicaid enrollees.⁷

The link between health insurance and this ultimate goal therefore should be thoroughly investigated. Current studies mostly investigated the relation between participation in health insurance and mortality or survival in certain diseases especially the non-communicable disease such as cancers, diabetes, heart-related diseases, and so on. Advanced investigation and research about the link between health insurance and health problems in general, not only based on certain disease, is needed in order to find out and improve efficacy of health insurance. Here explained systematic review of literature showing link of health insurance and health problems.

Materials and Methods

The systematic review was conducted using keywords "Insurance, Health"[Mesh] AND "Health Care Quality, Access, and Evaluation"[Mesh] on the database of Pubmed. From there, we proceed to look for studies which are related to our topic by using our inclusion criteria. The inclusion criteria include: studies which were published within the past five years, observational studies, and studies which look upon the effects of health insurance on the health of the users. On the other hand, exclusion criteria were also used. These include: inaccessible articles, articles written in languages other than English or Indonesian, and irrelevant articles.

Afterwards, we begin to collect important data from each study, including: author(s) name, year of publication, STROBE score, type of insurance used, research design, location, sample size, type of disease assessed, method of analysis, result, and limitations of the study. The review was done qualitatively by three assessors and conclusions were then drafted after consensus had been achieved. All of this process could be viewed on [Figure 1](#).

Results

The search was conducted via the database of Pubmed. Titles were screened for relevancy and duplication. Contents were screened for inclusion and exclusion criteria. Articles went over criteria were fully assessed for eligibility and study design. Lastly, six suitable observational studies were reviewed and included in this systematic review. Articles were assessed with STROBE's criteria to ensure its quality. STROBE result of all articles could be seen in Appendix (in Supplementary

Material), while the entire process can be seen in [Figure 1](#). Included study design and the respective characteristics of each study are further shown in [Table 1](#).

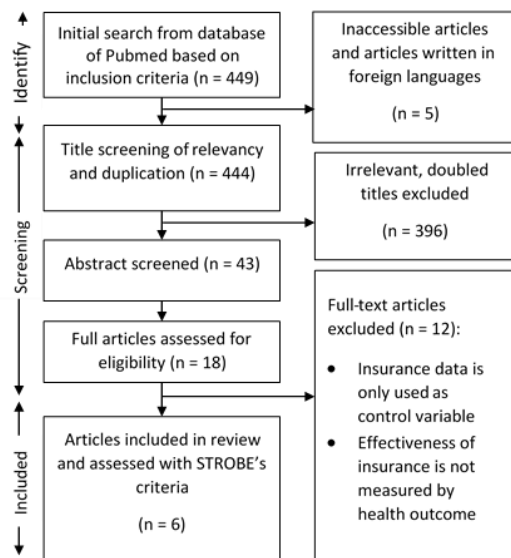


Figure 1. Flow chart of the systematic review

Discussion

Based on the study conducted by Xie, et.al in 2017, which explains about the relationship between lowering cost share and the rates of self-management in diabetes, shows that people who use the high-cost share group has a lower risk of hyperglycaemia rather than the low-cost share group. This means that people who pay for the insurance more will have a better condition and receive more health service than people who pay only a little amount of money for insurance.⁸

Other study conducted by Andersen ND, et.al. reveals that people who suffer cardiac arrest and are underinsured will have a higher risk for thoracic aortic operations. This condition could happen due to the fact that underinsured people will receive less medication and less screening. Less medication and less screening in this study mean that people will have a higher rate of

hypercholesterolemia and hypertension. These two events will lead to an acute cardiac arrest. A severe acute cardiac arrest results in the demand of a thoracic aortic operation.⁹ The same result is also explained through a study by Hiroi, et.al. In this study the researcher discovers the correlation of *H. pylori* infection gastritis with the coverage of insurance. The result is positive which means that the usage of insurance will decrease the event of *H. pylori* infection gastritis.¹⁰

There are other studies that showed significant improvement of healthcare outcomes when using health insurance. Those studies include the study conducted by Stecker et al in 2017 that showed the significant reduction in out-of-hospital cardiac arrest in patients with health insurance.¹¹ Another study is conducted by Saunders et al, in which the samples used are 934 individuals with urine albumin-to-creatinine ratio ≥ 30 mg/g, which is a diagnostic value of albuminuria. The study also discusses cardiovascular mortality as one of the complications of kidney disease. The aim of the study is to compare the rate of mortality between uninsured, individuals with public insurance, and individuals with private insurance. Individuals with public insurance and those who are uninsured showed higher rates of all-cause mortality compared with individuals with private insurance. Also, similar pattern can be seen in cardiovascular mortality rates. However, the cardiovascular mortality rate between those individuals are not significant.¹²

There is one study that also compares two medical insurances in China, those are New Cooperative Medical Scheme (NCMS) and the Urban Employees' Medical Insurance (UEMI). NCMS is mainly for rural residents. The study is conducted by Wang et al. The result

Table 1. Included study designs and characteristics

Author and Year of Publication (STROBE)	Type of Insurance	Research Design	Location	Sample size	Disease	Method of Analysis	Results	Limitation of Study
Xie Y, et al; 2017 (19.33/22)	Private	Observational Retrospective	Netherlands	7,155 patients (3,575 low-cost share group, 3,580 high-cost share group)	Type I Diabetes Mellitus	SAS 9.4; t-test, Pearson's chi-square, modified Poisson model	Higher rate of continued testing strip fills in low-cost share group than high-cost share group (89% vs 82%, P<0.001)	Pharmacy fills do not necessarily confirm actual use of dispensed testing strips, all patients were from a single large commercial insurer
Andersen MD, et al; 2017 (16.16/22)	Private and government (Medicare, USA)	Retrospective	United States	826 patients; 736 had insurance; 90 were underinsured	Acuity of Thoracic Aortic Operations	Mann-Whitney rank sum test, chi-square test; logistic regression, Cox proportional-hazards regression; STATA 11.1	Underinsured patients were at greatest risk of requiring nonelective thoracic aortic operations (OR: 2.67; P<0.0001)	Study only includes patient who underwent operation; does not account for unmeasured confounders, such as social variables; single-institution analysis
Hiroi S, et al; 2017 (19.1/22)	Japanese health insurance	Retrospective observational	Japan	81,119 and 170,993 patients in two databases;	<i>Helicobacter pylori</i> gastritis	SAS 9.4	Insurance coverage may reduce the prevalence of <i>H. pylori</i> infection.	Success rate of eradication was obtained from previous studies, potential bias of health insurance claims database
Stecker EC, et al; 2017 (18.94/22)	Governmental (Affordable Care Act)	Retrospective observational study	Multnomah County, Oregon, United States	Adult residents of Multnomah County (636,000)	Out-of-Hospital Cardiac Arrest	PASS 13, SAS 9.4	Health insurance expansion was associated with significant reduction in OHCA incidence. (middle-aged population:	Single urban geographic area as location, underpowered regression-based techniques, assumption that OHCA can be a surrogate of SCA

Table 1. Included study designs and characteristics (cont'd)

Saunders MR, et al.; 2016 (16.4/22)	Government and private insurance	Cohort observational	United States	934 individuals with UACR \geq 30 mg/g;	Albuminuria	Cox model, Schoenfeld residuals	Higher crude rates of all-cause mortality in the uninsured and individuals with public insurance compared with those with private insurance (17.8 and 24.1 vs 10.4, respectively); similar pattern can be seen in cardiovascular mortality rates.	102 per 100,000 to 85 per 100,000 with P = 0.01; elderly population: 275 per 100,000 to 269 per 100,000 with P = 0.70)	The study only had access to a single UACR and eGFR determination, rather than using multiple measures; limited time, data can be biased since uninsured individuals may have subsequently lost their insurance.
Wang Z, et al; 2015 (17.43/22)	New Cooperative Medical Scheme (NCMS) and the Urban Employees' Medical Insurance (UEMI)	Cohort prospective	PD Center, Wuhan no. 1 Hospital, China	564 patients(415 (77.0%) with UEMI and 149 (23.0%) with NCMS); has received continuous ambulatory PD for >3 months	Peritonitis	SPSS 17.0; chi-square test, unpaired t-test, Kaplan-Meier method, Cox regression model.	Biomedical parameters for diseases were inferior in patients with NCMS compared with patients with UEMI. (P<0.05)	Data were from a single center and the sample was small.	

of this study is that individuals with NCMS are more inferior to those with UEMI in biomedical parameters, which include haemoglobin levels, phosphorus in blood, nutrition, and residual renal function. For example, individuals with NCMS have lower haemoglobin levels that can be due to low-income-related-malnutrition.

Hypophosphatemia does exist in individuals with NCMS which also correlates with economic status in rural residents. In conclusion, individuals with NCMS do have higher rate of mortality associated with peritoneal dialysis compared with individuals with UEMI due to different economic status.¹³

The study conducted by Wang et al also correlates with other studies that compare uninsured and insured individuals like the study conducted by Stecker et al and Saunders et al. Those three studies showed significant differences in patients with insurance or those with private insurance when compared to public insurance. Higher economic status (those with private insurance) associated with more compliance in check-ups and drug intake compared to those with lower economic status. However, compared to those who were uninsured, individuals with insurance (public or private) do have a higher survival rate almost in all studies.

Even though a profound connection between quality health insurance and health outcomes of its users could be seen, this systematic review has several limitations. Firstly, the studies included were quite heterogeneous in location, sample size, as well as in type of insurances and diseases. This heterogeneity could become a potential source of bias. However, this should be understandable given the small amount of current literature on the effects of health insurance. Secondly, as a systematic review, it could be susceptible to bias arising from author competing interests of its assessors. This is

understandable given the nature of systematic review as a qualitative literature.

Conclusion

This review using systematic methods shows that ownership of health insurance may indicate better prognosis of the patient, regardless of the disease. Furthermore, the government of countries may try to consider administering a social insurance system, or at least the government may try to increase people's participation in health insurance. It is recommended that the community may consider enrolling in health insurance for better access to the health care services thus higher health quality., etc. These attempts may be one of many ways to achieve a better health level for the community. Further research should be conducted with more homogeneous data, especially related to location the research conducted. Future research could fruitfully explore this issue by conducting the study in developing country, , seeing that most of the studies related to the linking between health insurance and health quality conducted in developed countries. More databases may also be used in order to get more studies related to the relation between health insurance and health quality.

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Conflict of Interest

None declared.

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