The Regional Medical Welfare Factor Relating With The Death Rate Year-To-Year Percentage Change

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Abstract:

The purpose of this study was to clarify the relationship between mortality and data related to medical welfare factors in Nagoya city.The average length of stay and the number of person with requiring of long-term care and so on were used as data related tothese factors in a region. As a result in multivariate logistic regression on incrementation or not of the mortality, the average length of stay was revealed the variable statistically significant. Therefore, for the purpsoe of not increasing the regional mortality, this study suggested that the appropriate treatment and nursing care were needfor not extending average length of stay in the region.

KeyWords: Regional Health Planning, Mortality, Length of Stay, Public Health Nursing

Introduction:

The death rate is increasing with growth in population aged in recent year. The proportion of poplutaion aged 65 or over per 10,000rised to 24.1% and the death rate which was the number of death per 1,000 was elevatedto 10.1% in 2014. However, it shoudn't be considered that the incremental mortality was able to been interpreted withonly the effect of gain aged population.

Some studies on factors which affected the mortality analyzed individual anamnesis and status of daily activity and so on.But few studies focused on regional factors for clarifying relationship withthe mortality. Nakamura(2003) analyzed the relationship between the Years of Potential Life Lost (YPLL) with regional factors, and then reported increasing YPLL was related to decrease the proportion of health-checkups use statistically significant. Momeover, Takeda(2004) founded that more use of the service in long-term care insurance was correlated with extending prognoses in Japan.

These studies foused on status of medical welfare and population variable in the region, whereas didn't analyze suchones of year-to-year percentage change.It was believed that analyzing factors in terms of the change rata on health welfare factors was neccessary because rapid growth of aged population had influened on medical welfare demand in Japan. For instance, if the number of beds didn't increase along with rise in aged population in a region, it was thought that the regional supply of medical welfare service would be in short. Therefore, this study analyzed the number of beds and population year-to-year change for exploring the relationship with death rate.

This study aimed to clarify relationship between the change of mortatlity rate which display a dichotomous variable and regional factors year-to-year percentage change such as the number of beds and population in a region.Elucidating this relevancy, this study attempted tofind suggestions for not incrasing mortality in Japan

Method:

This study used the population census published by the Ministry of Internal Affairs and Communications (MIAC) and the annual report on health and welfare published by Nagoya city.Annual reports on 16wards in Nagoya city included data setsin terms of medical welfare state since 2005 to 2013.

Nagoya city is the prefectual capital of Aichi prefecture. Aichi prefecture locates in Tokai area, Japan and the population of Aichi was approximately 7.4 million in 2015. The populatuion of Nagoya city was approximately 2.3 million in 2015. And the manufacturing industry such as the automobile one is very active in there.

The amount of change on regional factors was a value by calculatinga difference of two datas in continuous years.Then, the change rate on these factors was given by computingthis diffenrence divided by the value in previous year.

Analyzing variables were the incrementation or not of death rate in a region (dichotomous variable) as outcome, and annual change rate of population, populaiton aged 65 or over, foreigner population, number of households,average age, number of livelihood protection recipients, number of regional health promotion measures participant, number of health-checkups user, number of beds per 100,000, use rate of beds,

average length of stay in hospital, number of persons requiring long-term care, number of ambulance user, number of retained motor vehicles.

The number of livelihood protection recipients was the recipient number to an entire population in a ward. As variables in terms of the number of health-checkups user, a number of examinee for gastric cancer and colon cancer were used. The data about examination for lung cancer weren't used in this analysis, because the data had been changed the type of data since 2012. These examination for gastric cancer and colon cancer, lung cancer are for inhabitants aged 40 or over. Moreover, these examinee have been subsidized once a year. The regional health promotion measures is service which involve lectures for providing information on healthcare and, supporting exchange meetings, and so on. In this study, the number of these participant was used in analysis. The number of retained motor vehicles was the sum of private car and commercial vehicle.

A person requiring long-term care qualified was had a certification of need on long-term care. The levels of long-term care need is classified 7 levels which are requiring supprt 1 and 2, requiring long-trerm care 1 to 5. The level of requiring support denotes the need of care prevention such as outpatient care service, and the level of requiring of long-term care does the need of long-term care such as regular visiting and nurisng care and so on. The requiring of long-term care 5 represents highest necessity of care. This study used the total number of person evaluated requiring long-trerm care 1 to 5 as a independent variable.

The number of ambulance user in a region was

he difference value in continuous two years.In additon, dummy variables representing year were used.

This study used Wilcoxon rank sum test in univariate analysis at first, then multivariate logistic regression with stepwise method. In a result of univariate analysis, only variables related to change rate of mortality were analyzed with the multivariate method. The level of siginificance was chosen to be p < 0.10 in univariate analysis and p < 0.05 in multivariate analysis. Data analyses were performed with SAS University edition.

sample size in this study was 144. Then, as a result of Wilcoxon rank sum test, the number of ambulance user and average age, average length of stay were founded to relate statistically significant with theincrementationornot of mortality.

These variableswere analyzed with multivariate logistic regression to determine relationship with the mortality and, therefore,the average length of stay founded to be only a variable statistically significant. Moreover, the odds ratio of it was 0.920 (p=0.049). In a result of Hosmer-Lemeshow test, it didn't accept the goodness of fit of the logistic model as poor (p=0.292).

Results:

In a result of collecting the published data by Nagoya city and MIAC from 2005 to 2013, the

Table1. Results of descriptive statistics and univariate statistics   n=144

Variable of year-to-year percentage change	Mean	SD	Median	Min	Max	Median in increased death rate group (n=106)	Median in not increased death rate group (n=38)	p value*
Population	0.38	0.77	0.31	−1.50	4.14	0.28	0.37	0.252
Foreign population	1.14	3.70	0.81	−8.14	10.22	0.81	1.11	0.305
No of households	1.04	1.30	1.04	−3.69	7.49	1.04	1.03	0.705
Average age	0.65	0.41	0.67	−0.45	2.99	0.67	0.46	0.063[†]
Population aged 65 or over	3.04	1.70	2.90	−1.02	10.31	2.92	2.88	0.854
No of livelihood protection recipients	8.20	11.71	6.15	−33.15	57.20	6.48	4.47	0.539
No of gastric cancer examinee	9.56	14.61	5.80	−25.77	47.87	5.75	6.19	0.286
No of colon cancer examinee	12.84	13.92	11.91	−24.98	51.59	11.91	11.97	0.498
No of participants in regional health promotion measures	74.83	403.68	0.90	−93.30	4239.39	1.38	−3.67	0.416
No of persons requiring long-term care‡	4.75	2.64	4.65	−1.25	12.96	3.46	3.30	0.951
No of beds per 10,000 population	−0.31	5.76	−0.54	−15.21	46.91	−0.53	−0.56	0.309
Bed utilizaiton rate	−0.80	5.11	−0.75	−38.30	25.40	−0.75	−0.65	0.888
Average length of stay	−1.36	5.22	−2.16	−24.61	18.84	−1.72	−3.31	0.064[†]
No of ambulance user §	110.76	275.23	156.50	−755.00	851.00	3.29	0.79	0.033[†]
No of retained motor vehicles	−0.90	0.83	−0.88	−2.65	1.20	−0.88	−0.85	0.698

* Wilcoxon rank sum test
† $\alpha < 0.10$
‡ except for perosns requiring support
§ This value is not a year-to-year percentage change, but a difference value in continuous two years.

Table2. Result of multivariate logistic regression analysis (n=144)

Variable	Odds ratio[*]	p value
Average length of stay year-to-year percentage change	0.920	0.049

* Reference value is "death rate year-to-year percentage change was > 0".

Discussion:

This study analyzed the relationship between incrementation or not of the mortality and regional factors year-to-year percentage change. As a result, the change rate of average length of stay founded to be a sigificant variable. The odds ratio 0.920 was smaller than 1, that it to say, increasing the average length of stay year-to-year percentage changein a ward suggested to influence rising the risk of mortality in the same ward in Nagoya city.

The average length of stay refers to a mean number of inpatient days in hospital. The public policy is underway to shorten the length of stay for the purpose of preventingexcessive growth in medical expenditure is underway in Japan.However, any patients who have a more sever condition (Murata, et al.2013), and/ora dementia (Suzuki,2009; Ono,et al. 2010) was reported such a patients hospitalized longer because of taking a long time for treatment and nursing care.

The result of this study identified becoming the average length of stay longer was related withincreasing mortality.In the region with getting hospitalization longer,this study suggested that many patients taking a lot of time for treatment made the regional mortality longer. Moreover, the necessity of not extending hosipitalization period was suggested for the purpose of decresing the mortality in a region. Therefore, this study suggested that the appropriate treatment and nursing care for patients having a sever condition and/or a dementia is very important.

Conclusion:

As a result of this study, it concluded that not increasing the moratlity in a region was related with not extending average length of stay.

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