

Defining the activities of publicness for Korea's public community hospitals using the Delphi method

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Abstract

This study aims to identify which activities of a public community hospital (PCH) should be included in their definition of publicness and tries to achieve a consensus among experts using the Delphi method. We conduct 2 rounds of the Delphi process with 17 panel members using a developed draft of tentative activities for publicness including 5 main categories covering 27 items. The questions remain the same in both rounds and the applicability of each of the 27 items to publicness is measured on a 9-point scale. If the participants believe government funding is needed, we ask how much they think the government should support each item on a 0% to 100% scale. After conducting 2 rounds of the Delphi process, 22 out of the 27 items reached a consensus as activities defining the publicness of the PCHs. Among the 5 major categories, in category C, activities preventing market failure, all 10 items were considered activities of publicness. Nine of these were evaluated as items that should be compensated at 100% of total financial loss by the Korean government. Throughout results, we were able to define the activities of the PCH that encompassed its publicness and confirm that there are “good deficits” in the context of the PCHs. Thus, some PCH deficits are unavoidable and not wasted as these monies support a necessary role and function in providing public health. The Korean government should therefore consider taking actions such as exempting such “good deficits” or providing additional financial aid to reimburse the PCHs for “good deficits.”

Abbreviations: NHI = national health insurance, PCH = public community hospital.

Keywords: community financing, costs, Delphi technique, public hospital, public sector

1. Introduction

Health is one of the most important factors in our lives.^[1] Individual health and public health can be affected by both socioeconomic and environmental factors.^[2–5] In particular, establishing a hospital can increase the health status of the population in its regional area while at the same time, if a regional hospital shuts down, this could have a

negative effect on the health of local residents as well. However, hospital closures are a fairly common phenomenon around the world.^[6–10] It is also known that numerous factors (i.e., financial performance, level of competition, institutional features, and patient characteristics) are associated with hospital viability or hospital closure.^[7] However, the most important factors in hospital closures are fiscal problems resulted from various reasons such as inadequate reimbursements, inflation, management problems, organizational structure, and societal factors.^[10] When a hospital closes, it has a broad impact in terms of not only accessibility and availability of healthcare and potential health outcomes, but also in terms of economic effects on the local community.^[6,11–13] In particular, the impact on the vulnerable, such as the poor and medically underserved population, could be more serious in case of the closure of a public hospital, which plays a critical role in providing safety-net services.^[8]

As of June 2010 in Korea, there were 40,703 healthcare organizations comprised of 1605 hospitals (44 tertiary hospitals; 271 general hospitals; and 1290 hospitals) and 39,098 clinics.^[14] Among them, there are only approximately 200 hospitals that are in the public sector owned by government (the rest are privately owned). In particular, as of 2013, 34 regional core public hospitals were designated as a public community hospital (PCH) by the Korean government.^[15] However, the private sector is still outpacing the public sector in terms of number of hospitals owned and managed, and in market share.^[16] According to a study by Noh et al,^[6] overall, there were 203 hospitals in Korea that closed between 1996 and 2002 and among them, only 3 were public hospitals. Thus, the closure of a public hospital is not a common phenomenon in Korea.

In February 2013, Gyeong Nam Province, 1 of the 17 metropolitan areas and provinces in Korea, declared that it would

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shut down the Jinju PCH. The province announced it could not afford to operate the system anymore because of accumulated deficits and inefficiency in its operations. However, opponents indicated that most of the accumulated deficits resulted from the hospital's reconstruction. As a result, the Governor was forced to withdraw the declaration.^[17–21] Most of the 34 PCHs have a considerable amount of deficit, although for different reasons. Such hospitals believe that one of their important missions is to take care of the vulnerable, such as the homeless and Medical Aid recipients, thus being the safety net for these people as well as society as a whole. A considerable amount of the PCH deficit could be due to unavoidable circumstances. On the other hand, the PCHs are criticized for underperformance in terms of both level of health care and operational management.

The declared closure of the Jinju PCH sparked a fierce national debate on the fundamental value of public community hospitals. It reflected a massive collision of 2 important but different values; one being effectiveness and efficiency (conservatives or right-wing) and the other publicness (being publicly owned or the quality of being public) and social solidarity (liberals or left-wing). The governor of Gyeong-Nam province sides with the opinions of the conservatives (or right-wing), stating that PCHs have been inefficiently operated and their accumulated deficits are unnecessary and avoidable. Therefore, shutting down the Jinju PCH would be more reasonable than addressing the deficits compensating with an increase in local taxes. On the other hand, the liberals (or left-wing) believe that PCHs play an important role in providing essential medical services across the country. They also insist that a considerable amount of the deficits are necessary and unavoidable because PCHs perform several activities for the public such as caring for a higher portion of Medical Aid recipients, offering relatively cheaper medical fees, fewer uncovered medical services by the national health insurance (e.g., CT scans and MRIs), and a higher portion of patients with free of charge services than private sector hospitals. In sum, the 2 sides (conservatives and liberals) have totally different points of view regarding the role and function of PCHs; thus, the crisis at Jinju PCH was the massive collision between these 2 different value sets. Regarding this issue, the President of Korea commented that “recently many people have been mentioning the ‘good deficit’ or ‘healthy deficit’ in PCHs.”^[22] The official position statement of the Korean government is that there could be a “good deficit” among the total deficits of PCHs. Therefore, in the case of a good deficit, the Korean government could take actions such as exempting the “good deficit” or providing additional financial aid to reimburse for the “good deficit.”^[17–19,22] However, there is no official definition of “good deficits” in a PCH in Korea. Thus, such a deficit could be commonly accepted as a deficit from healthcare service delivery for the purpose of the public good, maintaining a social safety net, implementing the health policy of central and local governments, and public activity for the community.^[17–19,23,24] However, as the President mentioned, for the government to take action, there must be a calculation of the scale of the good deficit; thus, it is essential to discover which activities make up this “good deficit.” On the other hand, there is much controversy in defining the public activities of the PCH and Korean society has never come to a consensus on this issue.

This study aims to identify which activities of the PCH should be included in its publicness and try to achieve a consensus for this among experts representing conservatives (right-wing) and liberals (left-wing) using the Delphi method. Finally, the study

investigates how much the government should be responsible for the activities that have been negotiated and agreed to.

2. Methods

We used a modified Delphi method in order to reach consensus defining the activities encompassing the publicness of PCHs.

2.1. Panel composition

The panel is comprised of 17 people; 2 scholars in academia, 2 CEOs of PCHs, 2 local government representatives, 2 members of special interest groups, such as the Korea Hospital Association and a consulting company, 3 representatives of nongovernment organizations, 2 journalists, and 1 individual from an agency operated by the government. We performed 2 rounds of the Delphi process and, to protect anonymity, we hid the identity of the members.

2.2. Developing the draft of public activities performed by PCHs

In order to draft the public activities of the PCHs, we reviewed 2 reports from the World Health Organization and the World Bank.^[25,26] In addition, we investigated the content of 2 main laws regarding PCHs including the Public Health and Medical Services Act and Act on The Establishment And Management of Local Medical Centers.^[27] Additionally, we conducted interviews with experts in the PCH.^[23] We summarized the public activities in the PCHs based on the results from our literature review and the expert interviews. Finally, we categorized 5 areas of activities including 27 items; category A: providing appropriate and essential healthcare services, category B: maintaining a social safety net, category C: preventing market failure, category D: carrying out government policy, and category E: providing public health services. Table 1 presents the detailed information on these and the explanations of each category and item of public activity.

Category A (providing appropriate and essential healthcare services) includes 2 concepts. First, it is believed that PCHs provide medical services at lower prices compared to other same level private hospitals, therefore, the difference in price should be considered a part of their public activities. Second, PCHs are asked to run 16 essential medical departments to maintain their role and function as regional core hospitals. However, in many cases, maintaining 16 essential medical departments creates considerable economic losses, therefore, at least the operating costs of these could be reimbursed by the government. Category B (maintaining a social safety net) addresses the vulnerable population (i.e., Medical Aid recipients). Private hospitals tend to avoid treating this population, thus PCHs should be responsible for the care of the vulnerable. However, considerable financial losses occur from treating this population, therefore these losses should be designated as part of public activity and be reimbursed by the government. Category C (preventing market failure) encompasses some facilities necessary to the community but not profitable such as emergency departments, intensive care units, and isolation units. Private hospitals do not operate such facilities due to expected economic losses; however, PCHs should maintain these facilities for their communities. Category D (carrying out government policy) deals with pro bono services or mandatory charity services. PCHs have been asked by local or central governments to provide various free of charge services. Finally, Category E (providing public health services) addresses

Table 1**Activities defining publicness of PCH.**

Category	Item	Meaning or additional explanation	
Category A: Activities providing appropriate and essential healthcare services	(1) Medical service (covered by national health insurance) provision with low medical fees	(1) The difference in medical fees between PCH and same level hospitals operated by the private sector covered by national health insurance (in general, supporters of PCH insist that the levels of medical fees at PCHs are less than other hospitals of the same level)	
	(2) Medical service (not covered by national health insurance) provision with low medical fees	(2) The difference in medical income generating by providing uncovered items from the NHI between the PCH and other same level hospitals (supporters insist that the PCH provides a smaller amount of uncovered medical services to lessen the economic burden of local population)	
	(3) The operating costs of maintaining 16 essential medical departments	(3) To maintain the role and function of a regional core hospital, the Korean government recommends that PCHs operate 16 essential medical department such as internal medicine, surgery, obstetrics and gynecology, pediatrics, psychiatrics, orthopedic surgery, neurology, neurosurgery, urology, rehabilitation, anesthesia, radiology, laboratory medicine, oral and maxillofacial surgery, ophthalmology, and otorhinolaryngology	
Category B: Activities maintaining a social safety net	(4) Financial loss due to caring for Medical Aid recipients	(4) The amount of reimbursement to Medical Aid recipients is lower than NHI beneficiaries so that private hospitals tend to avoid treatment for such people	
	(5) Financial loss generated from providing psychiatric services	(5) The amount of reimbursement from providing psychiatric services is extremely low resulting in private hospitals avoiding treatment for these people	
	(6) Financial loss due to caring for the vulnerable	(6) The amount of reimbursement for other vulnerable people is lower than NHI beneficiaries so that private hospitals tend to avoid treatment for these people	
Category C: Activities preventing market failure	(7) The operating costs for emergency departments	(7) Some PCHs maintain emergency departments 24/7 regardless of financial loss	
	(8) The operating costs for intensive care units (including neonatal intensive care units)	(8) Some PCHs maintain ICU service 24/7 regardless of financial loss	
	(9) The operating costs for delivery room and in-patients units for neonatal	(9) Some PCHs maintain delivery and neonatal services 24/7 regardless of financial loss	
	(10) The operating costs for the ward for the homeless	(10) Some PCHs maintain special wards for the homeless regardless of financial loss	
	(11) The operating costs for isolation units (including decompression units)	(11) Some PCHs maintain isolation units for preparing for emergency situations regardless of financial loss	
	(12) The operating costs for hospice wards	(12) Some PCHs maintain a hospice ward regardless of financial loss	
	(13) The operating costs for psychiatric wards	(13) Some PCHs maintain a psychiatric ward regardless of financial loss	
	(14) The operating costs for rehabilitation treatments	(14) Some PCHs maintain a department of rehabilitation regardless of financial loss	
	(15) The operating costs for special medical facilities	(15) Some PCHs maintain a special facility such as a hyperbaric oxygen chamber for divers regardless of financial loss	
	(16) The operating costs for specific healthcare programs in a certain community	(16) Some PCHs maintain specific healthcare programs such as health examination for local residents regardless of financial loss	
	Category D: Activities carrying out government policy	(17) The costs for free treatments, free operations, and free examinations in the hospital	(17) There are financial losses from the provision within PCHs of free of charge services by following the decrees of central or local government
		(18) The costs for free treatments and free examinations in outreach services	(18) There are financial losses from free of charge outreach service provision at the community level by following the decrees of central or local government
		(19) The costs for providing free care-givers	(19) There are additional financial losses in the case of adopting a free care-giver policy according to the focus of the central and local government
		(20) The costs for achieving the mission of the PCH	(20) There are financial losses in the case of pursuing leading projects as PCHs in their communities such as trauma centers and shelter services
(21) The labor costs for mandatory policy enforcement		(21) PCHs have to provide mandatory services base on their aims and responsibilities (however, this results in additional labor costs)	
(22) The infrastructure costs for mandatory policy enforcement		(22) PCHs have to provide mandatory services based on their own aims and responsibilities (however, this results in additional investment costs for infrastructure)	
(23) Supporting costs for various events and exhibits		(23) Sometimes, central and local governments request support for various community events free of charge	
(24) Support costs for responding to emergency/disaster situations		(24) PCHs provide medical staff, equipment, and facilities in the case of emergencies and disastrous situations in the community free of charge	
Category E: Activities providing public health services		(25) The costs for providing comprehensive health programs targeted at local residents	(25) Central or local governments sometimes force PCHs to participate in comprehensive health programs without any financial support (in this case, PCHs would take a financial loss)
		(26) The labor operating costs for the Department of Public Health	(26) PCHs operate the Department of Public Health and absorb its related labor costs
	(27) The indirect operating costs for the Department of Public Health	(27) PCHs operate the Department of Public Health and absorb its related indirect costs	

NHI=national health insurance, PCH=public community hospital.

the operating costs for the Department of Public Health in the PCHs and its healthcare program costs.

2.3. The consensus process

We conducted 2 rounds of the Delphi process among the 17 panelists using the developed draft of the tentative activities for publicness including 5 main categories with 27 items (first round: January 6–11, 2014; second round: January 15–22, 2014). The questions were the same in both rounds and how much the 27 items were applicable to public activity was measured on a 9-point scale. If the panelists believed government funding was needed, we asked them how much the government needed to support this on a 0% to 100% scale. For example, if the panelist gave 7 points to an item of public activity and believed that the government should provide 50% of its support, we entered 50%. In the second round, we gave them their personal responses along with the whole panel's response average, standard deviation, and the analysis table, allowing them to check other responses and also to change their responses if they chose.

After conducting the 2 Delphi rounds, we evaluated whether consensus had been reached; we concluded that if two-thirds of the panel, 11 people, chose either 1 to 3 or 7 to 9, this would be considered agreement. For example, in category A, if 12 people scored a selected item 7 to 9, this would then be concluded as agreement that the item should be a public activity. Alternatively, if those people instead scored the selected item 1 to 3, we concluded this as agreement that the item should not be a public activity. Last, if there were no items receiving two-thirds of the votes, either 1 to 3 or 7 to 9, this would then be ranked as neither a public or nonpublic activity.

2.4. Ethical approval

The institutional review board of Konkuk University Hospital (IRB No. KUH1260019) approved this study.

3. Results

After conducting the 2 rounds of the Delphi process, 22 of the 27 items (81.5%) reached consensus as activities defining publicness. In category A (providing appropriate and essential healthcare services), items 2 and 3 were recognized as public activities. Each of their proportion of support from the government was marked at 50%. In category B (maintaining social safety net) items 4 to 6 were considered activities for publicness. Their proportion of support from the government was marked at 60%, 60%, and 100%, respectively. In category C (preventing market failure), items 7 to 16 were considered activities defining publicness. The proportion of government support for these items varied from 70% to 100%. In regards to category D, (carrying out local government policy), 5 out of the 8 items were considered activities for publicness. The proportion of government support for these varied from 50% to 80%. Last, in category E (providing public health services), items 25 and 26 received a consensus as activities for publicness. Government support for these was marked at 80% and 90%, respectively (see Table 2).

The following items did not reach a consensus: category A, item 1 (medical service—covered by national health insurance—provision with low medical fees); category D, item 18 (the costs of free treatments and free examinations in outreach services), item 21 (the labor costs of mandatory policy enforcement), and item 23 (support costs for various events and exhibits), and finally,

category E, item 27 (the indirect operating costs for the Department of Public Health) (see Table 2).

4. Discussion

This is the first study to define the activities of the PCHs in Korea that address their publicness. Using the Delphi method, we defined not only whether an activity should be included in terms of the publicness of the PCHs, but also what proportion of its support should be the responsibility of the Korean government.

Our results provide some meaningful information to health authorities and policy makers. First, overall, 22 of the total 27 items (81.5%) reached a consensus as activities that should be part of PHC publicness. Second, among the 5 major categories, in category C (preventing market failure), all 10 items (7–16) were considered as activities representing publicness (see Tables 1 and 2). In other words, the panel reached a strong consensus around all activities preventing market failure, representing the most important role and function performed by the PCH. In particular, seven items (the emergency department, intensive care unit, delivery room, homeless ward, isolation unit, special medical facility, and specific healthcare programs in a certain community) were evaluated highly along with the fact that these items should be reimbursed at 100% of their financial losses by the Korean government. Interestingly, there were only 2 other items scored with 100% government support; financial loss due to caring for the vulnerable (category B, item 6) and the cost of achieving the mission of the PCH (category D, item 20).

Even though 4 items (category A, items 2–3, and category D, items 17 and 24) were identified as activities encompassing the publicness of PCHs, in terms of government support they scored only 50% (the lowest of these Delphi results). Thus, it can be assumed that the intensity of consensus was not strong. This implies that some members may have doubts about these items; for example, are the prices of uncovered services at PCHs really cheaper than hospitals in the private sector (item 2), are 16 essential medical departments necessary (item 3), under current financial scenarios in the PCH, are free treatments a necessary function (item 17), and under the current level of quality at the PCH, should qualified services for emergency or disaster situations be provided (item 24)?

There were 5 items (1, 18, 21, 23, and 27) that were not scored as public activities that should define PCH publicness. First, the panel did not see medical service provision at a low price (item 1) as an activity to include in publicness. This implies that they either thought the statement was not true or the activity not a public one. For example, some conservatives believe the reason a lower price should not be a public characteristic is that it indicates an unfair discount being given to acquire patients. Although provision of free treatments, free operations, and free exams at the hospital were agreed on as public activities, outreach service (item 18) was not included in the definition of publicness. This could be because, under current financial pressure, panelists consider outreach services as inappropriate. In addition, they did not see the costs supporting various events and exhibits as publicness (item 21). This may be because such activities are seen as one offs and thus as program money wasters.

Consensus methods, such as the Delphi process, can provide a useful way to identify and measure uncertainty in healthcare research.^[28] In particular, the Delphi method is an effective way to make decisions through the consensus (agreement) of experts and is particularly suitable when it is difficult to obtain related information, to predict an uncertain future, or when the base of

Table 2**Final results of 2 rounds of the Delphi process: consensus and proportion of government support.**

Category	Item	Reaching consensus		Median score (1–9)		Government support proportion (%)	
		Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Category A: Activities providing appropriate and essential healthcare services	(1) Medical service (covered by national health insurance) provision with low medical fees	No	No	6	6	—	—
	(2) Medical service (not covered by national health insurance) provision with low medical fees	No	Yes	7	7	50	50
	(3) The operating costs of maintaining 16 essential medical departments	No	Yes	7	8	50	50
Category B: Activities maintaining social safety net	(4) The financial loss due to caring for Medical Aid recipients	Yes	Yes	7	7	70	60
	(5) The financial loss generated by providing psychiatric services	No	Yes	7	7	70	60
	(6) The financial loss from caring for the vulnerable	Yes	Yes	8	9	100	100
Category C: Activities preventing market failure	(7) The operating costs for emergency departments	Yes	Yes	9	9	100	100
	(8) The operating costs for intensive care units (including neonatal intensive care units)	Yes	Yes	9	9	80	100
	(9) The operating costs for delivery room and in-patients units for neonatal	Yes	Yes	9	9	100	100
	(10) The operating costs for wards for the homeless people	Yes	Yes	8	9	100	100
	(11) The operating costs for isolation units (including decompression units)	Yes	Yes	9	9	100	100
	(12) The operating costs for hospice wards	Yes	Yes	9	9	100	80
	(13) The operating costs for psychiatric wards	Yes	Yes	8	8	75	80
	(14) The operating costs for rehabilitation treatments	Yes	Yes	8	8	70	70
	(15) The operating costs for special medical facilities	Yes	Yes	9	9	100	100
	(16) The operating costs for specific healthcare programs in a certain community	No	Yes	9	9	90	100
Category D: Activities carrying out government policy	(17) The costs from free treatments, free operations, and free examinations in the hospital	Yes	Yes	8	9	50	50
	(18) Costs from free treatments and free examinations in outreach services	No	No	7	9	—	—
	(19) Costs of providing free care-givers	Yes	Yes	8	8	75	90
	(20) Costs from achieving the missions of PCHs	Yes	Yes	9	9	80	100
	(21) Labor costs from mandatory policy enforcement	No	No	6	6	—	—
	(22) Infrastructure costs from mandatory policy enforcement	Yes	Yes	8	9	75	90
	(23) Support costs for various events and exhibits	No	No	6	6	—	—
Category E: Activities providing public health services	(24) Support costs for responding to emergency/disaster situations	Yes	Yes	9	9	50	50
	(25) The costs for providing comprehensive health programs targeted at local residents	Yes	Yes	8	9	80	90
	(26) The labor operating costs for the Department of Public Health	Yes	Yes	8	9	80	80
	(27) The indirect operating costs for the Department of Public Health	No	No	8	8	—	—

PCH=public community hospital.

knowledge is weak.^[29] In other words, the primary goal of the Delphi method is to provide a concrete basis of information that, in this case, policymakers can use to make final decisions.

In a traditional Delphi process, the first round begins with an open-ended questionnaire that serves as the cornerstone of soliciting specific information about a content area from the subject experts. However, in this study, we adopted a modified Delphi method, which began the process with a set of carefully selected items. A modified Delphi approach is an effective way to gain consensus because it can increase the initial round response rate and provide a solid methodology based on previously developed work.^[30] However, this study may also face limitations from the Delphi method, such as biased research questions, inadequate validity, generalization problem, and biased selection of experts, which result in methodological criticism.^[28–32]

Accordingly, we have tried to reduce the possible occurrence of such negative aspects of the Delphi method. First, when drafting the activities that define publicness, we based these on 2 core laws in Korea and credible reports from the World Health Organization and World Bank in order to avoid establishing biased research questions. Second, we carefully selected the Delphi panel members to avoid leaning either toward liberals or conservatives. Thus, establishing a balanced Delphi panel was very important. For example, we selected two journalists for the panel from either side; one from Chosunilbo, a conservative newspaper, and the other from Hangyore, a liberal newspaper. Nevertheless, we cannot guarantee that our Delphi panel was 100% perfectly neutral and balanced. However, we believe the Delphi method is the most appropriate one to define the activities that should shape the publicness of PCHs. Specifically, the Delphi panel member decisions are changeable during additional Delphi rounds even though each panel member has his or her own beliefs and preferences. In this study, each Delphi panel member was provided with his or her personal response, the whole panel's average response, the standard deviation, and the analysis table. This aspect of the Delphi method allows the participants to review other responses, change their responses, and reach a consensus.

Last, our suggestion here is that the Korean government should regularly (every 2 or 3 years) redefine the activities of publicness for the PCHs and reestimate the proportion of government support needed as the circumstances of the PHCs as well as public opinion could change over time. In that case, a new consensus would need to be made.

5. Conclusions

This study shows that the Delphi method can be a very meaningful approach in reaching a consensus regarding issues facing political debate. We defined which activities of the PCHs should be part of their publicness and confirmed that there was some "good deficit" at a PCH. Based on our results, some PHC deficits are unavoidable and not wasted as these monies are being used to perform necessary roles and functions in providing public health. Thus, the Korean government should consider taking actions such as exempting such good deficits or providing additional financial aid to reimburse for such good deficits.

References

[1] Leischik R, Dworak B, Strauss M, et al. Plasticity of health. *Ger J Med* 2016;1:1–7.

- [2] Sampson UKA, Kaplan RM, Cooper RS, et al. Reducing Health Inequities in the U.S. Recommendations from the NHLBI's Health Inequities Think Tank Meeting. *J Am Coll Cardiol* 2016;68:517–24.
- [3] Fuchs VR. Social determinants of health: caveats and nuances. *JAMA* 2017;317:25–6.
- [4] Hinds AM, Bechtel B, Distasio J, et al. Health and social predictors of applications to public housing: a population-based analysis. *J Epidemiol Commun Health* 2016;70:1229–35.
- [5] Demakakos P, Biddulph JP, Bobak M, et al. Wealth and mortality at older ages: a prospective cohort study. *J Epidemiol Community Health* 2016;70:346–53.
- [6] Noh M, Lee Y, Yun SC, et al. Determinants of hospital closure in South Korea: use of a hierarchical generalized linear model. *Soc Sci Med* 2006;63:2320–9.
- [7] Chiang HC, Wang SI. What affects local community hospitals' survival in turbulent times? *Int J Qual Health Care* 2015;27:214–21.
- [8] Ko M, Derosé KP, Needleman J, et al. Whose social capital matters? The case of U.S. urban public hospital closures and conversions to private ownership. *Soc Sci Med* 2014;114:188–96.
- [9] den Hartog M, Janssen R, Haselbekke BJ, et al. Factors associated with hospital closure and merger: a survival analysis of Dutch hospitals from 1978 to 2010. *Health Serv Manage Res* 2013;26:1–8.
- [10] Hernandez SR, Kaluzny AD. Hospital closure: a review of current and proposed research. *Health Serv Res* 1983;18:419–36.
- [11] Bindman AB, Keane D, Lurie N. A public hospital closes. Impact on patients' access to care and health status. *JAMA* 1990;264:2899–904.
- [12] Jackson GA, Whyte J. Effects of hospital closure on mortality rates of the over-65 long-stay psychiatric population. *Int J Geriatr Psychiatry* 1998;13:836–9.
- [13] Probst JC, Samuels ME, Hussey JR, et al. Economic impact of hospital closure on small rural counties, 1984 to 1988: demonstration of a comparative analysis approach. *J Rural Health* 1999;15:375–90.
- [14] Lee JY, Lee SI, Kim NS, et al. Healthcare organizations' attitudes toward pay-for-performance in Korea. *Health Policy* 2012;108:277–85.
- [15] Ministry of Health and Welfare and National Medical Center. Statistics in Public Health Medical Service in 2014, Seoul. 2015. In Korean. Available at: http://www.ppm.or.kr/pmedi_potat/board/thumbnaillist.do?MENUID=A04020000. Accessed 20 Feb, 2015.
- [16] Chun CB, Kim SY, Lee JY, et al. Republic of Korea: health system review. *Health Syst Transit* 2009;11:1–84.
- [17] Kang S, Kim M. Short-run cost minimization and capacity utilization of regional public hospitals in South Korea. *Mod Econ* 2015;6:21–9.
- [18] Kim JW. Jinju Medical Center closed. *The Korea Times*. May 29, 2013. Available at: http://koreatimes.co.kr/www/news/nation/2013/05/113_136584.html Accessed 20 Feb, 2015.
- [19] Kim JJ. 103-year-old Jinju Medical Center to be Shut Down: Why Did the Government Fail to Secure Public Health Care? *The Kyunghyang Shinmun*. May 30, 2013. Available at: http://english.khan.co.kr/khan_art_view.html?artid=201305301410207&code=710100. Accessed 20 Feb, 2015.
- [20] Lee K. The role and function of Public Community Hospitals in the era of oversupply of hospitals using the perspective of "good deficit". *Health Policy Forum* 2013; 11:55–62. Available at: http://webzine.rihp.re.kr/webzine_201310/w_04_02.html. Accessed 21 Feb, 2015.
- [21] Jung BK. The progress and current status of Jinju Public Community Hospital Crisis. Policy Debate in National Assembly, Seoul, 2013. In Korean. Available at: <http://www.google.com/url?sa=t&rcrt=j&q=&csrc=s&source=web&cd=9&ved=0CEsQFjAI&url=http%3A%2F%2Fyikim.tistory.com%2Fattachment%2Ffile3.uf%40143E7D3E514EA9B044CC2C.pdf&ei=83NQVdnKMcHm8AXcYjDYCw&usq=AFQjCNHzfywzRgHLVsKYJqB67bi5uNT7PA&bv=m=92885102.d.dGc>. Accessed 23 Apr, 2015.
- [22] Ahn HW. President Park Finally Says Something about Closure of Jinju Medical Center: But the Horse Has Bolted. *The Kyunghyang Shinmun*. July 19, 2013. Available at: http://english.khan.co.kr/khan_art_view.html?artid=201307191122097&code=710100. Accessed 22 Apr, 2015.
- [23] Ministry of Health and Welfare. The estimation of costs for publicness in Public Community Hospitals and managing consulting for PCHs, 2013; Seoul. 2013. Available at: http://www.google.com/url?sa=t&rcrt=j&q=&csrc=s&source=web&cd=1&ved=0CB0QFjAA&url=http%3A%2F%2Fwww.prism.go.kr%2Fhomepage%2FresearchCommon%2FdownloadResearchAttachFile.do%3Bsessionid%3D7E82766DEFAA8BF305F629952A0FAD37.node02%3Fwork_key%3D001%26file_type%3D001%26seq_no%3D001%26pdf_conv_yn%3DY%26research_id%3D1351000201300204&ei=HdQVbHtM8nq8AXq_YCQCw&usq=AFQjCNFwzmx0zUKWmObsUoA-lacblf_g&bv=m=92885102.d.dGc. Accessed 22 Apr, 2015.

- [24] Ministry of Health and Welfare, National Medical Center. Diagnosis the current status of Public Community Hospital and improvement plan for 2011, Seoul. 2011. Available at: https://www.google.co.kr/url?sa=t&rc=t=j&q=&esrc=s&source=web&cd=1&ved=0CB0QFjAA&url=http%3A%2F%2Fwww.prism.go.kr%2Fhomepage%2FresearchCommon%2FdownloadResearchAttachFile.do%3Bjsessionid%3D8DD6A98113D1418079DC725EE81F30ED.node02%3Fwork_key%3D001%26file_type%3DCPR%26seq_no%3D001%26pdf_conv_yn%3DY%26research_id%3D1351000-201100221&ei=crVZVcbPGYn1oASjroCQAQ&usg=AFQjCNF-SWhB-djpau3tjd319wdqTnIQQ&sig2=Jp9hEWKb8qozeRZcrPaMvw&bv=bv.93564037,d.cGU&cad=rjt. Accessed 11 May, 2015.
- [25] Ramagem C, Ruales J. The Essential Public Health Functions as a Strategy for Improving Overall Health Systems Performance: Trends and Challenges Since the Public Health in the Americas Initiative, 2000–2007. Washington, DC: the Pan American Health Organization/World Health Organization (PAHO/WHO); 2008.
- [26] Claeson M, Elmendorf E, Miller D, et al. Public Health and World Bank Operations. HNP/World Bank, Washington:2002.
- [27] Statues of the Republic of Korea. Available at: http://elaw.klri.re.kr/eng_service/main.do. Accessed 07, March, 2017.
- [28] Jones J, Hunter D. Consensus methods for medical and health services research. *BMJ* 1995;311:376–80.
- [29] Turoff M. The policy Delphi. In the Delphi method: Techniques and applications edited by: Linstone, Harold A, Turoff, Murray; 2002. Available at: <http://is.njit.edu/pubs/delphibook>. Accessed 9 Apr, 2015.
- [30] Custer RL, Scarcella JA, Stewart BR. The modified Delphi technique—a rotational modification. *J Career Tech Educ* 1999; 15:1–0.
- [31] Woudenberg F. An evaluation of Delphi. *Technol Forecas Soc Change* 1991;40:131–50.
- [32] Rowe G, Wright G, Bolger F. Delphi—a reevaluation of research and theory. *Technol Forecas Soc Change* 1991;39:235–51.