

Original Article

Health Impact Assessment as a Strategy for Intersectoral Collaboration

Eunjeong Kang¹, Hyun Jin Park², Ji Eun Kim³

¹Department of Health Administration and Management, Soon Chun Hyang University, Asan; ²Graduate School of Public Health, Seoul National University; ³Division of Health Promotion Research, Korea Institute for Health and Social Affairs, Seoul, Korea

Objectives: This study examined the use of health impact assessment (HIA) as a tool for intersectoral collaboration using the case of an HIA project conducted in Gwang Myeong City, Korea.

Methods: A typical procedure for rapid HIA was used. In the screening step, the Aegi-Neung Waterside Park Plan was chosen as the target of the HIA. In the scoping step, the specific methods and tools to assess potential health impacts were chosen. A participatory workshop was held in the assessment step. Various interest groups, including the Department of Parks and Greenspace, the Department of Culture and Sports, the Department of Environment and Cleansing, civil societies, and residents, discussed previously reviewed literature on the potential health impacts of the Aegi-Neung Waterside Park Plan.

Results: Potential health impacts and inequality issues were elicited from the workshop, and measures to maximize positive health impacts and minimize negative health impacts were recommended. The priorities among the recommendations were decided by voting. A report on the HIA was submitted to the Department of Parks and Greenspace for their consideration.

Conclusions: Although this study examined only one case, it shows the potential usefulness of HIA as a tool for enhancing intersectoral collaboration. Some strategies to formally implement HIA are discussed.

Key words: Healthy public policy, Intersectoral collaboration, Rapid health impact assessment (HIA)
J Prev Med Public Health 2011;44(5):201-209

INTRODUCTION

Intersectoral collaboration, defined as the participation of various actors, is an essential subject of recent research and intervention in public health [1-3]. Intersectoral collaboration is important because the complexity of health determinants makes it difficult for one institution to deal with all public health problems [4]. In addition, it has been recognized that information delivery, motivation, skills, and self-confidence, which have been key strategies in health education, are not sufficient for inducing behavior changes. Instead, changes in the social and physical environment need to be made in a way that supports health [5].

Intersectoral collaboration was advocated as early as the Alma-Ata Declaration resulting from an international conference on primary health care in 1978 [6]. The first clause of this declaration states that the highest level of health requires the participation of various social and economic sectors as well as the health sector. Thirty years later, however, an evaluation of the Alma-Ata

Declaration found that intersectoral collaboration had been largely ignored in various sectors, including education, agriculture, housing, and public programs [7].

In fact, intersectoral collaboration rarely occurs naturally, and therefore specially designed tools should be introduced [8]. Stead [8] categorized intersectoral collaboration in policy formation into three levels: policy cooperation as the lowest level, policy coordination as the middle level, and policy integration as the highest level. Stead [8] proposed health impact assessment (HIA), together with a sustainable development plan and strategic environment assessment, as a tool for policy coordination.

HIA is a policy tool for minimizing the possible negative health impacts and maximizing the possible positive health impacts of a policy, a plan, or a program by predicting and informing decision makers of its health impacts. HIA aims to have health considered in all policies rather than making health the top priority in all circumstances [9]. HIA was one of the priority areas during the fourth phase (2003 to 2008) of the European

Table 1. Plan for land use and facilities

Facilities	Use	Details of use	Size (m ²)	Composition ratio (%)
Sum			92 170	100.0
Landscaping facilities	Fountain, streamlet, wildflower garden, etc.	Making ecologically stable biotopes in ponds and a reservoir and creating recreational and educational places for users Creating places for environmental experiences and aiding environmental education by linking recreation facilities and educational facilities	3350	3.7
Recreation facilities	Viewing platform, resting place	Planting trees around recreation places and outdoor classrooms to provide places for users and local residents	2810	3.0
Education facilities	Outdoor performance hall, sculpture park, deck, outdoor classrooms, etc.	Inducing proper use of ecological trails by setting up explanation boards and nameplates to provide information on natural resources and to introduce how to use the facilities Designing explanation boards with pictures and photos for easy understanding	7370	
Convenience facilities	Parking lot		2420	2.6
Management facilities	Administration (cafeteria, toilet, etc.)	A cafeteria, a toilet, and an auditorium for users on the first floor An administration center and audiovisual room on the second floor	770	0.8
Road and square	Road, linkage road, walkways and trails, squares		6810	7.4
Green space and other spaces	Greenland, reservoir, ponds	Preserving existing green spaces and making places for tree planting Installing water purification plants in the reservoir to provide a pleasant environment	68 640	74.5

Healthy Cities Network and has been actively implemented in the United States, Canada, Australia, New Zealand, and several Southeast Asian countries, especially Thailand.

Health impact assessment can be classified into narrow HIA and broad HIA based on the comprehensiveness of the health determinants and the acceptability of the evidence [10]. A narrow HIA, which originated from the field of environmental health, is based on toxicology and epidemiology and emphasizes the measurement and quantification of health impacts. On the other hand, a broad HIA, which originated from the holistic health model, emphasizes the value of democracy and community participation, but quantification of health impacts is relatively less appreciated. A broad HIA has greater relevance to health promotion policy because it can contribute to intersectoral collaboration as well as healthy public policy and community participation [9,11].

The merits of HIA as a tool for intersectoral collaboration for health promotion have little been explored in Korea. One study examined the potential of HIA as a tool for improving health inequality [12], and one case report of an HIA that can be classified as a broad HIA has been published [13]. Most of the HIAs reported in Korea have been narrow HIAs [13]. Overall, broad HIA has not been explored much in Korea, either in general or as a strategy for intersectoral collaboration.

The purpose of this study was to explore whether an HIA could be an effective tool for intersectoral collaboration in Korea. For this purpose, we examined

the case of Gwang Myeong City, where a rapid HIA of the master plan for Aegi-Neung Waterside Park was conducted.

The Aegi-Neung reservoir was being used as a fee fishing spot. It was located in the development restriction area and had been polluted by trash and paste baits due to fishing. A good ecological pond and a wetland were located in the southern part of the reservoir, and low hills, farmlands, and the Gwang Myeong interchange were located in the western part. Mt. Gureum, Younghoewon, a historic site, and a 400-year-old nurse tree are also located near the reservoir.

The waterside park was intended to be the center of the city's greenspace system, connecting hiking tracks, forests, and the nearby historical sites. The waterside park was also to provide places for leisure and relaxation for visitors and ecological learning for adolescents, and to become the landmark of the city. The plan was first drafted in 2008 and planned to be approved by 2011. The contents of the plan are summarized in Table 1.

METHODS

I. Rapid Health Impact Assessment (HIA)

Health impact assessment can be classified into rapid HIA, intermediate HIA, and comprehensive HIA, according to the level of resources required and the scope of health impacts being appraised [15]. Rapid HIA is the simplest type of HIA and is usually used when

time and resources are limited. Rapid HIA normally takes 6 to 12 weeks and involves collection and analysis of existing literature and data to assess potential positive and negative health impacts [14]. It is the type of HIA most frequently used in practice because it requires less extensive resources than other types of HIA [15].

Rapid HIA goes through the same process as other types of HIA. It usually involves a participatory stakeholders' workshop [16]. A half-day or one-day workshop provides the participants with an opportunity to discuss health impacts from an initiative and at the same time realize democracy, which is one of the main principles of HIA [17]. Substantial evidence was found that participatory rapid HIA can be an effective tool for intersectoral collaboration or participation of interest groups, especially in European countries [10,18].

II. HIA Procedure

Gwang Myeong City selected Aegi-Neung Waterside Park Plan as the target of HIA according to the following process. As the screening process, the city chose 10 plans from the list of projects scheduled to be implemented in 2009, considering their size and political importance. Researchers from the Korea Institute for Health and Social Affairs (KIHASA) examined the suitability of each of the 10 plans using a pre-screening tool [16]. The results of this review were then discussed with the Community Health Center of Gwang Myeong City, and three out of the ten projects were selected on 13 May 2009. Aegi-neung Waterside Plan was one of these three projects.

Before moving on to the scoping stage, a preliminary meeting took place among researchers from KIHASA who were in charge of the appraisal and civil servants from the Community Health Center and the Department of Parks and Greenspace which was in charge of the waterside park. The participants in this meeting also constituted the steering committee for the HIA. The aims

of the meeting were to introduce HIA to the civil servants of the Department of Parks and Greenspace and to request data that might be needed for HIA.

Then, in the scoping stage, the steering committee met to discuss the specific assessment plan. The steering committee selected rapid HIA because of the limited time and expertise available. A number of other topics were discussed during the steering committee meeting, including preliminary positive and negative health impacts of the park plan, assessment methods and required data, and the range of the participants and their roles at the participatory workshop. Although judged by expert opinion, the positive and negative health impacts that were assessed using a comprehensive health impact checklist allowed even those new to HIA to effectively envision the HIA outputs. For instance, positive health impacts included preservation of the green fields, an increase in walking, protection of species and habitat, preservation of historical remains, decrease in community severance, and strengthening community networks.

Next, in the appraisal stage, a participatory workshop was held with the stakeholders from several sectors to overview the literature-reviewed health impacts and their evidence. After a comprehensive review on the potential health impacts, the group developed recommendations for maximizing the positive health impacts and minimizing the negative health impacts and prioritized them. Finally, a report was written by researchers from KIHASA. This report was first submitted to the Community Health Center and then to the Department of Parks and Greenspace as an official document. Figure 1 summarizes the complete procedure of the HIA.

III. Health Impact Assessment (HIA) Method

In a rapid HIA, it is common to use existing data with opinions from experts and stakeholders rather than to collect new data. In this HIA, the decision was made to

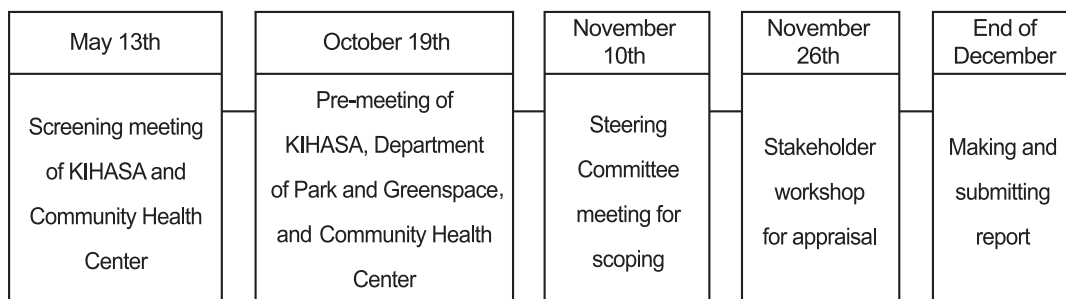


Figure 1. Procedure of the HIA on the Aegi-Neung Waterside Park Plan.

KIHASA: Korea Institute for Health and Social Affairs.

Table 2. Program of the participatory workshop for HIA on the Aegi-Neung Waterside Park Plan

Time (min)	Program
2:00 - 2:05 (5)	Introduction of the participants (by the Community Health Center)
2:05 - 2:20 (15)	Introduction of HIA (by KIHASA)
2:20 - 2:35 (15)	Introduction of the Aegi-Neung Waterside Park Plan (by the Department of Park and Greenspace)
2:35 - 2:50 (15)	Presentation of health profile of Gwang Myeong City (by KIHASA)
2:50 - 3:00 (10)	Break
3:00 - 4:15 (75)	Discussions on health impacts and recommendations
4:15 - 4:25 (10)	Prioritization of recommendations
4:25 - 4:30 (5)	Wrap-up

HIA: health impact assessment, KIHASA: Korea Institute for Health and Social Affairs.

use a literature review and a stakeholders' workshop. The group included ten plus the facilitator; this number was suitable to avoid neglect of minority opinions. Each decision was made by consensus. There were two members from the Department of Parks and Greenspace, one from the Department of Culture and Sports, one from the Department of Environment and Cleansing, two from the Community Health Center, two from civil society, and two residents.

The workshop was largely divided into two parts (Table 2). In the first half of the workshop, general descriptions of HIA, the Aegi-Neung Waterside Park Plan, and the health profile of Gwang Myeong City were presented. This part was carried out to allow for a general understanding of HIA before reviewing health impacts. During the latter half of the workshop, the pre-identified health impacts and differential health impacts using a tool developed in England [19] and translated into Korean were reviewed and discussed, and recommendations were made accordingly. Last, the recommendations were prioritized by voting.

RESULTS

I. Community Profile

The purpose of the profile was to provide the health and socio-demographic context of the Aegi-Neung Waterside Park Plan and to clarify the potential health impacts and the particular population groups that may be affected. As of 2007, more than 316000 people (115000 households) lived in Gwang Myeong City. The area of the city was 38.5 km². Approximately 31.53 km² (or 81.6%) of the city was greenspace, including a limited development district, and 6.43 km² (or 16.7%) of the area was used for residential purposes. The city was also relatively convenient for transportation and had several culture facilities and tangible and intangible cultural assets.

To characterize the health status of the population living in Gwang Myeong City, statistics from the Community Health Survey were examined. Some indicators were worse than the national average. For example, the prevalence of doctor-diagnosed hypertension was 136.4 per 1000 (national average, 129.3 per 1000). The prevalence of self-reported stress was 31.5% (national average, 27.6%). Approximately 49.8% adults experienced excessive alcohol use (national average, 45.8%). On the other hand, seemingly due to the large greenspace in Gwang Myeong City, 62.4% of adults were walking for exercise (national average, 51.4%) and 19.9% of adults (national average, 21.8%) were classified as obese (body mass index [BMI] \geq 25 kg/m²).

II. Participatory Workshop

A participatory workshop was held during the appraisal step. Various interest groups including the Department of Parks and Greenspace, the Department of Culture and Sports, the Department of Environment and Cleansing civil societies, and residents discussed the previously reviewed literature on the potential health impacts of the Aegi-Neung Waterside Park Plan. Positive health impacts were anticipated in areas including water quality and pollution, a clean city and recycling, accessibility/mobility/transport, education, leisure, community network, community development, health service, social service, physical activity, and stress. On the other hand, negative health impacts were expected in external air quality, water quality and pollution, energy consumption, noise, community safety, accidents, smoking, drinking alcohol, drugs, and sexual behavior (Table 3). After reviewing the possible health impacts, recommendations to maximize positive health impacts and to minimize negative health impacts were developed (Table 3).

Table 3. Potential health impacts of the Aegi-Neung Waterside Park Plan and recommendations

Determinant of health	Potential health impact	Evidence	Recommendation
Environmental conditions			
External air quality, air pollution	Negative	<p>Literature review</p> <ul style="list-style-type: none"> - Removed air pollution, mitigated the heat island effects produced by concrete and glass, and lowered energy demands and associated emissions during warm periods - Removed pollutants - Filtered airborne particulates, absorbed harmful gases and reduced carbon emissions. - Trapped small airborne particles, absorbed sulfur dioxide, nitrogen oxides, and carbon monoxide - Prevented carbon incorporation into air, controlled the amount of CO₂ and regional climate <p>Workshop</p> <ul style="list-style-type: none"> - The park plan, which included new constructions of artificial facilities in a natural space, could increase the amount of energy used, carbon emissions, and air pollution. 	Use renewable energy or new energy
Indoor air quality, water quality & pollution	None positive/negative	<p>Literature review</p> <ul style="list-style-type: none"> - Prevented soil erosion, purified water <p>Workshop</p> <ul style="list-style-type: none"> - Stopping fishing could improve the water quality. - However, the reservoir could be polluted during the period of water shortage and there could be serious environmental damage if the water from the water treatment plant was polluted. 	<p>Use water purification plants</p> <p>Prepare water-circulation strategies</p> <p>Maintain the amount of water</p> <p>Operate water quality check system</p> <p>Restore and preserve biotic habitat with elements from nature</p> <p>Use natural bank protection</p> <p>Analyze current animals in the planned space and conduct such analysis regularly afterward</p>
Clean city and recycling	Positive	<p>Literature review</p> <ul style="list-style-type: none"> - Place of various flora and fauna - Prevent floods <p>Workshop</p> <ul style="list-style-type: none"> - Currently existing species in the planned included kestrels, pheasants, great tits, magpies, tree frogs, silver frogs, Eurasian red squirrels, squirrels, reptiles, raccoon dogs, rabbits, and owls. 	<p>Use natural bank protection</p> <p>Analyze current animals in the planned space and conduct such analysis regularly afterward</p>
Open space	None	Literature review	Use renewable energy or new energy
Energy consumption	Negative	<ul style="list-style-type: none"> - Mitigating the heat island effects produced by concrete and glass, and lowering energy demands <p>Workshop</p> <ul style="list-style-type: none"> - The park plan, which included new constructions of artificial facilities in natural spaces, could increase energy use. 	Use renewable energy or new energy
Accessibility, mobility, transport	Positive	<p>Workshop</p> <ul style="list-style-type: none"> - Possibility of the creation of a new bus line, expansion of roads - Increasing access to Mt. Gureum, Yeonghoewon. 	
Noise	Negative	<p>Literature review</p> <ul style="list-style-type: none"> - Attenuated noise <p>Workshop</p> <ul style="list-style-type: none"> - There could be noise pollution, if the theatre were built as planned. 	Exclude the theatre from the plan and vitalize the existing community theatre
General socioeconomic and cultural conditions			
Poverty	None		Consider implementing a usage fee
Housing	None	Literature review	Install CCTVs
Community safety & crime	Negative	<ul style="list-style-type: none"> - Increased the risk of criminal, social, or psychological aggregation, and drug abuse and conduct offenses <p>Workshop</p> <ul style="list-style-type: none"> - There could be issues of crime or homeless people. 	Restrict access after sunset
Education	Positive	<p>Literature review</p> <ul style="list-style-type: none"> - Auckland, New Zealand: Invited students to the forest to run 400 programs every year, increasing awareness of the importance of forests - William Curtis Ecological Park, London, UK: Provided visitor circulation system, an information booth, and specialized teachers in the park - Gildong Ecological Park, Seoul, Korea: Gave opportunities for citizens and students to touch nature, to learn about and experience the ecosystem <p>Workshop</p> <ul style="list-style-type: none"> - Increased educational effects were expected. 	Limit the number of visitors to 200 per day, or operate a reservation system for park use by area,

Table 3. Continued

Determinant of health	Potential health impact	Evidence	Recommendation
Employment	Positive	Workshop - Increased employment opportunities for Hakon-Dong residents	Give Hakon-dong residents priority in hiring opportunities
Work environment	None		
Leisure	Positive	Literature review - Perceived a park as a place of beautiful scenery, life, culture, and play - The majority of visitors to the Han River were not sport facility users but non-sport facility users Workshop - Increase in leisure activities (picnic area, ecological park, mountain trails) was expected.	Preserve and develop reservoir in the most environmentally friendly way possible
Accidents	Negative	Workshop - Increased risk of drowning accidents - Increased risk of forest fires	Install handrails around the reservoir
Agriculture & food production	None	Workshop - There were people using the reservoir water for farming, but since they could use another source of water, there would be no negative impacts.	Designate the park as a nonsmoking area
Social and Community Network			
Social exclusion	None		
Community network	Positive	Literature review - Increased social activities - Increased social cohesion and collective efficacy - Facilitated social activities among women Workshop - Increased social clubs, informal social gatherings	
Community development	Positive	Literature review - Had direct utility values (e.g., fishing, agriculture, leisure, source of energy), indirect utility values (controlling flood, preventing the effects of storms, recharging underground water), selective/quasi-selective values (future uses, value of information for the future), and existence values (increasing biodiversity, cultural properties, value of relics) Workshop - The road construction could help community development.	
Health services	Positive	Workshop - Increased roads and transportation system could increase access to health care services in downtown area.	
Social services	Positive	Workshop - Increased roads and transportation system could increase access to social services in downtown area.	
Lifestyles			
Diet	None		
Physical Activity	Positive	Literature review - Increased physical activities - Not significantly associated with achieving recommended levels of physical activity Workshop - Increased physical activities were not guaranteed by the plan because the plan did not include sports facilities.	Introduce exercise programs for children and adolescents (e.g., badminton) Do not install lights for activities at night. Install a bicycle path around the reservoir, and make a connection to the downtown
Smoking	Negative	Workshop - There could be more smokers.	Recruit neighborhood patrols or guards
Alcohol	Negative	Workshop - There could be more drinkers.	
Sexual behavior	Negative	Literature review - Behaved in more informal and intimate ways, e.g., kissing, hugging, and sexual activity as well as anti-social behavior	Recruit neighborhood patrols or guards
Drugs	Negative	Literature review - Behaved in more informal and sometimes intimate ways, e.g., "hanging out" with friends, boisterous play, and anti-social behavior	
Stress	Positive	Literature review - Reduced stress and depression and improved the ability to focus, pay attention, be productive, and recover from illness - Promoted recovery from any form of stress, both mild short-term stress and longer term problems	

Table 4. Potential differential health impacts of the Aegi-Neung Waterside Park Plan across population and recommendations

Population groups	Potential health impact	Evidence	Recommendations
Hakon-dong residents	Positive	Literature review - Increased the possibilities of physical activity	
Adolescents	Positive	Literature review - Increased physical activity of young people - Increased physical activity of young girls - More amenities (lighting or playgrounds, footpath, jogging track, basketball courts) could increase park use	
Children	Positive	Literature review - Increased physical activity and decreased overweight - Reduced stress and depression and improved the ability to focus, pay attention, be productive, and recover from illness - Improved the functioning of children with Attention Deficit and Hyperactivity Disorder	
Women	Positive	Literature review - Facilitated social activities	
People with disabilities, from lower income, the elderly	Negative	Literature review - Lack of access to transport lowered use of public spaces	Offer vehicles for the disabled and older people Make the bus system affordable and accessible

III. Potential Differential Impacts Across Populations

After reviewing the potential impacts of comprehensive health determinants, the group discussed potential differential impacts across populations based on the literature review. The group identified issues of access to the park among the disabled, lower income people, and older people. On the basis of this finding, the group made recommendations to make the park more accessible to these people (Table 4).

IV. Prioritizing the Recommendations

Each participant was asked to put three stickers on his or her three most important recommendations. Using renewable energy or new energy, creating a public transport system, and securing water quality, all of which received seven votes, were the top priorities of the group.

V. Reporting

The report on the HIA, including the background, procedure and methods, and results, was first submitted to the Community Health Center for review. Then, the HIA report was submitted to the Department of Parks and Greenspace for their consideration.

DISCUSSION

Intersectoral collaboration is related to the process of decision making, and therefore the effectiveness of HIA in intersectoral collaboration can be evaluated by the extent that the health sector and other sectors collaborate. In this case study, the HIA was operated by the steering committee, which consisted of representatives from the health sector and the sector responsible for the master plan. Moreover, during the participatory workshop, the Department of Culture and Sports and the Department of Environment and Cleansing also participated. Without the HIA, the Department of Parks and Greenspace would not have involved these other sectors.

Success of intersectoral collaboration through HIA can also be evaluated based on the extent to which the common goal was achieved. The common goal of the intersectoral collaboration through HIA was to consider health in the planning of the waterside park. Impacts of the plan across comprehensive determinants of health including physical environments and social networks, as well as health behaviors, were assessed. Therefore, it can be said that health was considered by the non-health sectors through the HIA.

Although this case study found some usefulness of HIA, it would be difficult to expect ongoing intersectoral collaboration if an HIA is completed as an ad hoc program as in this case. To encourage continuous intersectoral collaboration through HIA, we should consider proper strategies, governance, capacities,

outputs, and outcomes of HIA implementation [20].

First, strategies for providing a motivation for intersectoral collaboration through HIA are needed. The motivation for intersectoral collaboration could be firmly generated by a legal obligation of some kind [21]. In Thailand, for example, HIA is included in the Constitution. As a consequence, intersectoral collaboration through HIA is practiced at all levels of government. In this study, the HIA result was reported to the mayor, which is weak as an obligation. The lack of legal ground for HIA will hinder the regular practice of HIA.

Second, proper governance is necessary for HIA implementation. Governance is a system and structure that enables implementation of a plan and achievement of a goal. Governance for HIA can also be specified when HIA has a legal basis. Since there is no legal basis for HIA at the governmental level in Korea, governance for HIA is likely to be commissioned ad hoc.

Third, capacity building is needed for HIA implementation. Intersectoral leadership and mutual trust are necessary conditions for intersectoral governance [20]. One study found that the main cause of adopting HIA in decision making was the leadership of the key department [22]. In the case of Gwang Myeong City, the strong leadership of the Director of the Community Health Center encouraged the mayor to adopt the HIA program.

Leadership for HIA can be developed by education and training. However, there are few opportunities for education and training available in Korea, especially as related to health promotion. For the purpose of capacity building, education and training programs should be developed and provided to civil servants and academics. Demonstration projects can also be helpful by providing opportunities for learning by doing.

Fourth, specific outputs of intersectoral collaboration from HIA are needed. One of these outputs is whether health was considered in the decision making of the sector of interest [23]. Most HIA guidelines also recommend monitoring of the change in decision making resulting from HIA [14,24]. Visible outputs from intersectoral collaboration can help the collaboration to continue. This study, however, did not include monitoring because the final master plan had not been approved at the time of writing this paper.

Fifth, the improvement in final outcomes as well as outputs can demonstrate the value of HIA for intersectoral collaboration. Outcome indicators such as improvement of health status or reduction in health risks can provide solid evidence of the value of HIA, but

extensive time and resources are required to obtain these indicators and therefore they are not practical. Quigley and Taylor [23] have recommended that we focus on whether HIA affects decision making rather than on long-term health outcomes because the purpose of HIA is to influence decision makers.

Last, we would like to discuss some of the limitations of this study. Rapid HIA in general uses qualitative evidence from a participatory workshop of interest groups as the evidence for decision making, and thus it may not be accepted in a decision environment where quantitative data and analyses are more appreciated. In addition, the result of a participatory HIA cannot be replicated, and therefore it is difficult to test its validity and reliability. Furthermore, HIA results can differ depending on who participated and who did not. In the HIA case of this study, only a few members of each sector participated, which might have undermined the representativeness of the study. In future rapid HIAs, more participants from various interest groups should be included so that the HIA can be more participatory and reliable.

In sum, rapid HIA can be an effective tool for encouraging the health sector and non-health sectors to meet and consider health in decision making. For HIA to be a continuous tool for intersectoral collaboration, we need HIA legislation, proper governance, leadership, capacity building, and monitoring of HIA results.

ACKNOWLEDGEMENTS

This study was supported by Korea Institute for Health and Social Affairs.

CONFLICT OF INTEREST

The authors have no conflicts of interest with the material presented in this paper.

REFERENCES

1. Baker EA, Metzler MM, Galea S. Addressing social determinants of health inequities: learning from doing. *Am J Public Health* 2005; 95(4): 553-555.
2. Lasker RD, Weiss ES. Broadening participation in community problem solving: a multidisciplinary model to support collaborative practice and research. *J Urban Health* 2003; 80(1): 14-47.

3. Butterfoss FD, Kegler MC. Toward a comprehensive understanding of community coalitions. In: DiClemente RJ, Crosby RA, Kegler MC. *Emerging theories in health promotion practice and research: strategies for improving public health*. San Francisco: Jossey-Bass; 2002. p. 157-193.
4. Marmot MG, Wilkinson RG. *Social determinants of health*. Oxford: Oxford University Press; 1999.
5. Nutbeam D. Evaluating health promotion-progress, problems and solutions. *Health Promot Int* 1998; 13(1): 27-44.
6. World Health Organization. Declaration of Alma-Ata, 1978. [cited 2011 May 1]. Available from: http://www.who.int/hpr/NPH/docs/declaration_almaata.pdf.
7. Lawn JE, Rohde J, Rifkin S, Were M, Paul VK, Chopra M. Alma-Ata 30 years on: revolutionary, relevant, and time to revitalise. *Lancet* 2008; 372(9642): 917-927.
8. Stead D. Institutional aspects of integrating transport, environment and health policies. *Transp Policy* 2008; 15(3): 139-148.
9. Kemm J. Health impact assessment: an aid to political decision-making. *Scand J Public Health* 2008; 36(8): 785-788.
10. Greig S, Parry N, Rimmington B. Promoting sustainable regeneration: learning from a case study in participatory HIA. *Environ Impact Assess Rev* 2004; 24(2): 255-267.
11. Yoo WS, Kim KY, Koh KW. Introduction of health impact assessment and healthy cities as a tool for tackling health inequality. *J Prev Med Pub Health* 2007; 40(6): 439-446. (Korean)
12. Kang EJ, Lim SE. Improvement of child welfare service using health impact assessment: a case of the Cheongju Dream Start Center. *Korean J Health Educ Promot* 2011; 28(1): 115-130. (Korean)
13. Cole BL, Shimkhada R, Fielding JE, Kominski G, Morgenstern H. Methodologies for realizing the potential of health impact assessment. *Am J Prev Med* 2005; 28(4): 382-389.
14. University of New South Wales, Centre for Health Equity Training, Research, and Evaluation; New South Wales, Dept. of Health. *Health impact assessment: a practical guide*. Liverpool: University of New South Wales Centre for Health Equity Training, Research, and Evaluation; 2007.
15. Chilaka MA. Vital statistics relating to the practice of Health Impact Assessment (HIA) in the United Kingdom. *Environ Impact Assess Rev* 2010; 30(2): 116-119.
16. Ison E. Rapid appraisal tool for health impact assessment: a task-based approach. Eleventh iteration, 2002. [cited 2011 May 1]. Available from: <http://www.apho.org.uk/resource/item.aspx?RID=44890>.
17. Quigley R, den Broeder L, Furu P, Bond A, Cave B, et al. *Health impact assessment international best practice principles. Special publication series No. 5*. Fargo, ND: International Association of Impact Assessment; 2006.
18. McCartney G, Palmer S, Winterbottom J, Jones R, Kendall R, Booker D. A health impact assessment of the 2014 Commonwealth Games in Glasgow. *Public Health* 2010; 124(8): 444-451.
19. Association of Public Health Observatories and Health Development Agency. Toolkit: health and well-being. 2003. [cited 2011 May 1]. Available from: [http://www.hiaconnect.edu.au/files/Toolkit%20Final%201%20June%2005%20\(2\).pdf](http://www.hiaconnect.edu.au/files/Toolkit%20Final%201%20June%2005%20(2).pdf).
20. Horwath J, Morrison T. Effective inter-agency collaboration to safeguard children: rising to the challenge through collective development. *Child Youth Serv Rev* 2011; 33(2): 368-375.
21. Meyers MK. Organizational factors in the integration of services for children. *Soc Serv Rev* 1993; 67(4): 547-574.
22. Ahmad B, Chappel D, Pless-Mulloli T, White M. Enabling factors and barriers for the use of health impact assessment in decision-making processes. *Public Health* 2008; 122(5): 452-457.
23. Quigley RJ, Taylor LC. Evaluating health impact assessment. *Public Health* 2004; 118(8): 544-552.
24. Scott-Samuel A, Birley MH, Ardern K; University of Liverpool. Dept. of Public Health; Merseyside Health Impact Assessment Steering Group. *The Merseyside guidelines for health impact assessment*. 2nd ed. Liverpool: Dept. of Public Health, University of Liverpool; 2001.