

Health Impact Assessment in Healthy Cities in Korea

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**Health Impact Assessment in Healthy Cities
in Korea**

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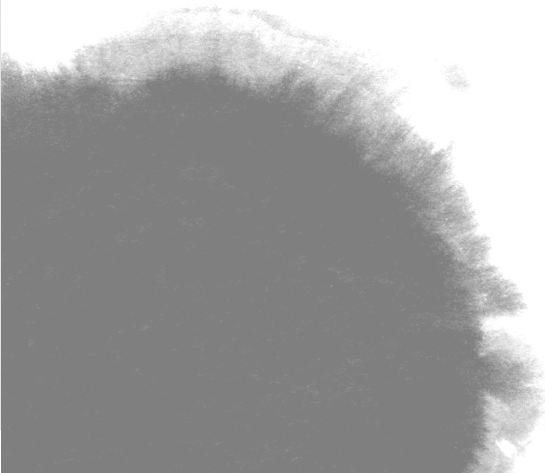
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01

Introduction



CHAPTER 1

Introduction

Section 1 Need for Health Impact Assessment

A healthy environment is an important factor in promoting health. Determinants of health broadly consist of biological factors, lifestyles of individuals, social and community influences, residential and working conditions and other broad set of social, economic, cultural and environmental conditions (Table1-1). The model of health determinants shows that public policies in a wide range of fields and social, economic and physical environments can affect health. This contention is supported by a number of studies conducted for the past several decades (WHO, 1946; Berkman, Kawachi, 2000; CSDH, 2006; Kang et al., 2009).

〈Table 1-1〉 Examples of specific health determinants

Categories of Health Determinants	Health Determinants
Social, economic, cultural and environmental conditions	<ul style="list-style-type: none">- Public policies (economy, health, labor, education, national defense, transportation, housing, diplomacy, welfare, etc.)- Policies based on demographics (emergency health service, police, health and social care, education, transportation, welfare, child-caring, leisure)- Social and cultural values and norms (discrimination, attitude towards different groups of society, justice, equity)

Categories of Health Determinants	Health Determinants
	<ul style="list-style-type: none"> - Relationship between the state and citizens - Safety - Employment situation - Educational level - Income
Residential and working conditions (physical environment)	<ul style="list-style-type: none"> - Residential environment and housing supply - Working conditions (exposure to hazardous materials, etc.) - Quality of water, air and soil - Noise - Disposal of waste materials - Use of energy and sustainability of resources
Social and community influences	<ul style="list-style-type: none"> - Social support and cohesion - Social exclusion - Community spirit - Community participation in public policies - Employment environment (opportunity, quality) - Educational/training environment (opportunity, quality, cost)
Lifestyles of individuals	<ul style="list-style-type: none"> - Individual behaviors (diet, smoking, drinking, physical activity, etc.) - Self-esteem - Attitude, conviction
Biological factors	<ul style="list-style-type: none"> - Age, gender, genetic factors

Source: EPHIA Group, European Policy Health Impact Assessment: A guide, 2004. (partially revised); Kang et al., 2009)

The determinants of health, except biological factors and individual lifestyles, are collectively known as social determinants of health. Most social determinants of health can change according to policies or projects in sectors outside the health sector. Income, education and working conditions are outside the health sector that can influence health. Therefore, developing policies outside the health sector with an eye toward health promotion must be a key strategy in promoting health (Kang et al., 2009).

WHO identified 'healthy public policy' as one of the five

key elements in promoting health in the Ottawa Charter in 1986. A healthy public policy refers to a policy that seeks to promote health of individuals or local communities affected by the policy and to improve equity in health.

Health impact assessment can become the most appropriate means of implementing healthy public policies as it is defined as a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population. (WHO, 2006). Health impact assessment provides information needed to develop healthy public policies and is used as a method of forecasting health outcomes when different policy alternatives are executed (Kemm & Parry, 2004).

With the growing awareness of healthy public policies in Korea, the Korean government also began to pay attention to health impact assessment. The government included health impact assessment in the "Lee Myung-bak Government's 100 National Initiatives" and is reviewing it as one of key initiatives in the field of safety, environment and health of "The Health Plan 2020." If health impact assessment is eventually included in the Health Plan 2020, it will prompt the government to take efforts to create a healthy and safe environment at the national level which has been under-invested despite its importance.

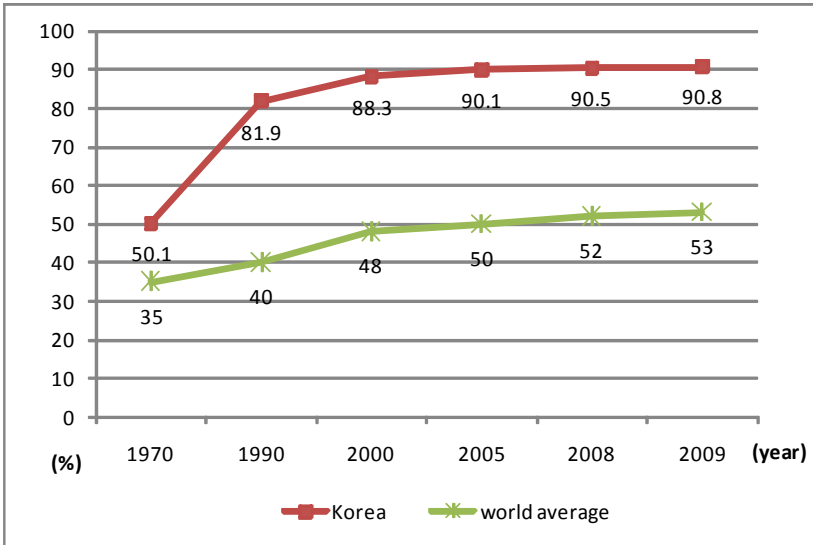
Section 2 Need for Conducting Health Impact Assessment in Healthy Cities

1. Background and current status of healthy cities

In 2009, the rate of urbanization was 53 percent globally, but it was as high as 90.8 percent in Korea (Figure 1-1). Korea has experienced rapid urbanization since 1970 and as a result approximately 80 percent of its population currently live in cities.

Such a rapid urbanization brought its own set of problems, such as a rise in traffic congestion, deaths from traffic accidents, pollution of water and air, waste materials and lack of housing. As a result, urban dwellers have undergone various kinds of health problems due to changes in social and physical environments and associated lack of exercise or increased stress. This not only relates to the urbanization but also to social and economic changes as a whole, and these social changes made people pay attention to healthy cities as an integrated approach to addressing the new health concerns caused by the social changes.

[Figure 1-1] Degree of urbanization in Korea



Source: Ministry of Health & Welfare, Management Center for Health Promotion, Challenges and opportunities for sustainable Healthy Cities, 2010

The concept of a Healthy City was first adopted by the WHO Regional Office for Europe to provide a vehicle for testing application of healthy city principles intended to promote health. Promotion of health within local communities requires participation by various fields as well as systematic political and administrative support, and the Healthy Cities project was created to test this in urban centers (Park et al., 2010). At the beginning of the project, 24 cities in Europe participated in Healthy Cities, and today, more than 1,200 cities or villages in 30 countries are participating in Healthy Cities or Healthy Cities network.

In Korea, a Healthy Cities demonstration project was conducted in Gwacheon City in 1996, after which 4 cities participated in Healthy Cities in 2004. As of March 2011, 52 cities including Seoul and 9 institutions¹⁾ including the

Korea Institute for Health and Social Affairs are conducting Healthy Cities projects. To support the Healthy Cities efforts with a network, the Korea Healthy Cities Partnership was established in 2006.

2. Healthy Cities and health impact assessment

WHO defines the Healthy City as "one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life and in developing to their maximum potential" (WHO, 1998), while Hancock et al. defines it as "one with the process and structure that tries to improve health in cities by putting health of citizens at the center of the decision-making process of public policies" (Hancock et al., 1986). These definitions emphasize 2 things: first, it is more important to enhance public policies and local communities in practicing healthy living of individuals and second, what determines a healthy city is not the level of health of those living in cities, but whether health is considered in all public policies (Park et al., 2010).

Conducting a health impact assessment in healthy cities is

-
- 1) 9 institutions (Healthy Cities Research Center of Yonsei University, Social Medicine Center of Kosin University, Healthy Cities Research Center of Chungnam National University, Health Promotion Development Center of Seoul National University, Healthy Cities and Health Impact Assessment Research Center of Soonchunhyang University, Korea Institute for Health and Social Affairs, Graduate School of Public Health of Kyungpook National University, Graduate School of Public Health and Welfare of Konyang University, Healthy Cities Research Center of Korea University) are mostly schools or research institutions and engage in providing consultation to member cities as associate members of the Healthy Cities Partnership.

important for the following reasons:

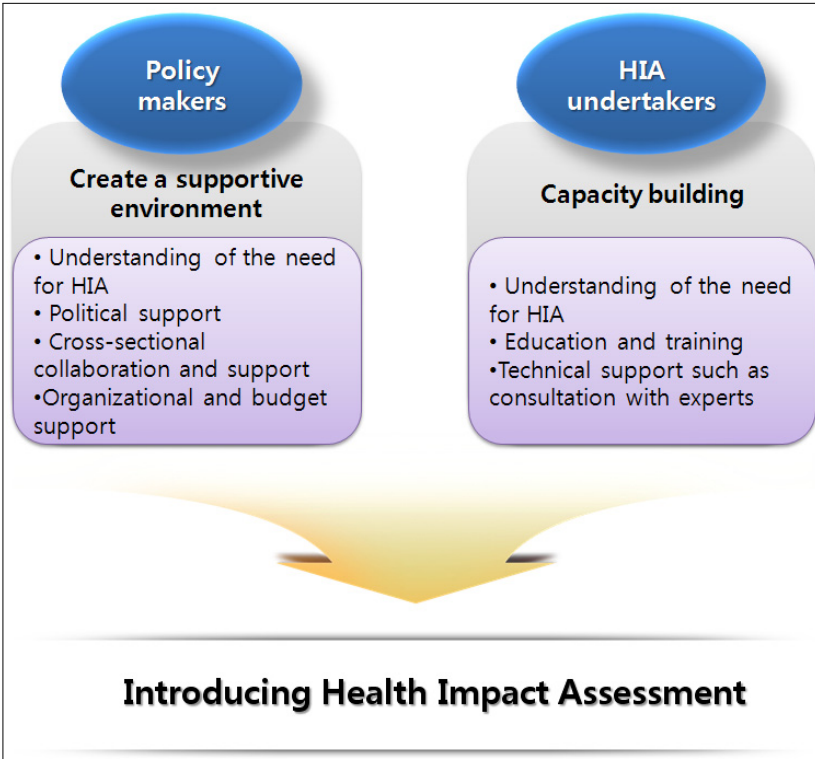
First, local governments generally influence more health determinants than the central government does not just in healthy cities. For example, most services such as housing, education, welfare and transportation are under the control of local governments. For this reason, a number of policies or projects subject to health impact assessment are more likely to be conducted by local governments and therefore it will be more effective for local governments including healthy cities to undertake health impact assessment. Second, both healthy cities and health impact assessment pursue 'healthy public policies.' As such, health impact assessment in healthy cities can serve as a systematic tool that enables policy makers to factor health and well-being of residents in the development of policies, projects or programs (Kang et al., 2009).

In the meantime, the concept of health impact assessment is still unfamiliar to even health professionals in Korea and thus technical support programs targeting project officers or policy makers is urgently needed. In particular, it is essential for local governments to raise capabilities to conduct health impact assessment and utilize health impact assessment results in their actual duties in the future by gaining knowledge of health impact assessment such as its concept, procedures and methods and by obtaining in-depth understanding through case studies and practical courses.

To conduct health impact assessment in healthy cities, policy makers including politicians must cooperate in creating a supportive environment for conducting the endeavor, and potential undertakers of health impact assessment, such as public officials, must raise capabilities to conduct health

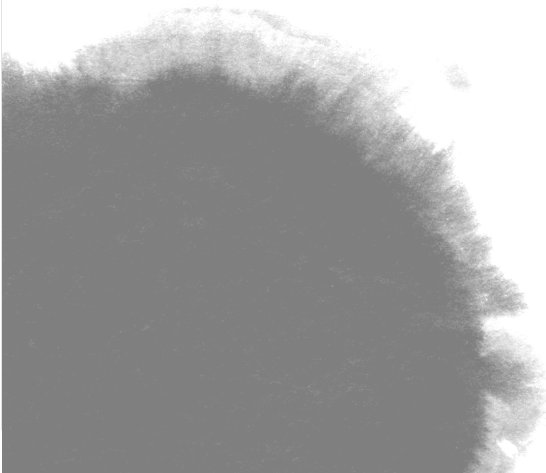
impact assessment. This requires that both policy makers and health impact assessment undertakers are aware of the need for the health impact assessment (Figure 1-2).

[Figure 1-2] Approach to introducing health impact assessment in healthy cities



02

**Health Impact Assessment in
Health Cities**



CHAPTER 2

Health Impact Assessments in Healthy Cities

Section 1 Purpose of HIA Projects

Health impact assessment (HIA) projects in healthy cities have 3 major objectives.

First, an HIA project is intended to bring health considerations in the decision-making process of public policies in the health sector as well as in non-health sectors. This is a kind of an organizational learning process that makes policy makers aware of the health of citizens who get affected by public policies. It is also important in a sense that it facilitates cross-sectoral collaboration essential for establishing healthy public policies.

Second, an HIA project is aimed at educating work-level officials in healthy cities so that they can better understand health impact assessment. This includes learning by doing whereby officials get first-hand involvement in the entire process of a project.

Third, an HIA project is intended to pave the way for spreading and institutionalizing health impact assessment projects. A health impact assessment project in healthy cities is the first step in spreading health impact assessment projects, and successful execution of demonstration projects

is expected to spread health impact assessment projects to all local governments.

Section 2 Project Procedures

Health impact assessment targeting healthy cities projects has been undertaken since 2009. Procedures of health impact assessment projects began with the local governments of the Healthy Cities Partnership that wished to participate in the projects.

The health impact assessment research group of the Korea Institute for Health and Social Affairs requested local governments wishing to participate in the projects to submit project plans, with the number of simplified health impact assessment projects limited to 5 per healthy city.

After 2 weeks of issuing a call for proposed projects for health impact assessment, 3 local governments submitted 14 project plans in 2009, and 11 local governments submitted 29 project plans in 2010. The submitted project plans were reviewed by the 'Health Impact Assessment Center' set up within the Korea Institute for Health and Social Affairs, which selected 5 projects in 2009 and 6 projects in 2010.

These selected projects are characterized by the fact that health impact assessment was not limited to the health field but was conducted for a wide range of sectors, such as transportation, parks & landscaping, development of local communities and housing.

〈Table 2-1〉 Selection result of HIA projects 2009-2010

Local Government	Project/Policy Name	Responsible Division
HIA Projects in 2009		
Gangnam-gu, Seoul	Carbon mileage project	Local Economy Division of Gangnam-gu Office
Gwangmyeong City, Gyeonggi	School artificial grass installation project	Education Office of Gwangmyeong City, Youth Division
	School night lighting project	Healthy Cities Team of Gwangmyeong City Health Center
	Plan for creating a waterfront park	Parks & Landscaping Division of Gwangmyeong City
Changwon City, Gyeongnam	Bicycle policy	Bicycle Policy Division of Changwon City
HIA Projects in 2010		
Gangnam-gu, Seoul	Plan for building Cheonsan street in Gangnam	Parks & Landscaping Division of Gangnam-gu Office
Gangdong-gu, Seoul	Demonstration project for establishing BRT (Bus Rapid Transit) between Seoul and Hanam	Traffic Administration Division of Gangdong-gu Office
Siheung City, Gyeonggi	Healthy apartment building project	Healthy Cities Team of Siheung City Health Center
Dong-gu, Gwangju	Dongjeokgol trail creation project	Urban Development Division of Dong-gu Office, Culture & Art Team, Tourist Health Team of Health Center
Jinju City, Gyeongnam	Residential environment improvement project for low-income urban families	Urban Division of Jinju City
	Free childhood immunization support project	Public Health Administration Division of Jinju City Health Center

One of the considerations in the selection of HIA projects 2009-2010 involved selection of projects for which 'Desk-based Health Impact Assessment' or 'Rapid Health Impact Assessment' can be conducted using relatively less time and resources. The purpose was to get health impact assessment outcomes and accumulate experiences by conducting many projects within a short period of time without using many resources during the 2-year demonstration period, and eventually provide the accumulated experiences and results to public officials or project officers of local governments including healthy cities so that they can conduct health impact assessment by themselves in the future.

Those projects selected each year were immediately undertaken using detailed tasks and timelines determined in discussions with each local government's project officers.

Section 3 Project Contents and Outcomes

As described earlier, a total of 11 health impact assessment projects were conducted for 2 years between 2009 and 2010. Among these projects, 4 major projects will be discussed in this section.

〈Table 2-2〉 Overview of HIA projects

Local Government	Project/Policy Name (Responsible Division)	Field	Type of HIA	Assessment Methods
Gwangmyeong City, Gyeonggi	School artificial grass installation project	Creation of a healthy environment	Comprehensive	<ul style="list-style-type: none"> - Local community profiling - Product testing - Students survey - Literature review - Experts advisory meeting
Changwon City, Gyeongnam	Bicycle policy	Transportation	intermediate	<ul style="list-style-type: none"> - Local community profiling - Literature review - Citizens survey - Citizens focus group - Policy analysis - Experts advisory meeting
Jinju City, Gyeongnam	Free childhood immunization support project	Health care	rapid	<ul style="list-style-type: none"> - Local community profiling - Literature review - Citizens survey - Experts advisory meeting - GIS space analysis - Stakeholders workshop
Gangdong-gu, Seoul	Demonstration project for establishing BRT (Bus Rapid Transit) between Seoul and Hanam	Transportation	intermediate	<ul style="list-style-type: none"> - Local community profiling - Literature review - Second data analysis - Pedestrian safety evaluation using tools

1. HIA of School Artificial Grass Installation Project in Gwangmyeong City, Gyeonggi²⁾

A. Project overview

The Korean government developed a plan to cover school playgrounds with artificial grass in 2005, and later revised the plan to set up diverse facilities at school playgrounds such as grass (natural or artificial), urethane facilities (tracks, multi-purpose fields), night lighting facilities or sprinklers when the safety issue of fill (rubber powder) of artificial grass was raised.

Garim Middle School located in Gwangmyeong City, Gyeonggi, developed a plan to cover its school playground with artificial grass with the budget it obtained from the government and conducted health impact assessment to find ways to prevent or minimize negative effects of artificial grass on health such as its potential hazard to health while maximizing health gains.

The school had a total of 29 classes including 2 special classes with 1,135 (581 male and 554 female) students. Parents, teaching staff and local community members set up a steering committee to discuss and make decisions on major issues concerning the school. Installing artificial grass was also decided by the committee.

The school had about 7,470m² wide ground which was relatively bigger than other schools, and thus a bigger

2) This health impact assessment project was conducted under the responsibility of Kang Eun-jeong, research associate of the Korea Institute for Health and Social Affairs.

amount of budget - KRW883 million - was appropriated for the school's project. With the budget, the school plans to cover 3,774m² of ground with artificial grass, install elastic tracks of 2,256m² space and set up a multi-purpose field of 1,440m² space.

B. Need for health impact assessment

Study of existing publications shows that while the installation of artificial grass at schools can positively affect health by increasing physical activities and preventing obesity, it may also have adverse effects such as release of toxic substances from artificial grass, fill particles, odor or temperature rises. There can also be other problems if the artificial grass is not properly maintained or replaced at the right time due to a lack of awareness of management cost.

However, there have not been sufficient studies or research on the potential positive or negative effects of artificial grass on health. Therefore, it is necessary for local governments or schools that intend to install artificial grass at school grounds to gather more information on those effects before making decisions and to work out ways to maximize health benefits and minimize negative effects.

C. Procedures and methods

The steering committee for health impact assessment was made up of public officials from the local government, representatives of teaching staff, representatives of the school steering committee, industrial experts, professionals in the

academic field and researchers from the Korea Institute for Health and Social Affairs.

〈Table 2-3〉 HIA steering committee members of the 'Artificial grass installation project for Garim Middle School in Gwangmyeong City'

Organization	Name
Gwangmyeong City Health Center	Ryu Young-cheol, manager of health center Lee Wang-rak, leader of Healthy Cities Team
Education Office of Gwangmyeong City	Kim Tae-seong, supervisor
Garim Middle School	Kim Tae-jung, teacher Lee Chung-ho, member of the school steering committee
Youth Division of Gwangmyeong City	Chung Gye-hwan, section chief
Environmental Science Department of Kangwon National University	Kim Hee-gap, professor
Department of Preventive Medicine in Kyungpook National University	Kim Geon-yeop, professor
Korea Compound Elasticity Association	Park Jong-bu, executive director
Korea Institute for Health and Social Affairs	Kang Eun-jeong, research associate

The health impact assessment was conducted in the order of pre-data gathering, screening, scoping, data gathering, review session of the assessment group and assessment. Actual timeline is as shown in the table below. First, during the pre-data gathering period, publications relating to artificial grass projects were studied and then screening was conducted to identify specific target items for health impact assessment and assessment methods.

Next step was the first steering committee meeting,

intended for scoping. During scoping, the assessment group set tasks of health impact assessment to be actually carried out and gathered qualitative and quantitative data needed for health impact assessment for 3 weeks. The second steering committee meeting reported results of the health impact assessment including its recommendations, and prepared a final report by incorporating what was discussed in the committee’s meeting.

〈Table 2-4〉 HIA timeline for the artificial grass installation project

Step	W1	W2	W3	W4	W5	W6	W7	W8
Pre-data gathering	■	■						
First steering committee (project planning)			■					
Data gathering				■	■	■		
Assessment meeting of the assessment group						■	■	
Second steering committee (reporting by the assessment group)							■	
Report production							■	■

To evaluate effects of artificial grass on health, the project first analyzed health effects of toxic substances contained in artificial grass by reviewing existing literature, and additionally reviewed safety test results of commercially available artificial grass products and tested toxic substances of 3 major artificial grass products. In addition, it conducted surveys on health effects such as allergies, atopic dermatitis, asthma and headache caused by artificial grass at schools where artificial grass is installed. Based on the data gathered, an experts advisory meeting was held before a

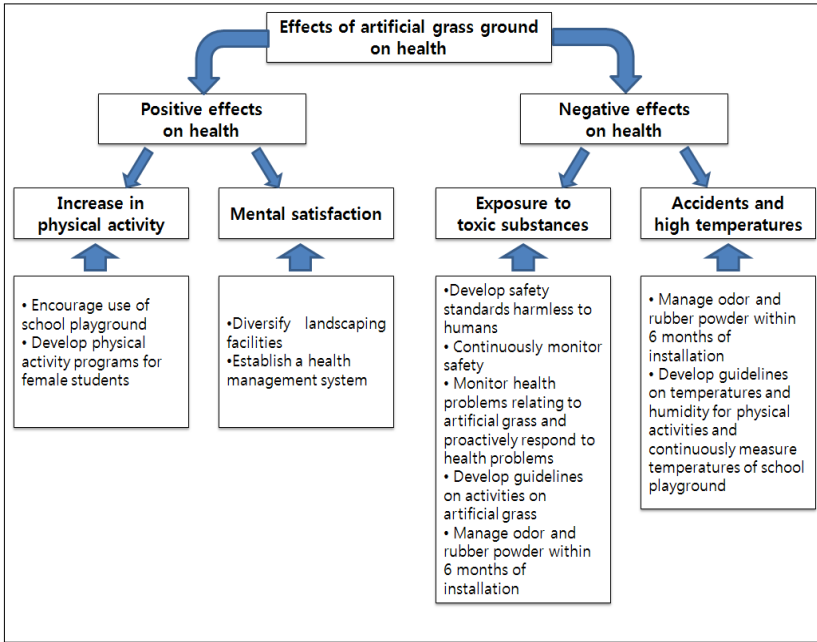
final report on health impact was prepared.

D. Results of health impact assessment

In this health impact assessment, exposure to toxic substances such as heavy metals and associated accidents were assessed as negative effects of artificial grass, and an increase in physical activities and mental satisfaction were assessed as positive effects of artificial grass. Data used in the assessment included a study of related publications, interviews with health teachers from the school in Gwangmyeong City that installed artificial grass, survey with fifth- and sixth-grade students at these school and data on temperatures measured at the actual school playgrounds.

The assessment found that artificial grass can increase physical activities and mental satisfaction among students. At the same time, artificial grass seemed to pose the risk of causing several kinds of diseases and accidents as reported in foreign literature. Major effects of artificial grass on health are summarized in [Figure 2-1] below.

[Figure 2-1] Health impact assessment results of artificial grass ground



As the purpose of this health impact assessment is to maximize health gains and minimize negative effects of artificial grass, the following recommendations can be considered as final outputs of health impact assessment.

First, it is recommended that a separate space for female students be provided so that they can do physical activities they enjoy to maximize health gains. Second, it is recommended that physical activities on a school playground be actively encouraged. Third, it is recommended that diverse landscaping facilities be set up along with the artificial grass to maximize mental satisfaction. Fourth, it is recommended that the school put in place a system to manage sanitary conditions of its school playground.

To minimize negative effects on health, it is first

recommended that strict safety standards be developed to ensure use of harmless rubber powder that does not cause such diseases as dermatitis or allergies. Second, it is recommended that the school, as the undertaker of the project, have regulations to ensure that product safety is continuously monitored. Third, as a government agency responsible for protecting the health of students, the Ministry of Education, Science and Technology needs to monitor health-related problems in schools with installed artificial grass and take appropriate measures when problems occur. Fourth, it is necessary to develop detailed guidelines on activities on artificial grass. For instance, after students finish physical activities on artificial grass, they must dust artificial grass or rubber powder stuck in their bodies before stepping into classrooms, and while or after they do some activities on artificial grass, they must be careful not to rub eyes with hands or make sure to wash their hands clean. Fifth, it is recommended that schools keep windows closed during class for the first five or six months after installation of artificial grass to shut out inflow of odor or rubber powder. Also, it is recommended that air cleaners be installed or air-purifying plants be placed in classrooms to purify indoor air. Sixth, sprinklers must be installed to keep ground surface at proper temperatures. Seventh, guidelines on temperatures and humidity like WBGT regarding physical activities of children and adolescents must be developed and distributed to schools. It is also recommended that the school install dry-bulb, black-bulb and wet-bulb thermometers to monitor WBGT and take appropriate measures for each temperature measured.

2. HIA of Bicycle Policy in Changwon City, Gyeongnam³⁾

A. Project overview

Changwon City selected environmental issues as its key challenge and developed a short- and long-term comprehensive plan to encourage use of bicycles as an environment-friendly means of transportation. The comprehensive plan included creating an infrastructure for bicycles, establishing institutional mechanisms and creating a bicycle boom among citizens. Under the plan, the city introduced public bicycles so that anyone can use bicycles at cheap prices; formed an organization within the city office to oversee its bicycle policy; and adopted other innovative policies such as buying an insurance covering all its citizens. As a result of these policies intended to encourage use of bicycles, including a bicycle riding campaign conducted in 2007, the number of bicycle users in Changwon grew steadily. By 2008, the number of bicycles held per household rose to 0.75 per household.

〈Table 2-5〉 Number of bicycles in Changwon City: June 2008

	Number of Bicycles Held	Remark
Citizens' bicycles	129,500	0.75 bicycle per household
Business bicycles	20	15 ordinary bicycles, 5 electric bicycles
Free lease bicycles	290	16 locations
Bicycle racks	5,268	296 locations

Source: Bicycle Policy Division, Changwon City, 2009 Work Plan

3) This health impact assessment project was conducted under the responsibility of Kang Eun-jeong, research associate of the Korea Institute for Health and Social Affairs.

According to the 2005 census, the rate of bicycle use as a means of transportation for commuting purposes was 1.2 percent on average nationwide, but the rate was 2.1 percent in Changwon City, which was about 0.9 percent higher than the national average. In 2007, the average rate of bicycle use was 3.0 percent nationally and 5.0 percent in Changwon City. In 2008, the rate grew to 7 percent in Changwon City.

B. Need for health impact assessment

Bicycle riding can prevent chronic diseases such as cardiovascular diseases, strokes, overweight and obesity by enhancing physical activities as well as improve mental health such as reduced depression. However, growing use of bicycles generally also comes with a growing number of traffic accidents. In other words, bicycle riding has relatively clear positive effects and negative effects on health.

For about 10 months between September 2008 and August 2009 when the bicycle accident insurance was in effect, approximately 193 cases of bicycle accidents occurred. But what needs to be noted from the health impact perspective is that as time went by, not only the number of accidents has grown, but more serious accidents, including fatal accidents, have also occurred in recent years.

〈Table 2-6〉 Monthly payment history of citizens' bicycle insurance (as of August 3, 2009)

	Total	Oct. '08	Nov.	Dec.	Jan. '09	Feb.	Mar.	Apr.	May	Jun.
Number of Cases	193	8	0	49	17	18	13	8	19 (1 death)	61 (3 deaths)
Amount (KRW thousand)	191,600	3,200	0	19,600	6,800	7,200	5,200	3,200	36,200	110,200

Source: Analysis of citizens' bicycle accident insurance by type, 2009

As Changwon City intended to promote use of bicycles, it needed to continuously revise or complement its bicycle policy. The city especially felt a need to refine the policy with a view to maximizing health benefits and minimizing negative effects and decided to undertake a health impact assessment.

C. Procedures and methods

The health impact assessment was undertaken in the order of pre-meeting, pre-data gathering, screening, scoping, data gathering, review sessions of the assessment group and assessment. Actual timeline is as shown in the table below.

First, in a pre-meeting, the health impact assessment project was briefed to officials of Changwon City's public health centers and officials in charge of the bicycle policy. Collaboration with the Korea Institute for Health and Social Affairs was confirmed. During the pre-data gathering period, publications relating to the city's bicycle policy were studied and the first steering committee meeting was prepared.

The first steering committee meeting involved screening and scoping. During scoping, the assessment group set tasks

of health impact assessment to be actually carried out and gathered qualitative and quantitative data needed for health impact assessment for 4 weeks. The second steering committee meeting reported results of the health impact assessment including its recommendations and prepared a final report by incorporating what was discussed in the committee's meeting.

〈Table 2-7〉 HIA timeline for Changwon City's bicycle policy

Step	W1	W2	W3	W4	W5	W6	W7	W8
Pre-meeting	■							
Pre-data gathering	■	■						
First steering committee (project planning)			■					
Data gathering				■	■	■	■	
Assessment meeting of the assessment group							■	
Second steering committee (reporting by the assessment group)								■
Report production							■	■

It is important to set up a steering committee to effectively conduct health impact assessment. A steering committee provides general oversight and determines the scope and boundaries of HIA project.

To set up a steering committee, Changwon City received recommendations and referrals of public officials in charge of the city's bicycle policy, citizens and experts from the Changwon City's public health centers. These recommended citizens were people who were well familiar with the city's bicycle policy. Experts were professionals in the fields of

physical activities, road traffic and urban design. As a result, the steering committee was made up of a total of eight members including public health centers.

〈Table 2-8〉 HIA steering committee for Changwon City's bicycle policy

Organization	Name
Changwon City Health Center Bicycle Policy Division of Changwon City	Lee Bu-ok, manager of health center Cho Seong-wuk, section chief of Healthy Cities Team Yoon Dong-jin, chairman Sung Seong-hyo, chairman Park Kyung-hun, professor Koh Gwang-wuk, professor Song Gi-wuk, doctor Kang Eun-jeong, research associate
Changwon City Bicycle Association	
Changwon City Bicycle Riding Association	
Changwon University	
Kosin University Graduate School of Public Health	
Environment & Traffic Research Division of Gyeongnam Development Institute	
Korea Institute for Health and Social Affairs	

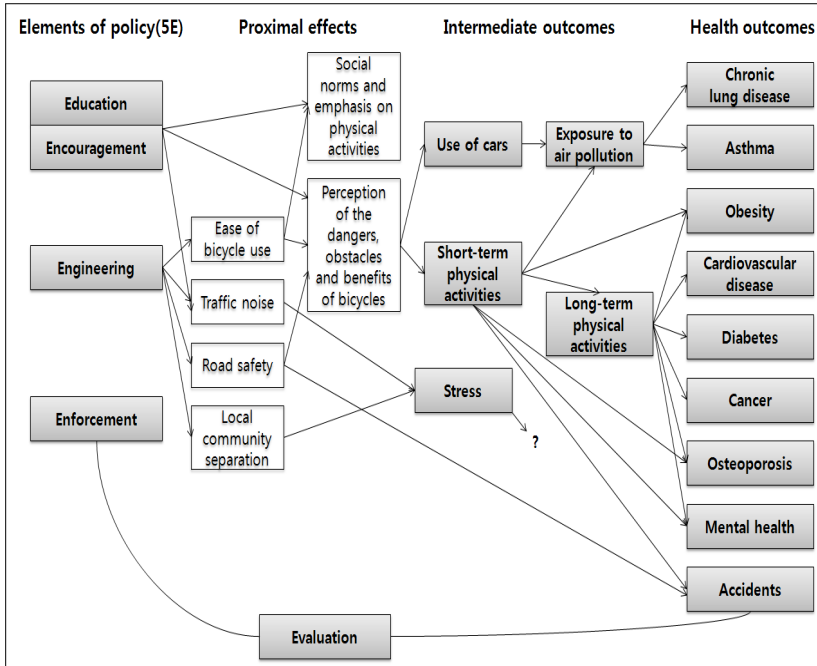
In assessing the impact of the bicycle policy on health, Changwon City used local community profiling on demographic and health status of Changwon residents, data on use frequency and use patterns of bicycles, phone surveys to understand Changwon citizens' preference for the bicycle policy, focus group interviews with related stakeholders and other quantitative and qualitative analysis methods.

D. Results of the health impact assessment

To assess health impact of Changwon City's bicycle policy, pathways of the policy impact on health have been

mapped out. These pathways show proximal effects of the policy and subsequent intermediate outcomes and ultimate health outcomes such as occurrence of diseases.

[Figure 2-2] Logical model for HIA of the bicycle policy in Changwon City



Among the pathways, health effects to be finally reviewed considering resources used in the assessment included physical activities, mental health, some chronic diseases and air pollution.

1) Use of bicycles and physical activities

Changwon City's bicycle policy has positive effects on health by increasing physical activities through the use of

bicycles. Following recommendations are made to further increase the use of bicycles.

○ Education

First, social groups (especially women aged 65 or older) that are not using bicycles because they don't know how to ride bicycles must be the focus of education. The number of bicycle training sessions targeting housewives and students need to be increased, and educational programs for senior citizens need to be developed.

Second, it is necessary to significantly increase classes from the 4 rounds for 40 students currently provided. Like Japan, different bicycle teaching materials including safety education for primary, middle and high school students need to be developed and distributed to schools.

Third, it would be desirable to utilize occasions like neighborhood meetings accessible to all local residents as a tour education tool designed to raise awareness.

○ Encouragement

Light bicycles must be introduced to the elderly and the infirm or women who find it difficult to ride heavy bicycles.

Second, it is recommended that bicycles to which safety seats can be attached be leased to women in their 30s many of whom are in child rearing.

Third, it is recommended that bicycle repairs be done more quickly.

Fourth, granting subsidies to those individuals who purchase their own bicycles needs to be considered.

Fifth, provision of incentives such as free delivery for

customers who purchase bicycles from large retail marts through an agreement with those marts can increase use of bicycles among housewives as well as help marts save parking cost.

Sixth, it is recommended that regions, groups or institutions that have high interest in bicycle riding be selected and assisted, rather than undertaking large-scale bicycle riding promotion campaigns.

○ Engineering

First, it is urgently needed to keep bike lanes in good conditions in industrial complex areas as it was found in a survey that residents in these areas were highly unsatisfied with the conditions of bike lanes.

Second, it is necessary to extend bike lanes for leisure purposes and develop many events involving bicycle riding.

Third, it is recommended that installation of bike racks at public places be made mandatory. Having indoor parking space like Japan and Europe needs to be considered.

Fourth, to reduce collisions between motor vehicles turning right and cyclists going straight, it is necessary to introduce a traffic signal that prohibits right turn on red and install bicycle crossings or bicycle signals to facilitate convenient crossing.

Fifth, it is necessary to form greenways (a corridor of green land) for recreational use along residential areas.

Sixth, it is recommended that conditions of roads widely used for bicycling be evaluated and mapped so that it can be used as information by bicycle users and in planning improvements of bicycle projects by administrative agencies.

Seventh, it is necessary to designate special zones by

purpose of bicycle use on roads widely used for bicycle riding, including setting speed limit and installing bike lanes.

2) Reduction in air pollution

There is no sufficient evidence showing that the introduction of the bicycle policy has led to air pollution reduction. Following suggestions are made to reduce air pollution.

First, reduction in air pollution will be achieved by more direct effects like a reduction in the source of pollution through less use of cars, rather than by the indirect effects like dissemination of bicycles.

Second, it is necessary to develop a comprehensive plan suitable for the capital of environment and to set out specific pollution reduction targets.

Third, the degree of transition from motor vehicles to bicycles must be monitored in a scientific way.

3) Accidents

With the use of bicycles growing due to the bicycle policy, adverse effects on health such as a rise in accidents have also been growing. Following suggestions are made to reduce accidents.

○ Education

First, it is necessary to develop guidelines to educate primary, middle and high school students.

Second, it is necessary to develop guidelines on bicycle use at nighttime (e.g., luminous boards for bicycles, correction of

bicycle light position, making it mandatory to wear safety T-shirts or vests for nighttime riding, or making it mandatory to use flickering lights)

Third, it is necessary to support bicycle club activities to carry out safety education activities.

Fourth, it is necessary to provide safety education through community centers and neighborhood meetings.

Fifth, it is necessary to educate vehicle drivers to be careful of bicycle riders.

Sixth, it is necessary to recommend use of safety helmets.

○ Encouragement

It is necessary to distribute luminous safety T-shirts or vests for free to encourage bicycle riders to follow rules of nighttime riding.

○ Engineering

As most of road sections with bike lanes have wide green buffers, it is necessary to consider installing bicycle use sections separated from pedestrian paths within the green buffers.

○ Enforcement policy

First, it is necessary to limit speed in lanes open to both motor vehicles and bicycles.

Second, it is necessary to monitor illegal parking and issue penalties.

Third, it is necessary to develop detailed regulations on bicycle passing (e.g., prohibition of riding in reverse, hand signals when turning or stopping, how to use bicycles at night) and penalties.

4) Weight control, cardiopulmonary function, muscular strength, stress or depression, social health, sex life

Growing use of bicycles among citizens driven by Changwon City's bicycle policy is positively affecting their health in terms of weight control, cardiopulmonary function, muscular strength, stress or depression reduction, social health and sex life. Following suggestions are made to maximize those effects.

First, it is necessary to publicize results of the 'Effects of regular use of bicycles on the quality of life, physical strength and the level of health' research to citizens.

Second, it is necessary to develop educational materials containing effects of bicycle riding on health and the minimum use of bicycles required to improve health.

Third, considering that 60 to 90 minutes of physical activity is recommended globally to prevent and control obesity, it is necessary to develop a new policy and create an environment that goes beyond the current recommendation of bicycle riding in daily life.

3. HIA of the free childhood immunization support project in Jinju City⁴⁾

A. Project overview

National vaccination programs are government-led initiatives in which the government bears the cost and directly provides

4) This health impact assessment was undertaken under the responsibility of professor Kim Geon-yeop of Kyungpook National University.

the vaccination service to the public (Article 11 of Prevention of Contagious Diseases Act). These programs target 14 diseases such as diphtheria, polio, pertussis, measles, tetanus, tuberculosis, hepatitis B, mumps, rubella, chickenpox, typhoid, Japanese encephalitis, influenza and hemorrhagic fever with renal syndrome, but this number is fewer than the 17 diseases whose vaccinations are recommended by WHO.

Target patients must go to public health centers to get free vaccines provided by the government, or pay vaccination cost if they are vaccinated at private hospitals and clinics. In the past, this cost was covered entirely by the patient, but since March 2009, 30 percent of vaccination cost is picked up jointly by the central government and local governments (Government support for mandatory vaccinations). In this case, there is a cost burden on the part of patients who use private hospitals and clinics. There is also an issue of geographical access to vaccination services in the case of free immunizations provided by public health centers, thereby making it difficult to dramatically increase vaccination rates.

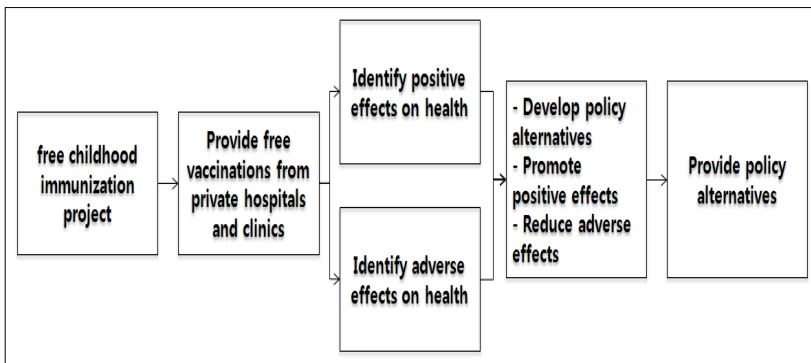
For this reason, Jinju City has been undertaking a project since January 2011 aimed at providing mandatory vaccinations for free for children even by private hospitals and clinics. The purpose is to create a health-friendly environment for local community citizens who find it difficult to get vaccinated due to geographical or economic barriers to vaccinations despite the importance of vaccinations and to ultimately improve health of children living in Jinju City by increasing vaccination rates and preventing contagious diseases.

B. Need for health impact assessment

As the free immunization project for children is primarily aimed at improving vaccination registration rates, actual vaccination rates and timely vaccination rates among children in Jinju City, assessing the feasibility of the project will be the main objective of the health impact assessment. The assessment will bring alternative solutions that can promote health gains and resolve or reduce negative effects on health.

Screening of the project shows that while the project has substantially positive effects on physical health among Jinju citizens, especially among children, it also has a few problems, such as equality for the weak and vulnerable regions or classes, storage and safety of vaccines and optional vaccinations. Jinju City came to the conclusion that a health impact assessment is needed to identify desirable ways of further advancing its immunization program.

[Figure 2-3] Purpose of health impact assessment



C. Procedures and methods

The health impact assessment of the free mandatory vaccinations program for children in Jinju City was conducted according to the procedures shown in the figure below.

First, a steering committee was set up to make major decisions needed in progressing with the health impact assessment. The committee conducted screening and scoping.

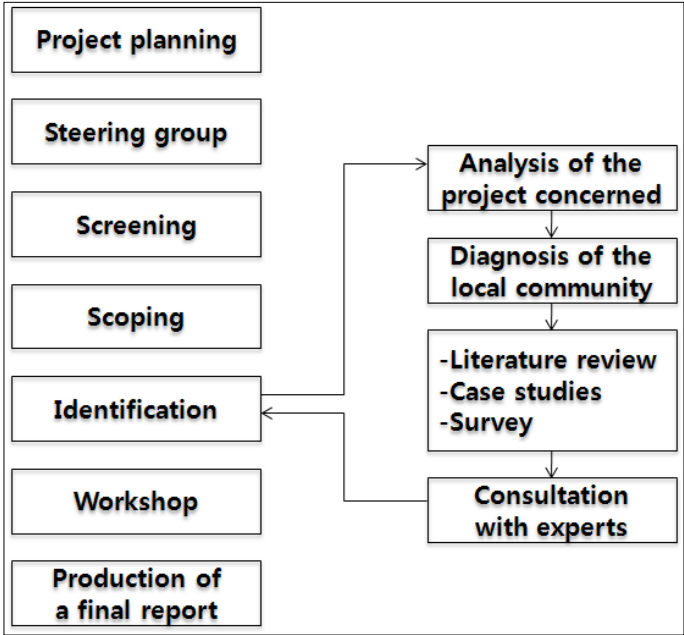
Next, there was a briefing on the project, including its background and plan. This was followed by data gathering on demographic composition of target vaccination groups in the local community (the weak and the vulnerable population), status of medical institutions responsible for vaccinations, the number and vaccination rates and occurrence of vaccination-related contagious diseases.

To identify positive and negative effects of free vaccinations from private hospitals and clinics on health, publications studies, case studies and surveys on certain target residents were conducted during the identification period. Along with these, opinions on expected positive or negative health impact were gathered through meetings with officials of the Center for Disease Control and Prevention in charge of vaccinations, officials in other public health centers that already has been undertaking the project of free immunizations and other experts from related fields.

After the identification was conducted, a workshop involving the steering committee members (researchers, local community representatives, medical associations, related public officials, consultants, etc.) was held based on the data and advice gathered. The workshop included a briefing on

the project and discussions on the expected health impact. Based on the workshop results, suggestions and policy alternatives to better undertake the project were put together.

[Figure 2-4] Health impact assessment procedures



A steering committee was set up to lead the health impact assessment for the free immunization project in Jinju City. The committee carried out screening, scoping and assessment, and participated in a workshop to provide project alternatives and policy consultations for increasing the effectiveness of the project.

〈Table 2-9〉 Composition of the steering committee

Name	Participating Agency
Kim Geon-yeop	Professor from medical school, Kyungpook National University
Chun Man-jung	Professor from medical college, Yeungnam University
Kim Min-su	Director of paediatrics & adolescent medicine hospital
Kim Hyo-jeong	Housewife
Park Hye-jeong	Secretary-general of Jinju Women's Association
Chung Geum-sun	Social worker for Jinju Christian Orphanage
Paek Yun-seon	In charge of health promotion (health impact assessment) in Health Promotion Division
Kim Chun-hee	In charge of vaccinations in Public Health Administration Division

The health impact assessment project for free immunizations was mainly focused on the issues involving the weak and the vulnerable regions and classes, storage and safety of vaccines and optional vaccinations that may occur in the course of undertaking the initiative.

The assessment included investigation of the health status of the local community, a study of publications relating to vaccinations, case studies of other regions that provided free vaccinations, surveys on community residents, health impact analysis using GIS, consultation with experts (Center for Disease Control and Prevention, experts in the academic circles) and a workshop to discuss results of the assessment.

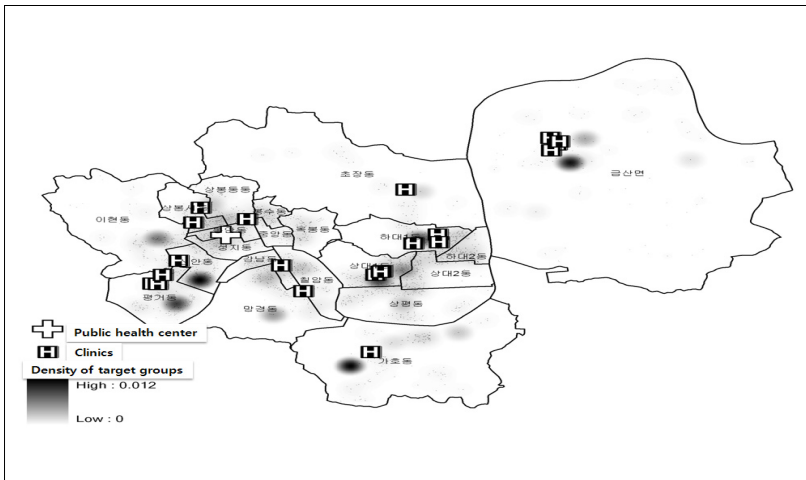
D. Results of the health impact assessment

The positive and negative effects on health of the 'free childhood immunizations project in Jinju City' are as follows:

1) Positive effects

First, access to vaccinations is expected to grow if the vaccination function is taken up by private hospitals and clinics. According to the GIS analysis, a majority of target vaccination groups live near private hospitals and clinics, so geographical access and convenience is expected to greatly improve.

[Figure 2-5] Target groups to be vaccinated by public health centers in Jinju City and distribution of public health centers in Jinju City



Moreover, there are likely to be spillover effects whereby time and cost decreases while opportunity cost increases as people can use private hospitals and clinics nearer than

public health centers.

Second, childhood vaccination rates will grow. Active participation by private hospitals and clinics will help increase vaccination registration rates, which will lead to a reduction in overlapping vaccinations. Additional vaccination rates that tend to drop among children aged 2 or older is expected to rise, thereby contributing to the improvement of children's health.

Third, children will be able to receive more comprehensive health services from private hospitals and clinics rather than simple vaccination service currently provided by public health centers. As free vaccinations from clinics that children routinely visit become available, other services related to children's health will be provided.

Fourth, if private hospitals and clinics directly take part in the vaccination service, public health centers will be able to focus on promoting immunization or making other improvement efforts for the local community. That is, public health centers will be able to pay more attention to management of the supply and demand of vaccines, management of the quality of vaccination programs, management of information and statistics and management of groups of society with poor access to the vaccination service.

Fifth, free immunization can be one of good public policies in Jinju City in addressing its low fertility problem. Low fertility is currently a serious issue in Jinju City, but the city does not have sufficient measures that its community people find effective compared to other cities. In this regard, the project is expected to generate important outcomes with which the city can effectively address its low fertility issue.

Sixth, the effects of the project will spill over into neighboring regions and help improve vaccinations among children across the Gyeongnam province as Jinju City's free immunization project is expected to prompt neighboring regions to follow suit.

2) Negative effects

While there are no negative effects directly caused by the free immunization project in Jinju City, some potential adverse effects need to be considered.

First, while the project improves geographical access to health service, only those living in downtown of Jinju City where most private hospitals and clinics are located benefit from the improved access, while many people from the weak and the vulnerable classes living in rural areas don't, thereby raising the issue of equality.

Second, there can be a problem of poor management of vaccines. Currently, public health centers keep vaccines in dedicated refrigerators and manage vaccines relatively better than private hospitals and clinics in terms of maintaining cold chains, providing against emergencies, and managing expiration dates of vaccines.

Third, there can be a problem in managing quality of vaccination personnel. In most hospitals, patients are vaccinated directly by doctors, but in some other hospitals, patients are vaccinated by medical staff who lack sufficient knowledge or skills of vaccinations. In the case of public health centers, vaccination personnel regularly receive education and training from the central health care agency.

Fourth, overuse of vaccines whose superior efficacy is not proven can increase the economic burden on residents. Some hospitals or clinics recommend vaccines that are not recommended by the government, resulting in overuse of vaccines because children have no knowledge to make judgment of those vaccines.

3) Recommendations

Recommendations of the steering committee and experts to promote positive effects and minimize negative effects are as follows:

- Considerations to be made by local governments (public health centers)

First, as the vaccination function is transferred to the private sector, it is necessary to change functions of public health centers so as to focus on managing immunization, and necessary preparation must be made for this to happen. Among other things, it is necessary for public health centers to provide vaccination manuals and self-checklist to private hospitals and clinics so that they can manage vaccines. Public health centers then need to oversee their fulfillment. In addition, it is necessary to provide educational programs to vaccination personnel (e.g., doctors, nurses, assistant staff) as needed.

Second, it is necessary to map out a policy to boost additional mandatory vaccination rates (e.g., chickenpox, DTP round) among children aged 2 or older, whose vaccinations tend to drop.

Third, it is necessary to find ways to improve access to

vaccination services for people living in areas whose geographical access does not improve despite free vaccinations from private hospitals and clinics (selection of vulnerable locations). It is also necessary to find other ways to boost vaccination rates among multicultural families, single-parent families, disabled families, basic livelihood security recipients, members of the near-poverty class and others who are weak and vulnerable.

Fourth, free mandatory vaccinations must be actively and properly publicized to residents to ensure that they - especially the weak and the vulnerable such as multicultural families - can benefit from the free service and that there is no misunderstanding between medical institutions and consumers.

Fifth, the free immunization project must not cause Jinju City to cut down on budget of other welfare projects.

Sixth, in the long term, local governments need to consider also subsidizing optional vaccinations. In particular, optional vaccinations (e.g., pneumococcus, rotavirus) targeting children from the weak and the vulnerable classes need to be the priority.

Seventh, it is necessary to put in place mechanisms that enable continuous monitoring and evaluation of the project to ensure that advantages of the project are maximized and disadvantages are minimized.

Eighth, it is necessary to facilitate cross-sectoral collaboration within the local community. Collaboration is required not only with doctors associations (hospitals and clinics) but also with those community children centers where children of the weak and vulnerable classes are collectively accommodated, social welfare centers that take care of these children as well as education offices responsible for students.

○ Considerations to be made by private hospitals and clinics

First, hospitals and clinics need to have guidelines on the storage of vaccines and training of vaccination personnel and manage their quality.

Second, small clinics need to be able to deal with vaccine supply problems.

Third, public health centers are responsible for medical examination of infants, along with the vaccination function. If the vaccination function is transferred to the private sector, private hospitals and clinics must also be able to provide medical examination for infants.

Fourth, optional vaccinations and vaccinations not recommended by the government need to be sufficiently explained to parents and other caregivers of children to avoid their distrust in those vaccines.

4. HIA of the BRT demonstration project in Gangdong-gu, Seoul⁵⁾

A. Project overview

In the metropolitan area, road supply fails to meet demand due to the increasing number of traffic-generating facilities and growing use of motor vehicles. This situation, combined with the rising oil prices and other environmental issues, has prompted a new paradigm of public policy to

5) This health impact assessment project was conducted under the responsibility of Kim Dong-jin, research associate of the Korea Institute for Health and Social Affairs.

pursue a shift from cars to public transport.

As such, the government came to consider introducing a BRT (Bus Rapid Transit) system that combines benefits of railways and buses in major roads of the metropolitan area as a new transport system. The new transport system was intended to resolve traffic congestion in main roads caused by concentration of people and industrial facilities in the metropolitan area while overcoming limitations in road supply and making the most of currently limited transport infrastructure.

The BRT system is considered as an effective means of improving use of public transport by complementing the existing public transport system that centers around buses and maximizing social effectiveness because additional space is not required as is often the case with subways or urban railways.

B. Need for health impact assessment

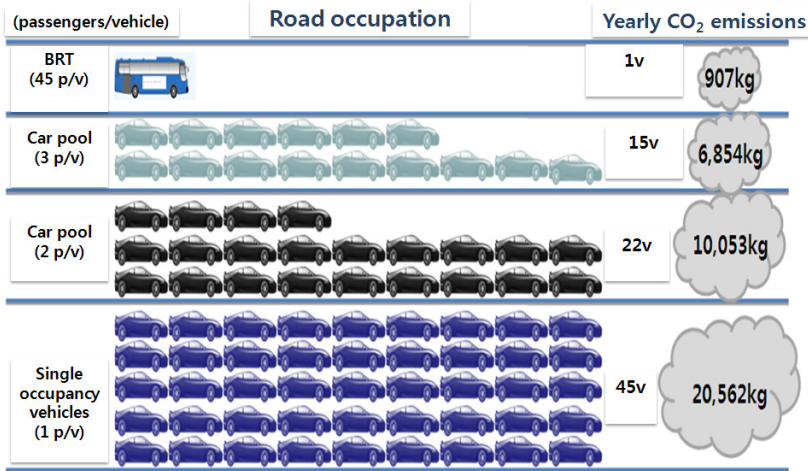
The BRT project of Gangdong-gu is an advanced concept of the Bus-Only Lane system currently in operation in Seoul and is a demonstration project whose budget is borne by the Seoul Metropolitan Government, Hanam City and the Ministry of Land, Transport and Maritime Affairs. Government agencies in charge of the project expect the transport speed of public transport (bus) to substantially improve.

However, if the project is observed from the health perspective, not from the transit or traffic flow perspective, it seems to have mixed effects on health. For instance, if the project is undertaken, drivers must go through side streets

of residential areas because U-turn is not allowed in major roads, raising the risk of accidents in residential areas. Passengers also face a bigger risk of traffic accidents than they do today by having to cross a crosswalk to take a bus. On the other hand, the BRT project is also expected to boost use of public transport and ultimately generate positive health impact due to reduced air pollution.

As such, Gangdong-gu felt a need to focus on evaluating health determinants such as air pollution, noise and vibration, safety and traffic accidents (including safety of pedestrians), physical activities and mental health like stress when it conducts health impact assessment of its BRT project.

[Figure 2-6] Yearly CO₂ emissions by means of transportation



Source: People-oriented traffic data released by the Seoul Metropolitan Government, 2009

Note: 1) Yearly CO₂ emissions are based on use of 10km a day and 250 days of driving

2) In the case of BRT between Seoul and Hanam, 2,136 tons of air pollution (or KRW410 million) a year has been reduced

C. Procedures and methods

Health impact assessment generally consists of the following 6 steps (Harris et al., 2007; Mindell et al., 2003):

1. Screening
2. Scoping
3. Identification
4. Appraisal
5. Reporting with recommendations
6. Evaluation and follow-up

Health impact assessment procedures for the BRT demonstration project in Gangdong-gu were not much different except that this assessment was conducted up to the fifth step, or reporting with recommendations. A steering committee was set up to conduct screening and scoping, followed by assessment of expected health effects primarily by researchers.

〈Table 2-10〉 Composition of the HIA steering committee

Name	Organization
Cho Jong-hee	Gangdong-gu Health Center
Hong Hye-suk	Gangdong-gu Health Center
Park Sang-shik	Gangdong-gu Health Center
Pyun Hye-suk	Gangdong-gu Health Center
Kim Mee-ok	Traffic Administration Division of Gandong-gu Office
Lee Young-su	Korea Environment Institute
Kim Dong-jin	Korea Institute for Health and Social Affairs
Kang Eun-jeong	Korea Institute for Health and Social Affairs
Kim Ji-eun	Korea Institute for Health and Social Affairs

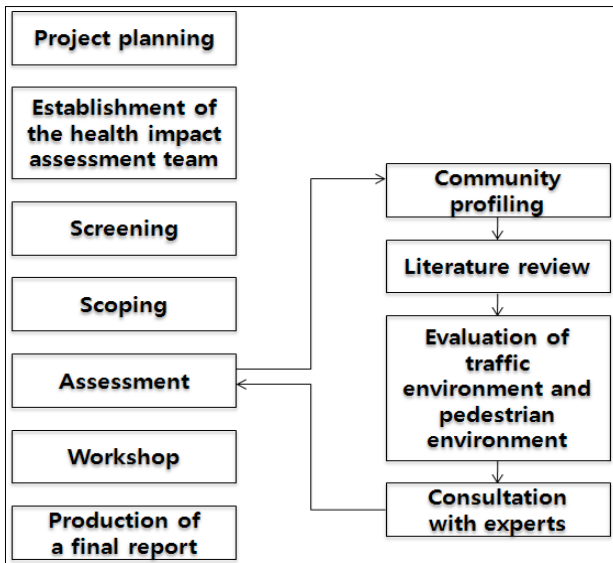
As part of health impact assessment of the BRT project, environmental assessment of road sections that came into the scope of the BRT project was conducted. Such environmental assessment included evaluation of a sustainable traffic environment and evaluation of pedestrian environmental quality.

The evaluation of a sustainable traffic environment employed several tools from the Healthy Development Measurement Tool (HDMT), developed by the San Francisco Department of Public Health (SFDPH), which has been used in a number of projects for evaluating land use plans.

The Pedestrian Environmental Quality Index (PEQI) was developed by SFDPH in 2008.

These 2 types of tools were translated and modified by Korean researchers to make them applicable in the BRT project, and actual research was carried out primarily by project officers of the Gangdong-gu Office.

[Figure 2-7] HIA procedures for the BRT project in Gangdong-gu



D. Results of the health impact assessment

First, according to existing research results (Gilbert et al., 2008), air pollution has decreased by over 40 percent since the BRT system was implemented, and BRT buses generate one third less air pollution than conventional buses. Reduced air pollution can result in positive health gains with reduced incidence of respiratory, cardiovascular or cerebrovascular diseases.

Second, the introduction of the BRT system generates less noise than conventional buses (Choi Gi-ju et al., 2007; Curri, 2006). Noise and vibration generate stress, and especially traffic noise is known to be associated with headache, hypertension, fatigue and dizziness.

Third, there are research studies indicating that traffic accidents drop if the public transport system is reorganized around the BRT system. In the case of Gandong-gu, however, it is possible that traffic accidents might increase in residential areas because vehicles making a U-turn are likely to use side streets in residential areas and passengers must cross a crosswalk to take a bus.

Fourth, use of public transport positively affects health as passengers walk or use bicycles to get to the public transport locations, thereby boosting physical activities. As the BRT system promotes use of public transport, health benefits from increased physical activity can be expected.

Fifth, the assessment of the BRT road sections using the HDMT found that while access to means of transportation was good, environment for using bicycles was not quite good.

〈Table 2-11〉 HDMT assessment result example for the BRT demonstration project in Gangdong-gu

Sustainable Transport	Yes	No	Insufficient Information	Not Relevant	Related Information
<i>Objective 1. Provision of choices for means of transportation that are affordable and accessible</i>					
[Transit facilities] Does this project contain strategies of significantly increasing movement via public transport by addressing the following?					
1) Does the project exist within 0.8km of transfer stations of the region? Or are shuttles linking to the region's transfer stations available in frequencies based on the estimated demand? Also, does the project exist within 0.4km of transfer stations?	○				
2) Does the project provide <u>sufficient lighting, shade and space</u> at all bus stations and does it provide more improved convenience at major stations?	○				
3) Do grounds near the ground transfer stations provide shade for commercial use, proper lighting (<u>convenience in surroundings of stations</u>) and <u>real-time bus arrival information</u> at regular intervals, and are they also open to the public during extended service hours?	○				
1) Does the project subsidize discounted transfer tickets for basic livelihood recipients? (<u>assistance in public transport cost for low-income families</u>)		○			
<i>Objective 2. Creation of a safe and high-quality pedestrian and bicycle-riding environment</i>					
[Bicycle-riding environment] Does the project contain strategies of significantly reducing bicycle accidents?					
1) Does the project include bike lanes or other roads linked to the existing bicycle network?	○				
2) Does the project include more than three interventions out of the following six interventions?					
- Bike lane wider than 1.5m	○				
- Bike lane signals		○			
- Bike lanes at crossroads marked in dotted line		○			
- Bike lanes in two lines (one on each side)		○			
- Prohibition of driveway cut or restriction to less than 4 per roadway section		○			
- Bike lanes that allow left turns		○			

Sustainable Transport	Yes	No	Insufficient Information	Not Relevant	Related Information
- Shared-lane marking, or sharrows (or bicycle signage painted on the paved surface)	○				
- Smooth surface of paved roads	○				
- Streetlight (sufficient for bicycle riders)	○				
- Roadside trees (traffic calming, improvement of bicycle-riding environment)	○				
Total number of items checked in each column	9	6	0	0	

Note: 'Yes' - The project clearly fulfills development objectives

'No' - The project does not fulfill development objectives, or development objectives were not discussed, or certain part of the project does not fulfill development objectives

'Insufficient Information' - Sufficient amount of information needed to evaluate fulfillment of development objectives by the project is not provided

※ Generally, this category is relevant when development plans and objectives were mentioned in the course of the project, but certain details regarding execution of the project were not provided.

※ This category is not relevant if the development objectives were not mentioned at all in the course of the project.

'Not Relevant' - The development objectives are not relevant, or the evaluated project has nothing to do with the development objectives

※ For example, while development objectives are pertaining to green industry, the evaluated project does not contain industrial development and is only related to residential objectives

'Related Information' - Describe briefly how and where the project explained its development objectives

- Describe briefly how public policies or measures can be improved in the course of planning or undertaking the project to achieve its development objectives

- If the categories above are not applicable, explain why

Sixth, the evaluation of the pedestrian environment using the PEQI found that both the Gi-dong Intersection and the Gangdong Sacred Heart Hospital Intersection generally provide favorable pedestrian environments.

<Table 2-12> PEQI assessment result example for the BRT demonstration project in Gangdong-gu

Crossroad 1	
Name of Crossroad: Gildong Intersection	Name of Main Road: Cheonho Boulevard
	Name of Secondary Road: Dunchonro

	1. Crosswalk	2. Ladder Crosswalk	3. Pedestrian Signals	
			With Numbers	Without Numbers
4-Way	<input type="radio"/>		<input type="radio"/>	
3-Way				
2-Way				
1-Way				
None				

7. No Right Turn Signal (number of signals)	0	<input type="radio"/>	3	
	1		4	
	2			

8. Crossroad Traffic Calming Technique*	0	<input type="radio"/>
	1-2	
	3-4	
	Over 5	

* Check relevant boxes

Bike Lane at Crossroad	Rotary
------------------------	--------

Kerb Extension	Semi-diverter
----------------	---------------

Mini-Circle	Speed bump
-------------	------------

Partial Closure	Speed bump table
-----------------	------------------


Pavement Handling	
-------------------	--

9. Additional Signals for Pedestrians	Yes	<input type="radio"/>
	No	

4. Crossroad Signal	Yes	<input type="radio"/>	
	No		
Crossing Time (second)			10

Length of Crossroad (m, main road)		70
5. Crossing Speed:	(xxm/second)	7m/s
6. Diagonal Crosswalk	Yes	
	No	<input type="radio"/>

Road	
Name of Road: Dunchonro	
Cross Cut Road #1:	Cross Cut Road #2:

Area:	Index:	Index Value:		Opinion:
Vehicular Traffic: 	10. Number of Lanes (excluding lanes for turning)	4+		
		3	<input type="radio"/>	
		2		
		1		
		0		



11. One-way Street	Yes		
	No	<input type="radio"/>	




12. Speed Limit Sign	Yes	<input type="radio"/>	
	No		
Speed Limit (km/hour)	30		
	40		
	50		
	60	<input type="radio"/>	
	70		
	80+		



13. Traffic Calming Technique	Yes		
	No	<input type="radio"/>	
Check relevant boxes			
Chican e		Rumble Strip (for speed reduction)	Speed Bump Table
Pavement Handling		Speed Bump	Median Strip (e.g., flowerbed)
		Speed Monitoring	

Note: From this section, record condition of the road for each direction. North or east=North/East, South or west=South/West

Area:	Index:	Index Value:	North / East	South / West	Remark:
Sidewalk: 	14. Width of Sidewalk	No sidewalk			Not: Actual width except kerb
		Less than 2m			
		2m-5m	<input type="radio"/>		
		5m or wider			



15. Pavement Condition of Sidewalk Surface	Serious			Note: Carrying strollers must not be a difficulty
	Partial			
	No	<input type="radio"/>		
	No sidewalk			



16. Width of Large Effective Road of Sidewalk (existence of obstacles to the sidewalk)	Yes, permanent			Note: Two passengers must be able to walk side by side on the entire sidewalk
	Yes, temporary			
	No	<input type="radio"/>		
	No sidewalk			



17. Kerb	Yes	<input type="radio"/>		
	No			



18. Disconnected Pedestrian Sections due to Vehicle Lanes	Record number of sections:			Note: Parking space is considered as 2 sections
	5 or more	<input type="radio"/>		
	Less than 5			
	No			



19. Trees:	Continuous	<input type="radio"/>		
	Intermittent			
	No			



20. Flowerpots/ Gardens	Yes	<input type="radio"/>		
	No			





21. Chairs/Benches	Yes			
	No	<input type="radio"/>		





22. Buffers	Bike Lanes (BL)			Note: Street cleaning limit is not considered as parallel parking
	Parallel parking with no parking time limit (PP)	<input type="radio"/>		
	Parallel parking with parking			


	time limit (TPP)			with time limit
	BL and PP			
	BL and TPP			


Land Use: 	23. Shopping Center:	3 or more	<input type="radio"/>		
		1~2			
		0			


	24. Public Art/Historical Venue	Yes			
		No	<input type="radio"/>		



Safety/Other 	25. Illegal Graffiti:	Yes			
		Almost none/No	<input type="radio"/>		

	26. Garbage:	Yes			
		Almost none/No	<input type="radio"/>		

	27. Street Lighting	Yes, public facilities (e.g., streetlight)	<input type="radio"/>		
		Yes, private facilities	<input type="radio"/>		
		No			

	28. Construction Site	Yes			
		No	<input type="radio"/>		

	29. Abandoned Building	Yes			
		No	<input type="radio"/>		

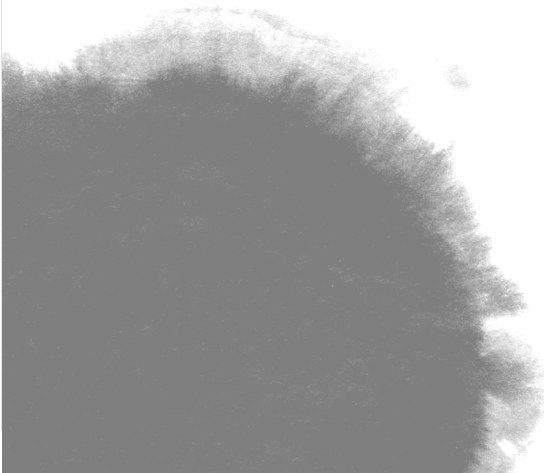
	One must be able to observe from one standing point.		Can be best evaluated while walking along the street.
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As the BRT project brings changes to the transit system, it is true that the project affects the traffic environment and pedestrian safety. The health impact assessment found that additional road maintenance is not required, but some improvements are needed in order to provide a better road environment for bicycle use, such as through installation of bike lanes.

Results of the BRT project undertaken by Gandong-gu are expected to affect other districts in making better BRT plans by providing them with information on which elements of public health should be particularly considered in the BRT project.

03

Conclusions



CHAPTER 3

Conclusions

Section 1 Health Impact Assessment in Healthy Cities

Promotion of health in local communities requires participation by players from a wide range of sectors and systematic political and administrative support, and the Healthy Cities project was created to test this in urban centers (Park et al., 2010). Healthy Cities have gained a substantial momentum in recent years as an integrated approach to addressing the new health issues brought about by social changes. Currently, more than 1,200 cities or villages in some 30 countries are participating in the Healthy Cities network, and 52 cities are conducting Healthy Cities projects in Korea. Following benefits can be expected by introducing health impact assessment in the course of implementing a healthy city (WHO Europe, 2005):

First, health impact assessment provides politicians and decision makers with a more comprehensive set of information that can be used as the basis for decision-making or determining priorities.

Second, once decisions are made, health impact assessment enables politicians to better respond to health problems.

Third, politicians and decision-makers are made aware of health as an important aspect of sustainable development.

Fourth, health impact assessment helps bring attention to the health and well-being of local residents.

Fifth, health impact assessment provides an opportunity to learn and advance the process of improving health in a wide range of sectors, not just in the health or health determinants sector.

Sixth, health impact assessment makes it possible to utilize resources before problems occur, not after problems occur.

Section 2 Achievements of Health Impact Assessment Demonstration Projects and Constraints

Health impact assessment demonstration projects has been conducted from 2009 on a wide range of fields, such as residential environment, sport facilities and park creation, transportation, and air pollution, rather than limited to just health. Outputs of these projects can be valuable information to be referenced by other local governments that intend to pursue similar policies.

Achievements gained from these demonstration projects are as follows:

First, the demonstration projects paved the way for local governments to develop the so called "healthy public policies" in which public health becomes the first consideration for policies or programs conducted at the local level like the Healthy Cities project.

Second, policy makers or project officers became aware of how important it was to consider health in the course of a project and to work together with other players in promoting health.

Third, the demonstration projects enabled residents to directly take part in the decision of policies or programs targeting them, creating a democratic consensus-forming process. Also, pre-assessment of health impact on all demographic groups contributed to achieving equity in health for all different demographic groups.

Fourth, health impact assessment in healthy cities and related research organizations contributed to spreading health impact assessment projects.

These achievements, however, came with several constraints which need to be addressed by steadily conducting projects going forward.

First, when a request for project proposals was issued, many applicants wanted to carry out projects that cannot be subject to health impact assessment. For instance, health impact assessment was often confused with public health project planning, and there were a few local authorities who requested for planning of health promotion projects for their residents or requested for evaluating effects of a project after it was executed. In quite a few instances, health impact assessment results could not be incorporated in planning at all because a project was already in fairly an advanced stage or a project plan was not even developed.

Second, a need for incorporating health impact assessment results in project planning can be raised. As the purpose of health impact assessment is to minimize health damage of a

project or policy by making use of its results from the stage of project or policy planning, assessment results may become useless if they are not reflected in planning. Therefore, health impact assessment of a project or policy must not be an end in itself; it must be used in convincing policy makers and project officers to make modifications and improvements on a plan.

Third, it is necessary to monitor health impact assessment results in the long term. Monitoring of health impact assessment involves checking from a longer-term perspective whether expected potential health impact has actually occurred, and to what extent the plan, modified in response to the expected health impact, has indeed prevented health damage. However, as health impact assessment itself is still in its demonstration stage, and as local governments such as Healthy Cities are not equipped with necessary capabilities or resources, undertaking such monitoring will be somewhat a limited effort for now.

Fourth, health impact assessment projects have not generated enough spillover effects because they have been undertaken mostly in metropolitan areas for the past two years. Therefore, it is necessary to consider selecting target regions or projects that have the potential of creating bigger spillover effects.

Health impact assessment in healthy cities defines health broadly and comprehensively to include physical, mental and social well-being, and takes into account various types of determinants of health, including social and physical environments of local communities. Among others, health impact assessment brings health and equity into the focus of

all policy, project or program considerations for all sectors including health. Therefore, it is necessary to institutionalize health impact assessment projects to ensure that these projects are conducted steadily and regularly to eventually enable the development of "healthy public policies" pursued by WHO. In institutionalizing the projects, careful deliberation by professionals in the academic and other circles, including the Ministry of Health & Welfare is required.



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