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BRIEF REPORT

Korea Community Health Survey Data Profiles

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Abstract

In 2008, Korea Centers for Disease Control and Prevention initiated the first nationwide survey, Korea Community Health Survey (KCHS), to provide data that could be used to plan, implement, monitor, and evaluate community health promotion and disease prevention programs. This community-based cross-sectional survey has been conducted by 253 community health centers, 35 community universities, and 1500 interviewers. The KCHS standardized questionnaire was developed jointly by the Korea Centers for Disease Control and Prevention staff, a working group of health indicators standardization subcommittee, and 16 metropolitan cities and provinces with 253 regional sites. The questionnaire covers a variety of topics related to health behaviors and prevention, which is used to assess the prevalence of personal health practices and behaviors related to the leading causes of disease, including smoking, alcohol use, drinking and driving, high blood pressure control, physical activity, weight control, quality of life (European Quality of Life-5 Dimensions, European Quality of Life-Visual Analogue Scale, Korean Instrumental Activities of Daily Living), medical service, accident, injury, etc. The KCHS was administered by trained interviewers, and the quality control of the KCHS was improved by the introduction of a computer-assisted personal interview in 2010. The KCHS data allow a direct comparison of the differences of health issues among provinces. Furthermore, the provinces can use these data for their own cost-effective health interventions to improve health promotion and disease prevention. For users and researchers throughout the world, microdata (in the form of SAS files) and analytic guidelines can be downloaded from the KCHS website (http://KCHS.cdc.go.kr/) in Korean.

1. Introduction

Owing to the different health levels among communities in Korea, there is a need to implement policies aimed at planning appropriate health services to satisfy residents' health requirements. In 1995, the Community Health Act was enacted to establish the appropriate health service plan for communities and to meet the residents' health requirements [1]. Because local governments are obliged to create their own health service plans, the

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demand for community-based health statistics has increased. Although local governments need their own community statistics to use the existing data such as death and health insurance statistics, they do not have any information available in the community [2,3]. Some local governments are researching the health level of residents on their own, however, survey indices and procedures are not standardized sufficiently to be comparable throughout communities or the nation. For this reason, the survey indices and procedures have not been usable as objective statistics comparable with national or other community surveys. Compared to national statistics, the survey items lack the knowledge and experience necessary to meet the demand of the communities. The Korea Community Health Survey (KCHS) is designed to establish the base for implementing well-grounded health services by producing community health statistics that establish and evaluate the community health care plan. In addition, it tries to integrate evaluation indices for the health services of local governments by standardizing survey indices and procedures comparable among communities. The KCHS was conducted by the survey performance team created in cooperation with 253 community health centers in cities, provinces, and universities within the communities. This was done to ensure a smooth survey process, improve the application of survey results, and strengthen community capability. A total of 35 universities (responsible universities) from all over the nation participated as community partners in conducting 4−14 surveys (average: 7) under the control of a community health center [4]. The Ministry of Health and Welfare and Korea Centers for Disease Control and Prevention (KCDC) standardized the survey methods, contents, and output indices to make the survey results comparable among communities [5]. In addition to this, they provided service performance guidance, technical support, and related data guidelines. The operating system consists of KCDC, 16 cities and provinces, and responsible universities (Figure 1). To give stable and professional services, it makes decisions on major issues ranging from planning to official announcement of results, thus providing a channel for spreading decisions. The technical committee aids in management in each particular area and provides the operating committee with advice on current issues. The advisory committee is organized temporarily when other matters need its attention. The management office was created in KCDC to support in conducting surveys and statistical analyses. The responsible universities carry out general activities such as surveys, field supervision, training of interviewers, and data analysis. To standardize community surveys, KCDC supports survey conduction and item guidelines, interviewer training material, and data analysis syntax.

2. Materials and methods

2.1. Sample design

Because the main purpose of the KCHS is to produce health statistics comparable to the city (Si), county (Gun), and district (Gu) levels, the target population is defined as adults aged $\geq$ 19 years and who live in the jurisdiction of one community health center. Note, however, that it is impossible to interview the entire population residing in the area during the survey. For this reason, considering the representability and
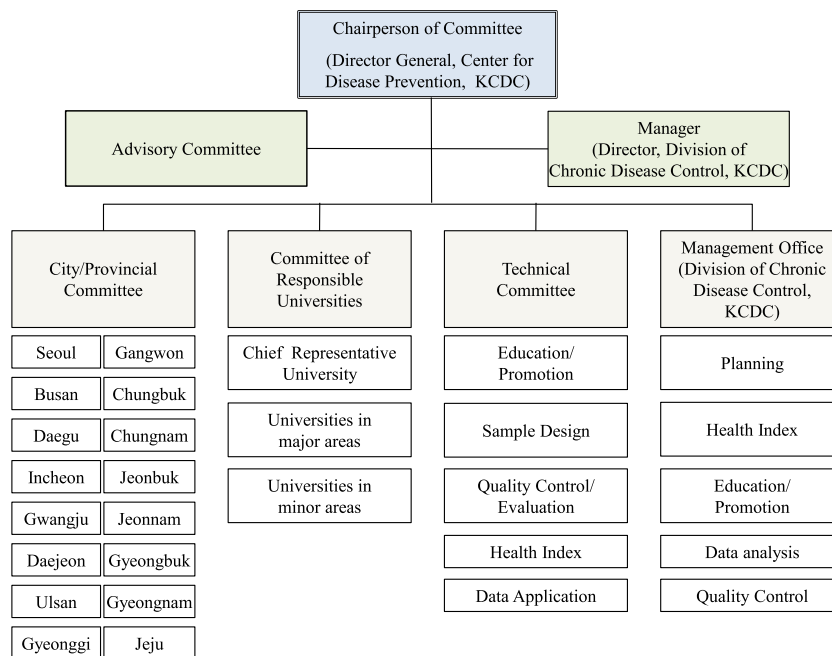
Figure 1. Korea Community Health Survey (KCHS) Conducting System. KCDC = Korea Centers for Disease Control and Prevention.

reliability of officially produced statistics, the surveyed population is limited to registered residents aged ≥ 19 years in the jurisdiction of the community health center. The registered population data are obtained from the Ministry of Public Administration and Security. Because the registration data are the latest available data and are representative of the current states, these are most suitable for the analysis of gender, age, and population structure as well as for the stratification and weighting of the surveyed population. Furthermore, the registration consists of Tong Ban/Lee (smallest administrative district units), and helps survey interviewers identify the location and conduct the survey right away. According to the stratification of the surveyed population, which shows the characteristics of the survey contents, the first stratum is Dong/Eup Myeon (small administrative units) where 253 community health centers are located across the country; the second one is made up of housing units (apartments and houses). The sample design seeks to produce accurate statistics with a small-scale sample survey, with the help of the stratification of the surveyed population. The sample size is selected so that the main health index in each community health center has $\pm 3\%$ desired sampling error with 95% confidence level [6].

2.2. Household selection

It was impossible to interview all residents aged ≥ 19 years in the area during the survey (surveyed population). Therefore, considering the feasibility and efficiency of the survey progress, Tong Ban/Lee was defined as the primary sampling unit, and households in the area were selected as the final sampling units.

Using the PROC SURVEYSELECT procedure of SAS (SAS, Inc., Cary, NC, USA), and based on the registered population, Tong Ban/Lee was selected as the primary sampling unit of housing types in Dong/Eup Myeon through probability proportionate sampling. Moreover, the features of its own weighting design were taken into consideration. After the number of households in the sampling point of Tong Ban/Lee was counted and the household list was completed, the survey households were sampled by systematic sampling. By contrast, the number of survey households was listed based on the number of adults per household in the Dong/Eup Myeon area where the sampling point is located [7].

2.3. Selection of participants

In the sampling point, five households on average were selected as samples, and all household members aged ≥ 19 years in the sample household were interviewed. In case there were no residents older than 19 years, the housing type was nonresidential, or the household members refused to take part in the survey or were absent, backup sample households were chosen as replacements (Figure 2).

2.4. Sample size

To ensure the same confidence level and accuracy of the main health index produced in 253 community health centers, within the available budget, a sample size of 900 people on average was decided in each community health center. Size management of the valid sample was performed by the time the survey progress reached 75% and 90%, with each community health center roughly calculating the estimated number of people who completed the survey. Based on this estimated number of people, the number of survey households in the target point was adjusted to 3−7, which changed according to the sampled survey households in the sampling point. At that time, the sampling method for the survey households was suggested to prevent bias in household selection.

2.5. Data processing
2.5.1. Weighting

For the sample survey data to be objective, they calculated the estimated figures after giving weighting factors based on the sample design structure. Weighting factors are classified as households or individuals for respective analysis. Household weighting (W_{hi}) reflected the household sampling rate, which considers the sampling process of sample design, suitability rate of survey

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$W_{hi} = \frac{M_{hi}}{n_{hi}} = \frac{e_{hi} \cdot N_{hi}}{n_{hi}}$

- N_{hi}: h Dong/Eup Myeon i number of households by housing type
- M_{hi}: h Dong/Eup Myeon i number of suitable households by housing type
- n_{hi}: h Dong/Eup Myeon i number of survey households by housing type
- e_{hi}: h Dong/Eup Myeon i suitability rate of survey households by housing type

$W'_{hijkl} = BF_d \cdot W_{hijkl}$

$BF_d = \frac{d(sex \cdot age) registered\ population\ number}{\sum_h \sum_i \sum_{jkl} W_{hijkl} I_{d \in sex \cdot age}}$

$W_{hijkl} = W_{hijk} \times \frac{P_{hijk}}{p_{hijk}}$

- P_{hijk}: number of household members aged ≥ 19 years
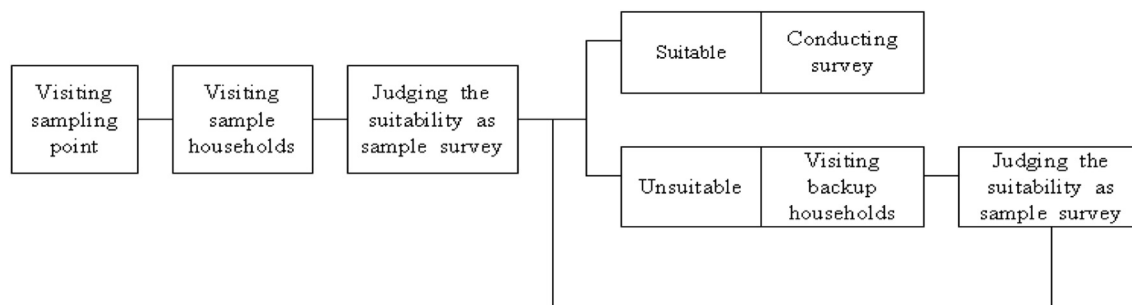- p_{hijk}: number of household members aged ≥ 19 years interviewed

Figure 2.   Replacing sample households.

households, and household rate by housing type. Individual weighting (W_{hijkl}) took personal response rate into account with the household weighting. Correction weighting (W'_{hijkl})—which is used for estimation—was produced after individual weighting was corrected by gender and registered population structure by age in each survey conducting area [8].

2.5.2. Nonresponse

Nonresponse is classified into two types: (1) the "entity nonresponse" wherein no questions are answered because survey participants do not participate; and (2) the "item nonresponse" wherein some of the questions are not answered. In the community health survey, nonresponse was not replaced but was excluded when calculating the index [9,10].

2.5.3. Standardization

The population structure by age—which affects the health index—differs depending on the survey area or time. This is why standardization is needed to compare one health index with others that were created in different areas and at different times. The major index was standardized by making the population rate by gender and age identical, so that the results of the KCHS were comparable in different communities [11].

2.6. Survey contents and methods

Survey items and output indices were determined by the operating committee after getting feedback from policy departments and local governments. After such determination, the survey items and output indices were finally set, based on the results of the demand aimed at the Ministry of Health and Welfare, cities, provinces, community health center, and trusted universities. Survey contents included health behavior, physical checkups, vaccinations, contraction of diseases, medical care, injuries, accidents, addiction, activity limitation, quality of life, visiting medical institutions, education, economic activity, and household survey (Table 1).

The health index and the number of questions for a community were decided by a variety of survey demands in each community. To improve the application of the produced index, a rotating survey system was introduced in 2010 [12]. The entire cycle of the rotating

❖ Survey form
  • Household survey (interviewing 1 household member)
  • Individual survey (interviewing all household members)
❖ Common survey in all administrative areas (Si·Gun·Gu)
❖ Rotating index consideration starting in 2010

Table 1.   Korea Community Health Survey Contents.

Category	Survey contents
Household survey	Household types, housing types, annual income
Health behavior	Health level, smoking, drinking, safety consciousness, exercise and physical activities, dietary life and nutrition, obesity and weight control, oral health, mental health
Vaccination and health checkup	Influenza vaccination, health checkup, cancer screening
Contraction of diseases	Experience of diagnosis of major diseases, disease care type
Medical care utilization	Using medical institutions and reason for non-treatment
Accidents and addiction	Experience and frequency of accidents and addiction
Activity limitation and quality of life	Number of activity limitation days, quality of life (EQ 5D, EQ-VAS)
Health and medical institution utilization	Using health and medical institutions or not and service using types
Education and economic activity	Occupation, civil status, education level

EQ-VAS = EuroQol Visual Scale; EQ-5D = EuroQol 5 Dimension.

Table 2. Application to the fifth community health and medical care plans (2011−2013) of KCHS.

Division	Subdivision	Community health survey index	2008	2009	2010	2011	2012	2013	Priority project of the community health and medical care plan
Health status and behavior	Smoking	Current smoking	✔	✔	✔	✔	✔	✔	Anti-smoking project
		Lifetime smoking	✔	—	—	—	—	—	
		attempt to quit smoking	✔	✔	✔	✔	✔	✔	
		Plan to quit smoking within 1 mo	✔	✔	✔	✔	✔	✔	
		Experience of anti-smoking campaign	✔	✔	✔	✔	✔	✔	
	Drinking	Lifetime drinking	✔	✔	✔	✔	✔	✔	Regional specialized health behavior improvement project
		High risk drinking	✔	✔	✔	✔	✔	✔	
	Physical activity	Over-moderate physical activity practice	✔	✔	✔	✔	✔	✔	Regional specialized health behavior improvement project
		Walking exercise practice	✔	✔	✔	✔	✔	✔	
	Obesity Control	Subjective obesity recognition	✔	✔	✔	✔	✔	✔	Regional specialized health behavior improvement project
		obesity population	✔	✔	✔	✔	✔	✔	
		attempt to control weight	✔	✔	✔	✔	✔		
	Oral health	Mastication trouble complaint (>65 y)	✔	✔	✔	✔	✔	✔	Oral health project
		Practice of toothbrushing after lunch	✔	✔	✔	✔	✔	✔	
	Mental health	Subjective stress recognition	✔	✔	✔	✔	✔	✔	Mental health project
		Experience of depression	✔	✔	✔	✔	✔	✔	
		Contemplating suicide	✔	✔	—	—	—	✔	
	Security consciousness	Wearing seatbelt while driving	✔	✔	✔	✔	✔	✔	—
		Wearing seatbelt when sitting on the front passenger seat	✔	✔	✔	✔	✔	✔	—
Diseases and injuries	Vaccination	Influenza vaccination	✔	✔	✔	✔	✔	✔	Infectious disease prevention project
	Non-infectious disease	Checkup (cancer screening)	✔	✔	✔	—	✔	—	Cancer control project
		Taking a health checkup	✔	✔	✔	—	✔	✔	Health checkup project
		High blood pressure prevalence *	✔	✔	✔	✔	✔	✔	Cardio/cerebrovascular disease prevention project
		Diabetes prevalence *	✔	✔	✔	✔	✔	✔	
		Stroke prevalence *	✔	✔	✔	✔	✔	✔	
		Angina prevalence *	✔	✔	✔	✔	✔	✔	
		Myocardial infarction prevalence *	✔	✔	✔	✔	✔	✔	
	Injuries	Accidents and intoxication incidence	✔	✔	✔	✔	✔	✔	—

KCHS = Korea Community Health Survey.
* Lifetime experience of diagnosis.

Figure 3. (A) Interview survey situation and (B) CAPI equipments. CAPI = computer-assisted personal interview.

Figure 4. Korea Community Health Survey Report (2013).

survey system was determined as a 4-year period according to the community health care plan, which is supposed to be established and evaluated every 4 years. Depending on the importance, frequency, application, and social interests of the survey questions, the survey index and items were proportioned to three types of cycles: every year, every 2 years, and every 4 years (Table 2).

The KCHS is conducted by a trained interviewer who visits the selected sample households and conducts one-on-one interviews with all adults aged ≥ 19 years using an indirect entry method. The interview takes approximately 20−30min/person (Figure 3). In July, community health centers and responsible universities mail the selected households survey selection letters along with brochures and promotional materials. This survey is conducted from September to November across the nation.

3. Use of results and reporting

At least 253 community health centers across the country utilize their own statistics to establish

community health and medical care plans. Local governments make use of the results of the KCHS to evaluate the current health services, decide the priority of health services, and make community health and medical care plans (Table 2). The KCHS is employed for evaluating and monitoring the effects of the existing community health center services based on objective data representing communities (Figure 4). Because different levels of health behavior and health care are recognized among communities, each community can make the most of the survey results to adjust the priority of health issues.

4. Conclusion

The KCHS is designed to establish the base for implementing well-grounded health services by producing community health statistics that establish and evaluate the community health care plan. In addition, it tries to integrate evaluation indices for the health services of local governments by standardizing survey indices and procedures comparable among communities.

KCDC will continue to work closely with community partners to ensure that the KCHS continues to provide data that are useful for public health research and practice, and for local health policy decisions. By collecting behavioral health risk data at the local level, the KCHS has become a powerful tool for targeting and building health promotion activities.

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgments

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