

23rd Population Census Conference

**Households Under the Minimum
Housing Standard**

By

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1. Introduction

The Population and Housing Census of Korea has been carried out on a quinquennial basis since 1925. The results have played an important role in national and sub-national policies and plans for socioeconomic development, research, and business purposes by providing valuable insight on the latest economic, social and demographic conditions and trends of Korean society. Statistically, the census provides a “base population” for the population projection for the whole country as well as for the provinces. It provides a “bench mark” and also functions as a sampling framework for sample surveys.

The results of the Population and Housing Census also have been used to measure the quality of dwelling conditions of households as well as quantity of housing in Korea. According to the census results, the housing shortage has decreased considerably due to government policies to promote housing construction. The Korean Government has concentrated its effort on housing supply rather than improvement of housing condition for several decades. As a result of the government’s policy to promote housing construction, housing supply ratio (housing stock / households in demand of housing) has gradually increased from 71.7% in 1985 to 105.9 in 2005. Therefore, the policy makers of Korea have moved their focus from providing more housing to improving housing conditions.

For the improvement of housing conditions, the Korean Government (Ministry of Construction and Transportation) introduced the minimum housing standard by revising the Housing Construction Promotion Act. The primary

objective of the minimum housing standard is to measure the quality of households and support the improvement of housing conditions of the households under the minimum housing standard. The minimum housing standard also embodies article 35 of the Constitution of the Republic of Korea that enacts the citizen's right to a healthy and agreeable environment and is a responsibility of the state to ensure comfortable housing for all of its citizens. This paper aims at making an analysis and finding out the determinants of the households under the minimum housing standard for the policy makers.

2. Enactment of the Minimum Housing Standard of Korea

The minimum housing standard means socially-desirable minimum standards for housing that guarantee the human rights of a healthy and safe environment. It also means the basic level that every household should attain to qualify as a healthy and safe dwelling. In 2003, the Ministry of Construction and Transportation revised the Housing Construction Promotion Act and prescribed the minimum standards of housing in Korea.

The minimum standards of housing were decided based on the following three fundamental rules and a sample survey which collected detail data to set up the minimum standards of housing.

- 1) Universal standards based on essential component of dwellings
- 2) Consideration of socio-economic conditions of Korea
- 3) Consideration of government budgets for the households under the minimum standards of housing

The minimum standard of housing in Korea consisted of four sections: bedroom standard, housing facilities standard, floor space standard, and environmental standard. The environmental standard prescribes the standards for street noise, odor, and air pollution. The environmental standard was not considered

in this paper as a criteria for measuring the minimum standards of housing because the data for environmental standard was unavailable.

The other three standards - bedroom, housing facilities, and floor space standard are as follows;

1) Bedroom standards

- o A married couple has a separate bedroom
- o Children who are 6 years old and over have a separate bedroom from the their parents
- o Two persons maximum per room
- o Boys and girls have a separate bedroom after age 8

2) Housing facilities standard

- o Kitchen: Each household has a modern style kitchen for private use
- o Bathroom: Each household has a flush toilet that is exclusively used by household members
- o Bathing facility: Each household has a hot and cold water bathing facility that is exclusively used by household members
- o Water supply: Each household has water supply facility that provides clean water

3) Floor space standard

- o Bedroom : 10.8 m² for main bedroom, 8.1 m² for twin room , 5.76 m² for single room
- o Kitchen : 2.4 m² for one person, 3.0 m² for 2~4 persons, 3.48 m² for 5 and more persons
- o Other space : 4.12 m² for one person, 6.49 m² for 2 persons, 6.49~9.2 m² for 3 persons, 9.2~11.92 m² for 4 persons,

10.53~13.24 m² for 5 persons, 13.24~15.10 m² for 6 persons,
 14.28~15.64 m² for 7 and more persons

3. Characteristics of Households under the Minimum Housing Standards

The selection of households under the minimum housing standards was carried out by applying the criteria of minimum housing standards to the 2000 and 2005 Population and Housing Census data. The total number of households under the minimum housing standards decreased to 1,911 thousand in 2005 from 3,312 thousand in 2000. Households under the minimum housing standards account for 12.0% of total households in 2005, down from 23.1% in 2000. Households under the housing facility standard, bedroom standard, and floor space standard account for 8.6 %, 0.6%, and 4.3% of total households in 2005 respectively.

In urban areas, the percentages of households under the floor space standard and bedroom standard are higher than those of rural areas due to the high population densities of urban areas, while in rural areas, the percentages of households under housing facility standard are 4.3 times bigger than those of urban areas. These results suggest that an assistance system should be applied according to the household characteristics under the minimum housing standards in urban and rural areas. Aid programs for rural areas should concentrate their resources on the households under housing facility standards, whereas in urban areas, aid programs should be distributed mainly to the households under the housing facility standards and floor space standards.

Table 1. Percentage of households under the minimum housing standards

	Total	Percentage under the minimum housing standards
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	Household	Total	Housing facility	Bedroom	Floor space	More than two standards
2005	15,887,128	12.0	8.6	0.6	4.3	1.5
Urban	12,744,940	9.2	5.2	0.7	4.9	1.6
Rural	3,142,188	23.5	22.1	0.3	2.2	1.1
2000	14,311,807	23.1	19.0	1.8	7.5	5.1
Urban	11,229,476	18.7	13.8	2.0	8.4	5.4
Rural	3,082,331	39.5	38.0	1.1	4.2	3.9

Analysis of the household head's age showed that teen-age and elderly household heads are dwelling in inferior housing conditions compared to other age groups. The elderly household heads marks the highest percentage and the teen-age household heads marks second highest percentages of under minimum housing standards by age group. Whereas the percentages of household heads aged in their 30's and 40's are lower than the other age groups.

Table 2. Percentage of households under the minimum housing standards by Household head age

Household head's age	2000 (%)	2005 (%)
Total	23.1	12.0
~19	49.0	21.7
20~29	23.6	11.4
30~39	15.1	6.6
40~49	19.2	9.5
50~59	23.1	11.3
60~64	30.3	14.4
65+	43.6	24.5

Table 3 indicates that housing conditions of residents residing in rental houses are worse than those of house owners. The percentages of rental houses under the minimum housing standards are 1.6 times higher than the percentages of owned houses. The rental house percentages are 9.9 times and 6.6 times higher concerning a lack of bedroom and floor space standards than those of owned houses respectively. The dwelling conditions of renters are weak in respect to the number of bedrooms and floor space. However, the percentages of rental households that are under the housing facility standards are lower than the percentage of owned house.

Table 3. Percentage of households under the minimum housing standards by type of occupancy

Type of occupancy	Total Household	Percentage under minimum housing standards				
		Total	Housing facility	Bedroom	Floor space	More than two standards
2005	15,887,128	12.0	8.6	0.7	4.3	1.5
Own house	8,828,100	9.5	8.4	0.1	1.3	0.3
Rent	6,568,615	14.9	8.2	1.3	8.4	3.0

According to household types, most family households have enjoyed good housing quality. Only 9.5% of family households are under the minimum housing standards. Among one-person households and households with no blood-ties, 21.2% and 22.0 % of the households are under the minimum housing standards respectively.

Table 4. Percentage of households under the minimum housing standards by type of household

2005	Type of household
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	Total	Family	Family+Non family	One-person	Non-family
Household (%)	12.0	9.5	12.1	21.2	22.0

Table 5 shows that most of old housings were in worse conditions in respect to the housing facility standards because they were not equipped with modern style housing facilities that have been requested as a part of minimum housing standards. More than half of the houses constructed before 1960 are under the minimum housing standards. However, among the houses built in recent years, the percentages of households under the floor space standard are higher than those of under the housing facility due to increase of population densities and rapid improvement in housing facilities.

Table 5. Percentage of households under the minimum housing standards by year of construction

Year of Construction	Percentage under the minimum housing standards				
	Total	Housing facility	Bedroom	Floor space	More than two standards
Total	12.03	8.55	0.65	4.34	1.51
2000~2005	4.09	1.55	0.73	2.42	0.61
1995~1999	4.97	2.46	0.49	2.56	0.54
1990~1994	7.76	3.32	0.51	4.74	0.81
1985~1989	12.49	8.02	0.73	5.62	1.89
1980~1984	17.08	13.09	0.80	5.76	2.57
1970~1979	30.72	26.26	0.89	7.97	4.41
1960~1969	52.20	48.28	1.00	9.14	6.21
Before 1959	63.64	61.37	0.72	7.10	5.54

4. Determinants of Households under the Minimum Housing Standards

The determinants of households under the minimum housing standards were investigated in this study. The data for this study came from the long form file of the 2005 Population and Housing Census of Korea. Households under the minimum housing standard are the dependent variable in this study. It is measured by applying the minimum housing standards to the long form data of the Korean census. The dependent variable (household under minimum housing standards) is a dichotomous variable that categorizes data into two groups as households under the minimum housing standard and households over the minimum housing standard. Logistic regression analysis is used to model dichotomous outcomes (households under minimum housing standard) of this study.

For independent variables of the logistic regression analysis model, four variables including household head's age, household head's educational attainment, gender of the household head, and year of construction are applied. Those four independent variables are census items that could be assumed as variables affecting the dependent variable. The model of this study was constructed as follows:

$$\text{logit}(Px) = \ln[Px/(1-Px)] = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4;$$

Where is Px = Probability of household under minimum housing standards

x_1 = gender of the household head,

x_2 = age of household head,

x_3 = educational attainment of household head,

x_4 = year of housing construction

Table 6. Results of analysis of maximum likelihood estimates

Parameter	DF	Estimate	Standard Error	Odd ratio	Pr > chisq
Intercept	1	-2.3039	0.0212	-	0.0001
Gender of the household head	1	0.0546	0.00314	1.115	0.0001
Age of household head	1	-0.0121	0.00023	0.988	0.0001
Educational attainment of household head	1	-0.4345	0.00237	0.648	0.0001

Year of housing construction	1	0.3723	0.00124	4.451	0.0001
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The logistic regression analysis results showed that all independent variables had statistically significant effects on the dependent variable. The variables of gender of the household head and year of housing construction had a positive effect on the probability of household under minimum housing standards. Oppositely, the age and educational attainment of household head variables had a negative effect on the probability of household under minimum housing standards.

Therefore, as a household head increases in age or attains higher levels of education, the household has less of a probability of being under minimum housing standards. Additionally, if a household head is female or the year of construction is dated, the household has more of a probability of being under the minimum housing standards. The odd ratio estimates indicates that a female household head has 1.12 times more probability than those of male households of under the minimum housing standards.

5. Conclusion: Summary and Discussion

The minimum housing standards of Korea were introduced in 2003 to measure the quality of households and support the improvement of the conditions of households under the minimum housing standard. In this paper, the characteristics of households under the minimum housing standards are studied using descriptive analysis. The descriptive analysis method indicated that households under the minimum housing standard possess different characteristics according to region (urban/rural), household head's age, type of occupancy, type of household, and year of housing construction. Therefore, the government's aid programs should be distributed according to the various characteristics of households under the minimum housing standards.

The analysis of the logistics regression model indicated that positive effects

of the gender of the household head and year of housing construction, and negative effects of the age and education of household head on the probability of household under minimum housing standards. This result also provides valuable information to policy makers for the improvement of dwelling conditions.

In this study, a general and brief analysis was conducted to identify the characteristics of households under the minimum housing standard using the Population and Housing Census results. In-depth and academic studies are recommended in the future to measure the quality of housing conditions in Korea.