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Housing health and satisfaction in log-frame houses

Report based on ALTTI survey

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**Housing health and satisfaction
in log-frame houses**
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NATIONAL INSTITUTE
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Preface

This study was commissioned as part of a project to construct a whole block of log-frame houses in the town of Pudasjärvi. The project will culminate in the construction of around 16 log-framed buildings forming a new residential area, named Karhukunnas.

The EU goals for energy efficiency in buildings pose new challenges for the log-house industry. Log-frame houses account for some 10 per cent of all new detached houses in Finland, while in Europe their share is very small.

The Pudasjärvi log-house project was launched in 2008 with the aim of collecting research-based data on the ecology of log-frame houses. Another goal was to conduct a preliminary study on the health and well-being of people who live in log-frame houses. This study realised the latter goal.

The aim was to find out whether there are any links between the main frame material of dwellings and the housing health and satisfaction of dwellers. The study used the ALTTI housing health and safety database of the National Institute for Health and Welfare (THL), which was found suitable for the purposes of the project. The study was coordinated by Matti Alasaarela, ecology expert, on behalf of the project and by Eino Hekali, head of technical group, on behalf of Hirsiteollisuus, an association for the log-house industry. It received funding from the European Regional Development Fund (ERDF) through the Regional Council of Oulu as well as from the town of Pudasjärvi and the business partners in the project.

The study was conducted by a THL research team of Housing and HealthyBuildings. The work was carried out by Mira Anttila, Trainee, and Maria Pekkonen, Researcher, and supervised by Ulla Haverinen-Shaughnessy, Senior Researcher. The report was translated into English by Henna Eronen. Also other members of the research team took part in the data collection. The data are based on a 2011 survey on housing health and safety in Finland (ALTTI2011). The survey was part of a project under the National Suburban Development Programme. The project was funded by THL and the Housing Finance and Development Centre of Finland (ARA).

Authors

Abstract

Mira Anttila, Maria Pekkonen ja Ulla Haverinen-Shaughnessy. Translation: Henna Eronen. Housing health and satisfaction in log-frame houses. Report based on Altti survey. National Institute for Health and Welfare (THL). Report 66/2012. 70 pages. Helsinki, Finland 2012. ISBN 978-952-245-763-9 (pdf)

Data collected through random sampling by THL for the 2011 survey on housing health and safety in Finland (ALTTI2011) were used in the study. The data were divided into three groups on the basis of construction type (log-frame, light-frame, masonry/concrete), and these were analysed in relation to housing health and housing satisfaction. The analysis showed that people who live in log-frame houses were four times more likely to be satisfied with indoor air quality compared to people who live in light-frame houses and six times more likely compared to people who live in masonry/concrete houses. Moreover, both satisfaction with dwelling and general health were better among people who live in log-frame houses compared to the other respondent groups, although these differences were not statistically significant. A probable cause for the lack of statistical significance is the small number of log-frame houses in the sample. Also, the log-frame houses included in the sample differed from the other types of construction with regard to dwelling age and location, which must be taken into account when the results are interpreted. Another factor to be considered is the relatively small number of log-frame houses in the sample. On the basis of the study results, it is recommended that factors affecting housing health and housing satisfaction in log-frame houses are further examined.

Keywords: housing health, construction type, satisfaction with indoor air quality

Tiivistelmä

Mira Anttila, Maria Pekkonen ja Ulla Haverinen-Shaughnessy. Käännös: Henna Eronen. Housing health and satisfaction in log-frame houses. Report based on Altti survey [Asumisterveys ja -tyytyväisyys hirsitaloissa. Altti-tutkimukseen perustuva selvitys]. Terveyden ja hyvinvoinnin laitos (THL). Raportti 66/2012. 92 sivua. Helsinki 2012.
ISBN 978-952-245-763-9 (pdf)

Tutkimuksessa käytettiin THL:n vuonna 2011 keräämää satunnaisotantaan perustuvaa kyselytutkimusaineistoa asumisterveydestä ja turvallisuudesta Suomessa (ALTTI2011). Aineisto jaettiin päärakennemateriaalin mukaan kolmeen ryhmään (hirsi, puu, kivi), joita analysoitiin suhteessa asumisterveyteen ja -tyytyväisyyteen. Analyysien perusteella hirsitaloasukkaat olivat neljä kertaa todennäköisemmin tyytyväisiä sisäilman laatuun verrattuna puutaloissa asuviin vastaajiin ja kuusi kertaa todennäköisemmin tyytyväisiä verrattuna kivitaloissa asuviin vastaajin. Lisäksi hirsitaloasukkaiden tyytyväisyys asuntoonsa sekä yleinen terveydentila oli parempi kuin muissa vastaajaryhmissä, vaikka erot eivät olleetkaan tilastollisesti merkitseviä. Tilastollisen merkitsevyyden puuttuminen todennäköisesti johtuu hirsitalojen pienestä määrästä. Aineistossa olevien hirsitalojen ikä ja asuinsijainti poikkesivat muista materiaalityypeistä, mikä täytyy ottaa huomioon tulosten tulkinnassa, samoin kuin hirsitalojen suhteellisen pieni määrä. Tämän tutkimuksen tulosten perusteella suositellaan jatkotutkimusta, jossa paneudutaan tarkemmin niihin tekijöihin, jotka vaikuttavat asumisterveyteen ja -tyytyväisyyteen hirsitaloissa.

Avainsanat: asumisterveys, rakennemateriaali, sisäilmanlaatuun tyytyväisyys

Sammandrag

Mira Anttila, Maria Pekkonen ja Ulla Haverinen-Shaughnessy. Översättning: Henna Eronen. Housing health and satisfaction in log-frame houses. Report based on Altti survey [Boendehälsa och -belåtenhet bland invånare i timmerhus. Utredning baserad på undersökningen Altti]. Institutet för hälsa och välfärd (THL). Rapport 66/2012. 92 sidor. Helsingfors, Finland 2012. ISBN 978-952-245-763-9 (pdf)

Utredningen baserar sig på enkätmaterial om boendehälsan och tryggheten i Finland. Materialet, som är ett slumpsample, samlades in av THL år 2011 inom ramen för projektet ALTTI2011. Enkätmaterialet delades in i tre grupper enligt bostadens huvudsakliga byggnadsmaterial (timmer, trä, sten). Grupperna analyserades med avseende på boendehälsan och -belåtenheten. Enligt analysen är invånare i timmerhus med fyra gånger större sannolikhet nöjda med inomhusluften än invånare i trähus. Sannolikheten är sex gånger större än bland invånare i stenhushus. Invånarna i timmerhus var nöjdare med sina bostäder och hade bättre allmän hälsa än invånarna i de övriga grupperna, men skillnaderna var inte statistiskt signifikanta. Bristen på statistisk signifikans beror sannolikt på det ringa antalet timmerhus. Timmerhusens ålder och läge avvek från husen i de övriga materialgrupperna, vilket bör beaktas vid resultattolkningen. Detsamma gäller timmerhusens relativt sett ringa antal. På basis av utredningsresultaten rekommenderas fortsatta undersökningar gällande de faktorer som inverkar på boendehälsan och -belåtenheten bland invånarna i timmerhus.

Nyckelord: boendehälsa, byggnadsmaterial, belåtenhet med inomhusluften

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1 Introduction

The data was based on a 2011 survey on housing health and safety in Finland (ALTTI2011) funded by THL and The Housing Finance and Development Centre of Finland. Data were collected by random sampling from a total of 3 000 household-dwelling units. The survey was also sent to persons who responded to the ALTTI survey in 2007 (Turunen et al. 2008). The study also used data received from the Population Register Centre (PRC) regarding the respondents' dwellings. As a result, it is possible to break down the respondents by construction type (wood frame (incl. light-frame and log-frame) and masonry/concrete). The survey itself provided data, submitted by the respondents, on the most common interior surface materials, log-frame among them. These variables can be examined in relation to common variables describing housing health and housing satisfaction.

The objective was to find out whether there are any differences in the health and housing satisfaction of people who live in log-frame houses compared to people who live in light-frame houses or masonry/concrete houses. The preliminary results will be of use in assessing the need for further studies as well as in developing a more accurate research plan for examining the possible health effects of log-frame houses. Only respondents who live in detached and semi-detached houses were included in the study.

2 Data

The data consisted of 939 observational units of which 38 reported log-frame house as their type of dwelling. One of the log-frame houses was a semi-detached house and one a terraced house. Of the 939 respondents, 358 had already responded to the ALTTI2007 survey and 581 took part in the survey for the first time. The total response rate was 44 per cent for ALTTI2007 and 30 per cent for ALTTI2011. The survey included 91 questions relating to respondents' background, dwelling location, dwelling, hygiene, physical and biological conditions, chemical impurities as well as health and safety (Appendix 1: Questionnaire).

Of the variables received from PRC (Appendix 2: Appendix tables 1, 2 and 3), the variables 'construction type' and 'dwelling age' were used in the analysis. PRC also supplied data on heating, house drainage, water supply, warm water supply, air conditioning, respondent's age, gender and marital status as well as type of occupancy. The analysis, however, used the data submitted by the respondents instead.

2.1 Data analysis

A comparison of background variables for detached, semi-detached and terraced houses by cross tabulation led to the elimination of persons who live in terraced houses: they differed from the rest of the data on the basis of, for example, gender, marital status and type of occupancy. Divorced persons (11%) and tenants (16%) were more common among terraced-house dwellers. Especially tenant-occupancy can skew the results as tenants accounted for less than 7 per cent of people who live in detached and semi-detached houses.

On the other hand, women were over-represented (62%) in semi-detached houses. Moreover, only one log-frame house was semi-detached. Semi-detached houses were, however, kept in the data since there were no significant differences in other background variables compared to detached houses. After elimination, the data consisted of 736 observational units, of which 37 (5%) were log-frame houses.

The observational units were divided into groups by construction type (log-frame, light-frame and masonry/concrete) in accordance with the building data submitted by PRC and the data on interior surface material (log-frame exposed) submitted by respondents. The survey data included 609 wood-frame houses

and 83 masonry/concrete houses. Seven observational units were eliminated from the analysis since the construction type could not be identified.

3 Preliminary results

3.1 Preliminary analyses

The data were examined by using the SPSS, SAS and Microsoft Excel software. Cross tabulation was used to analyse the relation between construction type (log-frame, light-frame and masonry/concrete) and a set of categorical variables (location, dwelling, pests, indoor air quality, heating, dampness, chemical impurities, and health). If any differences were detected between the variables in relation to construction type, a chi-squared test was conducted to test the correlation between two variables.

In a chi-squared test, observed frequencies are compared to expected frequencies. Expected frequencies are frequencies that are predicted on the assumption that the variables under comparison are independent. The chi-squared test is less reliable if the expected frequencies are low, i.e., if the number of observational units in a category is not sufficiently high. Categories were combined, where possible, to avoid this. A t-test based on a normal distribution assumption was conducted on continuous variables to see if there was any difference between two distributions. The p-value of 0.05 was selected as the level of statistical significance.

In statistical testing, the so-called null hypothesis (initial hypothesis) assumes that there are no differences between the variables under comparison, i.e., they originate from the same distribution. The level of statistical significance, the p-value, shows the probability of obtaining the test statistics, assuming that the null hypothesis is true. For example, if a comparison of the distributions of two variables gives a p-value of 0.05, there is a 5 per cent probability to obtain the test statistics, assuming that the null hypothesis is true, i.e., that there are no differences between the two variables. As a rough generalisation, there is a 5 per cent probability that the observed difference is a coincidence. Commonly, p-values below 0.05 indicate that there are statistically significant differences between the variables under comparison.

The relatively small number of log-frame houses in the data means that not all differences show as statistically significant. In consequence, also differences that are great in percentage terms have been taken into account as approximate results.

3.2 Data submitted by respondents

There were no differences in age, income, dwelling duration, gender, marital status, level of education, occupation or costs of living between persons who live in log-frame houses (1), light-frame houses (2), and masonry/concrete houses (3). The data were evenly distributed between men and women (Table 1). The age distribution (Figure 1) was focused on older respondents; one reason for this is that the data consisted of detached and semi-detached houses, which are mainly owner-occupied.

Table 1. Gender ratio by respondent groups

Gender	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Female	20	54.0	308	50.6	41	49.4	0.894
Male	17	46.0	301	49.4	42	50.6	

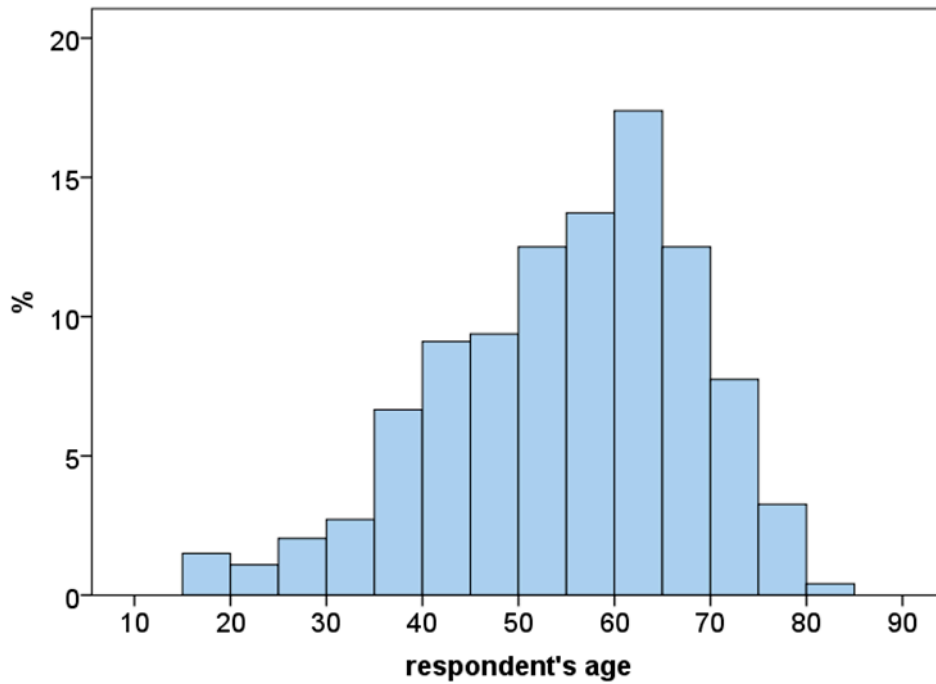


Figure 1. Age distribution of respondents

3.3 PRC data on dwellings

Nearly all the dwellings in the data had the same type of occupancy irrespective of respondent group; around 80 per cent of the dwellings were owner occupied, which is explained by the focus on detached and semi-detached houses. The background variables 'heating' and 'dwelling age' showed differences between respondent groups. Stove heating was the most common form of heating in log-frame houses, while light-frame and masonry/concrete houses had usually hot-water heating. There was a statistically significant difference in the age of dwellings; log-frame houses being usually older than light-frame or masonry/concrete houses (Table 2). The mean age for log-frame houses was 12 years higher than the mean age (37 years) for all the houses in the data (Figure 2).

Table 2. Dwelling age distribution by respondent group

	Log-frame	Light-frame	Masonry/concrete	
	N; mean (min - max)	N; mean (min - max)	N; mean (min - max)	p-value
Dwelling age	34; 49 (3-112)	597; 36 (1-211)	81; 33 (0-75)	0.004

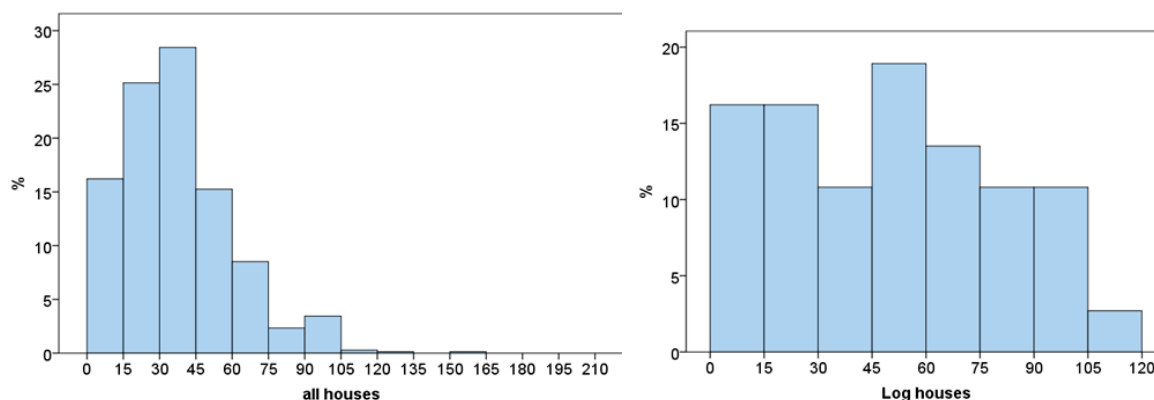


Figure 2. Dwelling age distribution for all the houses (on the left) and for the log-frame houses (on the right)

Lack of drainage, water supply, warm water supply and air conditioning was more common in log-frame houses than the other types of houses, which may be due to the higher age of log-frame houses and their location. It should be noted, however, that the data received from PRC date back to the time of construction and that alterations and renovations to the houses have not always been updated to the database. Consequently, the PRC data are not up-to-date on all accounts and, therefore, not entirely reliable. However, the PRC data on dwelling age can be considered reliable. The analysis uses, thus, mostly data submitted by the respondents; only the data on construction type and dwelling age originate from PRC.

3.4 Dwelling data submitted by respondents

Also the respondents reported owner occupancy as the most common type of occupancy. Owner occupancy accounted for around 90 per cent in each respondent group, which is a higher rate than in the PRC data. The primary mode of heating in log-frame houses was fireplace, in light-frame houses electricity, and in masonry/concrete houses electricity or district heating. In contrast to the PRC data, warm water supply existed in nearly all the houses. One log-frame house and ten light-frame houses were reported to have no warm water supply. Also, in contrast to the PRC data, mechanical exhaust and/or supply ventilation was installed in around 40 per cent of houses in all groups.

An air purifier was found in at least 14 per cent of all light-frame and masonry/concrete houses, but only in one log-frame house (Table 3). Although the differences are not statistically significant, the lack of air purifiers in log-frame houses may indicate that the dwellers feel that their houses have good indoor air quality. It is, however, possible that some of the respondents counted mechanical-ventilation filters as air purifiers. As filters are fixed to the type of ventilation, they do not signify a need for an air purifier. The fact that light-frame and masonry/concrete houses are generally younger than log-frame houses supports this assumption: mechanical supply and exhaust ventilation is more common in younger dwellings.

Some 77 per cent of people who live in log-frame houses and 47 per cent of people who live in masonry/concrete houses were satisfied with the renovations made to their house. The difference was statistically significant (Table 3). The most common interior surface material in log-frame houses was lacquered wood or panel (38%). Plasterboard with wallpaper was the most common material in light-frame houses (59%) and painted brick or concrete in masonry/concrete houses (79%). The differences are presented in Figure 3, where interior surface materials are broken down by respondent group. Each respondent could choose the three most common materials.

Table 3. Prevalence of air purifiers and satisfaction with renovations

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Air purifier	1	2.7	82	13.5	10	12.1	0.160
Satisfaction with renovations							
Satisfied	23	76.7	341	64.7	33	47.1	0.005
Other*	7	23.3	186	35.3	37	52.9	

*other = fairly satisfied, fairly dissatisfied and dissatisfied

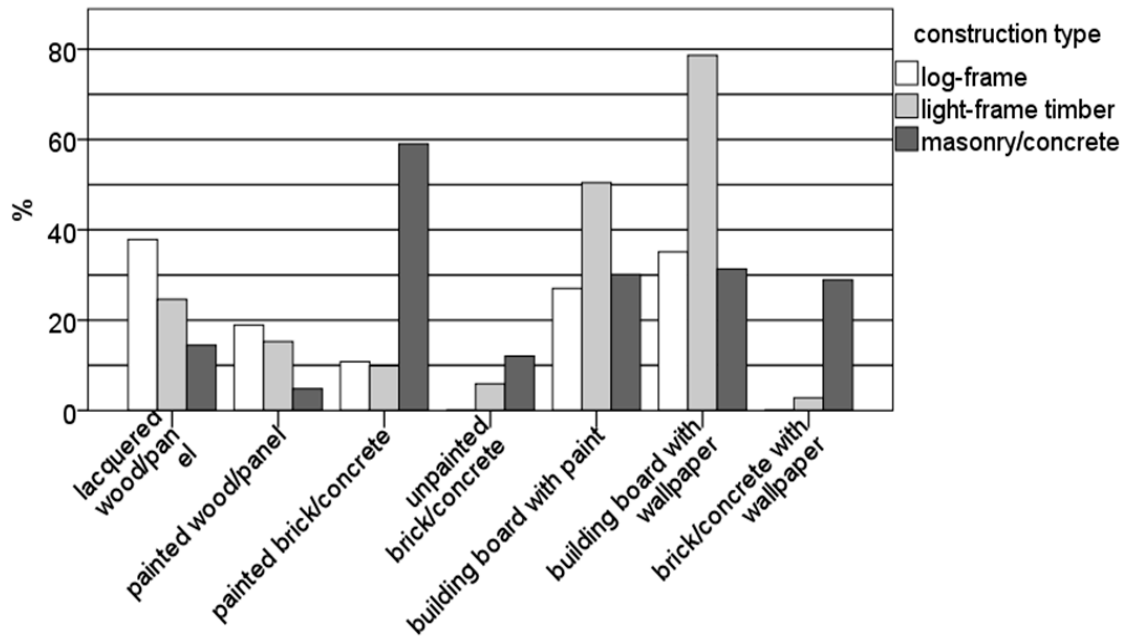


Figure 3. Interior surface materials

The differences between flooring materials were not as clear as with interior wall materials. Wood or parquet was the most common flooring material in living areas, especially in log-frame houses (Figure 4). The survey question enquired after the three most common types of material and, therefore, the responses may also include, for example, the flooring material in bathrooms. In consequence, plastic carpet / PVC as flooring material is possible even in log-frame houses.

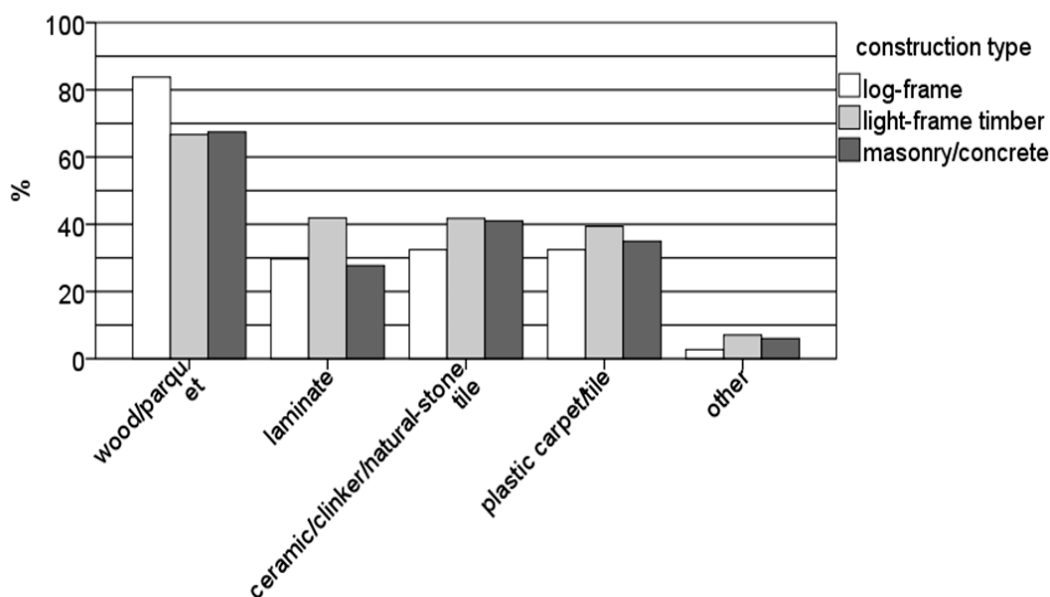


Figure 4. Flooring material

3.5 Location

There were differences in the location of dwellings among the respondent groups. Most log-frame houses were in semi-urban areas or rural areas, while most light-frame and masonry/concrete houses were situated in town centres, suburbs or fringe areas. The differences between groups were statistically significant (Table 4).

Table 4. Distribution of respondents by location

Location	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Town centre, suburb or fringe area	11	29.7	311	51.1	54	65.1	0.001
Semi-urban or rural area	26	70.3	298	48.9	29	34.9	

Farm living was significantly more common among people who live in log-frame houses (49%) than among people who live in light-frame houses (14%) and masonry/concrete houses (6%) (Table 5).

Table 5. Distribution of respondents by living on farm

Farm	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
No	20	54.1	514	84.4	76	91.6	<0.0001
Yes, land cultivated	4	10.8	23	3.8	4	4.8	0.116
Yes, livestock	1	2.7	11	1.8	0	0.0	0.419
Yes, pets	2	5.4	4	0.7	0	0.0	0.005
Yes, no active land cultivation, no animals	11	29.7	45	7.4	1	1.2	<0.0001

The effect of farms may also show in the prevalence of pets and pests. Cats or dogs, both indoors and outdoors, were more common in log-frame houses than the other types of houses. People who live in log-frame houses had also seen more often signs of rodents around the yard (Table 6).

Table 6. Prevalence of domestic animals and pests by respondent group

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Do you have dogs, cats, guinea pigs etc.?							
No	11	29.7	345	56.7	57	68.7	<0.0001
Yes, indoors	20	54.0	228	37.4	20	24.1	0.005
Yes, but not indoors	6	16.2	25	4.1	3	3.6	0.003
Have you seen any signs of rodents?							
No	17	46.0	353	58.0	55	66.3	0.105
Yes, indoors	8	21.6	65	10.7	8	9.6	0.109
Yes, outdoors	17	46.0	205	33.7	17	20.5	0.012

3.6 Dwelling conditions and satisfaction

People who live in log-frame houses were more satisfied with their present dwelling than the other respondent groups: the differences were definite in percentage terms and nearly significant in statistical terms. There was a statistically significant difference in satisfaction with indoor air quality. People who live in log-frame houses were more satisfied with indoor-air quality than the other groups. (Table 7) The prevalence of satisfaction is also presented in Figures 5 and 6.

Table 7. Satisfaction with dwelling and indoor air quality by respondent group

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Satisfaction with dwelling							
Satisfied	28	80.0	409	68.0	46	57.7	0.096
Other*	7	20.0	192	32.0	31	40.3	
Satisfaction with indoor air quality							
Satisfied	30	81.1	338	55.9	407	56.3	0.003
Other*	7	18.9	267	44.1	316	43.7	

*fairly satisfied, fairly dissatisfied and dissatisfied

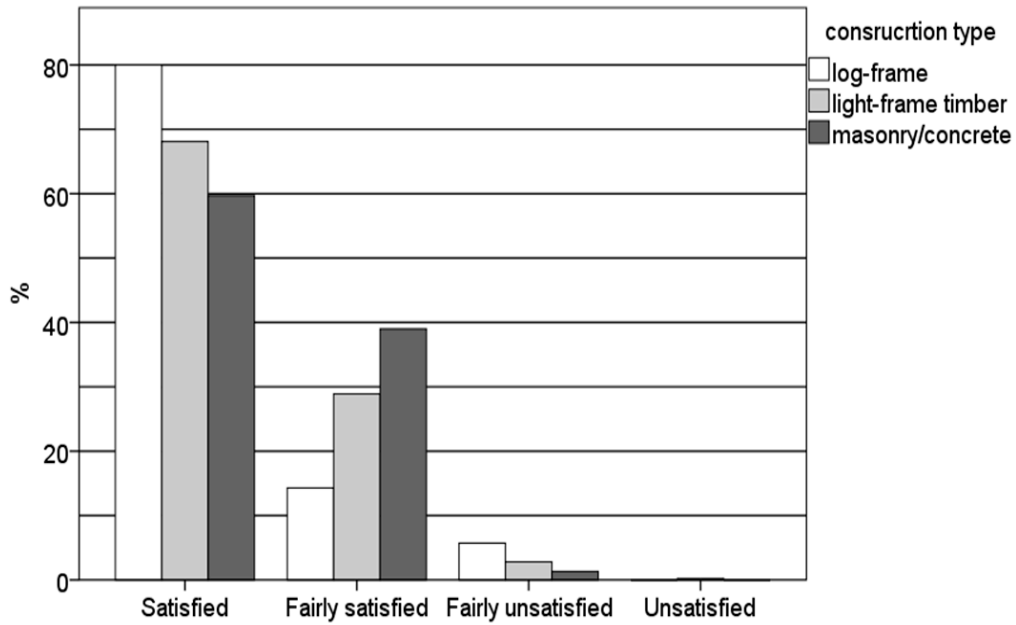


Figure 5. Satisfaction with dwelling by respondent group (non-standardised results)

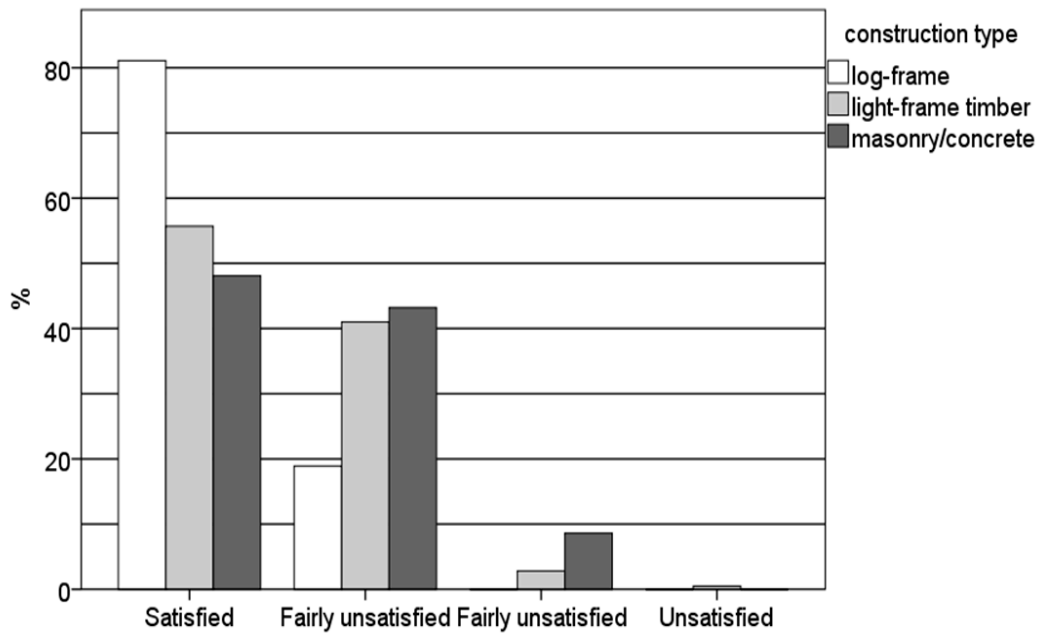


Figure 6. Satisfaction with indoor air quality by respondent group (non-standardised results)

No statistical differences were found concerning the mode of ventilation, although 'natural ventilation' or 'no ventilation' was more common in log-frame houses than in masonry/concrete houses in particular. However, there was a link between ventilation and dwelling age.

Only 35 per cent of log-frame houses had bedroom trickle vents, while the same figure was 59 for light-frame houses and 64 for masonry/concrete houses. The difference was statistically significant. However, trickle vents do not necessarily indicate good indoor air quality. Outdoor impurities can get indoors through, for example, trickle vents without filters.

There were statistically significant differences in the experience of indoor temperature. People who live in masonry/concrete houses and log-frame houses reported agreeable indoor temperature during summer more often than people who live in light-frame houses. People who live in log-frame houses reported draughtiness during winter more often than the other groups. (Table 8) However, not one log-frame house was reported to be either too cold or too warm during winter. Dwelling age had some impact on the level of draught. Houses aged over 50 years had significantly higher levels of draught than younger houses. On the other hand, there seemed to be no link between draught and the type of glazing (double, triple or quadruple).

Table 8. Experience of indoor temperature by respondent group

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Experience of temperature							
Agreeable temperature in summer	30	81.1	440	72.2	70	84.3	0.038
Draught in winter	4	10.8	20	3.3	5	6.1	0.045

Problems with natural light as indoor lighting were more common in log-frame houses than the other types of houses. Some 19 per cent of people who live in log-frame houses reported problems with indoor lighting; the same figure being five for light-frame houses and ten for masonry/concrete houses. The difference was statistically significant.

Noise nuisance was around 20 per cent less common in log-frame houses than in light-frame and masonry/concrete houses (Table 9). Especially courtyard noise was more often considered a problem in masonry/concrete and light-frame houses than in log-frame houses. The location of log-frame houses may account for the low level of noise nuisance, since most log-frame houses are located in semi-urban or rural areas (see Chapter 4.3).

Table 9. Noise nuisance by respondent group

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Noise from road/street traffic							
No noise nuisance	27	81.8	368	63.6	47	62.7	0.098
Noise nuisance	6	18.2	211	36.4	28	37.3	
Courtyard noise							
No noise nuisance	31	96.9	421	78.3	50	69.4	0.008
Noise nuisance	1	3.1	117	21.8	22	30.6	

Elevated levels of radon were less common in log-frame houses. Some 62 per cent of people who live in log-frame houses reported that radon levels were not elevated in their houses. The same figure was 43 for light-frame houses and 42 for masonry/concrete houses. Half of the respondents could not say whether radon levels were elevated or not.

3.7 Health

The health section of the study focused on the respondents' current health status and the frequency of symptoms and respiratory tract infections during the previous 12 months. No statistically significant differences between respondent groups were detected in general health, although a clearly larger proportion of people who live in log-frame houses reported their general health as good (Figure 7).

In the survey, general symptoms included headache, fatigue and concentration difficulties; upper respiratory tract symptoms included stuffy nose, common cold, and dry or sore throat; lower respiratory

tract symptoms included shortness of breath, cough and sputum; eye symptoms included itchy eyes, dry eyes and foreign body sensation; and rash or skin symptoms included red skin, dry skin and itching. No statistically significant differences were observed between respondent groups with regard to general, upper respiratory, lower respiratory, eye symptoms or skin symptoms. However, people who live in log-frame houses reported such symptoms less often than the two other groups: for example, there were differences of over 10 per cent between respondent groups concerning general symptoms and eye symptoms (Table 10).

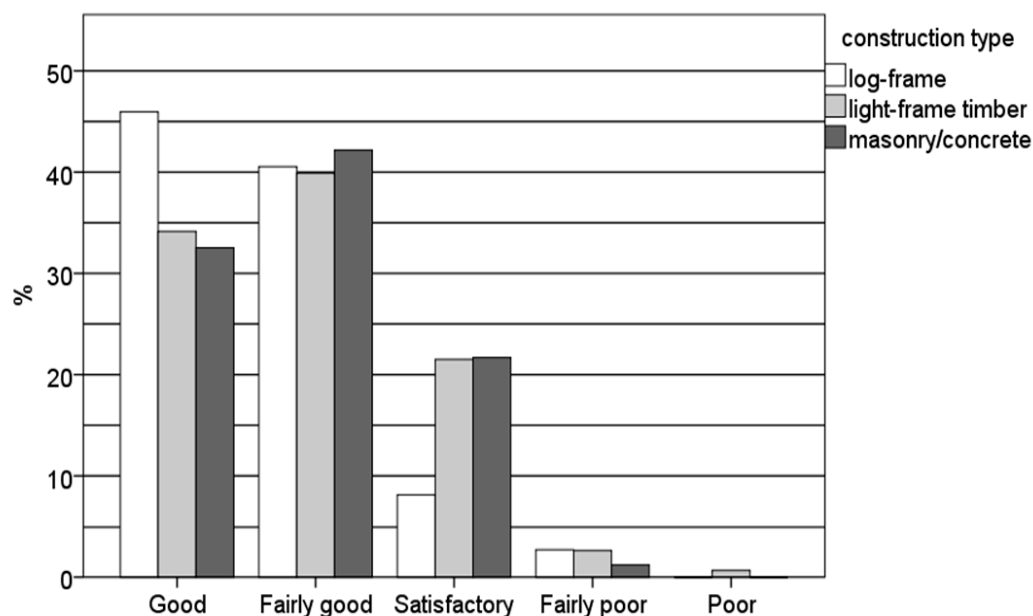


Figure 7. General health by respondent group (non-standardised results)

Table 10. General health and prevalence of symptoms

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
General health							
Good	17	47.2	207	34.4	27	33.3	0.278
Other*	19	52.8	395	65.6	54	66.7	
General symptoms							
Daily/weekly	3	10.0	116	21.5	18	25.7	0.213
Less often/never	27	90.0	424	78.5	52	74.3	
Upper respiratory tract symptoms							
Daily/weekly	2	6.5	64	12.0	10	14.1	0.549
Less often/never	29	93.5	471	88.0	61	85.9	
Lower respiratory tract symptoms							
Daily/weekly	2	7.1	48	9.1	5	7.2	0.838
Less often/never	26	92.9	481	90.9	64	92.8	
Eye symptoms							
Daily/weekly	2	6.3	71	13.1	11	15.5	0.431
Less often/never	30	93.7	471	86.9	60	84.5	
Skin symptoms							
Daily/weekly	1	3.3	59	11.2	9	13.0	0.348
Less often/never	29	96.7	468	88.8	60	87.0	

*fairly good, satisfactory, fairly bad and bad

No differences in the prevalence of asthma were observed between respondent groups. Of all allergies, pollen allergy was over 10 per cent less common in log-frame houses than in masonry/concrete houses (Table 11).

Table 11. Prevalence of asthma and allergies by respondent group

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Asthma							
No	27	72.97	481	78.98	61	73.49	0.488
Yes	3	8.11	45	7.39	9	10.84	
Allergy to house dust mite							
No	29	78.38	496	81.44	59	71.08	0.420
Yes	0	0	26	4.27	4	4.82	
Pollen allergy							
No	28	75.68	437	71.76	52	62.65	0.232
Yes	2	5.41	90	14.78	14	16.87	
Allergy to domestic animals							
No	27	72.97	465	76.35	59	71.08	0.786
Yes	2	5.41	56	9.20	6	7.23	
Mould allergy							
No	29	78.38	487	79.97	61	73.49	0.179
Yes	0	0	19	3.12	5	6.02	

Respiratory tract infections (ear infection, sinusitis or bronchitis) and resulting visits to a doctor were somewhat more common among people who live in log-frame houses, but the differences were not statistically significant (Table 12).

Table 12. Prevalence of respiratory tract infection by respondent group

	Log-frame		Light-frame		Masonry/concrete		p-value
	N	%	N	%	N	%	
Respiratory tract infections							
No	24	64.86	466	76.52	60	72.29	0.445
Yes	9	24.32	106	17.41	13	15.66	
Visit to a doctor							
No	24	64.86	471	77.34	62	74.70	0.159
Yes	10	27.03	94	15.44	14	16.87	
Absence from work							
No	26	70.27	469	77.01	62	74.70	0.594
Yes	4	10.81	59	9.69	5	6.02	

4 Results of advanced analyses

4.1 Advanced analyses

The effects of log-frame houses on housing health and well-being were examined by modelling variables that describe the respondents' housing conditions and health and that showed differences between respondent groups. The selected dependent variables included 'satisfaction with dwelling', 'satisfaction with indoor air quality' and 'general health'. Logistic regression was used in the modelling.

The aim of logistic regression is to determine which variables affect the probability of a dependent variable and what the size of the effect is. For example, logistic regression can be used to determine whether gender influences the degree of dwelling satisfaction, that is, whether women are more likely than men to be satisfied with their dwelling.

The odds ratio (OR) is the primary measure of effect size in logistic regression. It is the ratio of the odds of an event occurring in one group of categorical variables (usually the first group) to the odds of it occurring in other groups. The odds ratios in the tables below show the strength of association between a variable in a certain group and the dependent variable. For example, the logistic regression for the variable 'satisfaction with dwelling' compared the groups 'light-frame' and 'masonry/concrete' with the group 'log-frame'. Consequently, an odds ratio of 0.38 for masonry/concrete house indicates that people who live in masonry/concrete houses are 0.38 times more likely to be satisfied with their dwelling compared to people who live in log-frame houses. Inversion of the odds ratio for masonry/concrete house shows the odds ratio for log-frame house: $1/0.38=2.63$. People who live in log-frame houses are, therefore, around 2.6 times more likely to be satisfied with their dwelling than people who live in masonry/concrete houses. An odds ratio of 1 would indicate that the condition under study is equally likely to occur in both groups.

Logistic regression can include several independent variables. All independent variables affect the dependent variable. If two independent variables are associated, one variable may affect the dependent variable through the other variable. For example, log-frame as construction type can affect the dependent variable through other variables, such as 'satisfaction with indoor air quality', since the tests show that these two variables are not completely independent. Thus, associations between variables may affect the interpretation of a logistic regression with many variables.

The regression model consists of variables that are associated in a statistically significant degree ($p<0.05$), i.e., that affect the probability of the variable under consideration. A full model is a model that includes all the independent variables that are assumed to affect the dependent variable. The analyses in the present study used a full model by forcing all interesting variables into the model (see Table 13) in addition to the data and the constant variables (age, gender and marital status). The full model, then, indicated which variables are significant. Usually, the most significant variables can be observed already at this phase despite associations between variables. The full model also gives clues to which variables have the strongest effect on the probability of the dependent variable.

The full model was followed by a forward selection: the statistical programme adds new variables in the model one at a time on the basis of statistical significance. The variables selected are those that seem to have most effect on the probability of the dependent variable.

The final model in the study was, then, an adjusted model consisting of a set of variables selected manually. These variables seemed to be the most significant with regard to the dependent variable. In creating the adjusted model, specific attention was paid to how the inclusion of one variable affects the values of the other variables in the model. All models were standardised by keeping the background variables 'age', 'gender' and 'marital status' in the model. Standardisation was used to control the effect of these three variables. In other words, the aim was to avoid false conclusions, since the background variables can affect the dependent variable through other variables. Another aim with the inclusion of the three background variables was to ensure that if they have a significant effect on the probability of the dependent variable, this effect would be visible and not latent through other variables. On the other hand, it

was important to have enough, but not too many, variables so that the model would be clear and reliable. The analyses used the SPSS software.

Table 13. Variables included in the full model. (X = the variable is in the model)

Independent variables	Dependent variables			
	Satisfaction with dwelling	Indoor air quality satisfaction	General health	Respiratory tract infections
Respondent's age	constant	constant	constant	constant
Gender	constant	constant	constant	constant
Marital status	constant	constant	constant	constant
Educational level	X	X	X	X
Dwelling age	X	X		
Type of occupancy	X	X		
Location*	X	X		
Type of air ventilation	X	X		
Satisfaction with dwelling			x	
Satisfaction with indoor air quality	X		X	X
Agreeable temperature in summer	X	X		
Agreeable temperature in winter	X	X		
Heating	X	X		
Cats, dogs, guinea pigs, etc. indoors		X		
Trickle vent in bedroom		X		
Airing by open windows		X		
Condensation on windows in winter		X		
Open fireplace		X		
Fireplace		X		
Wood-burning stove		X		
Respondent's physical activity			X	X

*town centre; suburb or other urban residential area; fringe area; semi-urban area (parish village); rural area/countryside

4.2 Satisfaction with dwelling

Satisfaction with dwelling was measured with a binary variable with the values 'satisfied' and 'other' (fairly satisfied, fairly dissatisfied and dissatisfied). The assumption was that satisfaction with dwelling is affected by construction type, respondent's level of education, dwelling age, type of occupancy, mode of ventilation, satisfaction with indoor air quality, location, mode of heating, and indoor temperature. A full model was then created of these variables. Only the variables 'satisfaction with indoor air quality', 'satisfaction with temperature in winter' and 'construction type' were significant in this model, i.e., it is probable that these variables affect the probability of satisfaction with dwelling.

In the model consisting only of the constant variables (age, gender and marital status) and the variable 'construction type', log-frame houses seemed to have a statistically significant effect on satisfaction with dwelling (Table 14). However, the model gives a relatively poor explanation for satisfaction with dwelling: construction type and the constant variables do not alone have any great effect on the probability of satisfaction with dwelling.

The adjusted model finally adopted contained the constant variables, the variable 'construction type' as well as the variables 'satisfaction with indoor air quality', 'agreeable temperature in winter', and 'mode of ventilation' (Table 14). In this model, the effect of construction type disappeared, i.e., log-frame house does not affect directly the probability of satisfaction with dwelling. Married respondents were slightly more likely to be more satisfied with their dwelling compared to unmarried respondents. The respondents who were satisfied with indoor air quality were 5.5 times more likely than other respondents to be satisfied with

dwelling, also. Also the respondents who reported having an agreeable indoor temperature during winter were more likely to be satisfied with their dwelling. Of the modes of ventilation, mechanical supply and exhaust ventilation had a positive effect on satisfaction with dwelling.

Table 14. Logistic regression for the variable 'satisfaction with dwelling'

Variable	Model with data+constant variables			Adjusted model		
	p-value	odds ratio	confidence interval (95%)	p-value	odds ratio	confidence interval (95%)
Construction type	0.120			0.378		
Log-frame		1.00			1.00	
Light-frame	0.171	0.55	0.23–1.30	0.503	0.73	0.29–1.85
Masonry/concrete	0.049	0.38	0.15–1.00	0.222	0.52	0.18–1.49
Gender						
Male		1.00			1.00	
Female	0.308	0.85	0.61–1.17	0.551	0.90	0.62–1.29
Age	0.158	1.01	1.00–1.02	0.153	1.01	1.00 – 1.03
Marital status	0.277			0.264		
Unmarried		1.00			1.00	
Married	0.026	1.59	1.06–2.38	0.026	1.70	1.07–2.71
Divorced	0.253	1.88	0.64–5.52	0.537	1.45	0.44–4.78
Widow(er)	0.736	1.16	0.49–2.72	0.167	1.99	0.75–5.26
Satisfaction with indoor air quality						
Other*					1.00	
Satisfied				0.000	5.52	3.79–8.05
Agreeable temperature in winter						
No					1.00	
Yes				0.000	2.99	1.63–5.49
Ventilation				0.005		
Natural ventilation or no ventilation					1.00	
Mechanical supply and exhaust				0.001	1.71	1.37–3.42
Mechanical exhaust				0.041	1.02	1.02–2.84

*fairly satisfied, fairly dissatisfied and dissatisfied

In Table 14, class variables were compared as follows: 'light-frame' and 'masonry/concrete' were compared with 'log-frame'; 'women' with 'men'; other marital statuses with 'unmarried'; the 'satisfied' responses to satisfaction with indoor air quality with the 'other' responses; the 'yes' responses to agreeable temperature in winter with the 'no' responses; and 'natural ventilation or no ventilation' with mechanical ventilation.

4.3 Satisfaction with indoor air quality

A similar scale as with satisfaction with dwelling ('satisfied' compared to 'other') was used to measure satisfaction with indoor air quality. It was also assumed that the same variables that affect satisfaction with dwelling also affect satisfaction with indoor air quality (Chapter 3.2). Also the variables 'pets indoors', 'bedroom trickle vent', 'airing by open windows', 'condensation in winter' and 'fireplaces' were included in the full model. According to the analysis, the most important of these were 'ventilation', 'temperature', 'condensation' and 'heating'.

The variable 'construction type' was significant in the model consisting only of 'construction type' and the constant variables. However, as before, this model gave a relatively poor explanation for satisfaction with

indoor air quality. As other variables were added to the model, the effect of 'construction type' remained significant. This adjusted model includes the constant variables, the variable 'construction type' and the variables 'temperature' (agreeable temperature in summer and winter), 'ventilation', 'trickle vent' and 'condensation in winter' (Table 15). According to this model, people who live in log-frame houses were approximately four times more likely to be satisfied with indoor air quality compared to people who live in light-frame houses and over six times more likely to be satisfied with indoor air quality compared to people who live in masonry/concrete houses. However, the confidence intervals were wide, which could be explained by the small number of observational units. No significant differences were observed between light-frame and masonry/concrete houses. The respondents who considered their indoor temperature agreeable in summer and winter were more likely to be satisfied with indoor air quality. The respondents who reported mechanical supply and exhaust ventilation or mechanical exhaust ventilation were more likely to be satisfied with indoor air quality than those who reported natural ventilation or no ventilation. Also trickle vents had a positive effect on satisfaction with indoor air quality. The respondents who reported condensation in winter 'less often or never' were almost three times more likely to be satisfied with indoor air quality than those who reported condensation 'weekly or more often'. Condensation in winter can indicate insufficient ventilation.

Table 15. Logistic regression for the variable 'satisfaction with indoor air quality'

Variable	Model with data+constant variables			Adjusted model		
	p-value	odds ratio	confidence interval (95%)	p-value	odds ratio	confidence interval (95%)
Construction type	0.006			0.001		
Log-frame		1.00			1.00	
Light-frame	0.004	0.28	0.12–0.66	0.002	0.25	0.10–0.60
Masonry/concrete	0.001	0.21	0.08–0.55	0.000	0.16	0.06–0.43
Gender						
Male		1.00			1.00	
Female	0.690	0.94	0.70–1.27	0.912	1.02	0.74–1.41
Age	0.294	1.01	0.99–1.02	0.432	1.01	0.99–1.02
Marital status	0.159			0.180		
Unmarried		1.00			1.00	
Married	0.937	0.98	0.67–1.45	0.701	0.92	0.61–1.40
Divorced	0.054	3.10	0.98–9.79	0.027	3.99	1.17–13.60
Widow(er)	0.189	0.59	0.26–1.30	0.546	0.77	0.33–1.81
Agreeable temperature in summer						
No					1.00	
Yes				0.001	1.87	1.29–2.71
Agreeable temperature in winter						
No					1.00	
Yes				0.000	3.60	1.97–6.58
Ventilation				0.005		
Natural ventilation or no ventilation					1.00	
Mechanical supply and exhaust				0.001	2.01	1.32–3.06
Mechanical exhaust				0.012	1.77	1.13–2.77
Trickle vent						
No					1.00	
Yes				0.023	1.52	1.06–2.17
Condensation in winter						
Weekly or more often					1.00	
Less often or never				0.023	2.75	1.15–6.59

In Table 15, the class variables are compared in the same ways as in Table 14 above. For example, the 'yes' responses to trickle vent were compared with the 'no' responses; the 'less often or never' responses to condensation in winter were compared with the 'weekly or more often' responses.

4.4 General health

General health included the categories 'good' and 'other' (fairly good, satisfactory, fairly poor and poor). It was assumed that general health is affected by the variables 'construction type', 'education', 'type of occupancy', 'satisfaction with dwelling', 'satisfaction with indoor air quality', 'cost of living', 'location', and 'physical activity'. Of these, 'education', 'satisfaction with dwelling', 'satisfaction with indoor air quality' and 'physical activity' proved to be significant.

In the model including only 'construction type' and the constant variables, 'construction type' was not significant, while 'age' and 'marital status' were. As before, this type of model gave a relatively poor explanation for general health, i.e., 'construction type' and the constant variables do not alone have any great effect on the probability of good general health. It is, however, noteworthy that the differences between light-frame houses and log-frame houses were nearly statistically significant, to the advantage of log-frame houses. (Table 16.)

When other variables were added, the results remained the same for the constant variables. Also according to this model, 'construction type' had no significant effect on general health. Respondents who were satisfied with indoor air quality were 2.3 times more likely to have good general health. The same figure was 2.4 for respondents who were satisfied with dwelling. Also, respondents who were physically active several times a week were more likely to have good general health. (Table 16) Since people who live in log-frame houses were more satisfied with indoor air quality, and since there is a link between indoor air quality and general health, it is possible that construction type has an indirect effect on general health.

In Table 16, the comparison is between other levels of education and 'primary school'; 'satisfaction with indoor air quality' with 'other'; and 'physical activity several times a week' with 'physical activity less often'.

Logistic regression was used to model also the variables 'temperature' (agreeable temperature in summer) and 'general symptoms'. However, the variables could not be modelled because the size of the data was too small and because some observations were missing. The small size of the data and the missing observations had also an impact on the confidence intervals, which were very wide for several variables.

Table 16. Logistic regression for the 'variable general health'

Variable	Model with data+constant variables			Adjusted model		
	p-value	odds ratio	confidence interval (95%)	p-value	odds ratio	confidence interval (95%)
Material	0.157			0.304		
Log-frame		1.00			1.00	
Light-frame	0.056	0.49	0.23–1.02	0.135	0.55	0.25–1.20
Masonry/concrete	0.166	0.54	0.23–1.29	0.342	0.64	0.25–1.62
Gender						
Male					1.00	
Female	0.385	1.16	0.83–1.60	0.639	1.09	0.76–1.55
Age	0.000	0.96	0.95–0.98	0.000	0.96	0.94–0.97
Marital status	0.041			0.092		
Unmarried					1.00	
Married	0.003	1.99	1.27–3.12	0.012	1.88	1.15–3.06
Divorced	0.055	2.64	0.98–7.15	0.318	1.73	0.59–5.09
Widow(er)	0.062	2.39	0.96–5.95	0.022	3.13	1.18–8.34
Education				0.047		
Primary school					1.00	
Comprehensive school				0.913	1.06	0.37–3.06
Upper secondary school or vocational upper secondary school				0.456	1.28	0.67–2.42
Post-secondary degree				0.015	2.24	1.17–4.29
University degree				0.140	1.168	0.85–3.32
Satisfaction with indoor air quality						
Other*					1.00	
Satisfied				0.000	2.43	1.64–3.60
Satisfaction with dwelling						
Other*					1.00	
Satisfied				0.000	2.33	1.52–3.60
Physical activity						
Less often					1.00	
Several times a week				0.001	1.99	1.34–2.96

*fairly satisfied, fairly dissatisfied and dissatisfied

5 Conclusions and further measures

5.1 Conclusions of the analyses

Regarding dwelling age and location, the log-frame houses included in the sample differed from the other types of construction, which must be taken into account when the results are interpreted. Another factor to be considered is the small number of log-frame houses in the sample. The results apply to log-frame houses with a mean age of around 50 years. Dwelling age affected also other variables, such as indoor temperature (draughtiness). A half of all log-house dwellers lived in rural areas, which gave a higher prevalence of pets and pests and a lower prevalence of noise nuisance.

In logistic regression, construction type (log-frame) did not affect the probability of satisfaction with dwelling, but cross tabulation gave clear differences between respondent groups in terms of percentages. It

is possible that the variable 'construction type' has indirect effects through other variables (such as 'satisfaction with indoor air quality'), but this could not be verified with this study. In other words, it is possible that people who live in log-frame houses are satisfied with their dwelling because they are satisfied with indoor air quality.

Data on indoor air quality in log-frame houses was received on the basis of variables such as 'air purifier', 'ventilation', 'trickle vent' and 'satisfaction indoor air quality'. Only one log-frame house had an air purifier and even trickle vents were less common in log-frame houses than in light-frame and masonry/concrete houses. Modelling 'satisfaction with indoor air quality' with logistic regression showed that people who live in log-frame houses were four times more likely to be satisfied with indoor air quality compared to people who live in light-frame houses and six times more likely compared to people who live in masonry/concrete houses.

General health was better among people who live in log-frame houses compared to people who live in light-frame or masonry/concrete houses, although the differences were not statistically significant. Different kinds of symptoms (general symptoms, upper respiratory tract symptoms, etc.) were less common among people who live in log-frame houses than in the other two groups. No great differences between the respondent groups were found in the prevalence of asthma and allergies. However, the prevalence of respiratory tract infections was higher among people who live in log-frame houses than in the other groups. In logistic regression, log-frame houses did not have any significant effect on the probability of good health. However, education and satisfaction with both dwelling and indoor air quality were significant in the model.

The preliminary analyses gave great differences in terms of percentages (above 10%) in satisfaction with dwelling and general health, but these were not statistically significant. A probable cause for the lack of statistical significance is the small number of log-frame houses in the sample.

5.2 Assessment of the need for further studies

On the basis of the study results, it is recommended that factors affecting housing health and housing satisfaction in log-frame houses are further examined. One option for further studies could be a case-control study with a sufficient number of log-frame houses selected by random sampling and with a corresponding number of light-frame and masonry/concrete houses. While log-frame houses could be selected by random sampling, the emphasis should be on younger log-frame houses. The sample could be based on, for example, the client registers of the log-house industry.

The further study could be a combination of survey data collected directly from dwellers and of data based on objective indoor air measurements. The indoor air measurements could, for example, focus on chemical and microbiological impurities, indoor temperature as well as carbon dioxide and carbon monoxide contents; these can be used to evaluate the sufficiency of ventilation and the exposure to particles from combustion. To improve the response rate, the questionnaires should focus on what is essential for the study so as to keep the questionnaire as concise as possible. The questionnaire could be sent to the respondents by e-mail. The selection of questions could make use of the preliminary results presented in this study.

According to a preliminary calculation of the sample size, the data should include at least one hundred log-frame houses. The number of log-frame houses was calculated by giving the level of statistical significance the value 0.05 and the strength of the test the value 0.8 (the probability for rejecting the null hypothesis as false). The sample size was calculated by using logistic regression and by assuming that the probability of occurrence of the dependent variable is 60 per cent. The proposed sample size and the proposed assumptions enable the observation of those odds ratios between log-frame houses and light-frame or masonry/concrete houses that are higher than 2. If the strength and incidence probability of the dependent variable are greater or the odds ratio smaller, the sample size should be bigger. For example, if the probability of occurrence is 70 per cent and the strength is 0.9, the sample size would have to be 450, which means that the data should include 150 log-frame houses. A particular problem for closer consideration is to determine at how low a level odds ratios are significant, i.e., how much more likely it

should be that people who live in log-frame houses are satisfied indoor air quality compared to the other groups.

A more elaborate calculation of the sample size is recommended since the number of observations necessary affects first and foremost reliability of the results, mode of data collection and design of questionnaire (when the probable response rate is taken into account) as well as study expenses.

References

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HOUSING, HEALTH AND SAFETY

Welcome to take part in the ALTTI2011 survey on the quality, health and safety of residential environments! The survey gives us important information about housing health and safety and about variations in them across Finland. The survey results are processed in confidence, and the data submitted cannot be traced back to single respondent. It takes about 20–40 minutes to answer the questionnaire.

Instruction: Please tick the correct alternative(s) or write your answer in the space provided.

RESPONDENT'S INFORMATION

1.

2. Gender of respondent

Female
Male

3. Age of respondent _____ years

4. Are you

Unmarried
Co-habiting
Married
In a registered partnership
Divorced
Widow(er)

LOCATION INFORMATION

5. In what type of an area is your dwelling located?

Town centre
Suburban area or other urban residential area
Urban fringe area
Semi-urban area (e.g. parish village)
Rural area

6. Do you live on a farm?

No
Yes, I live on a farm with cultivation
Yes, I live on a farm with livestock (cattle, pigs, etc.)
Yes, I live on a farm with domestic animals (horses, sheep, rabbits, etc.)
Yes, I live on a farm with no active cultivation and no animals

7. What is the distance between your dwelling and the following? (If the distance is less than 1 km, enter the distance in metres in the second column. Otherwise, tick the correct alternative.)

	Distance in metres, if under 1 km	1–5 km	more than 5 km	I cannot say
Busy road or street				
Railway or underground				
Airport				
Factory, industry, power station, mine				
Petrol station or car repair shop				
Landfill site or waste water treatment plant				
Farming (piggery, fur farm, etc.)				
High voltage leads				

8. How do you get to work/school, and what is the usual duration and distance of your way to work/school? (Choose the alternatives you usually use on one trip to work/school)

	Duration (minutes)	Distance (kilometres)
By foot		
By bicycle		
By car		
By public transport (train, bus, tram, tram, etc.)		
By other means*		

*Please specify how _____

9. With which of the following possibilities and services in your living environment are you satisfied? You can choose more than one option.

- Public transport
- Sporting and recreational possibilities
- Child day care services / schools
- Banking services / postal services
- Library services
- Groceries
- Restaurants and cafés
- Proximity to nature, park and garden areas
- Accessibility of housing unit / housing corporation
- Neighbourhood accessibility
- Safety
- General attractiveness of the living environment

DWELLING INFORMATION**10. How satisfied are you with your present dwelling/building?**

- Satisfied
- Fairly satisfied
- Fairly unsatisfied
- Unsatisfied
- No opinion / I cannot say

11. What is the type of your dwelling and the number of storeys?

	Number of storeys
Detached house	
Semi-detached house	
Terraced house	
Block of flats	

12. If you live in a block of flats, on which floor do you live? _____ floor**13. How many years have you been living in your present dwelling? _____ years****14. What is the form of occupancy for your dwelling?**

- Rental flat in a tenement building
- Rental flat in a housing association building
- Owner-occupied flat/house
- Dwelling provided by the employer
- Right-of-residency apartment
- Other, please specify _____

15. Including yourself, how many people live permanently in your dwelling? (Please, indicate the number of occupants by age group.)

- Adults (aged 18 and over) _____
- Children aged 7 to 17 _____
- Children under the age of 7 _____

16. Do you find your dwelling spacious enough?

- No
- Yes

17. Are you planning to move to another dwelling within the next 12 months?

- No, move to Question 19
- Yes

18. Why are you planning to move to another dwelling? You can choose more than one option.

My dwelling is too small

My dwelling is too large

Condition of dwelling (excessive need for repair, etc.)

Dwelling does not meet my needs otherwise

We want to move to another residential area

Financial reasons

Other reasons, please specify _____

19. What is the type of roofing in your dwelling?

Ridge roof

Hipped roof

Flat roof

Pitched roof

I cannot say

Other, please specify _____

20. What is the type of floor construction in the lowest floor in your dwelling?

Floor with sub-floor space (e.g., floor construction with ventilated base floor or other ventilation space)

Ground-supported floor (e.g., concrete slab with no ventilation space under floor, although above ground insulation and gravel bedding are possible)

I cannot say

Other, please specify _____

21. Does your dwelling have a basement entirely or partially below ground? You can choose more than one option.

No, there is no basement

Yes, there is a basement used for storage

Yes, there is a basement used as a bathroom

Yes, there is a basement used as a recreation space

Yes, there is a basement used as a bedroom

Yes, there is basement used for other purposes

For other use, please specify _____

22. Which of the following types of interior lining have been used on the walls in your dwelling (bedroom/living room/kitchen)? Choose the three most common options.

Lacquered wood / panel

Painted wood / panel

Painted brick / concrete / stone / plastering

Unpainted brick / concrete / stone / plastering

Painted building board (wood fibre, plaster, chipboard, etc.)

Building board with wallpaper (wood fibre, plaster, chipboard, etc.)

Stone / concrete etc. with wallpaper

Log house / solid wood

I cannot say

Other, please specify _____

23. Which of the following types of floor covering have been used in your dwelling? Choose the three most common options.

Wood/parquet

Laminate

Ceramic tile/clinker/natural stone

Plastic membrane/tile

Linoleum

Wall-to-wall carpet

I cannot say

Other, please specify _____

24. What kind of windows have you got in your dwelling?

Double-glazing

Triple-glazing

Quadruple-glazing

I cannot say

Other, please specify _____

25. Which of the following equipment you have in your dwelling? You can choose more than one option.

Indoor WC

Shower

Shower cubicle

Bath

Sauna

Refrigerator

Freezer

Stove

Central heating

Air humidifier

Air purifier

Balcony

Glazed balcony

Lift

26. Have the following renovations been performed in your building? "Renovation" in this context means a relatively extensive and separate project for repairing or replacing the building's existing structures, components, fixtures, accessories, systems and equipment (e.g., exterior walls, balconies, windows as well as heating, water-distribution and sewer systems).

	No	Yes, during the past 12 months	Yes, during the past 5 years	Yes, more than 5 years ago	I cannot say
Roof repair					
Facade renovation (additional thermal insulation, etc.)					
Foundations repair					
Drainage repair					
Pipework renovation					
Ventilation system repair					
Balcony renovation					
Window renovation					
Heating system repair					
Other*					

***What other renovation work has been performed if any?** _____

27. How satisfied are you with the building maintenance and repairs that have been carried out?

- Satisfied
- Fairly satisfied
- Rather unsatisfied
- Unsatisfied
- No opinion / I cannot say

HYGIENE**28. Where do you get your drinking water?**

- Municipal water distribution system (tap water)
- Water co-operative
- Our private bore well
- Our private ring well
- Spring
- Elsewhere, please specify _____

29. Have you noticed any unusual smell, taste (e.g., of chemicals, detergents, salt or contamination), sediment or colour (e.g., reddish brown or yellowish) in your drinking water?

- No
- Yes

30. Do you use any devices or materials to filter or purify water?

- No
- Yes
- I cannot say

31. In the water supply for your household, have there been any interruptions during the past 12 months for any of the following reasons?

	No	Yes	I cannot say
System failure			
Freezing			
Dryness			
Interruptions due to repair work			
Other reason*			

***Other reason, please specify** _____

32. What is your opinion of the warm water supply in your dwelling? (The recommendation is 55–56 degrees Celsius.)

- Too cold
- Too hot
- Agreeable
- No warm water supply

33. Do you use warm tap water (directly from the tap) for drinking and/or cooking?

- No
Yes

34. Do you usually run cold water before taking water for drinking or cooking?

- No
Yes

35. Which sewage system do you have in your dwelling? You can choose more than one option.

	Washing water	Lavatory water
Municipal waste water system		
Cesspit		
Sedimentation basin + ground saturation/filtration		
Small-scale water treatment plant		
I cannot say		
Other*		

***Please specify** _____

36. How often do you do the following cleaning work at home?

	Several times a week	Every week	Every two weeks	Every month	At least twice a year	Less often
Dusting						
Sweeping						
Vacuuming						
Floor scrubbing/mopping (moist cloth)						
Carpet beating						
Laundering						
Changing sheets						
Vacuuming bed and mattress						
Airing bedclothes (mattress protector/cover, duvet, pillow)						
Washing of mattress protector/cover, duvet and pillow at higher than 60 degrees Celsius						
Taking the garbage out						

37. Do you have pets at home?

	No	Yes, indoors	Yes, not indoors
Cats, dogs, guinea pigs, etc.			
Birds			
Aquarium fish			
Terrarium animals (lizards, snakes, etc.)			
Other animals*			

*Please specify

38. Have you seen any signs of pests (live or dead insects or rodents, gnaw marks, excrement, etc.)? You may choose more than one option.

	No	Yes, indoors	Yes, in the courtyard area
Rodents (mice, rats, etc.)			
Insects (furniture beetles, cockroaches, carpenter ants, etc.)			

39. About which of the following housing health related topics would you like to learn more? You can choose more than one option.

Quality of water in household consumption

Waste water management

Dwelling cleanliness

Pet-related issues

Pest-related issues

None of the above

Other, please specify _____

PHYSICAL AND BIOLOGICAL CONDITIONS**40. How satisfied are you with the quality of the indoor air in your dwelling?**

Satisfied

Fairly satisfied

Fairly unsatisfied

Unsatisfied

No opinion / I cannot say

41. What is the type of ventilation in your dwelling?

Mechanical supply and exhaust ventilation

Mechanical exhaust ventilation

Natural ventilation

No ventilation

I cannot say

42. Do you have trickle vents in your bedroom(s)?

No

Yes

43. What is the primary and, if applicable, secondary form of heating in your dwelling?

	Primary	Secondary
District heating		
Electricity		
Fuel oil		
Ground heating		
Solar heating		
Air source heat pump		
Wood/pellet/wood-chip heating		
Fireplace in each room (open fireplace, stove, etc.)		
I cannot say		
No heating		
Other*		

***Please specify**

44. What kinds of stoves or fireplaces you have in your dwelling? You can choose more than one option.

Gas cooker/stove

Wood stove/oven or baking oven

Wood sauna-stove

Open fireplace

Iron stove

None of the above

Other, please specify _____

45. How and how often do you air your dwelling?

	Daily / almost daily	Less often	When necessary (cooking etc.)	Never	Not possible
I use the extractor hood					
I open windows					

46. What is the typical indoor temperature in your dwelling during the heating season?

Under 18 degrees Celsius

18–20 degrees Celsius

20–22 degrees Celsius

22–24 degrees Celsius

Over 24 degrees Celsius

47. What is the temperature in your dwelling? You may choose more than one option.

	Agreeable	Too cold	Too warm	Draughty	Cold floor surfaces, etc.
In summer					
In winter					

48. Where do you dry your laundry? You can choose more than one option.

Vented drying room

Tumble drier or drying cabinet

Bathroom

Elsewhere indoors (bedroom, living room, etc.)

Balcony

Outdoors when the weather permits

Elsewhere, please specify _____

49. Is there moisture condensation on the windows of your dwelling?

	Daily/almost daily	Weekly	Less frequently	Never
In summer				
In winter				

50. Has there been serious water damage in your dwelling (pipe leaks, storm damage, flooding) involving the soaking of large areas/building components by large volumes of water?No, **move to Question 52**

Yes, during the past 12 months

Yes, more than 12 months ago

I cannot say, **move to Question 52****51. How has the damage been repaired? You can choose more than one option.**

There have been no repairs

By drying the structures

By pulling down / removing damaged material

I cannot say

Otherwise, please specify _____

52. Is there any moisture or mould damage on the walls, floor or ceilings in your dwelling? You can choose more than one option.No, **move to Question 55**

Yes, indoors

Yes, outdoors, **move to Question 55**I cannot say, **move to Question 55**

53. What is the location and extent of the damage?

	Point-sized	Localised (under 1 m ² and limited to one area/building component)	Extensive (over 1 m ² or covers several areas/building components)
Kitchen			
Bathroom			
Living room / Bedroom			
Other living space*			

*Please

specify _____

54. What is the reason for the damage? You can choose more than one option.

Moisture from outdoors (rainwater, leakages, etc.)

Moisture from underneath the building (rising damp, defective subsurface drains, etc.)

Indoor sources (water supply, leakages from water furniture, laundry drying, etc.)

Moisture during construction

I cannot say

Other, please specify _____

55. Are there any deficiencies in the lighting of your residential environment?

	No	Yes
Interior lighting of the dwelling, natural light		
Interior lighting of the dwelling, artificial light		
Interior lighting of the building (staircases, storage areas, etc.)		
Lighting of the courtyard area (passage ways, parking spaces)		
Street and general lighting in the area		
Other location*		

*Other location, please

specify _____

56. Which of the following cause noise nuisance in your dwelling or neighbourhood and how often?

	No noise nuisance	Noise nuisance daily / almost daily	Noise nuisance weekly	Occasional / seasonal noise nuisance
Road and street traffic				
Rail traffic				
Air traffic				
Industry				
Yard noise (snow removal, leaf blowers, etc.)				
Noise from heating, plumbing, ventilation and electrical installation (lifts, etc.)				
Noise from neighbours (flat, balcony; loud talking, music, footsteps, etc.)				
Noise at home (music, power tools, etc.)				
Other noise*				

***Please specify**

57. About which of the following housing health related topics would you like to learn more? You can choose more than one option.

Ventilation

Maintenance and repair

Equipment/furniture

Heating system

Temperature

Moisture/mould damages

Lighting

Noise

None of the above

Other, please specify _____

CHEMICAL IMPURITIES, PARTICLES AND FIBRES**58. Does anyone smoke indoors in your dwelling?**

	Never	Daily/almost daily	Weekly	Occasionally
Me				
Someone else				

59. Do you or anyone else in your household use regularly the following products? You can choose more than one option.

	Perfume, hair spray	Scented floor and surface detergents and cleaners	Air fresheners
No			
Yes, me			
Yes, someone else			

60. Do you use any pesticides, insecticides or herbicides to prevent pests and/or weed?

	No, move to Question 63	Yes
Pesticides / insecticides		
Herbicides		

61. How often and where do you use pesticides/insecticides/herbicides?

	Every week	Every month	A couple of times a year	Less often
Indoors				
Outdoors				

62. How do you protect yourself? You can choose more than one option.

No

Airing

Leaving the dwelling / place

Using protective clothing/equipment

Otherwise, please specify _____

63. Are there any great pollen sources in the vicinity of your dwelling (large fields, birch groves, etc.)?

No

Yes, please specify _____

64. Are there unpleasant odours present in your dwelling or in the immediate surroundings and with what are they associated? You can choose more than one option.

	In the dwelling	Elsewhere in building indoor areas	Outdoors
Food odours			
Cigarette smoke			
Mould odour			
Construction materials			
General stuffiness			
Sewer odour			
Smoke odour			
Farming odours			
Industrial odours			
Odours from traffic			
Waste treatment			
No unpleasant odours			
Other odours*			

*Other odours, please specify _____

65. Are there any asbestos-containing materials in your building?

No, **move to Question 67**

Yes, in living areas

Yes, but not within the dwelling, **move to Question 67**

I cannot say know, **move to Question 67**

66. Is the asbestos-containing material intact and well attached to its base (not damaged, loose, cracked or chipped)?

No

Yes

I cannot say

67. Are there any elevated radon concentrations in your dwelling (i.e., concentrations exceeding the 400 Bq/m³ reference value or, if your dwelling was built after 1992, exceeding 200 Bq/m³)?

No, **move to Question 69**

Yes

I cannot say, **move to Question 69**

68. Have any measures been adopted at your dwelling to reduce the level of radon concentration? You can choose several options.

No

Yes, a system installed during construction

Yes, renovations after construction

I cannot say

69. Do you feel that you need more information about the following housing health related factors? You can choose more than one option.

Indoor air impurities

Use of chemicals

Use of pesticides/insecticides/herbicides

Unpleasant odours

Asbestos

Radon

None of the above

Other, please specify _____

SAFETY

70. Do you feel that your neighbourhood is

Safe

Fairly safe

Fairly unsafe

Unsafe

I cannot say

71. Have there been any break-ins/attempted break-ins in your dwelling or neighbourhood within the last 12 months or have your property been damaged in some other way? You can choose more than one option.

No

Yes, my dwelling/property

Yes, my neighbour's dwelling/property

I cannot say

72. Have you have been personally threatened outdoors in your neighbourhood within the last 12 months?

No

Yes

73. Which of the following safety devices you have in your dwelling? You can choose more than one option.

Smoke detector

Carbon monoxide detector

Fire extinguisher/smothering blanket

Stove guard

First aid kit / equipment

Burglar alarm

Special locks / safety lock / reinforced door, etc.

Peephole

Other, please specify _____

74. Do you store medicines and chemicals in an appropriate and safe space (i.e., locked and out-of-reach of children)?

No

Yes

Not necessary

75. Have any of the following accidents happened in your dwelling or neighbourhood within the last 12 months? You can choose more than one option.

Fire

Burn

Tumble/slip

Fall

Water-related accident

Risk of suffocation

Poisoning caused by harmful substances

None of the above

I cannot say

Other, please specify _____

76. Has special attention been paid to safety in your neighbourhood?

	No	Yes	There are no problems	I cannot say
By installing railings to prevent falls				
By building steps on steeply sloping paths				
By gritting icy paths sufficiently in winter				
By controlling the safety of children's playgrounds (climbing frames, swings) systematically at least once a year				
By other means*				

***Please specify how**

77. How accessible do you think your dwelling and neighbourhood are?

Accessible (it is possible to get around the dwelling and neighbourhood on a wheelchair)

Fairly accessible (there are small level differences, steep slopes, narrow spaces, etc.)

Fairly inaccessible (level differences and dimensioning make getting around difficult)

Very inaccessible (it is impossible to get around the dwelling or neighbourhood alone on a wheelchair)

78. About which of the following housing safety related factors you would like to learn more? You can choose more than one option.

Neighbourhood safety / crime prevention

Prevention of accidents

Safe paths, streets and roads

Dwelling security systems

Storage of harmful substances

Accessibility

None of the above

Other, please specify _____

WELL-BEING AND HEALTH

79. How has your general health been during the past 12 months?

Good

Fairly good

Satisfactory

Fairly poor

Poor

No opinion / I cannot say

80. During the past 12 months, which of the following symptoms have you had and how often?

	Daily/almost daily	Weekly	Monthly or less frequently	Never
General symptoms (headache, fatigue, concentration difficulties)				
Upper respiratory tract symptoms (stuffy nose, common cold, dry or sore throat)				
Lower respiratory tract symptoms (shortness of breath, cough, sputum)				
Eye symptoms (itchy eyes, dry eyes, foreign body sensation)				
Rash or skin symptoms (red skin, dry skin, itching)				
Joint pain or swelling				
Muscle pain				
Diarrhoea				
Sleeping problems				

81. Has your doctor ever diagnosed you with any of the following illnesses and which year were they diagnosed?

	No	Yes	Year of diagnosis
Asthma			
Allergy to house dust mites			
Pollen allergy			
Allergy to domestic animals			
Mould allergy			
Arterial hypertension			
Heart failure			
Cancer			
Rheumatoid arthritis			
Other articular disease			
Epilepsy			
Migraine			
Depression			
Other mental disorder			
Insomnia			
Other long-term illness*			

*Other long-term illness, please specify _____

82. During the past 12 months, have you had respiratory tract infections (such as ear infection, sinusitis or bronchitis), resulting in visits to a doctor, courses of antibiotics or absences from work or school?

	No	Yes
Respiratory tract infections		
Visited a doctor for respiratory tract infections		
Absences from work or school due to respiratory tract infections		

83. Have you hearing loss, other than hereditary or work-related, diagnosed by a doctor?

- No
- Yes

84. Are you taking physical exercise at least half an hour per day?

	Yes, several times a week	Yes, approximately once a week	Less often than once a week	Never
In the living environment or close to it				
On my way to/from school/work				
Elsewhere				

BACKGROUND INFORMATION

Finally, we would like you to give us some background information. This information is used to find out whether there are any differences in housing health and safety between different population groups.

85. Educational level

Primary school
 Lower secondary school
 Comprehensive school
 Upper secondary school / secondary school graduate
 Vocational upper secondary qualification
 Post-secondary degree
 University degree

86. Occupational group

Manager/upper-level employee
 Employee
 Entrepreneur
 Student
 Retired /outside working life

87. Current labour market status

Permanent full-day work
 Permanent part-time work
 Fixed-term full-day work
 Fixed-term part-time work
 Self-employed person/entrepreneur
 Full-time student
 Unemployed for one year or less
 Unemployed for more than one year
 Laid-off or on reduced working week
 Maternity/paternity leave or child care leave
 Retired
 In training or employed with labour market policy benefit
 Outside the working life for other reasons

88. What is your combined pre-tax household annual income, including wages and salaries, entrepreneurial and property income as well as current transfers received (such as child benefit, financial aid to students, housing allowance, social assistance)?

_____ €

89. What portion of your combined monthly pre-tax household income do you spend on dwelling costs? (In this context, “dwelling costs” means rent, maintenance fee, loans/loan expenses, heating, electricity and water, waste management, etc.)

- Under 15%
- 16–25%
- 26–35%
- 36–50%
- 51–65%
- Over 65%

FEEDBACK

90. Do you wish to have individualised feedback on your reply?

- No
- Yes, by post
- Yes, by e-mail to
address: _____

91. Do you have any comments, suggestions, opinions, issues occupying your mind, etc.?

Thank you for your reply!

TAULUKKO 1. VRK VASTAAJAN TIEDOT 1.

		Hirsi		Puu		Kivi		
Muuttuja	Vaihtoehdot	N	%	N	%	N	%	p-arvo
Sukupuoli	Nainen	19	51.35	290	47.85	38	25.78	0.851
	Mies	18	48.65	316	52.15	45	54.22	
Siviilisääty	naimaton	5	13.51	76	12.54	16	19.28	0.472
	avioliitossa	24	64.86	459	75.74	60	72.29	
	eronnut	4	10.81	39	6.44	3	3.61	
	leski	4	10.81	31	5.12	4	4.82	
	rek. parisuhde	0	0.00	1	0.17	0	0.00	
Hallintaperuste	oma	30	81.08	479	78.65	68	81.93	0.337
	vuokrattu	2	5.41	85	13.96	9	10.84	
	0 Puuttuva	5	13.51	45	7.39	6	7.23	
Julkimateriaali	betoni	0	0	0	0	5	6.02	
	tiili	0	0	126	20.69	17	20.48	
	metallilevy	0	0	1	0.16	2	2.41	
	kivi	0	0	2	0.33	1	1.20	
	puu	16	43.24	210	34.48	7	8.43	
	muu	0	0	2	0.33	3	3.61	
	0 Puuttuva	21	56.76	268	44.01	48	57.83	
Lämmitys	vesikeskuslämmitys	11	29.73	299	49.10	60	72.29	*<0.0001
	ilmakeskuslämmitys	0	0	21	3.45	1	1.20	
	suora sähkölämmitys	11	29.73	244	40.07	21	25.30	
	uunilämmitys	12	32.43	43	7.06	1	1.20	
	ei kiinteää läm- mityslaitetta	2	5.41	1	0.16	0	0	
	0 Puuttuva	1	2.70	1	0.16	0	0	
Polttoaine	kauko- tai aluelämpö	4	10.81	47	7.72	16	19.28	
	kevyt polttoöljy	3	8.11	152	24.96	29	34.94	
	sähkö	11	29.73	287	47.13	28	33.73	
	kaasu	0	0	1	0.16	0	0	
	kivihili, koksi, yms.	0	0	7	1.15	0	0	
	puu	17	45.95	95	15.60	7	8.43	
	turve	0	0	2	0.33	0	0	
	maalämpö tms.	0	0	13	2.13	3	3.61	
	muu	0	0	3	0.49	0	0	
	kauko- tai aluelämpö	4	10.81	47	7.72	16	19.28	
	0 Puuttuva	2	5.41	2	0.33	0	0	
Rakennemateriaali	kivi	1	2.70	0	0	83	100.00	
	puu	33	89.19	609	100.00	0	0	
	0 Puuttuva	3	8.11	0	0	0	0	

TAULUKKO 2. VRK VASTAAJAN TIEDOT 2

		Hirsi		Puu		Kivi	
Muuttuja	Vaihtoehdot	N	%	N	%	N	%
Runkotapa	elementti	2	5.41	129	21.18	12	14.46
	paikalla tehty	15	40.54	230	37.77	25	30.12
	0 Puuttuva	20	54.05	250	41.05	46	55.42
Sähkö	1	34	91.89	609	100.00	83	100.00
	0 Puuttuva	3	8.11	0	0	0	0
Kaasu	1	0	0	2	0.33	0	0
	0 Puuttuva	37	100.00	607	99.67	83	100.00
Viemäri	1	33	89.19	600	98.52	83	100.00
	0 Puuttuva	4	10.81	9	1.48	0	0
Vesijohto	1	33	89.19	598	98.19	83	100.00
	0 Puuttuva	4	10.81	9	1.48	0	0
Lämmin vesi	1	26	70.27	554	90.97	80	96.39
	0 Puuttuva	11	29.73	55	9.03	3	3.61
Hissi	1	1	2.70	3	0.49	4	4.82
	0 Puuttuva	36	97.30	606	99.51	79	95.18
Ilmastointi	1	5	13.51	175	28.74	32	38.55
	0 Puuttuva	32	86.49	434	71.26	51	61.45

TAULUKKO 3. VRK VASTAAJAN TIEDOT 3

	Hirsi	Puu	Kivi	
Muuttuja	N; mean (min - max)	N; mean (min - max)	N; mean (min - max)	p-arvo
Vastaajan ikä	37; 56.04 (12-76)	606; 54.41 (18-80)	83; 56.94 (18-80)	
Muuttopäivä	37; 1993 (1964-2010)	609; 1992 (1964-2011)	83; 1991 (1965-2011)	
Asukkaita	37; 2.40 (1-7)	609; 2.84 (1-11)	83; 2.58 (1-7)	
Rakennuksen ikä	34; 49 (3-112)	597; 36 (1-211)	81; 33 (0-75)	*0.004
Kerroksia	33; 1.48 (1-7)	604; 1.35 (1-3)	83; 1.70 (1-6)	

TAULUKKO 4.1. JATKUVAT MUUTTUJAT.

		Hirsi	Puu	Kivi	
Muut- tuja	Kysymys	N; mean (min - max)	N; mean (min - max)	N; mean (min - max)	p-arvo
K3	Vastaajan ikä	36; 56.86 (18-82)	591; 54.11 (18-84)	81; 56.94 (18-80)	
	Kotitalouden tulot	24; 59125 (18000-150000)	430; 60657 (10000-190000)	56; 65316 (14000-150000)	
K7	Mikä on asuntonne etäisyys seuraavista kohteista (jos alle 1 km)				
	Asunnon etäisyys tiestä tai kadusta	15; 297.67 (5-900)	345; 275.44 (0.50-920)	50; 272.90 (10-1000)	
	Asunnon etäisyys rautatiestä tai metrosta	1; 500.00	69; 362.36 (0.50-900)	15; 463.34 (100-800)	
	Asunnon etäisyys lentokentästä	0	7; 191.43 (30-500)	0	
	Asunnon etäisyys tehtaasta	1; 500.00	22; 371.55 (30-500)	5; 360.00 (100-1000)	
	Asunnon etäisyys huoltoasemasta	3; 366.67 (200-600)	84; 429.18 (1-900)	16; 425.00 (0-800)	
	Asunnon etäisyys kaatopaikasta	0	9; 248.56 (3-800)	3; 600.00 (300-1000)	
	Asunnon etäisyys maataloudesta	3; 180.00 (0-500)	37; 352.89 (0-900)	3; 184.67 (4-500)	
	Asunnon etäisyys korkeajännitejohdoista	5; 192.00 (50-500)	116; 300.29 (1-900)	14; 362.86 (10-1000)	
K11	Omakotitalon kerrosten lukumää	35; 1.66 (1-3)	560; 1.48 (1-3)	60; 1.47 (1-3)	
	Paritalon kerrosten lukumäärä	1; 1	40; 1.48 (1-3)	15; 1.80 (1-3)	
K13	Kuinka monta vuotta olette asuneet nykyisessä asunnossanne	36; 21.86 (1-76)	580; 20.12 (1-75)	79; 20.18 (1-63)	0.760
K15	Asunnossanne asuu vakituisesti aikuisia	30; 1.80 (1-3)	571; 2.06 (0-64)	73; 1.81 (1-4)	
	Asunnossanne asuu vakituisesti 7-17 vuotiaita	8; 1.38 (1-2)	174; 1.78 (0-6)	18; 1.44 (0-3)	
	Asunnossanne asuu vakituisesti 0-7 vuotiaita	2; 1.00 (1-1)	69; 1.38 (0-3)	4; 1.00 (0-2)	

TAULUKKO 4.2. VASTAAJAN TIEDOT

Muuttuja	Kysymys		Hirsi		Puu		Kivi		p-arvo
			N	%	N	%	N	%	
K2	Sukupuoli	nainen	20	54.05	308	50.57	41	49.40	0.894
		mies	17	45.95	301	49.43	42	50.60	
K4	Siviilisääty	naimaton	2	5.41	41	6.73	11	13.25	0.344 *
		avoliitossa	5	13.51	74	12.15	9	10.84	
		naimisissa	24	64.86	442	72.58	59	71.08	
		rekisteröidyssä parisuhteessa	1	2.70	1	0.16	0	0	
		eronneet	2	5.41	19	3.12	0	0	
		leski	3	8.11	29	4.76	4	4.82	
		0 Puuttuva	0	0	3	0.49	0	0	
K85	Koulutustaso	1 Kansakoulu	7	18.92	84	13.79	9	10.84	0.934
		2 Perus- / keskikoulu	1	2.70	22	3.61	5	6.02	
		3 Lukio / ammatillinen perustutkinto	14	37.84	227	37.27	29	34.94	
		5 Opistotason tutkinto	7	18.92	154	25.29	21	25.30	
		6 Korkeakoulututkinto	8	21.62	119	19.54	18	21.69	
		0 Puuttuva	0	0	3	0.49	1	1.20	
		0 Puuttuva	0	0	3	0.49	1	1.20	
K86	Ammattiryhmä	1 Johtaja / ylempi toimihenkilö	8	21.62	85	13.96	13	15.66	0.459
		2 Toimihenkilö / työntekijä	11	29.73	266	43.68	33	39.76	
		3 Yrittäjä	7	18.92	54	8.87	7	8.43	
		4 Opiskelija	1	2.70	14	2.30	1	1.20	
		5 Eläkeläinen / ei työelämässä	10	27.03	185	30.38	27	32.53	
		0 Puuttuva	0	0	5	0.82	2	2.41	
K89	Asumis-kustannukset	1 Alle 15 %	6	16.22	150	24.63	17	20.48	0.577
		2 16 - 25 %	14	37.84	187	30.71	29	34.94	
		3 26 - 35%	5	13.51	117	19.21	12	14.46	
		4 36 – 50 %	6	16.22	64	10.51	10	12.05	
		5 51 – 65 %	1	2.70	19	3.12	5	6.02	
		6 Yli 65 %	1	2.70	11	1.81	0	0	
		0 Puuttuva	4	10.81	61	10.02	10	12.05	

*vastaajat "rekisteröidyssä parisuhteessa" ei mukana

TAULUKKO 4.3. ASUINPAIKKAKUNNAN TIEDOT 1

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K5	Millaisella alueella asuntonne sijaitsee								
	1 Kaupungin keskustassa		0	0	29	4.76	4	4.82	*0.001 (luokat 1+2+3,4+5)
	2 Lähiössä tai kaupungin muulla asunto-alueella		5	13.51	199	32.68	37	44.58	*<0.0001 (kaikki luokat)
	3 Kaupungin reuna-alueella		6	16.22	83	13.63	13	15.66	
	4 Taajamassa maaseudulla (kirkonkylä tms.)		3	8.11	113	18.56	18	21.69	
	5 Haja-asutusalueella, maaseudulla		23	62.16	180	29.56	11	13.25	
	0 Puuttuva		0	0	5	0.82	0	0	
K6	Asutteko maatilalla?								
	En asu		20	54.05	514	84.40	76	91.57	<0.0001
	Kyllä, harjoitetaan viljelystä		4	10.81	23	3.78	4	4.82	0.116
	Kyllä, tuotantoeläimiä		1	2.70	11	1.81	0	0.0	0.419
	Kyllä, lemmikkieläimiä		2	5.41	4	0.66	0	0.0	0.005
	Kyllä, ei aktiivisessa viljelyssä, ei eläimiä		11	29.73	45	7.39	1	1.20	<0.0001
K7	Mikä on asuntonne etäisyys seuraavista kohteista?								
	Tiestä tai kadusta	1-5 km	9	24.32	196	32.18	21	25.30	
		yli 5 km	8	21.62	22	3.61	2	2.41	
		En tiedä	0	0	2	0.33	0	0	
	Rautatiestä tai metrosta	1-5 km	8	21.62	206	33.83	30	36.14	
		yli 5 km	21	56.76	270	44.33	26	31.33	
		En tiedä	2	5.41	21	3.45	5	6.02	
	Lentokentästä	1-5 km	2	5.41	30	4.93	5	6.02	
		yli 5 km	29	78.38	501	82.27	65	78.31	
		en tiedä	2	5.41	29	4.76	4	4.82	
	Tehtaasta	1-5 km	8	21.62	208	34.15	32	38.55	
		yli 5 km	21	56.76	306	50.25	35	42.17	
		en tiedä	2	5.41	28	4.60	2	2.41	
	Huoltoasemasta	1-5 km	10	27.03	318	52.22	49	59.04	
		yli 5 km	18	48.65	161	26.44	10	12.05	
		en tiedä	1	2.70	5	0.82	0	0	
	Kaatopaikasta	1-5 km	5	13.51	151	24.79	19	22.89	
		yli 5 km	26	70.27	378	62.07	50	60.24	
		en tiedä	0	0	30	4.93	3	3.61	
	Maataloudesta	1-5 km	7	18.92	152	24.96	14	16.87	
		yli 5 km	16	43.24	281	46.14	39	46.99	
		en tiedä	5	13.51	86	14.12	18	21.69	
	Korkeajännitejohdoista	1-5 km	7	18.92	238	39.08	36	43.37	
		yli 5 km	14	37.84	105	17.24	11	13.25	
		en tiedä	5	13.51	93	15.27	15	18.07	

TAULUKKO 4.4. ASUINPAIKKAKUNNAN TIEDOT 2

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%
K9	Mihin seuraavista asuinympäristönne mahdollisuuksista ja palveluista olette tyytymätön?							
	Julkiseen liikenteeseen		13	35.14	242	39.74	24	28.92
	Liikuntamahdollisuuksiin		5	13.51	72	11.82	7	8.43
	Päivähoitoon / kouluihin		3	8.11	24	3.94	3	3.61
	Pankki / postipalveluihin		9	24.32	140	22.99	17	20.48
	Kirjastopalveluihin		4	10.81	22	3.61	4	4.82
	Elintarvikeliikkeisiin		7	18.92	84	13.79	8	9.64
	Ravintoloihin ja kahviloihin		2	5.41	104	17.08	14	16.87
	Luonnonläheisyyteen		3	8.11	26	4.27	3	3.61
	Esteettömyyten asunnossa		3	8.11	9	1.48	0	0
	Esteettömyyten lähiympäristössä		2	5.41	13	2.13	1	1.20
	Yleiseen viihtyisyyteen		3	8.11	62	10.18	13	15.66

TAULUKKO 4.5. ASUINRAKENNUKSEN TIEDOT 1

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K10	Kuinka tyytyväinen olette nykyiseen asuntoonne/taloonne								
		1 Tyytyväinen	28	75.68	409	67.16	46	55.42	0.096 (tyytyväinen vs. muut)
		2 Melko tyytyväinen	5	13.51	174	28.57	30	36.14	
		3 Melko tyytymätön	2	5.41	17	2.79	1	1.20	
		4 Tyytymätön	0	0	1	0.16	0	0	
		5 En osaa sanoa	1	2.70	1	0.16	1	1.20	
		0 Puuttuva	1	2.70	7	1.15	5	6.02	
K14	Mikä on asuntonne hallintamuoto								
		1 Vuokrahuoneisto vuokratalossa	0	0	6	0.99	3	3.61	
		2 Vuokrahuoneisto osaketalossa	0	0	1	0.16	1	1.20	
		3 Omistusasunto	36	97.30	572	93.92	73	87.95	
		4 Työsuhdeasunto	0	0	1	0.16	3	3.61	
		5 Asumisoikeusasunto	0	0	5	0.82	0	0	
		6 Jokin muu, mikä	0	0	15	2.46	0	0	
		0 Puuttuva	1	2.70	9	1.48	3	3.61	
K16	Koetteko asuntonne riittävän tilavaksi								
		1 Ei	2	5.41	31	5.09	3	3.61	0.859
		2 Kyllä	34	91.89	575	94.42	77	92.77	
		0 Puuttuva	1	2.70	3	0.49	3	3.61	
K17	Suunnitteletteko asunnon vaihtoa seuraavien 12 kuukauden aikana								
		1 Ei	32	86.49	545	89.49	70	84.34	0.289
		2 Kyllä	1	2.70	56	9.20	10	12.05	
		0 Puuttuva	4	10.81	8	1.31	3	3.61	
K18	Suunnittelette asunnon vaihtoa								
		1 Asunto on liian pieni	0	0	4	7.14	1	10.00	
		2 Asunto on liian suuri	0	0	19	33.93	4	40.00	
		3 Asunnon kunto (esim. liian suuri korjaustarve)	0	0	8	14.29	1	10.00	
		4 Asunto ei vastaa muutoin tarpeita	0	0	7	12.50	1	10.00	
		5 Halutaan vaihtaa asuinalueetta	0	0	17	30.36	0	0	
		6 Taloudelliset syyt	0	0	5	8.93	1	10.00	
		7 Muu syy	1 (muutto kerrostaloon)	100.00	17	30.36	4	40.00	
K19	Mikä on asuntonne kattotyyppi								
		1 Harjakatto	34	91.89	540	88.67	58	69.88	
		2 Aumakatto	0	0	31	5.09	6	7.23	
		3 Tasakatto	0	0	4	0.66	5	6.02	
		4 Pulttikatto	0	0	9	1.48	6	7.23	
		5 En tiedä	0	0	3	0.49	3	3.61	
		6 Jokin muu	1	2.70	7	1.15	1	1.20	
		0 Puuttuva	0	0	31	5.09	6	7.23	

TAULUKKO 4.6. ASUINRAKENNUKSEN TIEDOT 2

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%
K20	Millainen on talonne alimman kerroksen lattiarakenne							
		1 Ryömintätilallinen	10	27.03	103	16.91	9	10.84
		2 Maanvarainen	21	56.76	426	69.95	57	68.67
		3 En tiedä	1	2.70	43	7.06	12	14.46
		4 Muu	0	0	19	3.12	2	2.41
		0 Puuttuva	5	13.51	18	2.96	3	3.61
K21	Onko rakennuksessa käytössä olevaa kellaria							
		1 Ei ole kellaria	20	54.05	356	58.46	50	60.24
		2 Kyllä, säilytystilana	17	45.95	210	34.48	29	34.94
		3 Kyllä, pesutilana	3	8.11	86	14.12	12	14.46
		4 Kyllä, harraste-/oleskelutilana	0	0	60	9.85	12	14.46
		5 Kyllä, makuuhuoneena	0	0	13	2.13	4	4.82
		6 Kyllä, muuna tilana	1	2.70	21	3.45	3	3.61
		7 Muussa käytössä	6	16.22	49	8.05	5	6.02
K22	Mitä seuraavista sisäverhoustyypeistä on käytetty asuinhuoneidenne (makuuhuone/olohuone/keittiö) seinäpinoissa?							
		1 Lakattu puu / paneeli	14	37.84	150	24.63	12	14.46
		2 Maalattu puu / paneeli	7	18.92	93	15.27	4	4.82
		3 Maalattu tiili / betoni / kivi / rappaus	4	10.81	60	9.85	49	59.04
		4 Maalaamaton tiili / betoni / kivi / rappaus	0	0	36	5.91	10	12.05
		5 Maalattu rakennuslevy (puukuitu, kipsi, lastulevy, tms.)	10	27.03	307	50.41	25	30.12
		6 Tapetoitu rakennuslevy (puukuitu, kipsi, lastulevy, tms.)	13	35.14	479	78.65	26	31.33
		7 Tapetoitu kivi / betoni tms.	0	0	17	2.79	24	28.92
		8 Hirsitalo / massiivipuu	37	100.00	0	0	0	0
		8 En tiedä	0	0	4	0.66	2	2.41
		9 Muu	0	0	13	2.13	2	2.41
K23	Mitä seuraavista pintamateriaaleista on käytetty asuinhuoneidenne lattioissa?							
		1 Puu / parketti	31	83.78	406	66.67	56	67.47
		2 Laminaatti	11	29.73	255	41.87	23	27.71
		3 Laatta / klinkkeri / luonnonkivi	12	32.43	254	41.71	34	40.96
		4 Muovimatto / -laatta	12	32.43	240	39.41	29	34.94
		5 Linoleum	0	0	15	2.46	1	1.20
		6 Kokolattiamatto	1	2.70	13	2.13	0	0
		7 En tiedä	0	0	1	0.16	1	1.20
		8 Muu	0	0	15	2.46	3	3.61
K24	Millaiset asuntonne ikkunat ovat							
		2-kertaiset lasit	9	24.32	115	18.88	21	25.30
		3-kertaiset lasit	25	67.57	450	73.89	58	69.88
		4-kertaiset lasit	1	2.70	29	4.76	3	3.61
		En tiedä	0	0	7	1.15	0	0
		Jokin muu	2	5.41	4	0.66	1	1.20
		0 Puuttuva	0	0	4	0.66	0	0

TAULUKKO 4.7. ASUINRAKENNUKSEN TIEDOT 3

Muuttuja	Kysymys	Hirsi N	%	Puu N	%	Kivi N	%
K25	Mitkä seuraavista kuuluvat asuntonne varustukseen?						
	10 Ilmankostutin	1	2.70	26	4.27	3	3.61
	11 Ilmanpuhdistin	1	2.70	82	13.46	10	12.05
K26	Onko taloon tehty seuraavia peruskorjaustoimenpiteitä?						
	Katon korjaus	Ei	17	45.95	372	61.08	62.65
	12 kk aikana	2	5.41	38	6.24	7	8.43
	5 vuoden aikana	3	8.11	88	14.45	11	13.25
	En tiedä	0	0	9	1.48	2	2.41
	Julkisivuremontti	Ei	19	51.35	394	64.70	63.86
	12 kk aikana	0	0	17	2.79	1	1.20
	5 vuoden aikana	4	10.81	41	6.73	2	2.41
	En tiedä	0	0	7	1.15	1	1.20
	Perustusten korjaus	Ei	18	48.65	400	65.68	66.27
	12 kk aikana	0	0	9	1.48	1	1.20
	5 vuoden aikana	4	10.81	18	2.96	0	0
	En tiedä	0	0	10	1.64	1	1.20
	Putkiremontti	Ei	17	45.95	344	56.49	62.65
	12 kk aikana	1	2.70	18	2.96	3	3.61
	5 vuoden aikana	7	18.92	88	14.45	7	8.43
	En tiedä	0	0	9	1.48	1	1.20
	Ilmanvaihtojärjestelmän korjaus	Ei	19	51.35	376	61.74	60.24
	12 kk aikana	2	5.41	13	2.13	4	4.82
	5 vuoden aikana	2	5.41	37	6.08	1	1.20
	En tiedä	0	0	8	1.31	2	2.41

TAULUKKO 4.8. ASUINRAKENNUKSEN TIEDOT 4

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
	Ikkunaremontti	Ei	18	48.65	356	58.46	50	60.24	
		12 kk aikana	1	2.70	20	3.28	0	0	
		5 vuoden aikana	3	8.11	64	10.51	11	13.25	
		En tiedä	0	0	7	1.15	1	1.20	
	Lämmitysjärjestelmän korjaus	Ei	18	48.65	345	56.65	41	49.40	
		12 kk aikana	2	5.41	27	4.43	8	9.64	
		5 vuoden aikana	2	5.41	94	15.44	16	19.28	
		En tiedä	0	0	7	1.15	1	1.20	
K27	Miten tyytyväinen olette talon kunnossapitoon ja tehtyihin korjauksiin?								
		1 Tyytyväinen	23	62.16	341	55.99	33	39.76	*0.005 (tyytyväinen vs. muut)
		2 Melko tyytyväinen	7	18.92	162	26.60	34	40.96	
		3 Melko tyytymätön	0	0	17	2.79	2	2.41	
		4 Tyytymätön	0	0	7	1.15	1	1.20	
		5 En osaa sanoa	1	2.70	22	3.61	6	7.23	
		0 Puuttuva	6	16.22	60	9.85	7	8.43	

TAULUKKO 4.9. HYGIENIA 1

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K29	Oletteko havainneet juomavedessä epätavallista hajua, makua?	1 Ei	33	89.19	564	92.61	73	87.95	0.176
		2 Kyllä	4	10.81	41	6.73	10	12.05	
		0 Puuttuva	0	0	4	0.66	0	0	
K32	Minkälaista on asuntonne lämmin talousvesi?	1 Liian kylmää	1	2.7	3	0.5	0	0.0	0.387
		2 Liian kuumaa	0	0.0	17	2.8	2	2.4	
		3 Sopivaa	35	94.6	568	95.0	80	97.6	
		4 Ei lämmintä johtovettä	1	2.7	10	1.7	0	0.0	
K37	Onko Teillä koiria kissoja marsuja tms.?	ei	11	29.73	345	56.65	57	68.67	<0.00 01
		kyllä, sisätiloissa	20	54.05	228	37.44	20	24.10	
		maatilakysymys? puuttuva	0	0	11	1.81	3	3.61	
	Onko Teillä lintuja?	ei	20	54.05	432	70.94	64	77.11	
		kyllä, sisätiloissa	0	0	2	0.33	0	0	
		kyllä, mutta ei sisätiloissa puuttuva	16	43.24	175	28.74	17	20.48	
	Onko Teillä akvaario?	ei	19	51.35	415	68.14	61	73.49	
		kyllä, sisätiloissa	2	5.41	19	3.12	5	6.02	
		kyllä, mutta ei sisätiloissa puuttuva	16	43.24	175	28.74	17	20.48	
	Onko Teillä liskoja käärmeitä?	ei	20	54.05	425	69.79	64	77.11	
		kyllä, sisätiloissa	0	0	6	0.99	1	1.20	
		kyllä, mutta ei sisätiloissa puuttuva	17	45.95	178	29.23	18	21.69	
Onko Teillä muita eläimiä?	ei	12	32.43	331	54.35	47	56.63		
	kyllä, sisätiloissa	0	0	4	0.66	0	0		
	kyllä, mutta ei sisätiloissa puuttuva	0	0	2	0.33	0	0		
K38	Oletteko nähneet merkkejä jyrstöistä?	ei	17	45.95	353	57.96	55	66.27	0.105
		kyllä, sisätiloissa	8	21.62	65	10.67	8	9.64	
		kyllä, pihapiirissä	17	45.95	205	33.66	17	20.48	
	Oletteko nähneet merkkejä hyönteisistä?	ei	25	67.57	450	73.89	60	72.29	
		kyllä, sisätiloissa	3	8.11	33	5.42	7	8.43	
		kyllä, pihapiirissä	6	16.22	67	11.00	12	14.46	

TAULUKKO 4.10. FYSIKAALISET JA BIOLOGISET OLOSUHTEET 1

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K40	Miten tyytyväinen olette asuntonne sisäilman laatuun?	1 Tyytyväinen	30	81.08	338	55.50	39	46.99	*0.003 (tyytyväinen vs. muut)
		2 Melko tyytyväinen	7	18.92	247	40.56	35	42.17	
		3 Melko tyytymätön	0	0	17	2.79	7	8.43	
		4 Tyytymätön	0	0	3	0.49	0	0	
		5 En osaa sanoa	0	0	3	0.49	1	1.20	
		0 Puuttuva	0	0	1	0.16	1	1.20	
K41	Millainen ilmanvaihto asunnonne on?	1 Koneellinen tulo ja poisto	9	24.32	190	31.20	29	34.94	0.472
		2 Koneellinen poisto	5	13.51	107	17.57	17	20.48	
		3 Painovoimainen	12	32.43	197	32.35	21	25.30	
		4 Ei ilmanvaihtoa	6	16.22	76	12.48	9	10.84	
		5 En tiedä	3	8.11	18	2.96	5	6.02	
		0 Puuttuva	2	5.41	21	3.45	2	2.41	
K42	Onko makuuhuoneessanne raitisilmaventtiileitä?	1 Ei	20	54.05	235	38.59	28	33.73	*0.033
		2 Kyllä	13	35.14	357	58.62	53	63.86	
		0 Puuttuva	4	10.81	17	2.79	2	2.41	
K43	Mikä on asuntonne lämmitysmuoto, kaukolämpö	1 Ensisijainen	3	8.11	57	9.36	24	28.92	
		2 Toissijainen	0	0	6	0.99	0	0	
		0 Puuttuva	34	91.89	546	89.66	59	71.08	
	Lämmitysmuoto, sähkö	1 Ensisijainen	12	32.43	269	44.17	24	28.92	
		2 Toissijainen	10	27.03	97	15.93	11	13.25	
		0 Puuttuva	15	40.54	243	39.90	48	57.83	
	Lämmitysmuoto, polttoöljy	1 Ensisijainen	4	10.81	125	20.53	18	21.69	
		2 Toissijainen	0	0	14	2.30	4	4.82	
		0 Puuttuva	33	89.19	470	77.18	61	73.49	
	Lämmitysmuoto, maalämpö	1 Ensisijainen	1	2.70	22	3.61	6	7.23	
		2 Toissijainen	0	0	3	0.49	0	0	
		0 Puuttuva	36	97.30	584	95.89	77	92.77	
	Mikä on asuntonne lämmitysmuoto, aurinkolämpö	1 Ensisijainen	0	0	0	0	1	1.20	
		2 Toissijainen	0	0	6	0.99	2	2.41	
		0 Puuttuva	37	100.0	603	99.01	80	96.39	
	Lämmitysmuoto, ilmalämpöpumppu	1 Ensisijainen	1	2.70	34	5.58	4	4.82	
		2 Toissijainen	6	16.22	91	14.94	11	13.25	
		0 Puuttuva	30	81.08	484	79.47	68	81.93	
	Lämmitysmuoto, puu/pelletti	1 Ensisijainen	6	16.22	90	14.78	7	8.43	
		2 Toissijainen	3	8.11	37	6.08	3	3.61	
		0 Puuttuva	28	75.68	482	79.15	73	87.95	
	Lämmitysmuoto, tulisijat	1 Ensisijainen	14	37.84	74	12.15	7	8.43	
		2 Toissijainen	14	37.84	289	47.45	28	33.73	
		0 Puuttuva	9	24.32	246	40.39	48	57.83	
	Lämmitysmuoto, en tiedä	1 Ensisijainen	0	0	4	0.66	0	0	
		2 Toissijainen	0	0	2	0.33	1	1.20	

		0 Puuttuva	37	100.0 0	603	99.01	82	98.80	
	Lämmitysmuoto, ei ole	1 Ensisijainen							
		2 Toissijainen	0	0	3	0.49	0	0	
		0 Puuttuva	37	100.0 0	606	99.51	83	100.0 0	
	Lämmitysmuoto, jokin muu	1 Ensisijainen	0	0	11	1.81	2	2.41	
		2 Toissijainen	0	0	3	0.49	0	0	
		0 Puuttuva	37	100.0 0	595	97.70	81	97.59	
K44	Millaisia liesiä tai tulisijoja asunnossanne on?	1 Kaasuliesi/ -uuni	2	5.41	10	1.64	1	1.20	
		2 Puuliesi / -uuni tai leivinuuni	27	72.97	252	41.38	21	25.30	
		3 Puukiuas	11	29.73	219	35.96	23	27.71	
		4 Takka	28	75.68	381	62.56	49	59.04	
		5 Kamina	3	8.11	19	3.12	1	1.20	
		6 Ei mitään yllämainituista	0	0	53	8.70	14	16.87	
		7 Jokin muu	2	5.41	52	8.54	14	16.87	
K45	Kuinka usein tuuletatte asuntoanne, käyttäen liesituuletinta?	1 Päivittäin / lähes päivittäin	17	45.95	339	55.67	43	51.81	
		2 Harvemmin	1	2.70	27	4.43	5	6.02	
		3 Tarvittaessa	13	35.14	145	23.81	27	32.53	
		4 Ei koskaan	0	0	5	0.82	0	0	
		5 Ei mahdollista	1	2.70	13	2.13	1	1.20	
		0 Puuttuva	5	13.51	80	13.14	7	8.43	

TAULUKKO 4.11. FYSIKAALISET JA BIOLOGISET OLOSUhteET 3

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
	Kuinka usein tuuletatte asuntoanne, avaamalla ikkunoita?	1 Päivittäin / lähes päivittäin	21	56.76	419	68.80	55	66.27	
		2 Harvemmin	8	21.62	87	14.29	15	18.07	
		3 Tarvittaessa	6	16.22	62	10.18	4	4.82	
		4 Ei koskaan	0	0	9	1.48	0	0	
		5 Ei mahdollista	0	0	0	0	1	1.20	
		0 Puuttuva	2	5.41	32	5.25	8	9.64	
K46	Mikä on asuntonne sisälämpötila lämmityskauden aikana tyypillisesti?	1 Alle 18 astetta	1	2.70	5	0.82	0	0	0.471 (luokat 2,3,4)
		2 18 - 20 astetta	9	24.32	132	21.67	22	26.51	
		3 20 - 22 astetta	19	51.35	344	56.49	51	61.45	
		4 22 - 24 astetta	6	16.22	120	19.70	10	12.05	
		5 Yli 24 astetta	0	0	3	0.49	0	0	
		0 Puuttuva	2	5.41	5	0.82	0	0	
K47	Millaiset ovat asuntonne lämpöolosuhteet?	sopivan lämmintä kesällä	30	81.08	440	72.25	70	84.34	*0.038
		liian kylmää kesällä	0	0	1	0.16	0	0	
		liian kuumaa kesällä	7	18.92	195	32.02	15	18.07	
		vetoisaa kesällä	0	0	1	0.16	0	0	
		kylmiä lattiapintoja kesällä	0	0	7	1.15	2	2.41	
		sopivan lämmintä talvella	32	86.49	550	90.31	75	90.36	0.748
		liian kylmää talvella	0	0	34	5.58	5	6.02	
		liian kuumaa talvella	0	0	6	0.99	0	0	
		vetoisaa talvella	4	10.81	20	3.28	5	6.02	*0.045
		kylmiä lattiapintoja talvella	7	18.92	89	14.61	17	20.48	0.322
K48	Missä kuivaatte pyykkinne	1 Kuivaushuoneessa, jossa on ilmanvaihto	6	16.22	74	12.15	16	19.28	
		2 Kuivausrummussa/-kaapissa	6	16.22	168	27.59	25	30.12	
		3 Pesutiloissa	21	56.76	349	57.31	48	57.83	
		4 Muualla sisätiloissa (makuuhuone, olohuone, tms.)	8	21.62	114	18.72	13	15.66	
		5 Parvekkeella	4	10.81	56	9.20	10	12.05	
		6 Ulkona sään salliessa	34	91.89	486	79.80	58	69.88	
		7 Muualla	6	16.22	47	7.72	4	4.82	
K49		Tiivistyykö asuntonne ikkunoihin kosteutta, kesällä?	1 Päivittäin / lähes päivittäin	0	0	4	0.66	0	0
	2 Viikoittain		0	0	1	0.16	0	0	
	3 Harvemmin		5	13.51	72	11.82	10	12.05	
	4 Ei koskaan		30	81.08	494	81.12	65	78.31	
	0 Puuttuva		2	5.41	38	6.24	8	9.64	

TAULUKKO 4.12. FYSIKAALISET JA BIOLOGISET OLOSUhteET 4

Muuttuja	Kysymys	Vaihtoehdot	Hirsi		Puu		Kivi	
			N	%	N	%	N	%
	Tiivistyykö asuntonne ikkunoihin kosteutta, talvella?	1 Päivittäin / lähes päivittäin	0	0	7	1.15	4	4.82
		2 Viikoittain	0	0	19	3.12	1	1.20
		3 Harvemmin	9	24.32	206	33.83	24	28.92
		4 Ei koskaan	28	75.68	359	58.95	50	60.24
		0 Puuttuva	0	0	18	2.96	4	4.82
K50	Onko asunnossa sattunut vakavia vesivahinkoja?	1 Ei	30	81.08	510	83.74	68	81.93
		2 Kyllä, viimeisen 12 kuukauden aikana	0	0	7	1.15	0	0
		3 Kyllä, yli 12 kuukautta sitten	2	5.41	60	9.85	7	8.43
		4 En tiedä	1	2.70	8	1.31	2	2.41
		0 Puuttuva	4	10.81	24	3.94	6	7.23
K51	Miten vahingosta aiheutuneita vaurioita on korjattu?	1 Ei ole tehty korjaustoimenpiteitä	1	50.00	0	0	0	0
		2 Kuivaamalla rakenteita	1	50.00	48	71.64	4	57.14
		3 Purkamalla / poistamalla vaurioituneita materiaaleja	1	50.00	59	88.06	6	85.71
		4 Ei tietoa						
		5 Muuten	0	0	3	4.48	0	0
K52	Onko asuntonne seinä lattia tai kattopinnoissa kosteus tai homevaurioita?	1 Ei	33	89.19	531	87.19	67	80.72
		2 Kyllä, sisäpinnoissa / asunnon sisäpuolella	0	0	22	3.61	10	12.05
		3 Kyllä, ulkopinnoissa / asunnon ulkopuolella	0	0	10	1.64	1	1.20
		4 En tiedä	3	8.11	31	5.09	4	4.82
K55	Onko asuinympäristönne valaistuksessa puutteita: asunnon sisävalaistuksessa, luonnonvalo?	1 Ei	27	72.97	526	86.37	61	73.49
		2 Kyllä	7	18.92	29	4.76	8	9.64
		0 Puuttuva	3	8.11	54	8.87	14	16.87
	Onko valaistuksessa puutteita: asunnon sisävalaistuksessa, keinovalo	1 Ei	27	72.97	495	81.28	63	75.90
		2 Kyllä	5	13.51	61	10.02	10	12.05
		0 Puuttuva	5	13.51	53	8.70	10	12.05

TAULUKKO 4.13. FYSIKAALISET JA BIOLOGISET OLOSUHTEET 6

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K56	Mitkä seuraavista aiheuttavat meluhaittaa, tie ja katuliikenne	1 Ei meluhaittaa	27	72.97	368	60.43	47	56.63	0.098 (ei melua vs. muut)
		2 Meluhaittaa päivittäin	2	5.41	92	15.11	16	19.28	
		3 Meluhaittaa viikoittain	1	2.70	26	4.27	1	1.20	
		4 Meluhaitta on satunnaista/kausittaista	3	8.11	93	15.27	11	13.25	
		0 Puuttuva	4	10.81	30	4.93	8	9.64	
	Mitkä seuraavista aiheuttavat meluhaittaa, pihamelu	1 Ei meluhaittaa	31	83.78	421	69.13	50	60.24	0.008 (ei melua vs. muut)
		2 Meluhaittaa päivittäin	0	0	5	0.82	1	1.20	
		3 Meluhaittaa viikoittain	1	2.70	14	2.30	0	0	
		4 Meluhaitta on satunnaista/kausittaista	0	0	98	16.09	21	25.30	
		0 Puuttuva	5	13.51	71	11.66	11	13.25	

TAULUKKO 4.14. FYSIKAALISET JA BIOLOGISET OLOSUHTEET 7

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%
	Mitkä seuraavista aiheuttavat meluhaittaa, LVIS-melu	1 Ei meluhaittaa	31	83.78	508	83.42	71	85.54
		2 Meluhaittaa päivittäin	0	0	9	1.48	2	2.41
		3 Meluhaittaa viikoittain	0	0	3	0.49	0	0
		4 Meluhaitta on satunnaista/kausittaista	0	0	13	2.13	0	0
		0 Puuttuva	6	16.22	76	12.48	10	12.05
	Mitkä seuraavista aiheuttavat meluhaittaa, naapurimelu	1 Ei meluhaittaa	30	81.08	449	73.73	58	69.88
		2 Meluhaittaa päivittäin	0	0	8	1.31	4	4.82
		3 Meluhaittaa viikoittain	2	5.41	17	2.79	2	2.41
		4 Meluhaitta on satunnaista/kausittaista	1	2.70	64	10.51	8	9.64
		0 Puuttuva	4	10.81	71	11.66	11	13.25
	Mitkä seuraavista aiheuttavat meluhaittaa, kotimelu	1 Ei meluhaittaa	26	70.27	436	71.59	62	74.70
		2 Meluhaittaa päivittäin	0	0	17	2.79	3	3.61
		3 Meluhaittaa viikoittain	0	0	21	3.45	0	0
		4 Meluhaitta on satunnaista/kausittaista	6	16.22	64	10.51	8	9.64
		0 Puuttuva	5	13.51	71	11.66	10	12.05

TAULUKKO 4.15. KEMIALLISET EPÄPUHTAUDET, HIUKKASET JA KUIDUT 1

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K58	Tupakoiko kukaan sisällä asunnossanne, itse?	ei lainkaan	33	89.19	592	97.21	77	92.77	
		päivittäin	1	2.70	6	0.99	2	2.41	
		viikoittain	0	0	1	0.16	0	0	
		satunnaisesti	2	5.41	3	0.49	1	1.20	
		puuttuva	1	2.70	7	1.15	3	3.61	
	Tupakoiko kukaan sisällä asunnossanne, joku toinen?	ei lainkaan	31	83.78	570	93.60	73	87.95	
		päivittäin	2	5.41	9	1.48	2	2.41	
		viikoittain	1	2.70	0	0	0	0	
		satunnaisesti	0	0	3	0.49	0	0	
		puuttuva	3	8.11	27	4.43	8	9.64	
K59	Käytättekö säännöllisesti seuraavanlaisia tuotteita?	1 Parfyymeja, ei käytetä	10	27.03	161	26.44	24	28.92	
		2 Hajustettuja puhdistusaineita, ei käytetä	15	40.54	142	23.32	31	37.35	
		3 Ilmanraikastimia, ei käytetä	21	56.76	246	40.39	38	45.78	
		4 Parfyymeja, itse	20	54.05	299	49.10	36	43.37	
		5 Hajustettuja puhdistusaineita, itse	14	37.84	285	46.80	27	32.53	
		6 Ilmanraikastimia, itse	7	18.92	114	18.72	14	16.87	
		7 Parfyymeja, joku toinen	14	37.84	286	46.96	41	49.40	
		8 Hajustettuja puhdistusaineita, joku toinen	6	16.22	138	22.66	23	27.71	
		9 Ilmanraikastimia, joku toinen	4	10.81	65	10.67	7	8.43	
K60	Käytetäänkö kotitaloudessanne hyönteismyrkkyjä, torjunta-aineita?	1 Ei	23	62.16	319	52.38	45	54.22	0.178
		2 Kyllä	8	21.62	236	38.75	30	36.14	
		0 Puuttuva	6	16.22	54	8.87	8	9.64	
	Käytetäänkö kotitaloudessanne rikkaruohomyrkkijä?	1 Ei	23	62.16	307	50.41	47	56.63	0.052
		2 Kyllä	7	18.92	168	27.59	13	15.66	
		0 Puuttuva	7	18.92	134	22.00	23	27.71	

TAULUKKO 4.16. KEMIALLISET EPÄPUHTAUDET, HIUKKASET JA KUIDUT 2

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K63	Onko asuntonne läheisyydessä voimakkaita siitepölylähteitä?	1 Ei	12	32.43	250	41.05	32	38.55	0.646
		2 Kyllä	23	62.16	341	55.99	45	54.22	
		0 Puuttuva	2	5.41	18	2.96	6	7.23	
K64	Onko asunnossanne tai sen lähiympäristössä hajuja?								
		home asunnossa	0	0	1	0.16	0	0	
		home sisällä	0	0	3	0.49	0	0	
		rakennusmateriaalit asunnossa	0	0	3	0.49	0	0	
		rakennusmateriaalit sisällä	0	0	2	0.33	0	0	
		tunkkaisuus asunnossa	0	0	24	3.94	3	3.61	
tunkkaisuus sisällä	0	0	10	1.64	1	1.20			

TAULUKKO 4.17. KEMIALLISET EPÄPUHTAUDET, HIUKKASET JA KUIDUT 3

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K64	Onko asuinrakennuksessanne asbestipitoisia materiaaleja?	1 Ei	30	81.08	530	87.03	59	71.08	0.001
		2 Kyllä, asuintiloissa	0	0	3	0.49	2	2.41	
		3 Kyllä, mutta ei asuintiloissa	3	8.11	19	3.12	6	7.23	
		4 En tiedä	2	5.41	35	5.75	13	15.66	
		0 Puuttuva	2	5.41	22	3.61	3	3.61	
K67	Onko asunnossanne kohonneita radonpitoisuuksia?	1 Ei	23	62.16	264	43.35	35	42.17	0.110
		2 Kyllä	1	2.70	11	1.81	0	0	
		3 En tiedä	12	32.43	320	52.55	45	54.22	
		0 Puuttuva	1	2.70	14	2.30	3	3.61	

TAULUKKO 4.18. HYVINVOINTI JA TERVEYS 1

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K79	Millaiseksi koette yleisen terveydentilanne tällä hetkellä?	1 Hyväksi	17	45.95	208	34.15	27	32.53	0.280 (hyvä vs. muut)
		2 Melko hyväksi	15	40.54	243	39.90	35	42.17	
		3 Tyydyttäväksi	3	8.11	131	21.51	18	21.69	
		4 Melko huonoksi	1	2.70	16	2.63	1	1.20	
		5 Huonoksi	0	0	4	0.66	0	0	
		6 En osaa sanoa	0	0	2	0.33	0	0	
		0 Puuttuva	1	2.70	5	0.82	2	2.41	
K80	Kuinka usein ollut yleisoireita 12 kuukauden aikana?	päivittäin/lähes päivittäin	0	0	35	5.75	8	9.64	0.213
		viikoittain	3	8.11	81	13.30	10	12.05	
		kuukausittain	5	13.51	95	15.60	7	8.43	
		harvemmin	13	35.14	220	36.12	30	36.14	
		ei lainkaan	9	24.32	110	18.06	15	18.07	
		puuttuva	7	18.92	68	11.17	13	15.66	
		Kuinka usein ollut ylähengitystieoireita 12 kuukauden aikana?	päivittäin/lähes päivittäin	1	2.70	34	5.58	4	
viikoittain	1		2.70	30	4.93	6	7.23		
kuukausittain	7		18.92	59	9.69	9	10.84		
harvemmin	12		32.43	288	47.29	35	42.17		
ei lainkaan	10		27.03	125	20.53	17	20.48		
puuttuva	6		16.22	73	11.99	12	14.46		
Kuinka usein ollut alahengitystieoireita 12 kuukauden aikana?	päivittäin/lähes päivittäin		0	0	27	4.43	2	2.41	0.841
	viikoittain	2	5.41	21	3.45	3	3.61		
	kuukausittain	2	5.41	31	5.09	6	7.23		
	harvemmin	9	24.32	247	40.56	31	37.35		
	ei lainkaan	15	40.54	204	33.50	27	32.53		
	puuttuva	9	24.32	79	12.97	14	16.87		

TAULUKKO 4.19. HYVINVOINTI JA TERVEYS 2

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
	Kuinka usein ollut silmäoireita 12 kuukauden aikana?	päivittäin/lähes päivittäin	1	2.70	32	5.25	4	4.82	0.431 päivittäin/ viikoittain vs. harvem- min)
		viikoittain	1	2.70	39	6.40	7	8.43	
		kuukausittain	4	10.81	51	8.37	5	6.02	
		harvemmin	6	16.22	186	30.54	30	36.14	
		ei lainkaan	20	54.05	235	38.59	25	30.12	
		puuttuva	5	13.51	66	10.84	12	14.46	
	Kuinka usein ollut ihottumaa tai iho-oireita 12 kuukauden aika- na?	päivittäin/lähes päivittäin	1	2.70	31	5.09	4	4.82	0.348
		viikoittain	0	0	28	4.60	5	6.02	
		kuukausittain	3	8.11	40	6.57	5	6.02	
		harvemmin	6	16.22	171	28.08	18	21.69	
		ei lainkaan	20	54.05	258	42.36	37	44.58	
		puuttuva	7	18.92	81	13.30	14	16.87	

TAULUKKO 4.20. HYVINVOINTI JA TERVEYS 3

Muuttuja	Kysymys	Vaihtoehdot	Hirsi N	%	Puu N	%	Kivi N	%	p-arvo
K81	Onko Teillä lääkärin toteama astma?	1 Ei	27	72.97	481	78.98	61	73.49	0.488
		2 Kyllä	3	8.11	45	7.39	9	10.84	
		0 Puuttuva	7	18.92	83	13.63	13	15.66	
	Onko Teillä lääkärin toteamaa allergiaa pölypunkeille?	1 Ei	29	78.38	496	81.44	59	71.08	0.420
		2 Kyllä	0	0	26	4.27	4	4.82	
		0 Puuttuva	8	21.62	87	14.29	20	24.10	
	Onko Teillä lääkärin toteamaa allergiaa siitepölylle?	1 Ei	28	75.68	437	71.76	52	62.65	0.232
		2 Kyllä	2	5.41	90	14.78	14	16.87	
		0 Puuttuva	7	18.92	82	13.46	17	20.48	
	Onko Teillä lääkärin toteamaa allergiaa kotieläimille?	1 Ei	27	72.97	465	76.35	59	71.08	0.786
		2 Kyllä	2	5.41	56	9.20	6	7.23	
		0 Puuttuva	8	21.62	88	14.45	18	21.69	
	Onko Teillä lääkärin toteamaa allergiaa homeille?	1 Ei	29	78.38	487	79.97	61	73.49	0.179
		2 Kyllä	0	0	19	3.12	5	6.02	
		0 Puuttuva	8	21.62	103	16.91	17	20.48	
K82	Oletteko sairastaneet viimeisen 12 kuukauden aikana hengitystietulehduksia?	1 Ei	24	64.86	466	76.52	60	72.29	0.445
		2 Kyllä	9	24.32	106	17.41	13	15.66	
		0 Puuttuva	4	10.81	37	6.08	10	12.05	
	Oletteko käyneet lääkärissä viimeisen 12kk aikana heng.tulehdusten vuoksi?	1 Ei	24	64.86	471	77.34	62	74.70	0.159
		2 Kyllä	10	27.03	94	15.44	14	16.87	
		0 Puuttuva	3	8.11	44	7.22	7	8.43	
	Oletteko olleet poissa töistä hengitystietulehdusten vuoksi?	1 Ei	26	70.27	469	77.01	62	74.70	0.594
		2 Kyllä	4	10.81	59	9.69	5	6.02	
		0 Puuttuva	7	18.92	81	13.30	16	19.28	

TAULUKKO 4.21. HYVINVOINTI JA TERVEYS 4

Muuttuja	Kysymys	Vaihtoehdot	Hirsi		Puu		Kivi	
			N	%	N	%	N	%
K84	Liikutteteo/kuntoiletteko asuin ympäristös- sä vähintään puoli tuntia päivässä?	useita kertoja viikossa	22	59.46	358	58.78	51	61.45
		noin kerran viikossa	6	16.22	120	19.70	15	18.07
		harvemmin kuin kerran viikossa	5	13.51	77	12.64	8	9.64
		ei lainkaan	2	5.41	25	4.11	2	2.41
		puuttuva	2	5.41	29	4.76	7	8.43
	Liikutteteo/kuntoiletteko koulu- tai työmat- kalla vähintään puoli tuntia päivässä?	useita kertoja viikossa	2	5.41	102	16.75	16	19.28
		noin kerran viikossa	3	8.11	23	3.78	3	3.61
		harvemmin kuin kerran viikossa	4	10.81	54	8.87	5	6.02
		ei lainkaan	9	24.32	149	24.47	21	25.30
		puuttuva	19	51.35	281	46.14	38	45.78
	Liikutteteo/kuntoiletteko muualla vähintään puoli tuntia päivässä?	useita kertoja viikossa	13	35.14	110	18.06	22	26.51
		noin kerran viikossa	4	10.81	100	16.42	11	13.25
		harvemmin kuin kerran viikossa	4	10.81	84	13.79	10	12.05
		ei lainkaan	4	10.81	66	10.84	5	6.02
		puuttuva	12	32.43	249	40.89	35	42.17