## Effect of filters in health related questions

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**Abstract**

**Background:** The Global Activity Limitation Indicator (GALI) measure long-standing health related activity limitations. There have been recommendations that the GALI question is not preceded by a screening question on health problems to avoid selection[[1]](#footnote-1)[1]. In the Norwegian SILC 2011, one part of the sample all the respondents were asked the GALI questions, while the other part of the sample only respondents who suffered from chronic illness or condition got the GALI questions. This paper is an analysis of the outcome of this experiment and what significance the filtering of the GALI question has.

**Method:** The Norwegian EU-SILC had a gross sample of 9 200 persons aged 16 years and older in 2011, 4 700 persons were interviewed. Bi- and multivariate analysis is used to explore to what extent filters have a significant effect on the outcome of the GALI questions.

**Results:** Very few reports on having limitations in activities because of health issues when they do not suffer from any chronic illness or conditions. But when the fact that the two subsamples are different is taken into account, there is a higher probability to have limitations because of health issues when the GALI question is not screened.

**Conclusion:** The experiment does not show a very clear connection between the use of filters and the share who reports on having limitations because of health issues. The results of the analysis can however be interpreted that the screening leading up to the GALI questions can have a significant importance for the likelihood to respond that one have limitations caused by health issues. If one asks the GALI questions without filtering for chronic illness the share with limitations because of health issues will most likely be higher.

## 1. Background

Statistics on Income and Living Conditions (EU-SILC) contains seven health-related variables. Three variables on health status composing the Minimum European Health Module (MEHM) and four variables related to unmet needs for health care. MEHM is a set of three general questions on self-perceived health, chronic conditions and activity limitations. MEHM is used in several EU social surveys. EU-SILC is an output harmonized survey, i.e. that each country is not bound by a specific question formulation. There has been work done to harmonize these health variables across surveys and countries.

One central indicator is the Healthy Life Years (HLY). The EU-SILC indicator of limitations in activities because of health problems, also known as the Global Activity Limitation Indicator (GALI), is included in the computation of HLY. The GALI indicator consists of the following four concepts: i) being limited, ii) in activities people usually do, iii) because of health problems and iiii) for at least the past 6 months. The standard wording of the GALI question is: For at least the past 6 months, to what extent have you been limited because of a health problem in activities people usually do? Would you say you have been… 1. Severely limited 2. Limited but not severely, or 3. Not limited at all? In developing the GALI instrument it has been recommended that the question should not be preceded by a screening question on health problems to avoid selection[[2]](#footnote-2)[1].

Since the start of the Norwegian SILC in 2003 the health questions related to the GALI indicator have been divided in several questions[[3]](#footnote-3), including use of the question on health problems and chronic conditions as a screening question to the GALI questions. Only respondents who state that they have long term health problems or disabilities will get the follow-up question on limitations in activities people usually do.

In accordance with the work done in the EU regarding harmonization of health variables, there was conducted an experiment in the data collection in the 2011 operation of the Norwegian SILC. To test the effect of screening leading up to the GALI question the sample was divided in two groups, an experimental group and a control group. The control group had filtering of the GALI questions, whilst in the experimental group all the respondents got the GALI questions without any filtering. In the control group only the respondents who suffered from chronic illness or condition where exposed to the GALI questions. This paper will look at the outcome of this experiment, and how the effect is with or without using chronic illness or condition as a screening question leading up to the GALI question.

## 2. Data

The two subsamples in this experiment are not randomly selected and thereby not equal when it comes to different background characteristics. EU-SILC is a longitudinal survey and in the Norwegian design, each selected respondent was part of the sample for eight years in 2011[[4]](#footnote-4). Each year 1/8 of the sample was replaced. The sub sample that was included for the first time in the survey in 2011 was used as the experimental group. The new subsample is drawn as the proportion *p* of the population 16 years and over. Each of the 7 existing rotational groups in the old sample is supplemented with new 16 year olds and new immigrants to ensure representativity. These respondents are also part of the experimental group. Another part of the experimental group is respondents that is in the old gross sample, but did not participate at least in the survey in the previous year T-1. The control group is the part of the sample that have been part of EU-SILC previous years and at least participated in the survey in 2010. In this way the two groups in this experiment are not equal when it comes to central background characteristics. To account for the different composed groups, we have as well as bivariate analysis also done multivariate analysis to explore the effect of filtering of the GALI questions. All the results are adjusted with weights for non-response.

The two samples are thus similar on many background characteristics, but differ on age and education level structure (see table 1). The gender distribution is similar in both the control group and experimental group. The percentage of persons living in single households are also the same in the two samples, this applies to about a quarter of both samples. The experimental group has a higher share of younger respondents, compared to the control group. In the experimental group the average age is 42 years old, compared to 48 in the control group. The education level is also higher the control group, most likely because the respondents are older. Both age and education level is known to correlate with health issues and limitations in activities, and this can very likely influence the outcome of the GALI questions in the two different subsamples [[5]](#footnote-5)[1]. Despite the age and education differences in the two groups the two samples co responds when it comes to self-perceived health. 73 percent in both samples responded that they had very good or good health in general. Barely one fifth responded to have fair health, respectively 19 and 17 percent.

Table 1 Net samples by different background characteristics. 2011. Percent

|  |  |  |
| --- | --- | --- |
|  | Control group | Experimental group |
| Females | 49 | 50 |
| Males | 51 | 50 |
|  |  |  |
| 16-24 years | 10 | 22 |
| 25-44 years | 35 | 36 |
| 45-66 years | 38 | 28 |
| 67 years and older | 17 | 13 |
|  |  |  |
| Below upper secondary level | 26 | 35 |
| Upper secondary level | 42 | 35 |
| Tertiary education | 30 | 23 |
|  |  |  |
| Single household | 26 | 25 |
| Not single household | 74 | 75 |
|  |  |  |
| Very good and good health | 73 | 73 |
| Fair health | 19 | 17 |
| Bad and very bad health | 8 | 10 |
|  |  |  |
| Respondents | 3 849 | 851 |

Source: Survey on living conditions EU-SILC 2011. Statistics Norway

## 3 Results

The question used for screening, leading up to the GALI questions, is if the respondents suffer from any longstanding illness or have any disabilities. Table 2 shows how the two samples respond to this question. Despite the age and education differences in the experimental- and the control group the shares suffering from any chronic illness or condition are more or less equal in the two samples. In both samples about four out of ten reports that they suffer from a chronic illness or condition.

The statistically significant differences in the two samples are; a higher share of men in the control group suffers from chronic illness or condition compared to the experimental group, 39 against 34 percent. A lower share of respondents 67 years or older in the control group suffers from chronic illness or condition compared to the sample without filter, 54 against 61 percent. Further there is a higher share that suffers from chronic illness amongst those with just basic education in the control group compared to the experimental group, 52 against 44 percent. Finally there is a lower share who suffers from a chronic illness or condition amongst those who reports on having bad health in the experimental group, 93 against 96 percent.

In the control group 58 percent did not suffer from any chronic illness or condition and thereby did not get the follow-up GALI questions about limitations in activities.

Table 2 Suffer from any chronic illness or condition. 2011. Percent

|  |  |  |
| --- | --- | --- |
|  | **Control group** | **Experimental group** |
| **Total** | 42 | 40 |
|  |  |  |
| **Females** | 45 | 47 |
| **Males** | 39 | 34 |
|  |  |  |
| **16-24 years** | 32 | 34 |
| **25-44 years** | 35 | 34 |
| **45-66 years** | 45 | 43 |
| **67 years and older** | 54 | 61 |
|  |  |  |
| **Below upper secondary level** | 52 | 44 |
| **Upper secondary level** | 42 | 42 |
| **Tertiary education** | 34 | 36 |
|  |  |  |
| **Single household** | 48 | 50 |
| **Not single household** | 40 | 37 |
|  |  |  |
| **Very good and good health** | 28 | 28 |
| **Fair health** | 74 | 65 |
| **Bad and very bad health** | 96 | 93 |
|  |  |  |
| **Respondents** | 3 849 | 851 |

Source: Survey on living conditions EU-SILC 2011. Statistics Norway

## 3.1 Limitations in activities

It is not only the filtering of the GALI question that is different in the two samples. The wording of the question is also slightly different. One has to formulate the question differently when the respondents who do not suffer from any chronic illness are included in the question about limitations in activities. The screened question is slightly more causal-explanatory relative to stated health issues in the screening question, whilst the question that is not filtered asks if one experience limitations related to health problems[[6]](#footnote-6). The screened question is perhaps also more objective and the question that is not screened is more subjective in relation to experienced health issues. One can assume that the threshold for answering yes to the filtered question is higher than the not filtered question. This, together with the filtering, may influence the results.

All together 21 percent in the control group reported that they experienced limitations in activities because of health problems (table 3). The share in the experimental group was slightly higher, 23 percent. But this difference is not statistically significant and as we stated earlier in this paper the two groups are not randomly selected and thereby differ on several factors. We see however that there are some differences when it comes to minor groups. Females have a higher share that reports limitations when there is not a screening question, the same applies to older respondents. But when it comes to respondents who report bad and very bad health the share who reports that they experience limitations is higher in the sample that got the screening question first.

Table 3 Limitations in activities because of health problems. 2011. Percent

|  |  |  |
| --- | --- | --- |
|  | **Control group** | **Experimental group** |
| **Total** | 21 | 23 |
|  |  |  |
| **Females** | 25 | 29 |
| **Males** | 18 | 18 |
|  |  |  |
| **16-24 years** | 13 | 14 |
| **25-44 years** | 16 | 18 |
| **45-66 years** | 23 | 30 |
| **67 years and older** | 31 | 40 |
|  |  |  |
| **Below upper secondary level** | 31 | 28 |
| **Upper secondary level** | 21 | 28 |
| **Tertiary education** | 13 | 14 |
|  |  |  |
| **Single household** | 27 | 30 |
| **Not single household** | 19 | 21 |
|  |  |  |
| **Very good and good health** | 8 | 11 |
| **Fair health** | 43 | 42 |
| **Bad and very bad health** | 89 | 85 |
|  |  |  |
| **Respondents** | 3 849 | 851 |

Source: Survey on living conditions EU-SILC 2011. Statistics Norway

In addition to experience of limitations, an additional question is asked to classify how strongly limited one is and if it’s a chronic state (i.e. lasted for 6 months or more). Most respondents who have stated that they experience limitations have done so for six months or more. The share only drops about one percentage points in each group when this is accounted for.

If we look at the experimental group alone there are not many who states that they do not suffer from any chronic illness or conditions, and later states that they experience limitations in performing normal daily activities due to long term illness or health problems. In the sample this only applies to nine respondents. This implies that using chronic illness or condition as a screening question to the question about limitations because of health, does not make a huge impact on the share that have activity limitations. On the other hand a simple bivariate overview indicates that the question itself may have an impact on how many define themselves to have limitations.

Table 4 and 5 show how the two different samples replied to the questions. This shows that the group that got the question; *Do you experience limitations in performing normal daily activities because of long term illness, health problems or disabilities?* have a higher tendency to answer yes, compared to the sample that got the other question; *Does long-term illnesses or health problems and/or disabilities cause limitations in performing normal daily activities?* 55 percent of the sample who suffered from any chronic illness or condition stated that they had limitations when presented with the first question. On the other hand 50 percent of the sample who suffered from any chronic illness or condition stated that they had limitations when presented with the second question.

Table 4 Experimental group. 2011. Percent

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Limitations in activities because of health problems** | |
|  |  | Yes | No |
| **Suffer from any chronic illness or condition** | Yes | 55 | 45 |
| No | 2 | 98 |

Source: Survey on living conditions EU-SILC 2011. Statistics Norway

Table 5 Control group. 2011. Percent

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Limitations in activities because of health problems** | |
|  |  | Yes | No |
| **Suffer from any chronic illness or condition** | Yes | 50 | 50 |
| No | - | - |

Source: Survey on living conditions EU-SILC 2011. Statistics Norway

## 3.2 Multivariate analysis

The two samples are, as we have shown, not equal regarding various background characteristics. In order to better distinguish between the importance of various factors and the impact that the filter of the question has to the results of limitations in activities, we have applied multivariate analysis. In the logistic analysis we have included the same background characteristics as in the simple bivariate tables shown earlier in this paper. The dependent variable is the disposition to have limitations in activities because of health problems. The two subgroups in the sample, one which uses a screening question leading up to the GALI question and one without, are coded as a dummy variable to see the effect when equal on other factors.

Table 6 shows how different characteristics influence the probability to have limitation in health activities, given similarity on the other background factors. Here we compare respondents with the same sex, age, education, household type and self-perceived health.

Table 6 Correlation between whether you have limitations in activities because of health problems and various background factors. Logistic regression. Odds ratios. 2011. N = 4 687

|  |  |  |
| --- | --- | --- |
|  | **Odds Ratio Estimate** | **Pr>Chi-Square** |
| **Control group (ref: Experimental group)** | 0.805 | 0.0108 |
|  |  |  |
| **Sex (ref: Males)** |  |  |
| Females | 1.615 | <.0001 |
|  |  |  |
| **Age (ref: 15-24 years)** |  |  |
| 25-44 years | 1.566 | 0.4509 |
| 45-66 years | 1.870 | <.0001 |
| 67 years and older | 1.724 | 0.0337 |
|  |  |  |
| **Education (ref: Tertiary education)** |  |  |
| Below upper secondary level | 1.778 | <.0001 |
| Upper secondary level | 1.372 | 0.0017 |
|  |  |  |
| **Single household (ref: Not single household)** | 1.223 | 0.0060 |
|  |  |  |
| **Self-perceived health (ref: Very good and good health)** |  |  |
| Fair health | 7.577 | 0.1898 |
| Bad and very bad health | 70.862 | <.0001 |

Source: Survey on living conditions EU-SILC 2011. Statistics Norway

When it comes to the disposition to have limitation in activities because of health problems the multivariate analyses verifies what is shown in table 3 when it comes to what is correlated with limitations in activities. Older respondents and females are more likely to have limitations, there is also a strong correlation regarding education, if one lives alone and to self-perceived health condition. The multivariate analyses shows, when controlling for the fact that the two samples are composed differently, that the control group have a slightly lower probability to reply that they have limitations because of health problems compared to the experimental group.

## 3.3 Effect of screening or question formulation?

A challenge in the analyses of what effect the screening of the question about limitation in activities is that the question itself is different in the two subsamples. It is then difficult to establish if we measure the effect of the screening of the question or the question formulation. In order to look at this we have also done a multivariate analysis where we have manipulated the subsample that did not have the filter. In this analysis we deleted the information on the GALI questions for the respondents who answered that they did not suffer from any chronic illness or condition. That is, those respondents who would not get the question of limitations in activities if the questionnaire had a filter (cf. table 4). In this way the two samples are alike when it comes to the filtering. The dependent variable is still the disposition to have limitations in activities because of health problems. The two subgroups in the sample, now equal when it comes to filtering of the limitations in activities but different when it comes to formulation of the question, are coded as a dummy variable to see the effect when equal on other factors. *Do you experience limitations in performing normal daily activities because of long term illness, health problems or disabilities?* is referred to as Q1 and *Does long-term illnesses or health problems and/or disabilities cause limitations in performing normal daily activities?* is referred to as Q2. The result of this analysis is shown in table 7.

Table 7 Correlation between whether you have limitations in activities because of health problems and various background factors. Logistic regression. Odds ratios. 2011. N = 4 678

|  |  |  |
| --- | --- | --- |
|  | **Odds Ratio Estimate** | **Pr>Chi-Square** |
| **Q2 (ref: Q1)** | 0.860 | 0.0803 |
|  |  |  |
| **Sex (ref: Males)** |  |  |
| Females | 1.613 | <.0001 |
|  |  |  |
| **Age (ref: 15-24 years)** |  |  |
| 25-44 years | 1.535 | 0.4803 |
| 45-66 years | 1.828 | <.0001 |
| 67 years and older | 1.679 | 0.0483 |
|  |  |  |
| **Education (ref: Tertiary education)** |  |  |
| Below upper secondary level | 1.781 | <.0001 |
| Upper secondary level | 1.355 | 0.0012 |
|  |  |  |
| **Single household (ref: Not single household)** | 1.217 | 0.0077 |
|  |  |  |
| **Self-perceived health (ref: Very good and good health)** |  |  |
| Fair health | 7.609 | 0.1759 |
| Bad and very bad health | 71.979 | <.0001 |

Source: Survey on living conditions EU-SILC 2011. Statistics Norway

When the two samples are equal when it comes to filtering and we adjust for the differently composed subgroups, there is no significant difference on a .95 level in the probability of responding that one has limitations in activities due to health. Although the estimate is weaker, there is a lower probability to have limitations when faced with question Q2 rather than Q1. The two multivariate analyses together imply that there likely is a combined effect of both the filter and the question formulation.

## 4. Concluding remarks

This analysis has shown that there is not a very clear connection between the use of filters and the share who reports on having limitations because of health issues. There is not a significant difference in the two subsamples regarding the share who reports to have limitation in activities people usually do. When there is no filtering of the GALI question only a small percentage (2 percent) of the respondents who do not suffer from chronic illness or condition report that they have limitations in activities because of health issues. The two subsamples are thus different when it comes to central background factors and this is likely to influence the results of the GALI questions. In order to take this into account we did a multivariate analysis to see the effect of the filtering given equality on certain factors. This analysis shows that the filtering of the GALI question has a significant importance for the likelihood of having limitations in activities because of health issues. Since the formulation of the question itself is different in the two subsamples there is also the possibility that the significant difference is caused by the question. To see if this is the case we also did an analysis where we manipulated the subsample that initially did not have filter leading up to the GALI questions, to make it similar to the filtered subsample. In this analysis we can see a similar pattern, but the different question formulations in itself did not have a significant impact on the probability to have limitations because of health issues.

The results of this analysis can be interpreted as that the screening leading up to the GALI questions, together with the different question formulation, most likely have a significant effect on the likelihood to respond that one have limitations caused by health issues. If the GALI questions are asked without the screening questions, this analysis indicate that the share with limitations will be slightly higher than using chronic illness or condition as a filter. It is important to acknowledge that this paper only has looked into some aspects of this question, and that it also can be other factors that may be of importance.

ANNEX 1

**Sample with filter:**

**Only respondents who suffers from any chronic illness or condition:**

Do long-term illnesses or health problems and/ or disabilities cause limitations in performing normal daily activities?

YES/NO

*If YES*

Have these limitations lasted for six months or longer?

YES/NO

*If YES*

Would you say that you experience severe limitations or some limitations?

1. SEVERE LIMITATIONS
2. SOME LIMITATIONS

**Sample without filter:**

Do you experience limitations in performing normal daily activities because of long term illness, health problems or disabilities?

YES/NO

*If YES*

Have these limitations lasted for six months or longer?

YES/NO

*If YES*

Would you say that you experience severe limitations or some limitations?

1. SEVERE LIMITATIONS
2. SOME LIMITATIONS

1. [1] van Oyen H, Van der Heyden J, Perenboom R, Jagger C (2006): Monitoring population disability: evaluation of a new Global Activity Limitation Indicator (GALI). Social Preventive Medicine, Vol 51, 153-161. [↑](#footnote-ref-1)
2. [1] van Oyen H, Van der Heyden J, Perenboom R, Jagger C (2006): Monitoring population disability: evaluation of a new Global Activity Limitation Indicator (GALI). Social Preventive Medicine, Vol 51, 153-161. [↑](#footnote-ref-2)
3. See annex 1 [↑](#footnote-ref-3)
4. The sample design for EU-SILC in Norway was revised in 2012. The survey was changed from an 8-years rotational panel to a 4-year rotational panel to be more in compliance to the regulation of EU-SILC. [↑](#footnote-ref-4)
5. [1] van Oyen H, Van der Heyden J, Perenboom R, Jagger C (2006): Monitoring population disability: evaluation of a new Global Activity Limitation Indicator (GALI). Social Preventive Medicine, Vol 51, 153-161. [↑](#footnote-ref-5)
6. Filtered question: Does long-term illnesses or health problems and / or disabilities cause limitations in performing normal daily activities?

   Not filtered question: Do you experience limitations in performing normal daily activities because of long term illness, health problems or disabilities? [↑](#footnote-ref-6)