



# Measuring health insurance literacy in the Netherlands – First results of the HILM-NL questionnaire

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## ABSTRACT

**Background:** There are several indications that citizens in the Netherlands struggle to make critical, well-considered decisions about which insurance policy best fits their needs and preferences. This can lead to citizens being sub-optimally insured, facing unexpected costs or suffering inadequate coverage. This study aims to examine how health insurance literacy (HIL) is distributed among citizens in the Netherlands; and to find out whether there are certain groups who have more difficulty choosing and using a health insurance policy.

**Methods:** We measured health insurance literacy using the HILM-NL questionnaire, the validated Dutch version of the original health insurance literacy measure (HILM). In February 2020, the HILM-NL was sent to 1,500 members of the Nivel Dutch Health Care Consumer Panel. The response rate was 54% (806).

**Results:** There is a wide variation in HIL among citizens in the Netherlands. The average total HILM-NL score is 55.14 (on a range of 21–84). The level of education and the household net income are significantly related to HIL.

**Conclusions:** Citizens who completed less education or earn a lower income are relatively more likely to have difficulty choosing a health insurance policy or using policy benefits to pay for health services once enrolled. It is important to support these vulnerable groups properly in their choice and use of a health insurance policy.

## 1. Introduction

Many Western countries have healthcare systems that expect their citizens to take an active role in choosing a health insurance policy [1]. This role entails individuals making their own critical, well-considered decisions about the care they would like to have insured, and subsequently which insurance policy best fits their needs and preferences. There are several indications that citizens struggle to fulfil this role. First, the complexity of the healthcare systems contributes to this. The abundance of insurance choices makes it difficult for many citizens to choose a suitable policy [2,3]. Secondly, citizens simply might not always have sufficient skills, support, or motivation to fulfil their role as critical consumers. Many have limited knowledge about the terminology of health insurance [4,5]. They struggle to understand basic financial terms such as premium and deductible found in health insurance policies [4,5]. Consequently, there is a large group of citizens who find it difficult to choose, rationally, a suitable health insurance policy [6,7]. Ultimately, this can lead to citizens being sub-optimally insured, facing unexpected costs or suffering inadequate coverage [8,9]. In addition to

financial consequences for citizens when choosing a sub-optimal insurance policy [10,11], there are indications that the choice of a well-fitting policy can have positive effects on health [12].

Attention is increasingly being paid to the concept of health insurance literacy (HIL). This can be defined as *the extent to which consumers can make informed purchase and use decisions regarding health insurance* [13]. It can be regarded as a specific domain of health literacy which focuses, in general, on the skills of people to access, understand, appraise and use health-related information in various domains [14]. However, choosing and using a health insurance policy also requires distinctive skills, such as understanding how health insurance benefits are structured, and how to estimate the costs of sharing responsibilities [15]. In this study, we take a closer look at HIL.

To understand how citizens choose and use a health insurance policy better, the health insurance literacy measure (HILM) was developed by the American Institutes for Research in 2014. The HILM has been developed from a conceptual model that addresses: health insurance knowledge, information seeking, document literacy, and cognitive skills [15]. It provides insight into how citizens perceive their skills in these

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components. Furthermore, it can provide insight into which groups of citizens need additional support when enrolling in a health insurance policy or when using policy benefits to pay for health services once enrolled. It is the only reliable and validated self-assessment measure of citizens' ability to select and use a private health insurance policy [16].

To date, studies focusing on HIL have mostly been conducted in the United States (US) and relate to the American health insurance market. It has emerged, among other things, that half of the US citizens rate their HIL as inadequate [17]. Younger citizens, females, the unemployed, and those on lower incomes had lower HIL compared to their counterparts [17,18]. Furthermore, it has emerged that US citizens with low HIL indicate, to a greater extent, that they have difficulties in finding the best and most affordable policy, than citizens with a higher one [19]. Moreover, US citizens with lower HIL had greater avoidance of both healthcare services than citizens with higher one [20,21]. Following these findings from US studies, it also seems valuable to investigate the concept of HIL in other countries.

In the Netherlands it is mandatory for everyone aged 18 and over to purchase a basic health insurance policy. Citizens are expected to choose between a wide variety of health insurance policies on their own [22]. In 2021, they could choose between 57 basic health insurance policies offered by 20 different insurance companies [23]. These health insurance companies, in turn, must accept all citizens for their basic insurance policies, for which the content is set by the government. There are indications that a significant group of citizens in the Netherlands do not fully understand the detailed structure of health insurance policies [24]. Furthermore, as in the US, there are indications in the Netherlands of difficulties in choosing a suitable health insurance policy. An experimental study showed that only five per cent of Dutch citizens did a better job in choosing a more favourable policy than they would had they chosen a policy at random [25]. Dutch citizens do not seem to have the appropriate skills to decide which insurance policy best fits their needs and preferences [22]. However, it is currently unknown how HIL skills are distributed among Dutch citizens and whether there are certain groups who have more difficulty choosing and using a health insurance policy. In order to gain insight into their skills the US HILM was translated and validated into Dutch in 2020 – the HILM-NL [26].

In this study we focus on the HIL among citizens in the Netherlands with the aim of examining how this literacy is distributed and whether certain groups have more difficulty in choosing and using a health insurance policy. We want to provide insight into how citizens in the Netherlands assess their own skills to choose and use a health insurance policy. If we could understand better which aspects citizens have difficulty with regarding their choice and use of a policy then we could improve the targeting of information about these. Furthermore, if understanding better which groups of citizens have these difficulties then they can enjoy better support. Citizens in the Netherlands in general will be better able to choose a policy that meets their needs and preferences.

## 2. Method

### 2.1. HILM-NL

We measured HIL among Dutch citizens using the HILM-NL, the Dutch version of the original US measure. The translation and cultural validation process of the HILM-NL was performed according to the World Health Organization (WHO) guidelines for the translation and adaptation of instruments [27]. This process consisted of a forward translation; discussion in an expert panel; a translation back to the original English language; and cognitive interviewing to establish the correct understanding and interpretation of the questions [27]. The HILM-NL is a self-assessment measure of Dutch citizens' ability to select and use a health insurance policy [26]. It has been shown to be a reliable and valid instrument [28]. It is publicly available on the Nivel website: <https://www.nivel.nl/nl/publicatie/health-insurance-literacy-measurement-nederlands-hilm-nl>

The HILM-NL consists of twenty-one questions, all of which are relevant for everyone. It contains questions that focus on both the actual situation and hypothetical situations. The questions are categorised into four subscales. These are: 1) confidence in choosing a health insurance policy (six questions), 2) behaviour in choosing a health insurance policy (seven questions), 3) confidence in using a health insurance policy (four questions), and, 4) behaviour in using a health insurance policy (four questions). The four subscales can be grouped into two domains, "confidence" (subscale 1 and 3), and "behaviour" (subscale 2 and 4). As with the HILM developed in the US, respondents are excluded if they answer fewer than three questions on subscale 1 and 2, or fewer than two on subscale 3 and 4. Answers to the questions of the domain "confidence" are scored on four-point ordinal scales. These are: not at all confident (1), slightly confident (2), moderately confident (3), and, very confident (4). Answers to the questions of the domain "behaviour" are also scored on four-point ordinal scales. These are: not at all likely (1), somewhat likely (2), moderately likely (3), and, very likely (4). The mean scores per subscale and domain can then be calculated on the basis of these categories. These mean scores range from one (marked one on all questions) to four (marked four on all questions). Since the questionnaire contains a total of twenty-one questions, the total HILM-NL score can range from 21 to 84. Higher scores imply a higher self-assessed ability in selecting and using health insurance.

### 2.2. Panel

In February 2020, the HILM-NL was sent to 1,500 members of the Dutch Health Care Consumer Panel (DHCCP), which is managed by Nivel (the Netherlands Institute for Health Services Research). The panel is an access panel [29] consisting of approximately 12,000 people, aged 18 and older, who have agreed to answer questions on a regular basis related to healthcare topics. As previously described in the study by Holst et al. [30], which also made use of the DHCCP, the demographic characteristics of these people, such as their gender, age, and level of education are known, and there is no possibility of people signing up for the panel on their own initiative. The panel is renewed on regular basis to ensure that representative samples of the Dutch population can continue to be drawn.

The HILM-NL was part of Nivel's annual monitoring of switching between different health insurers. This monitoring process investigates, among other things, whether citizens in the Netherlands have switched between health insurers, and if so, what their reasons for switching are. A multidisciplinary research team including experts in the Dutch healthcare system (including two co-authors in this study, JdJ and AB) developed this study's survey of the monitor. The draft survey was also commented upon by the programme committee of the Dutch Health Care Consumer Panel, consisting of different representatives from the healthcare sector, including the Dutch Ministry of Health, Welfare and Sport, the Dutch Consumers Association, and the umbrella organisation of health insurers in The Netherlands, Zorgverzekeraars Nederland.

The questionnaire, which included the HILM-NL, was sent either by email or on paper depending on the panel member's preference, a mixed-mode method. The panel members who were approached were representative of the adult population in the Netherlands regarding gender and age. In order to generate the largest possible response, reminders were sent to the respondents who had not yet completed the questionnaire.

As in the study by Holst et al. [30], the data are analysed anonymously, and processed according to the panel's privacy policy, which complies with the General Data Protection Regulation (GDPR). According to Dutch legislation, neither obtaining informed consent, nor approval by a medical ethics committee, is obligatory for carrying out research using the panel [20]. Participation is voluntary and members are not forced to participate in surveys, or to answer questions within the surveys. They can stop their membership at any time without giving a reason.

### 2.3. Demographic characteristics

We included the following demographic characteristics: gender, age, level of education, household net income per month, and self-reported degree of care consumed. Gender was divided in two categories (1 = man, 2 = woman), while age was divided in three categories (1 = 18–39 years, 2 = 40–64 years, 3 = 65 years and older). The level of education was classified as: low (none, primary school or pre-vocational education) (1), intermediate (secondary or vocational education) (2), and high (professional higher education or university) (3). The household net income per month was, based on the household income distribution of Statistics Netherlands [31], classified as: low (less than 1750 euro) (1), intermediate (between 1750 and 2700 euro) (2), and high (more than 2700 euro) (3). For the variable 'self-reported degree of care consumed', the participating panel members were asked how much they think they make use of healthcare. They could choose between five options: none, very little, little, a lot, or very much. We classified the self-reported amount of care used as: low (none or very little) (1), intermediate (little) (2), and high (a lot or very much) (3).

### 2.4. HILM score classifications

The literature does not provide valid cut-off points for categorising high or low health insurance literacy as measured with the HILM. Therefore, we used the classification of two US studies to be able to interpret the results of our HILM-NL scores. First, in line with the approach of Edward et al. [17], the respondents were classified into two groups. Respondents were labeled as inadequate for a specific domain if they chose the answer "not at all confident/likely" (1) or "slightly confident/somewhat likely" (2), once within a certain domain of the HILM-NL. If not, they were classified as adequate for a certain domain. Secondly, based on the results of the study of Tipirneni et al. [20], we classified respondents with a HILM-NL score below 60 as having low literacy, respondents with a HILM-score of 60–70 as intermediate, and respondents with a HILM-NL score higher than 70 as having high HIL. These cut-off points were determined by Tipirneni et al. by dividing the HILM scores from their study into three equally large groups. In addition to these two approaches, we also took our own HILM-NL scores as a starting point for classification. Using the same approach of Tipirneni et al., we classified our HILM-NL scores by dividing the respondents based in their HILM-NL score into three equally large groups.

### 2.5. Statistical analyses

First, descriptive analyses were performed to examine the demographics of the respondents. Because the final response of this study was not representative of all citizens in the Netherlands aged 18 years and older regarding gender and age, we applied a weighting factor (ranging from 0.71 to 2.56, see Appendix 1) to correct for this. We performed descriptive statistics to get insight into the total HILM-NL score, and the mean HILM-NL scores per subscale/domain. We performed skewness/kurtosis tests for normality to test whether the HILM-NL scores were normally distributed. We then performed a preliminary analysis to examine whether the type of health insurance policy (a basic insurance policy only, or both a basic and supplementary insurance policy) is related to the total HILM-NL score, as it might be reasoned that citizens with only a basic insurance policy interpret the HILM-NL in another way than citizens with a basic and supplementary insurance policy. However, this turned out not to be the case. There was no significant difference in the total HILM-NL score between citizens with a (self-reported) basic health insurance policy only (mean score 55.9) and those with both a (self-reported) basic and supplementary one (mean score 54.9), which means that there is no difference in self-assessed health insurance literacy skills between these groups. Thus, we decided not to include the type of health insurance policy in the rest of our analyses. Differences in the total HILM-NL score between groups of

citizens (gender, age, highest completed level of education, household net income, and self-reported degree of care consumed) were tested using a regression analysis, one-way ANOVA and Tukey post hoc tests. The dataset was analysed using STATA version 16.0 and significance levels were set at 5%.

## 3. Results

### 3.1. The demographics of the respondents

806 of the 1500 panel members we approached filled out the HILM-NL questionnaire, a response rate of 54%. Twenty-five respondents were excluded because they answered too few questions (fewer than three questions on subscale 1 and 2, or fewer than two on subscale 3 and 4). The results in this study are, therefore, based on 781 respondents. Table 1 shows that the average total HILM-NL score was 55.14 (SD = 13). Furthermore, Table 1 shows the demographics of the respondents. The gender of the respondents was nearly evenly distributed and the mean age was 58 years (not in table). One in ten respondents (11%) reported a low level of education, slightly less than half (46%) reported a net monthly household income of more than 2700 euro, and about a quarter (27%) indicated that they consumed a lot of, or very much, care.

### 3.2. Distribution of the HILM-NL score

Fig. 1 shows the total HILM-NL scores. The scores range from 21 (the minimum) to 84 (the maximum). The total HILM-NL scores are not normally distributed (prob > chi2: 0.00). They show a right truncation. However, the skewness (-0.21) and kurtosis (2.61) (not in table) do not deviate a lot from a normal distribution (0 and 3, respectively) [32].

### 3.3. The relationship between HILM-NL score and demographics included

Table 2 shows the relationships between the total HILM-NL score and the demographic characteristics we included. The level of education and the household net income were significantly related to HIL. More specifically, those with a low level of education have lower HIL than those citizens with an intermediate or high level of education. Also, those with a net monthly household income of up to 1750 euros have lower HIL than those citizens with a net monthly household income of more than 2700 euros.

**Table 1**  
The demographics of the respondents.

|                                         |                    | n   | %  | Total HILM-NL score |
|-----------------------------------------|--------------------|-----|----|---------------------|
|                                         | Total (weighted)   | 781 |    | 55.14               |
| Gender                                  | Male               | 386 | 49 | 55.23               |
|                                         | Female             | 395 | 51 | 54.79               |
| Age                                     | 18-39              | 123 | 16 | 56.07               |
|                                         | 40-64              | 424 | 54 | 55.34               |
|                                         | 65 and older       | 234 | 30 | 53.82               |
| Highest completed education level*      | Low                | 85  | 11 | 49.62               |
|                                         | Intermediate       | 352 | 46 | 54.83               |
|                                         | High               | 333 | 43 | 56.62               |
| Household net income per month in euros | < 1.750            | 176 | 23 | 51.04               |
|                                         | 1.750 - 2.700      | 232 | 31 | 53.53               |
|                                         | > 2.700            | 343 | 46 | 58.35               |
| Self-reported amount of care used       | None / very little | 274 | 35 | 56.46               |
|                                         | Little             | 300 | 38 | 53.74               |
|                                         | A lot / very much  | 207 | 27 | 54.91               |

\* Low = none, primary school or pre-vocational education. Intermediate = secondary or vocational education. High = professional higher or university.

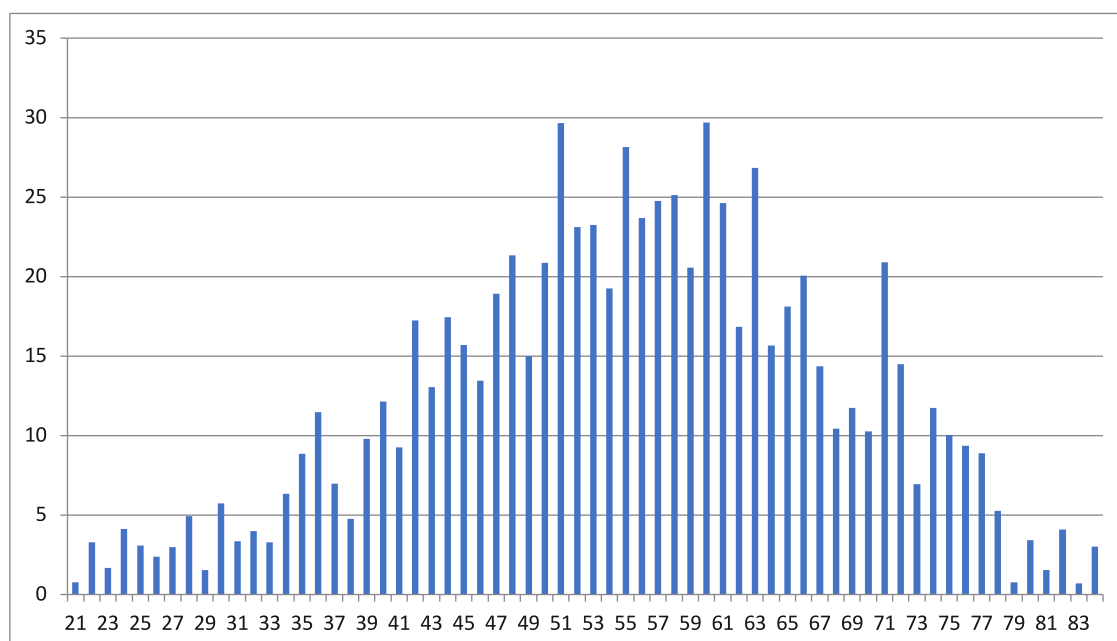


Fig. 1. Distribution of the total HILM-NL score, weighted for age and gender.

Table 2

Regression analysis to examine the association between the total HILM-NL score and the demographics included.

|                                         |                    | Dependent variable:<br>Total HILM-NL score<br>n=740 |             |
|-----------------------------------------|--------------------|-----------------------------------------------------|-------------|
|                                         |                    | Coefficient                                         | P-value     |
| Gender                                  | Male               | reference                                           |             |
|                                         | Female             | -0.04                                               | 0.97        |
| Age                                     | 18–39              | reference                                           |             |
|                                         | 40–64              | -0.36                                               | 0.79        |
|                                         | 65 and older       | -0.74                                               | 0.63        |
| Highest completed education level*      | Low                | reference                                           |             |
|                                         | Intermediate       | 4.25                                                | <b>0.01</b> |
|                                         | High               | 3.84                                                | <b>0.03</b> |
| Household net income per month in euros | < 1.750            | reference                                           |             |
|                                         | 1.750–2.700        | 1.85                                                | 0.16        |
|                                         | > 2.700            | 6.33                                                | <b>0.00</b> |
| Self-reported amount of care used       | None / very little | reference                                           |             |
|                                         | Little             | -2.21                                               | 0.05        |
|                                         | A lot / very much  | -0.40                                               | 0.75        |
| Constant                                |                    | 49.51                                               | 0.00        |

\* Low = none, primary school or pre-vocational education. Intermediate = secondary or vocational education. High = professional higher or university.

### 3.4. HILM score classifications

There are not valid cut-off points established for high or low health insurance literacy. Therefore, we use two different classification methods from the literature. First, we applied Edward et al. classification [17] to the HILM-NL scores from our study. This considers it as inadequate for a specific domain if the respondent chose the category “not at all confident/likely” (1), or “slightly confident/somewhat likely” (2) once within a certain domain of the HILM-NL. This resulted in 76% of the Dutch population scoring inadequately on confidence when choosing a health insurance policy (subscale 1). Seventy-three per cent scores inadequately on behaviour when choosing a health insurance policy (subscale 2). Seventy-two per cent scores inadequately on confidence when using a health insurance policy (subscale 3). And 75% scores inadequately on behaviour when using a health insurance policy

(subscale 4) (not in table).

We then applied the classification of Tipirneni et al. [20] to the HILM-NL scores from our study in which an HILM score of less than 60 is regarded as having low HIL, of 60–70 as having intermediate HIL, and above 70 as having high HIL. This gave a figure of 62% of the population in the Netherlands has low HIL, 25% has intermediate, and 13% has high HIL (not in table).

We then took our own HILM-NL scores as a starting point for classification and divided the HILM-NL scores into three equally large groups. We considered a respondent to have low HIL if they ranked in the bottom third of all respondents (score below 50, on a range of 21–84), intermediate if they ranked in the middle third (score 50 to 60), and high if they ranked in the top third (score higher than 60). It stands out that the group of citizens with low HIL consists, for a significantly larger part, of people with a low educational level and low household net income, than the group of citizens with intermediate or high HIL ( $p < 0.05$ ) (Table 3). Despite the lack of a clear significant relationship ( $p = 0.05$ ), the group of citizens with low HIL also seems to consist, for a greater part, of the elderly. One third of them (34%) are 65 years or older.

Fig. 2 (in Appendix 2) shows the mean HILM-NL scores per subscale and domain. The mean total HILM-NL score is 2.63. When we look at the domains, citizens score 2.65 on ‘confidence’ and 2.59 on ‘behaviour’. When looking at the subscales, we see that they score slightly higher on ‘confidence in choosing a health insurance policy’ (2.74) compared to the other subscales (2.57–2.60).

Focusing on the differences between citizens with low (HILM-NL < 50), intermediate (HILM-NL 50–60) and high HIL (HILM-NL > 60), it stands out that citizens with a low HIL score significantly lower on all subscales and domains ( $p = 0.00$ ). On the subscale ‘behaviour in choosing a health insurance policy’, the difference between citizens with low and high HIL is greatest. Citizens with low HIL score 1.74 on this subscale and citizens with high one 3.35.

## 4. Discussion

To prevent citizens from being sub-optimally insured, facing unexpected costs or suffering inadequate coverage, it is important that citizens are able to make critical, well-considered decisions on their own about the care they would like to have insured, and subsequently which

**Table 3**  
Characteristics of respondents with low, intermediate, and high health insurance literacy.

|                                         |                    | Low health insurance literacy (HILM-NL < 50) |    | Intermediate health insurance literacy (HILM-NL 50–60) |    | High health insurance literacy (HILM-NL > 60) |    | ANOVA <i>p</i> -value |
|-----------------------------------------|--------------------|----------------------------------------------|----|--------------------------------------------------------|----|-----------------------------------------------|----|-----------------------|
|                                         |                    | n                                            | %  | n                                                      | %  | n                                             | %  |                       |
| Gender                                  | Male               | 126                                          | 50 | 116                                                    | 45 | 144                                           | 53 | 0.13                  |
|                                         | Female             | 125                                          | 50 | 144                                                    | 55 | 126                                           | 47 |                       |
| Age                                     | 18–39              | 32                                           | 13 | 46                                                     | 18 | 45                                            | 17 | 0.05                  |
|                                         | 40–64              | 133                                          | 53 | 149                                                    | 57 | 142                                           | 53 |                       |
|                                         | 65 and older       | 86                                           | 34 | 65                                                     | 25 | 83                                            | 31 |                       |
| Highest completed education level*      | Low                | 41                                           | 17 | 18                                                     | 7  | 26                                            | 10 | 0.00                  |
|                                         | Intermediate       | 120                                          | 49 | 112                                                    | 43 | 120                                           | 45 |                       |
|                                         | High               | 85                                           | 35 | 128                                                    | 50 | 120                                           | 45 |                       |
| Household net income per month in euros | < 1.750            | 81                                           | 34 | 45                                                     | 18 | 50                                            | 19 | 0.00                  |
|                                         | 1.750–2.700        | 84                                           | 35 | 79                                                     | 32 | 69                                            | 26 |                       |
|                                         | > 2.700            | 74                                           | 31 | 125                                                    | 50 | 144                                           | 55 |                       |
| Self-reported amount of care used       | None / very little | 73                                           | 29 | 90                                                     | 35 | 111                                           | 41 | 0.07                  |
|                                         | Little             | 105                                          | 42 | 105                                                    | 40 | 90                                            | 33 |                       |
|                                         | A lot / very much  | 73                                           | 29 | 65                                                     | 25 | 69                                            | 26 |                       |

\* Low = none, primary school or pre-vocational education. Intermediate = secondary or vocational education. High = professional higher or university.

insurance policy fits their needs and preferences. The aim of this study was to examine how health insurance literacy (HIL) is distributed among citizens in the Netherlands. Furthermore, we wanted to find out whether there are certain groups who have more difficulty choosing and using a health insurance policy. For that purpose, the Dutch Health Insurance Literacy Measure (HILM-NL) was used. The total HILM-NL scores comprising 21 questions range from 21 (the minimum) to 84 (the maximum). The average total HILM-NL score was 55.14. The total HILM-NL scores are not normally distributed but they show a right truncation. When looking at the subscales, we see that citizens score slightly higher on ‘confidence in choosing a health insurance policy’ (2.74) compared to the other subscales (2.57–2.60).

The findings of this study suggest that there is a wide variation in HIL among citizens in the Netherlands. The level of education and the household net income were significantly related to HIL; lower-educated citizens and citizens with a lower income are relatively more likely to have lower HIL, than, respectively, higher-educated citizens and citizens with a higher income. This means that citizens who completed less education or earn a lower income are relatively more likely to have difficulty choosing a health insurance policy or using policy benefits to pay for health services once enrolled. These findings align with what we know about health literacy, where there is also a social gradient meaning that citizens with a low level of education in general have a lower health literacy score [33]. This implies that they have more difficulty accessing, understanding, appraising and using health-related information.

Studies from the US found that younger citizens, females, citizens who are unemployed, and citizens with lower income had lower HIL compared to their counterparts [17,18]. These groups are, therefore, considered vulnerable when choosing and using a health insurance policy. The findings of the current Dutch study show similar, but also divergent results to the studies from the US. In line with the results of the US studies, we found that income is related to HIL. However, in contrast to the results of the US studies, gender does not appear to be related to HIL in the Netherlands. Dutch men and women are equally skilled in their choice and use of a policy. Unemployment was not included in the current study.

As mentioned in the introduction, attention has only recently been given to the concept of HIL. To our knowledge, there are only a few studies that have used the HILM in a nationally representative sample, as we have done in the Netherlands. Furthermore, there are not yet valid cut-off points established for high or low health insurance literacy. Therefore, it is difficult to compare the HILM-NL scores from our study with the HILM scores of studies in other countries. However, we can compare our data to the studies of Tipirneni and Edward. Tipirneni et al. reported an average HILM score of 63.5 [20]. This is higher than our

results (55.14). Furthermore, when applying Edward’s classification to our results [14], approximately three quarters of the citizens in the Netherlands are inadequate in choosing and using a health insurance policy. This is significantly higher than among the respondents from Edward’s study in the US, where about half have inadequate HIL [17]. The results of these studies of Tipirneni and Edward suggest that the level of HIL in the Netherlands is lower compared to the level in the United States. This may be due to different factors, both at the system and at the population level. The American healthcare system differs from the healthcare system in the Netherlands in many aspects. An important difference is that the American government regulates healthcare to a lesser extent than the Dutch government does. It may be that citizens in the US are more motivated to understand their health insurance policy because the financial consequences of a sub-optimal insurance policy are greater in the US than in the Netherlands. Also, it may be that information about healthcare policies is presented in a simpler way compared to the Netherlands, thus making it easier for citizens to make their choices. In addition, the samples from the US studies do not seem to be comparable with our sample. For example, Tipirneni reports that the sample in her study was relatively younger and more highly educated than the general US population. This partly explains why she found a higher average HILM score than we did in our study. More studies in national representative samples are needed for adequate country comparisons. Also further validation studies are needed to establish valid cut-off points and to assess the relevance of the instrument for specific behaviours and outcomes. For example whether citizens with low HIL are less likely to switch from one health insurer to another, or whether they are more likely to take out supplementary insurance policies. By understanding how citizens with low HIL behave with regard to choosing and using a health insurance policy, we can better understand to what extent these citizens have the skills to make informed decisions regarding their health insurance. This understanding is important in order to be able to support vulnerable groups, so that Dutch citizens in general will be better able to choose a policy that meets their needs and preferences.

#### 4.1. Strengths and limitations

The HILM-NL questionnaire was administered in a mixed-mode among members of the Nivel Dutch Health Care Consumer Panel (DHCCP). The response was fair ( $n=804$ , response rate 54%) allowing us to perform analyses based on subgroups (age, level of education, etc.). Because health-related topics are often discussed in this panel, it is likely that the participating panel members have an above-average interest in healthcare. It could, therefore, be possible that, even though we found a wide variation, the average HILM-NL score in the Netherlands may, in

reality, be somewhat lower than is shown in this study. In addition, citizens who are illiterate or speak a foreign language were not able to participate in this study, as the questionnaire was in Dutch. It is plausible that this group of citizens has extra difficulties choosing and using a health insurance policy as a result of their literacy problems. It is important in follow-up research also to investigate what these groups experience in their choice and use of a policy.

## 5. Conclusion

Altogether, the current study demonstrates that there is a wide variation in HIL among citizens in the Netherlands. Citizens who completed less education or earn a lower income are relatively more likely to have difficulty choosing a health insurance policy or using policy benefits to pay for health services once enrolled.

## Declaration of Competing Interest

None

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## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.healthpol.2022.09.001](https://doi.org/10.1016/j.healthpol.2022.09.001).

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