METHODOLOGY: RESULTS FROM THE EIGHTH BELHEALTH WAVE

1. Data collection

The data collection for the 8th BELHEALTH online survey was carried out between March 17 and April 7, 2025. The survey is directed at adults (18 years and older) living in Belgium who have agreed to be part of the BELHEALTH cohort (i.e. 10,229 people). It was developed with the LimeSurvey software.

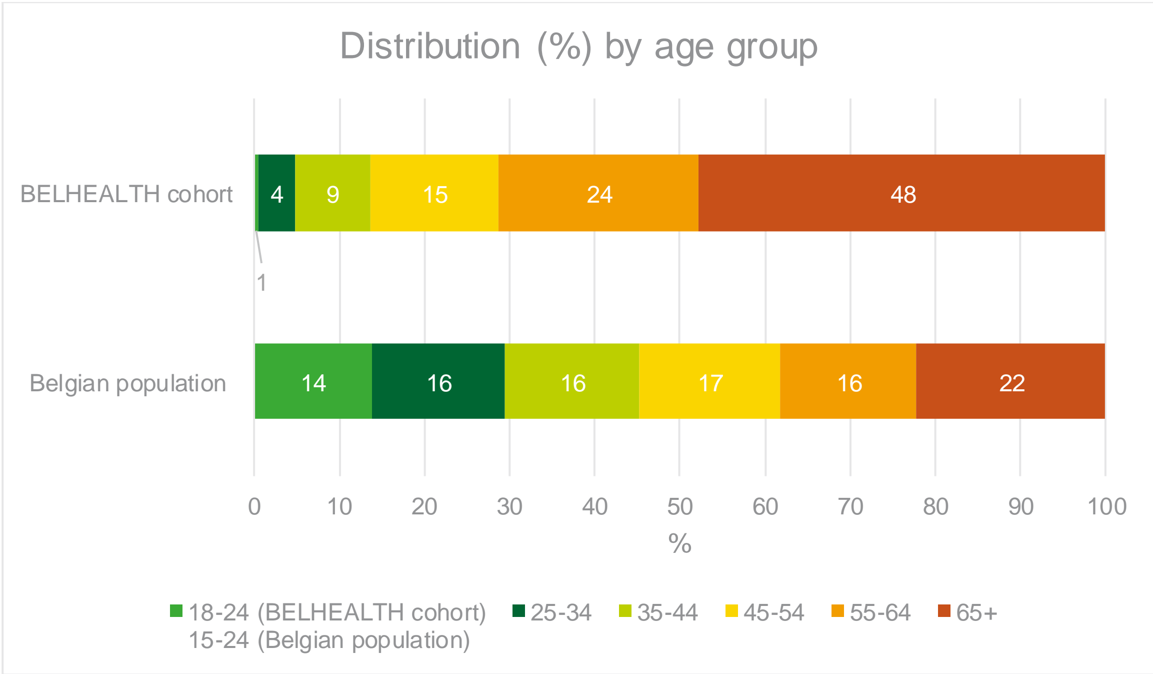
The following conditions had to be accepted before accessing the survey:

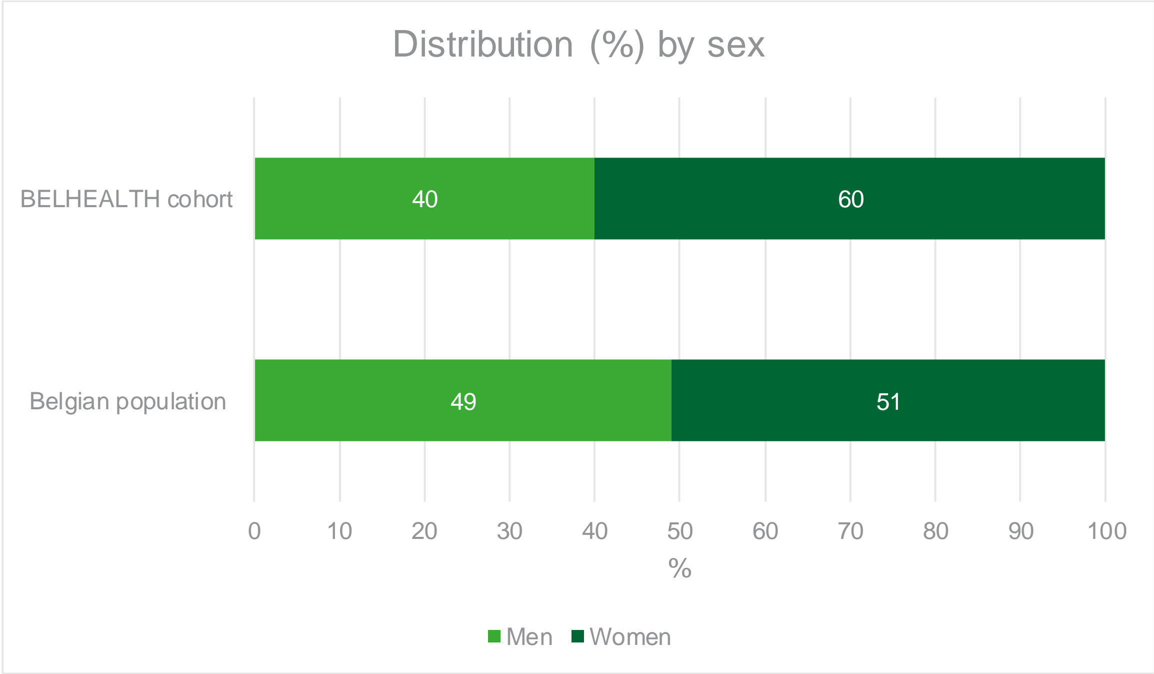
- Participation in the survey is voluntary, and participation can be stopped at any time;
- All information provided will only be used for the purposes of the study;
- Sciensano will only use the results of the survey to create general statistics, and individual data will never be passed on to third parties;
- The personal data collected will only be kept for the duration of the project.

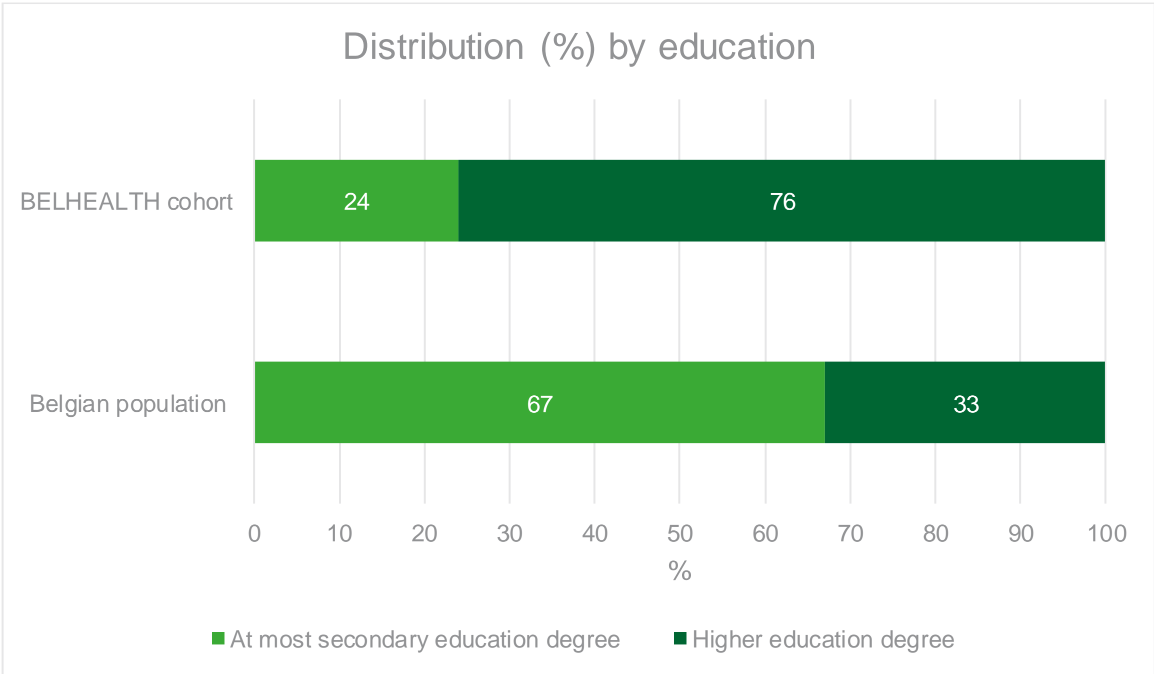
Among the cohort members, 6,223 responded to the survey. They provided at least information on their age, sex, education level, and postal code of residence in the sixth or one of the previous waves.

2. Profile of participants

The following figures give an overview of the composition of the BELHEALTH cohort compared with the composition of the Belgian population in 2019.




Distribution (%) by sex
BELHEALTH cohort
Belgian population
40
60
49
51
0
10
20
30
40
50
60
70
80
90
100
%
Men
Women


Distribution (%) by education
BELHEALTH cohort
Belgian population
24
76
67
33
0
10
20
30
40
50
60
70
80
90
100
%
At most secondary education degree
Higher education degree

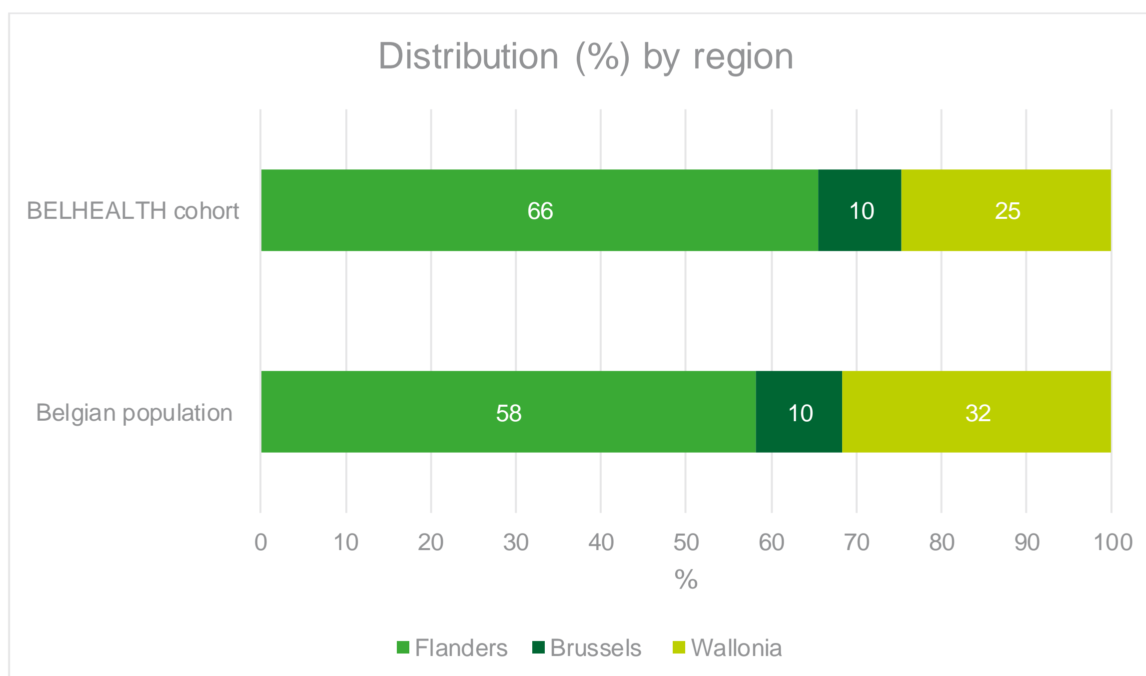


Table 1 gives an overview of the number and proportion of people aged 18 and over, broken down by sex and age group, who took part in the 8th BELHEALTH survey.

Table 1 | Profile of the participants of the 8th BELHEALTH survey, by sex and age group, March 2025

	Number of men (%)	Number of women (%)	Total number (%)
18-24 years	5 (0.1%)	26 (0.4%)	31 (0.5%)
25-34 years	76 (1.2%)	190 (3.1%)	266 (4.3%)
35-44 years	171 (2.7%)	378 (6.1%)	549 (8.8%)
45-54 years	275 (4.4%)	669 (10.7%)	944 (15.2%)
55-64 years	515 (8.3%)	948 (15.2 %)	1,463 (23.5%)
65+ years	1,466 (23.6%)	1,504 (24.2%)	2,970 (47.7%)
Total	**2,508 (40.3%)**	**3,715 (59.7%)**	**6,223 (100%)**

3. Weights

Because some groups were under-represented in our cohort (for example men and young people), a weighting adjustment (post-stratification) was used in the analyses to better match the distribution in the Belgian population and to obtain more accurate estimates. This technique consists of using the information on the actual composition of the population in Belgium (here in terms of gender, age group, education, and province) to adjust the participants' data to the exact distribution when calculating the survey results:

- The "exact" composition of the Belgian population (aged 15 years and older) by gender, age group, and province comes from the data on the composition of the population on 1 January 2019, calculated by Statbel;
- The composition of the population by level of education is based on the results of the Labour Force Survey 2018 (LFS), organized by Statbel. Two education groups were distinguished: people with at most a secondary (higher) education degree and people with a higher education degree.

We formed subgroups (called “strata”) in both the Belgian population and the BELHEALTH participants, based on a cross-reference between gender, age group, province, and education level. Weights were obtained by dividing, per stratum, the number of people in the population by the number of participants in the survey. An upper limit for the weights was then established, defined as the minimum value of all weights multiplied by 100. Any weights exceeding this upper limit were replaced to match the upper limit.

4. Questions and indicators

4.1. ANXIETY AND DEPRESSION

The proportion of anxiety and depressive disorders was measured by the GAD-7 scale (General Anxiety Disorder) and the PHQ-9 scale (Patient Health Questionnaire), respectively.

Questions of the GAD-7 (anxiety disorders)

AD.01. In the past 2 weeks, have you encountered difficulties such as:
(1. No, not at all / 2. Yes, several days / 3. Yes, more than half the time / 4. Yes, nearly every day)

01. Feeling nervous, anxious or on edge
02. Not being able to stop or control worrying
03. Worrying too much about different things
04. Having trouble relaxing
05. Being so restless that it is hard to sit still
06. Becoming easily annoyed or irritable
07. Feeling afraid as if something awful might happen

Questions of the PHQ-9 (depressive disorders)

08. Little interest or pleasure in doing things
09. Feeling down, depressed, or hopeless
10. Trouble falling or staying asleep, or sleeping too much
11. Feeling tired or having little energy
12. Poor appetite or overeating
13. Feeling bad about yourself or that you are a failure or have let yourself or your family down
14. Trouble concentrating on things, such as reading the newspaper or watching television
15. Moving or speaking so slowly that other people could have noticed? Or the opposite: being so fidgety or restless that you have been moving around a lot more than usual
16. Thoughts that you would be better off if you were no longer alive

The following indicators were calculated:

AD_1 Percentage of the people with generalized anxiety disorder (threshold value of 10+ from the GAD-7). The indicator is calculated by summing the scores of each item on the scale, after recoding them to [0-3] where the value 0 represents “not at all” and the value 3 represents “nearly every day”. The total score - ranging between 0 and 21 - is then dichotomized, with the value 10+ being used to identify individuals with generalized anxiety disorder.

AD_6 Percentage of the people with a depressive disorder. Depressive disorder is defined as any of a major depression disorder or another type of depression. The indicator is calculated by summing the scores of each item on the scale, after recoding them to [0-3] where the value 0 represents “not at all” and the value 3 represents “nearly every day”. To identify people with a depressive disorder, at least 2 out of the 9 symptoms (items 08-16) must be scored as ‘More

than half the days' (score of 2) or 'Nearly every day' (score of 3), and at least one of the first two symptoms (item 08 or 09) must be included. Item 16 (thoughts of death) is counted as a symptom if present at all (score of 1 or more).

4.2. TELEWORK

We asked the following question to participants regarding frequency of telework:

W07 Do you telework (work from home)?

1. Never, because this is not possible in my job
2. Never, because I choose not to work from home
3. About one day a month
4. More than one day a month but less than one day a week
5. About one day a week
6. Several days a week
7. Daily

The following indicators were calculated:

W07_1 Telework: less than weekly

1. Yes (W07 = 1-4)
2. No (W07 = 5-7)

W07_2 Telework frequency (4 cat)

1. Never (W07 = 1, 2)
2. Monthly (W07 = 3, 4)
3. Weekly (W07 = 5, 6)
4. Daily (W07 = 7)

4.3. ABSENCE FROM WORK FOR REASONS OF MENTAL HEALTH PROBLEMS

We asked the following questions to the participants:
W09 In the past 12 months, that is since 15 March 2024, have you been absent from work for reasons of mental health problems?

1. Yes
2. No

W10 In the past 12 months, how many days in total were you absent from work for reasons of mental health problems? If you don't know the exact number of days, give an estimation.

Number of days

4.4. MENTAL HEALTH CARE

Participants were asked the following questions regarding their mental health care:

MHC01 In the past 4 months, have you felt the need for professional mental health support?

1. Yes
2. No

MHC02 In the past 4 months, have you consulted a mental health professional?

1. Yes
2. No

MHC03 What are the reasons you have not consulted professional mental health support in the past 4 months?

1. I don't know how to enter mental health care or where to go
2. I tried to seek help, but faced long waiting lists
3. I have an appointment scheduled, but haven't consulted yet
4. I don't dare to take the step
5. I kept postponing it, thinking my situation might improve on its own
6. I don't have the time
7. I am concerned about the costs of counselling or therapy
8. I had previous negative experiences with counselling or therapy
9. I don't have the access to the type of professional counselling I want in my surroundings
10. I am afraid of what other people might think
11. I don't know

MHC10 Did your consultation with the mental health professional take place remotely (video or phone)?

1. Yes, by phone
2. Yes, by video (pc, smartphone …)
3. No, in person

MHC11 In the past 4 months, have you used an AI-powered chatbot (such as ChatGPT, Woebot, Wysa, or similar) for mental health support?

1. Yes
2. No

MHC12 What was the reason for using an AI-powered chatbot for mental health support?

1. Convenience (available anytime, anywhere)
2. Anonymity and privacy
3. Cost (free or low-cost)
4. Curiosity about AI technology
5. Lack of access to human therapists

The following indicators were calculated:

MHC_1 In need of professional mental health counseling

1. Yes (MHC01 = 1)
2. No (MHC01 = 2)

MHC_2b Received professional mental health counseling

1. Yes (MHC02 = 1)
2. No (MHC02 = 2)

MHC13_1 Mental health consultation remotely (2 cat)

1. Yes (MHC10 = 1 or 2)
2. No (MHC10 = 3)

MHC14_1 Use of AI-powered chatbot for mental health support

1. Yes (MHC11 = 1)
2. No (MHC11 = 2)

Reasons why using AI for MH support:
MHC1501 Convenience (available anytime, anywhere)
MHC1502 Anonymity and privacy
MHC1503 Cost (free or low-cost)
MHC1504 Curiosity about AI technology
MHC1505 Lack of access to human therapists
MHC15O Other reasons

1. Yes
2. No

4.5. SUBJECTIVE SOCIOECONOMIC STATUS

We used the MacArthur Scale of Subjective Social Status (Adler, 2025) to assess a person's perceived rank relative to others in their groups. It is a single-item measure from 0 (the bottom of the scale) to 10 (the top of the scale):

SSS01 Think of a ladder with ten steps. Imagine this ladder as a representation of where people in Belgium stand. On the tenth step are the people who are the best off – those who have the most money, the most education, and the most respected jobs. On the first step are the people who are the worst off – those who have the least money, least education, the least respected jobs, or no job. The higher up you are on the ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom. Where would you place yourself on this ladder? Please enter a number between 1 and 10:

4.6. LONELINESS

The 6-item DeJong Gierveld Loneliness Scale was used to assess loneliness[1].

SR.01. To what extent do each of the following statements apply to you?
(1. Yes / 2. More or less / 3. No)

1. I experience a general sense of emptiness
2. There are plenty of people I can rely on when I have problems
3. There are many people I can trust completely
4. There are enough people I feel close to
5. I miss having people around me
6. I often feel rejected

The following indicators were calculated:

[1] J. De Jong Gierveld and T. Van Tilburg, Research on Aging 2006, 28, 582-598

SR_1 Loneliness score (0-6). The score on items 1, 5 and 6 were reversed. A score of 1 was then recoded to 0 and a score of 2 and 3 to 1. The scores were summed across all items. If more than 1 answer was missing, the score was set to missing.

SR_2 Loneliness categories. The loneliness score (SR_1) was used to create three categories: not lonely (score of 0 or 1), moderately lonely (score of 2, 3 or 4) and severely lonely (a score of 5 or 6).

4.7. SUBSTANCE CONSUMPTION

The following questions were asked on alcohol, tobacco and illegal drugs consumption:

CHAN01 In the past 6 months, since September 2024, have you changed your consumption of the following?
(1. I have started using it/them since then / 2. I have increased my consumption / 3. My consumption remained the same as before / 4. I have decreased my consumption / 5. I stopped using it/them since then / 6. Did not use it/them before, nor now)

01 Alcohol
02 Tobacco
03 Illegal drugs

CAMP Did you take part in the 'Dry January' or 'Tournée minérale' alcohol-free campaigns?
(1. Yes, the whole month / 2. Yes, for 20 days or more / 3. Yes, but less than 20 days / 4. No, I was not interested / 5. No, I don't know what you are talking about / 6. No, I don't drink alcohol)

01 Dry January
02 Tournée Minérale (February)

The following indicators were calculated:

CAMP01_1 Participation Dry January (3 cat) and
CAMP02_1 Participation Tournée Minérale (3 cat)

1. 20 days or more (CAMP = 1, 2)
2. Less than 20 days (CAMP = 3)
3. No (CAMP = 4, 5)

CAMP01_2 Participated Dry January (2 cat) and
CAMP02_2 Participated Tournée Minérale (2 cat)

1. Yes (CAMP = 1, 2, 3)
2. No (CAMP = 4, 5)

4.8. WORRIES

Participants were asked whether they were worried about…

01. The threat of existing and future epidemies
02. Job loss or difficulty in finding work in the future
03. The wars, their spread and their consequences
04. The natural disasters (floods, hurricanes, drought, earthquakes, global climate change…)
05. The resurgence of terrorism and violence

06. The political developments worldwide
07. The economy and rise in cost of living
08. The migration, displacement and refugee crises
09. Discrimination based on race and ethnicity, sexual orientation, or religion
10. Disinformation and dissemination of fake news
11. Crime and violence
12. Other – specify

1. Not at all / 2. Slightly / 3. Moderately / 4. Very / 5. Extremely

For analysis, the five response categories were grouped into three levels: **low** (“Not at all”), **moderate** (“Slighlty” and “Moderately”), and **high** (“Very” and “Extremely”).

5. Statistical analyses

For the variables absence from work for reasons of mental health problems, mental health care use and need, and worries, logistic and linear models were used to investigate differences between age groups, sex, educational levels, regions, and household types.
Logistic regression models were used to investigate the relationship between anxiety and depression. These models were controlled for age, sex, and education level.
Additionally, longitudinal analyses were conducted using *proc glimmix* to model binary outcomes, such as anxiety, depression, mental health care use and need, and worries. These models were selected for their ability to handle the repeated measures within participants and account for the correlation between observations across different study waves. By incorporating both fixed effects and random intercept, the mixed models allowed us to assess the impact of various factors on the likelihood of developing mental health disorders, while accounting for individual variability and the longitudinal nature of the data.

SAS 9.4. software was used for the analyses. The proc surveyfreq, surveylogistic, surveymeans, and surveyreg statements were used for both descriptive and statistical analysis.

Questions?

- **Mail belhealth@sciensano.be**
- **visit our website Belgian Health and Well-being Cohort**