THL's Morbidity Index 2019
Large regional differences in morbidity

MAIN FINDINGS

- The morbidity rate of Finns has decreased steadily since 2000.

- The healthiest Finns live in the Helsinki Metropolitan Area and Ostrobothnia, and morbidity is highest in North Savo, North Ostrobothnia and North Karelia.

- Regional differences are largest in the index of musculoskeletal disorders and index of mental health.

- MSDs and severe mental disorders are more common than the average in cities with the highest morbidity.

THL's morbidity index takes into account seven different disease groups and four different weight aspects. The disease groups included in the index are cancers, coronary artery disease (CAD), cerebrovascular diseases (CVD), musculoskeletal diseases (MSD), mental disorders, accidents and dementia. Indices grouped by disease characterise the prevalence of illnesses in a specific age group compared to the morbidity of that age group nationwide (entire country = 100). The more common the morbidity in the region, the greater the index value. In the entire country, the morbidity index is 100 in the most recent statistical year.

When comparing the wellbeing services counties to the entire country in 2017–2019, the healthiest Finns lived in the Helsinki Metropolitan Area (Helsinki 80, West Uusimaa 81, Vantaa-Kerava 83, East Uusimaa 84) and Ostrobothnia (88), and the unhealthiest in North Savo (130), North Ostrobothnia (121) and North Karelia (121) (Figure 1). The traditional East-West division remains clearly visible with Eastern Finland having a greater prevalence of diseases and Western Finland being healthier. The reference figures are age-standardised, which means that the effect of the different age structures in the wellbeing services counties has been eliminated.

The largest differences in disease groups between regions are observed in musculoskeletal disorders, severe mental disorders, coronary artery disease and accidents. MSDs are most common in North Savo, where the index value is 157, more than three times higher than in the regions with the lowest prevalence of musculoskeletal disorders: Helsinki (50) and West Uusimaa (57). The MSD index is also high in Kainuu (144), North Ostrobothnia (142) and North Karelia (141) Severe mental disorders are most common in North Savo (145) and least common in the Helsinki Metropolitan Area and the Wellbeing services county of Ostrobothnia (East Uusimaa 73, West Uusimaa 80, Ostrobothnia and Helsinki 81 and Vantaa-Kerava 82).

Figure 1. Differences in morbidity between Finnish municipalities and wellbeing services counties. THL's Morbidity Index 2017–2019, age-standardised.
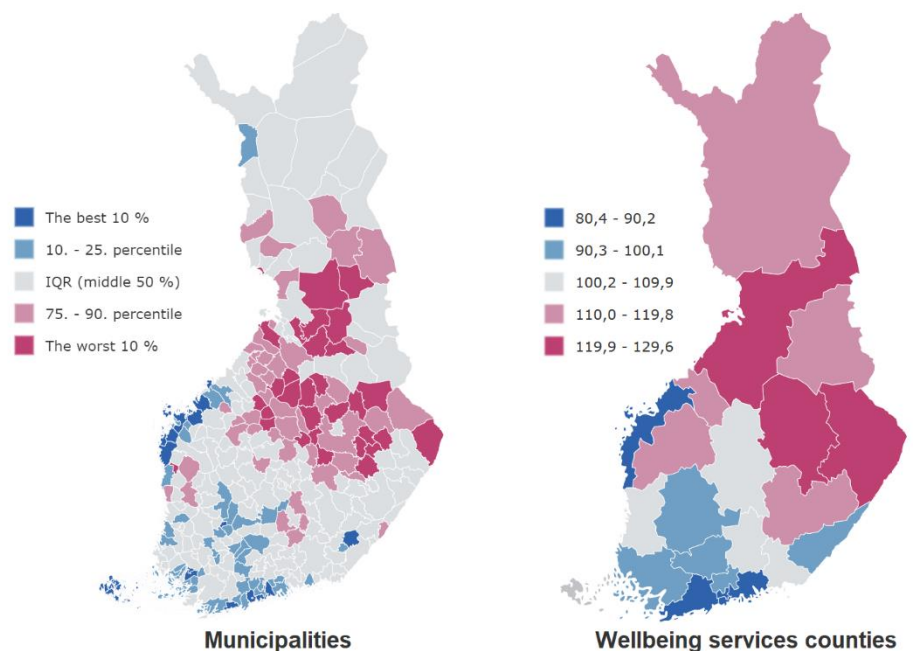
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The differences between the wellbeing services counties are clear also in the CAD index (range 76–133) and the accident index (range 79–132). CAD is diagnosed most often in South Karelia (133), North Savo (129) and Central Ostrobothnia (127). Accidents requiring hospitalisation are most prevalent in North Karelia (132). CVDs and cancers are fairly evenly distributed throughout Finland, however.

In the comparison of cities with more than 50,000 inhabitants, morbidity is highest in Kuopio (125), Oulu and Kotka (113), and lowest in Espoo (75) and Helsinki (80). Although the situation in cities with the highest morbidity appears to be partly due to different diseases, the common factor is that musculoskeletal disorders and severe mental disorders are more common than average.

Different trends in morbidity sub-indices

The morbidity rate of Finns has decreased steadily throughout the 21st century (Figure 2). However, different trends are observed by disease group.

The cancer index describes the number of people with cancer, which shows a slight increase in 2000–2019 in various parts of the country, due to the development of early diagnostics of cancer, for example. The MSD index describes the number of people on disability pension due to musculoskeletal disorders, which shows a clear decline in the last decades. This can stem from the fact that the chronic and strenuous MSDs leading to disability pension have become less common among the working-age population but probably also from changes in the grounds for granting a disability pension. This development can be seen in all wellbeing services counties.

The CVD index describes the number of first ischaemic attacks leading to hospitalisation or death, which has declined in the two last decades. The CAD index shows the number of coronary artery disease events leading to hospitalisation or death. The favourable trend of CAD, which started at the beginning of the millennium, slowed down in the middle of the 2010s. This could be caused by the increase in obesity and diabetes, for example. On the other hand, smaller and smaller infarctions can be identified due to more accurate diagnosis practices. More efficient treatment can explain the decline in CAD mortality. In addition, differences in treatment and diagnosis practices between hospitals can explain the regional variance.

The accident index shows the number of hospital stays due to injuries or poisonings within 12 months. The annual number of periods of treatment remained the same in the first decade of the millennium. In the 2010s, the number of periods of treatment due to injuries and poisonings declined both nationwide and in the majority of the wellbeing services counties. Severe mental disorders became more common among Finns in the first decade of the millennium but turned to decline in the second decade. The review of severe mental disorders is based on suicides, self-harm leading to hospitalisation, antipsychotic drugs subject to special reimbursement and disability pensions granted due to mental disorders.

New results of the dementia index are not published in these statistics, because the grounds for special reimbursement for medicines for Alzheimer's disease changed in 2016. The post-change results are not comparable with the results of the previous years.

Many factors behind health differences

Many factors affect the regional differences in morbidity. Lifestyle, such as smoking, alcohol use, physical activity and dietary habits have an impact, but lifestyle itself is affected by many things. Unemployment, financial situation and education are reflected in the health of the population. The functioning of health and social services as well as cultural and genetic factors also play a role.

THL's Morbidity Index

THL's Morbidity Index is available from 2000 to 2019. The results, including confidence intervals, have been produced for all municipalities, wellbeing services counties, counties and hospital districts in accordance with the most recent division into municipalities.

In the general morbidity index, the prevalence of each disease group is weighted based on its significance in terms of mortality, disability, quality of life and health care costs.

Both an age-standardised version of the morbidity index and a non-standardised version are published. The age-standardised results level out the effects of age structures, so the results can be used in comparisons between regions. On the other hand, the non-standardised index describes the actual burden of disease in the region.

In the future, THL's morbidity index will no longer be updated as such. It will be replaced by a new national health index, which combines the traditional THL's Morbidity Index and Kela's health barometer (Terveyspuntari).

Figure 2. Development of THL's morbidity index (general index) and subindices by disease groups in Finland in 2000–2019.
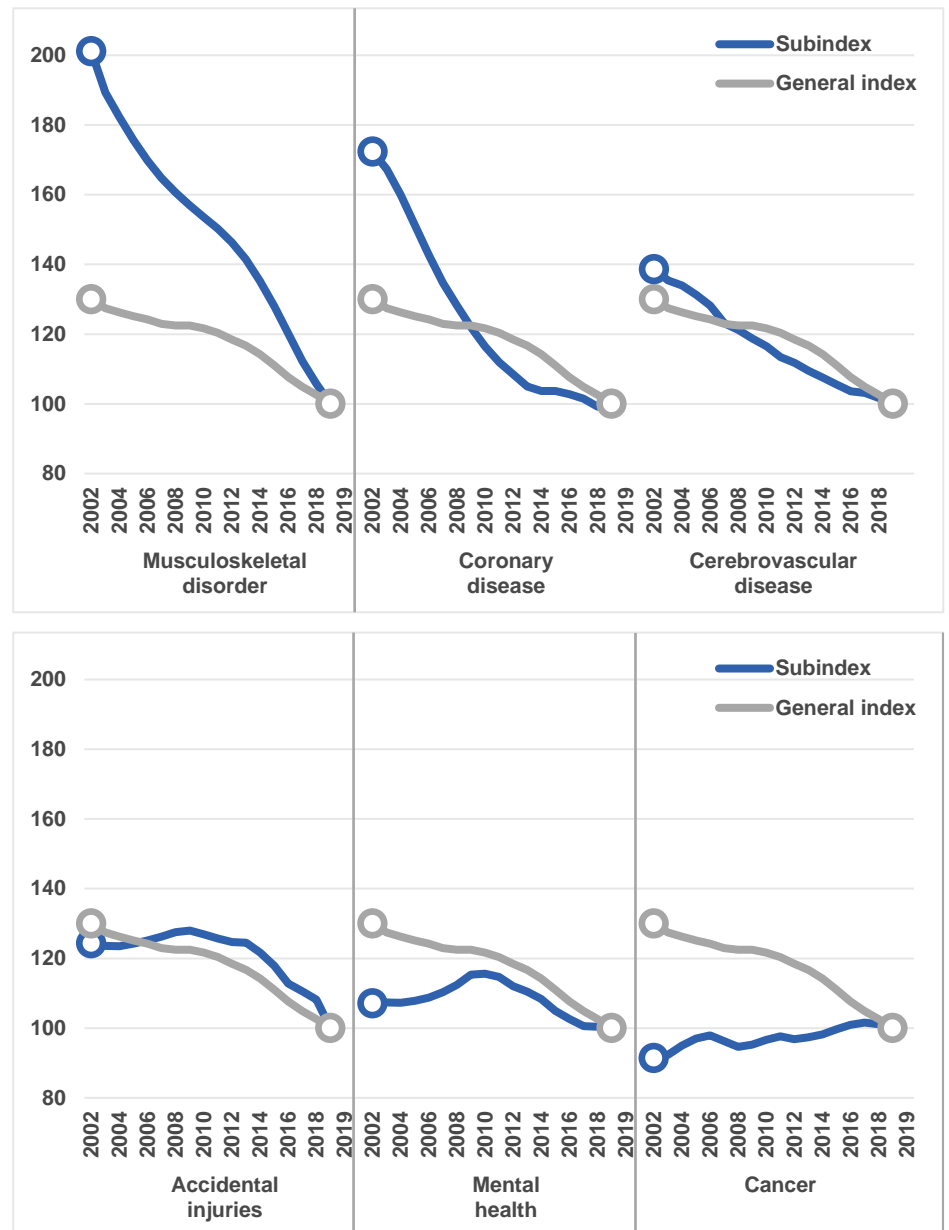
Most diseases are much more common in the elderly than in young people. Such diseases include dementia, cardiovascular diseases and cancer. Although morbidity has declined and this positive trend seems to continue for the majority of diseases, the proportion of the elderly in the population is growing, which means that the overall number of people suffering from illnesses will increase.

When comparing the figures in the morbidity index, it must be taken into account that a well-functioning healthcare system may be visible as a higher level of morbidity as diseases are screened, diagnosed and treated efficiently. These newly published statistics do not describe the possible impacts of the service and care debt resulting from the treatment of the Covid-19 epidemic, as the time series does not extend to the Covid-19 epidemic.

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Quality description

THL's Morbidity Index

Relevance of statistical data

The statistics are based on the Act on the National Institute for Health and Welfare (668/2008), under which THL's duties include studying and monitoring the population's welfare and health as well as studying, monitoring, assessing, developing and guiding social welfare and health care activities (Section 2). The municipalities have a statutory obligation to monitor the welfare of their citizens. To facilitate this work, the Finnish Institute for Health and Welfare (THL, formerly known as the National Institute for Health and Welfare) has produced THL's Morbidity index since 2012 (1), which is a collection of municipality-based data from several national registers on the prevalence of key diseases of public health importance (Appendix Table 1). With the index, municipalities and regions can compare their disease burden to that of the entire country and other regions. This information helps municipalities to prevent the development of problems and to take measures that best promote welfare and health.

On a national scale, the index can be used to monitor the development and regional differences of morbidity in the population. In addition, the Morbidity Index is a key indicator of the need for regional services, which THL uses for the performance assessment of the health and social services system. THL's Morbidity Index is available from 2000 onwards.

Methodology

THL's Morbidity Index consists of the general morbidity index and sub-indices by disease group. The disease groups included in the general index are cancers, coronary artery disease (CAD), cerebrovascular diseases (CVD), musculoskeletal diseases (MSD), mental health problems, accidents and dementia. The dementia morbidity information included in the general index describes the special reimbursement rights for medication used to treat Alzheimer's disease. In 2016, there was a change in the entitlement for this special reimbursement, and the post-change results are not comparable with the results of the previous years. That is why the information on the prevalence of dementia included in the general index has been frozen to the level of 2015. A separate dementia index will no longer be calculated.

Indices grouped by disease characterise the prevalence of illnesses in a specific age group compared to the morbidity of that age group nationwide (entire country = 100). The more common the morbidity in the region, the greater the index value. In the entire country, the morbidity index is 100 in the most recent statistical year.

The disease groups were selected in 2012 based on the fact that they are major public health problems that cause the majority of deaths and disability pensions among the Finns and reliable information is available from national registers. In a review in 2012, the disease groups included in the index covered slightly more than 60% of the years of life lost by persons under the age of 80 (Appendix Table 2). Approximately 80% of current disability pensions had been granted based on disease groups included in the index. The included disease groups accounted for slightly more than half of all direct health care costs. Other important selection criteria included availability of data for calculation by municipality, regular updating of datasets and suitability for describing morbidity in particular, instead of the different regional practices of the service system. The age limits are based on the fact that the disease is very rare among people who are younger than the selected age group, making it not feasible to collect data on them.

In the general morbidity index, the prevalence of each disease group is emphasised based on its significance in terms of mortality, disability, quality of life and health care costs. The aim of weighting is to illustrate various social and individual effects of morbidity. A regional index is the mean weighted prevalence rate by disease group.

When looking at the time series, it should be noted that the index values for previous years also change with the new update. In the calculation of the general index, each of the four

weighting criteria (mortality, disability, quality of life, health care costs) is weighted equally. Mental disorders, which are key causes of disability and decrease in the quality of life, have the greatest impact on the general morbidity index. The subindices and the weighting factors used to calculate the index are described in Appendix Tables 1 and 2.

To minimise random variation, the morbidity index is calculated on all regional levels based on the data from three consecutive years. For example, calculation of the 2019 morbidity index is based on the data for 2017–2019. In addition, margins of error (confidence intervals) have been calculated for the index values to allow evaluation of the impact of random variation. It is essential to consider the margins of error especially when interpreting the results of small municipalities and the results by disease groups.

Correctness and accuracy of data

Calculation of the morbidity index collected by THL is based on the data from the national registers of THL, Statistics Finland, the Finnish Centre for Pensions, the Finnish Cancer Registry and the Social Insurance Institution of Finland (KELA). Correctness of the morbidity index data depends on the comprehensiveness and accuracy of these registers, which is described in their quality descriptions (Appendix Table 1).

When looking at the time series, it should be noted that the values for previous years change with the new update. Both an age-standardised and non-standardised version of the index is produced, and their interpretations differ. Several diseases are heavily age-dependent, which means that the age structure of the population of a geographical area determines to a large extent the level of morbidity. The age-standardised index describes the difference in morbidity between various regions regardless of the age structure. For example, Savonlinna had a high percentage of residents over the age of 64 (32%) in 2019, and the non-stardardised morbidity index was high (120), but the age-standardised figure was only 107. On the other hand, in Oulu where a small proportion of residents were over the age of 64 in 2019 (16%), the non-standardised figure was 104 and the age-standardised figure 113. Without age-standardisation, it would seem that the morbidity of people of all ages is higher in Savonlinna when in reality it is the other way around. On the other hand, the non-standardised index provides a better description of the morbidity burden and the related costs in the area. Age-standardisation is based on an indirect method (2).

The morbidity index is developed to describe the regional differences in the morbidity of the population. Morbidity is caused by several reasons. With regard to lifestyle, particularly smoking and heavy use of alcohol increase morbidity. The population's age structure, employment situation as well as educational and income level contribute to morbidity. Several health risks and illnesses tend to accumulate in population groups with a lower educational attainment, low income and long-term unemployment. Because of this, the index should not be used to draw conclusions on the performance of the health care system in various areas; other factors affecting morbidity that underlie regional differences should also be considered.

There are also differences in health care treatment practices, diagnostics of illnesses and recording practices between regions that are independent of morbidity, and these may explain some statistical anomalies in individual municipalities. For example, differences in the mental health index from one municipality to the next may simply be caused by different recording practices. The health care system itself may also skew the findings: well-functioning health care may result in an apparently high morbidity that is actually due to more efficient screening, diagnosing and treating of diseases. Such factors may be reflected in the cancer index, for example: an index value higher than average may illustrate higher cancer morbidity or mean that the region is successful in the early diagnostics of cancer.

Timeliness and promptness of published data

THL's Morbidity Index has been updated since 2012. Calculation of the index combines data from three consecutive years to minimise random variation. Because of the timetable for completing the underlying register data, the index illustrates the prevalence of diseases of public health importance in Finland with an average delay of two years.

In the future, THL's morbidity index will no longer be updated as such. It will be replaced with the new national health index, which is calculated based on a more comprehensive set of data than THL's Morbidity Index. The new national health index (3) combines the traditional THL's Morbidity Index and Kela's health barometer (Terveyspuntari).

Availability and clarity of data

THL's Morbidity Index and its metadata are published in THL's [Terveytemme](#) (Our Health) online service. The online service includes the data for all municipalities, wellbeing services counties, counties and hospital districts in accordance with the most recent division into municipalities, including confidence intervals. The morbidity indices are also available in THL's indicator bank, [Sotkanet](#). However, indices by disease groups are not published in Sotkanet for municipalities with less than 2,000 inhabitants because of high uncertainty concerning randomness. Also, it is not possible to show confidence intervals in Sotkanet. The results for each statistical year are calculated based on the data for three consecutive years and recorded as the data for the last year of the three-year period (e.g. for 2019 for the period 2017–2019).

The statistics have their own [website](#).

Comparability and coherence of the published data

In this report, THL's morbidity indices for 2000–2019 have been calculated for the first time by wellness service counties. The information is also produced by municipality, hospital district, county as well as for the entire country.

In connection with the update of the indices, the indices of all previous years are counted again based on the most recent classification of municipalities. Other information is updated retrospectively as well, if it has changed.

Specific issues in the index for 2017–2019

A dementia index is not published in this report. In 2016, there was a change in the entitlement for special reimbursement for medication used to treat Alzheimer's disease, rendering the results no longer comparable with those from previous years. Dementia is still included in the general index, but the prevalence data of dementia has been frozen to the level of 2015.

Mental health index: Information for 2019 concerning the special reimbursement for drugs granted based on psychosis (Kela's illness code 112) have been replaced by information for 2018 in all areas.

Accident index: There are some doubts about the data for 2019 concerning the Care Register for Health Care. Based on the expected value of the Poisson distribution and variance, observations for 2019 that deviated too greatly from the previous years have been replaced by the data for 2018 for 11 municipalities.

Literature

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