1.1. Regular preventive contacts with a dentist (population aged 18+; population aged below 18 years) (EQ-7)

1.1.1. Documentation sheet

Description	EQ-7 Regular preventive contacts with a dentist (population aged 18+) Regular preventive contacts with a dentist (children aged between 3 and 17 years)
Calculation	We analyse inequity in regular preventive contacts with a dentist in the past 3 years (defined as contacts for preventive dental care in two different years during the last three years), see P-11. The **fairness gap** of each individual (aged 18+) in the EU-SILC survey is calculated (see methodological note on equity in healthcare use). Next, systematic differences in the fairness gap by socioeconomic group are evaluated by: • Differences in the fairness gap by socioeconomic status, e.g. income or educational attainment, in comparison to the general population. • Differences in the fairness gap for specific (vulnerable) population subgroups (e.g. single parents, beneficiaries of increased reimbursement, individuals with severe material deprivation), in comparison to the general population. • The (absolute) concentration index, which is a summary score of the inequity in the distribution of the fairness gap along a socioeconomic dimension (e.g. income distribution, educational attainment).
Rationale	See methodological note on equity in healthcare use See indicator P-11
Data source	Linked micro-data: EU-SILC & IMA – AIM & RIZIV – INAMI, years 2018, 2019, 2020, 2021. This is individual level data from respondents of the EU-SILC data from Statbel (Algemene Directie Statistiek – Direction générale Statistique – Statistics Belgium) enriched with their healthcare consumption data from IMA – AIM and municipality level data on healthcare supply from RIZIV – INAMI. KCE report 334 for years 2012, 2016[1]

Technical definitions	The calculation of the **fairness gap** and definition of socioeconomic and other population groups are described in the methodological note on equity in healthcare use**.**
	
	Definition of regular preventive contacts with a dentist
	
	• A contact with a dentist is identified through the professional code of the provider:
	  ○ The first two digits of the professional code (variable practitioner_cat in IMA – AIM GZSS database) greater or equal to 30 and lower or equal to 39, or
	  ○ The first two digits of the professional code (variable practitioner_cat in IMA – AIM GZSS database) greater or equal to 10 and lower or equal to 19 and the qualification of the healthcare provider (variable ss00065B in IMA – AIM GZSS database) equal to 52, 520, 152, 222, 422, 521.
	• A dental contact is considered preventive if one of the following nomenclature codes is used (variable ss00020 in IMA – AIM GZSS database): nomenclature code between 301394 to 302540, 371394 to 372540.

International comparability	No
Limitations	See methodological note on equity in healthcare use
Dimension	Equity
Related indicators	EQ-6 Regular contacts with a dentist (population aged 18+) A-4 Households facing catastrophic out-of-pocket payments (% of respondents, HBS) A-7 People with self-reported unmet needs for dental examination due to financial reasons (% of respondents 16+, EU-SILC) P-11 Regular contacts with dentist (% pop aged ≥3 years)
Reviewers	Roos Leroy (KCE); Carine Van de Voorde (KCE)

1.1.2. Results – Regular preventive contacts with a dentist (population aged 18+)

Evolution over time in the probability to have regular preventive dental visits

Table 1 reports the evolution over time of the probability to have regular preventive dental visits (visits for preventive dental care in at least 2 of the past 3 years). For the insured population aged 3 years or more, the fraction of individuals with regular preventive dental visits increased from 24.3% in 2012 to 33.4% in 2018 and remained more or less stable since.[2] Among the individuals included in the EU-SILC/IMA-AIM sample, we find a higher share of respondents with regular preventive dental visits (26.8% in 2012 up to 40.0% in 2021), and an upward time trend over the whole period. The fraction of individuals with regular preventive dental visits is lower (1 to 2 percentage points) when restricting the sample to the population aged 18 or more, which is used in the regression and inequity analysis.

Table 1 – Evolution (2012-2021) of the probability to have regular preventive dental visits in the past 3 years

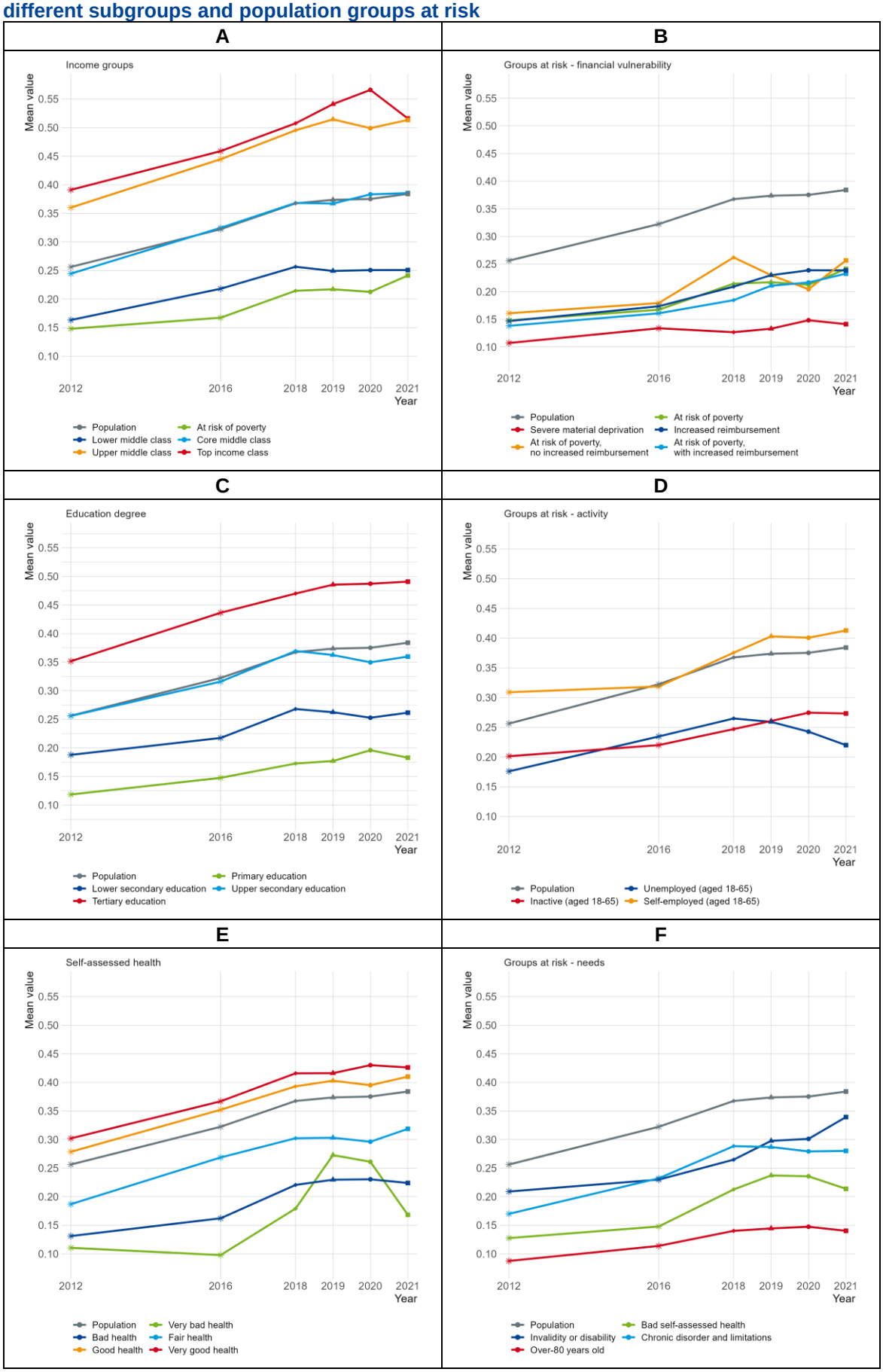
Sample	2012	2016	2018	2019	2020	2021
Population (3+)	24.3%	30.2%	33.4%	34.4%	33.6%	34.2%
Survey (3+)	26.8%	33.4%	37.6%	38.6%	38.9%	40.0%
Survey (18+)	25.6%	32.2%	36.7%	37.4%	37.5%	38.4%

Figure 1[a] shows the evolution of the probability to have regular preventive dental visits in the past 3 years for a variety of population subgroups (adult population). These are the crude trends, without a correction for healthcare needs.[1]

Figure 1 indicates that most population subgroups follow the upward trend over time in the adult population. There are, however, some exceptions. We find a decreasing or stable trend since 2018 in the probability to have regular preventive dental visits among the unemployed (aged 18-65), individuals with an upper/lower secondary education degree, individuals with (very) bad self-assessed health and individuals with a chronic disorder and limitations (panels C, D & E). Second, there is an important socioeconomic gradient with respect to income (panel A) and education (panel C). Individuals with high-income (upper middle and top income class) and high educational attainment (tertiary education) have a probability to have regular preventive dental visits well above the population mean. The opposite is true for individuals with low income (at risk of poverty and lower middle class) and low educational attainment (primary and lower secondary education). Other financially vulnerable population subgroups (individuals with increased reimbursement, with severe material deprivation, in unemployment or inactivity, see panels B and D) also have a probability well below the population average, in particular individuals with severe material deprivation. The middle income and educational groups (core middle class and upper secondary education) have a probability in line with the population mean. Third, the fraction of individuals with regular preventive dental visits is below average for individuals with high care needs, i.e. those with fair, bad and very bad self-reported health, with chronic disorder and limitations, invalidity or disability (panels E and F). The fraction is particularly low among over-80 year olds (panel F).

[a] Note the analysis is based on a survey sample and that results for some population subgroups are based on a small number of observations (e.g. over-80 years old, very bad self-assessed health, at risk of poverty without increased reimbursement, etc.). This may lead to fluctuations over time due random variation that interferes with the observed trends.

Figure 1 – Evolution (2012-2021) of the probability to have regular preventive dental visits for different subgroups and population groups at risk



Overview inequity over time for different population subgroups

Figure 2 and Figure 3 show how the probability to have regular preventive dental visits in the past 3 years in various population subgroups differs from the population average when looking at inequality as well as inequity. When analysing inequity, a correction is made for healthcare needs.[b] Contrary to other types of care (see EQ-1 to EQ-5), the correction for healthcare needs in case of preventive dental care is limited to differences by age and gender as there are no variables available in the EU-SILC/IMA-AIM database that are specifically related to dental care needs. Moreover, one could argue that regular dental care and in particular regular preventive dental care is recommended regardless of health status.

Figure 1 reveals a substantial gradient in regular preventive dental visits by self-assessed health and other proxies for high care needs, with lower contact rates among individuals in worse health. In our opinion, it would be incorrect to label these differences as fair and justified and adjust preventive dental care use accordingly.

In Figure 2, population groups are defined based on categories of equivalized income, categories of educational attainment, and categories of self-assessed health. In Figure 3, specific vulnerable population subgroups are considered.

The figures can be read as follows. Values to the left of the vertical line indicate that the population subgroup has a lower probability of having regular preventive dental visits than the population average. Values to the right of the vertical line, on the other hand, indicate a higher probability than the population average. In addition to an evaluation in terms of the population average, it is possible to make a comparison over time for a specific population subgroup or a comparison of different subgroups.

Given the minor correction for healthcare needs (only age and gender, see above), the results with respect to inequalities and inequities in Figure 2 and Figure 3 are quite similar. The disparities in having regular preventive dental visits are quite large compared to other types of healthcare and range between -25 and +15 percentage points.

We conclude that, first, there are important gradients in the probability to have regular preventive dental visits with respect to income, self-assessed health and education. The probability to have regular visits is markedly lower for individuals with primary and lower secondary education; individuals at risk of poverty and in the lower middle class; and individuals with fair, bad and very bad self-assessed health status. A probability above the population mean is found for individuals with tertiary education, in the upper middle and top income class and, to a lesser extent, for individuals with good and very good self-assessed health.

Second, for most vulnerable population subgroups the probability to have regular preventive dental visits is below the population average. This is particularly the case for financially vulnerable population subgroups (i.e. at risk of poverty, beneficiary of increased reimbursement, unemployed, inactive, severe material deprivation). In some cases there is a positive evolution over time, i.e. the average is evolving towards the population average (e.g. individuals at risk of poverty with increased reimbursement), but in other cases the situation is deteriorating, i.e. the difference is increasing over time (e.g. individuals in unemployment). It is important to note that increased reimbursement does not sufficiently increase access to the dentist for preventive dental care.

[b] The output of the regression analysis on which the correction is based is available upon request.

Figure 2 – Inequality and inequity in the probability to have regular preventive dental visits in the past 3 years: difference between the general population and population subgroups based on education, income, and self-assessed health

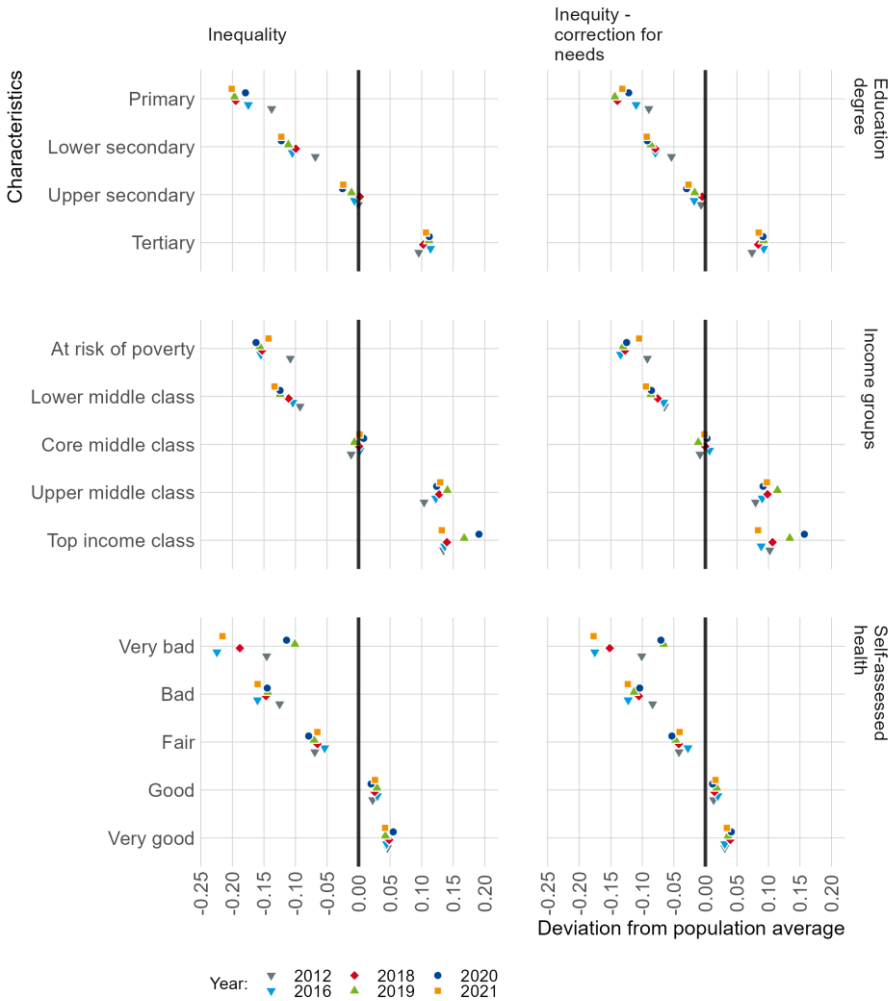
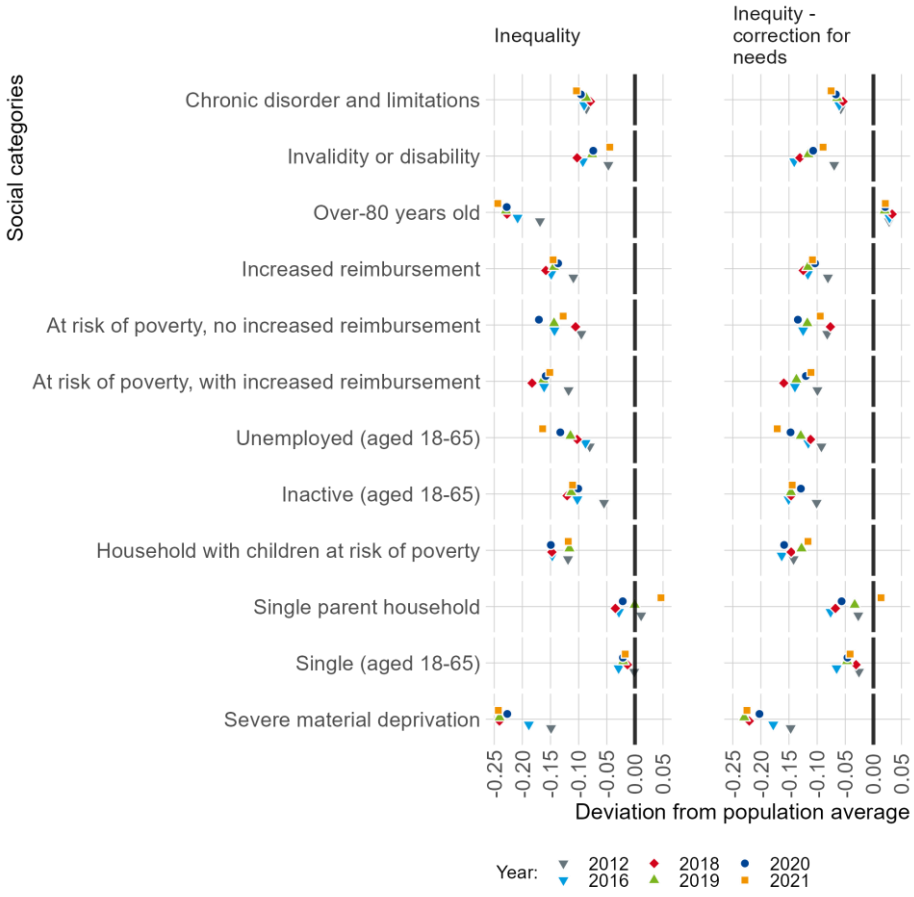


Figure 3 – Inequality and inequity in the probability to have regular preventive dental visits in the past 3 years: difference between the general population and specific vulnerable population subgroups

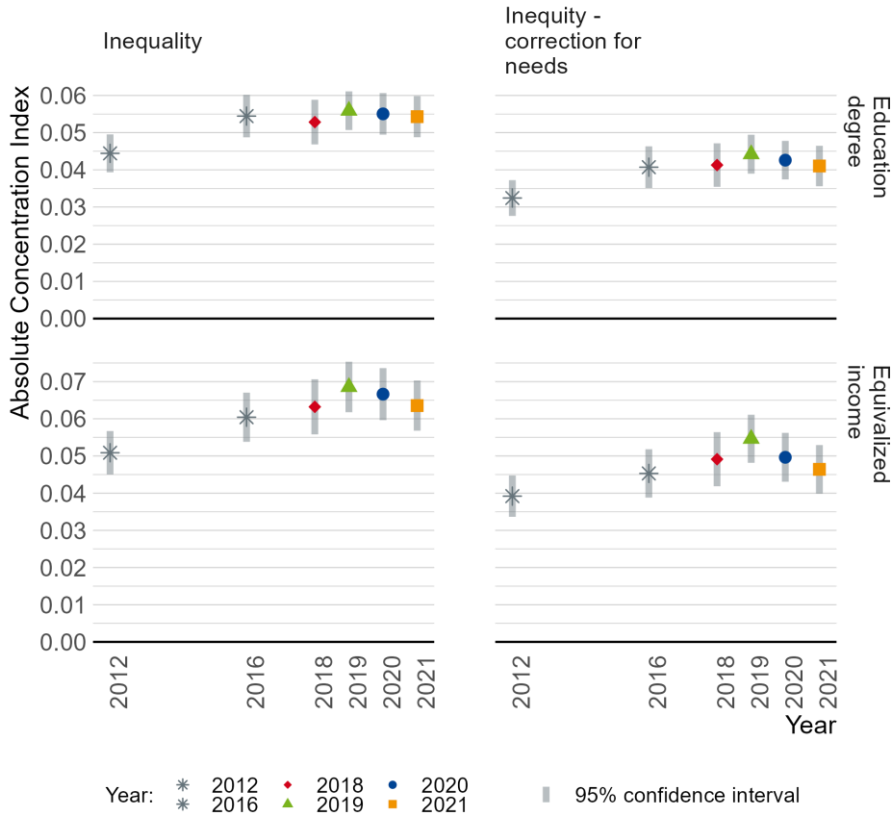


Systematic socioeconomic inequity as measured by the concentration index

Figure 4 shows the absolute concentration index of the needs-corrected probability to have regular preventive dental visits in the past 3 years to education and (equivalized) income. The absolute concentration index takes into account the entire distribution of care use in a similar way as the Gini index. Negative values of the concentration index should be interpreted as higher needs-corrected probabilities of having regular preventive dental visits concentrated among individuals with lower educational attainment or lower income. Positive values indicate higher needs-corrected probabilities for individuals with higher educational attainment and higher income.

The results in Figure 4 reveal systematic and substantial socioeconomic inequalities and inequities in the probability to have regular preventive dental visits, with higher probabilities concentrated among high-educated individuals and high-income individuals. The inequities as measured by the concentration index have slightly increased over time.

Figure 4 – Evolution (2012-2021) of socioeconomic inequality and inequity in the probability to have regular preventive dental visits in the past 3 years as measured by the absolute concentration index for subgroups based on education and income



Key points

- **The population adhering to regular preventive dental care has increased over time from one quarter of the population in 2012 to one third since 2018. The EU-SILC/IMA-AIM survey value is slightly higher and shows an upward trend over time. Higher preventive contact rates are found among individuals with higher income, higher educational attainment and better health status.**
- **No specific variables are available to correct for dental care needs, hence only a correction is made for age and gender. Moreover, one could argue that regular dental care and in particular regular preventive dental care is recommended regardless of health status.**
- **After correction for age and sex, there are important socioeconomic inequities in the probability to have regular preventive dental visits. Clear social gradients are found with regard to income class and educational attainment with contact rates increasing with income and level of education. Inequities in the probability to have regular preventive dental visits are found for all financially vulnerable population subgroups and in particular for individuals in households with severe material deprivation. Both improving (e.g. individuals at risk of poverty with increased reimbursement) and deteriorating (e.g. individuals with severe material deprivation) trends over time are observed.**
- **After correction for age and sex, lower contact rates are found for beneficiaries of increased reimbursement.**
- **The concentration index demonstrates systematic and substantial inequities by income (pro-rich: in favour of high-income individuals) and educational attainment (in favour of high-educated individuals). Inequities are slightly increasing over time.**

1.1.3. Results – Regular preventive contacts with a dentist (population aged between 3 and 17 years)

Evolution over time in the probability to have regular preventive dental visits

Table 2 reports the evolution over time of the probability to have regular preventive dental visits (visits for preventive dental care in at least 2 of the past 3 years). For the insured population aged 3 years or more, the fraction of individuals with regular preventive dental visits increased from 24.3% in 2012 to 33.4% in 2018 and remained more or less stable since.[2] Among the individuals included in the EU-SILC/IMA-AIM sample, we find a higher share of respondents with regular preventive dental visits (26.8% in 2012 up to 40.0% in 2021), and an upward time trend over the whole period.

In addition, we have information on preventive contact rates in children by age group. Low rates were found in the youngest children (age 3-4) increasing from 6.7% in 2012 to 11.3% in 2021. Children are recommended to go to a dentist from the age of two to three years, hence at the age of three to four years they may not yet have a history of regular dental contacts. Higher rates were observed in children aged between 5 and 14 years (increasing from 35.5% in 2012 to 44.5% in 2021), and in adolescents aged 15 to 17 years (increasing from 30.9% in 2012 to 39.4% in 2021). Among children included in the EU-SILC/IMA-AIM sample, a markedly larger share has regularly visited a dentist for preventive dental care, in particularly among the youngest children.

In this section, we analyse preventive dental care for children, which is a small group. When zooming in on particular subgroups, subgroups become very small and there might be random variation that interferes with the observed trends. Figure 5[c] shows the evolution of the probability to have regular preventive dental visits in the past 3 years for a variety of population subgroups (children aged between 3 and 17 years). These are the crude trends, without a correction for healthcare needs. We focus on the period 2018 to 2021 as no earlier results for this indicator are available in KCE report 334.[1] Note that no information was available on the self-assessed health status of children, so that no subdivision by health status could be made.

Table 2 – Evolution (2012-2021) of the probability to have regular preventive dental visits in the past 3 years

Sample	2012	2016	2018	2019	2020	2021
Population (3+)	24.3%	30.2%	33.4%	34.4%	33.6%	34.2%
Survey (3+)	26.8%	33.4%	37.6%	38.6%	38.9%	40.0%
Survey (3+, < 18 years)	33.6%	40.7%	42.6%	44.6%	44.8%	47.2%
Population (3-4 years)	6.7%	9.6%	10.3%	10.7%	10.5%	11.3%
Survey (3-4 years)	12.6%	19.3%	23.5%	26.8%	28.6%	25.0%
Population (5-14 years)	35.5%	41.0%	43.3%	43.9%	42.8%	44.5%
Survey (5-14 years)	37.3%	45.7%	47.6%	49.4%	49.1%	52.0%
Population (15-17 years)	30.9%	36.9%	38.9%	39.3%	38.2%	39.4%
Survey (15-17 years)	36.1%	39.6%	36.9%	39.4%	39.9%	41.5%

Figure 5 indicates that most population subgroups follow the slight upward trend between 2018 and 2021 in children. There are, however, some exceptions. We find a decreasing or stable trend since 2018 in the probability to have regular preventive dental visits in children with low-

[c] Note the analysis is based on a survey sample and that results for some population subgroups are based on a small number of observations (e.g. over-80 years old, very bad self-assessed health, at risk of poverty without increased reimbursement, etc.). This may lead to fluctuations over time due random variation that interferes with the observed trends.

educated parents (panel C). Second, there is an important socioeconomic gradient with respect to income (panel A) and education (panel C). Children in high-income households (core, upper middle and top income class) and high educational attainment of the parent(s) (tertiary education) have a probability to have regular preventive dental visits well above the population mean. The opposite is true for children in households with low income (at risk of poverty and lower middle class) and low educational attainment of the parent(s) (primary, lower and upper secondary education). Other financially vulnerable population subgroups (children with increased reimbursement, in households with severe material deprivation, in households with no parent at work, in single parent households, see panels B, D & E) also have a probability well below the population average.

Overview inequity over time for different population subgroups

Figure 6 shows how the probability to have regular preventive dental visits in the past 3 years in various population subgroups differs from the population average when looking at inequality as well as inequity. When analysing inequity, a correction is made for healthcare needs.[d] Contrary to other types of care (see EQ-1 to EQ-5), the correction for healthcare needs in case of preventive dental care is limited to differences by age and gender as there are no variables available in the EU-SILC/IMA-AIM database that are specifically related to dental care needs. Moreover, one could argue that regular dental care and in particular regular preventive dental care is recommended regardless of health status.

In Figure 6, population groups are defined based on categories of equivalized income, categories of educational attainment of the parent, and specific vulnerable population subgroups.

The figures can be read as follows. Values to the left of the vertical line indicate that the population subgroup has a lower probability of having regular preventive dental visits than the population average. Values to the right of the vertical line, on the other hand, indicate a higher probability than the population average. In addition to an evaluation in terms of the population average, it is possible to make a comparison over time for a specific population subgroup or a comparison of different subgroups.

Given the minor correction for healthcare needs (only age and gender, see above), the results with respect to inequalities and inequities in Figure 6 are quite similar. The disparities in having regular preventive dental visits are quite large compared to other types of healthcare and range between -30 and +20 percentage points.

We conclude that, first, there are important gradients in the probability to have regular preventive dental visits with respect to income and education. The probability to have regular preventive dental care is markedly lower for children whose parents have no tertiary degree, children in households at risk of poverty or in the lower middle class. A probability above the population mean is found for children whose parents have a degree of tertiary education, and children in households in the upper middle and top income class.

Second, for most vulnerable population subgroups the probability to have regular preventive dental visits is below the population average. This is particularly the case for financially vulnerable population subgroups, and is particularly pronounced among children in households with severe material deprivation or in households at risk of poverty, but without increased reimbursement. In some cases there is a positive evolution over time, i.e. the average is evolving towards the population average (e.g. children in households at risk of poverty with increased reimbursement), but in other cases the situation is deteriorating, i.e. the difference is increasing over time (e.g. children in households at risk of poverty without increased reimbursement). It is important to note that increased reimbursement does not sufficiently increase accessibility to the dentist for preventive dental care in children.

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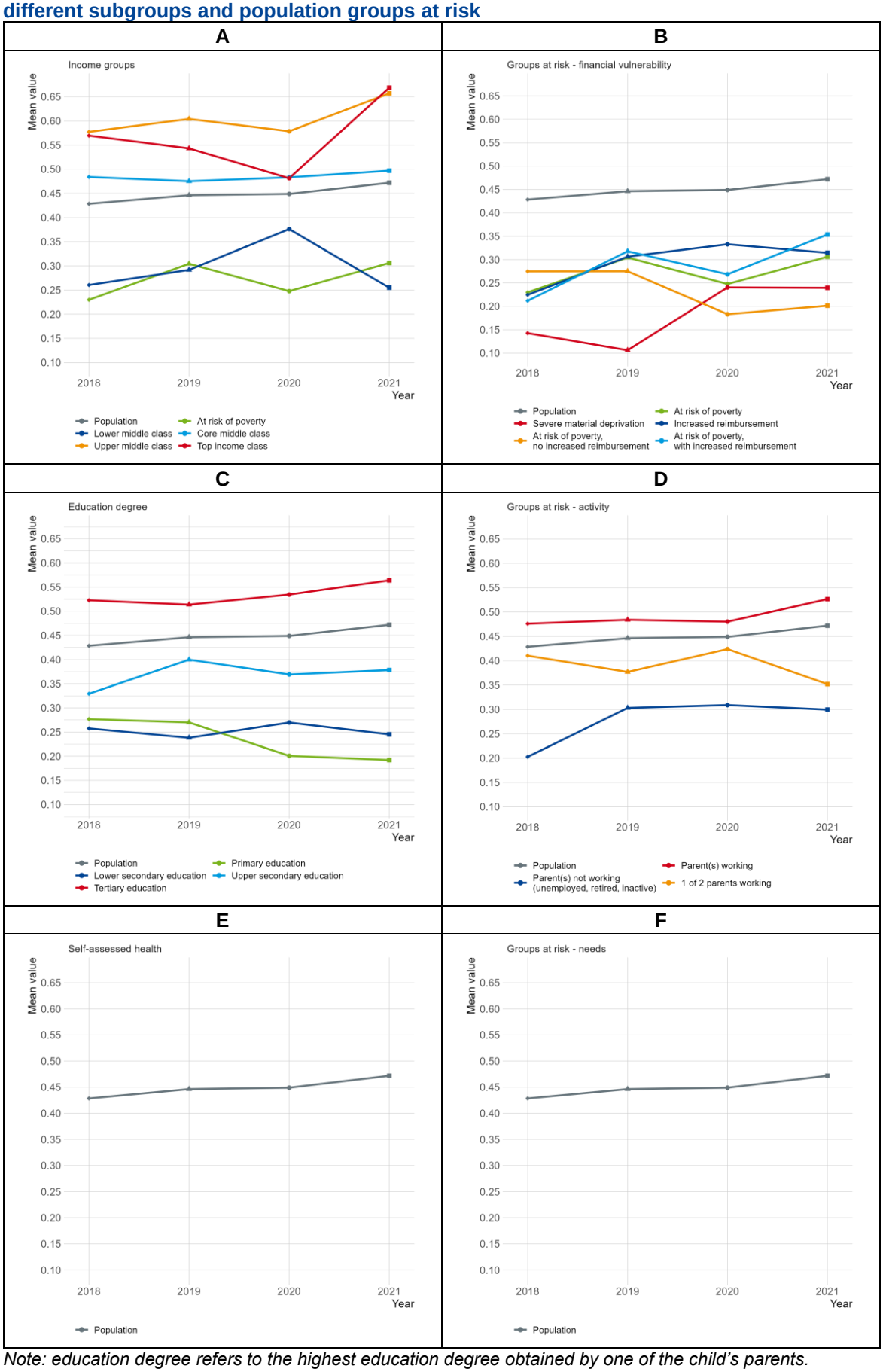
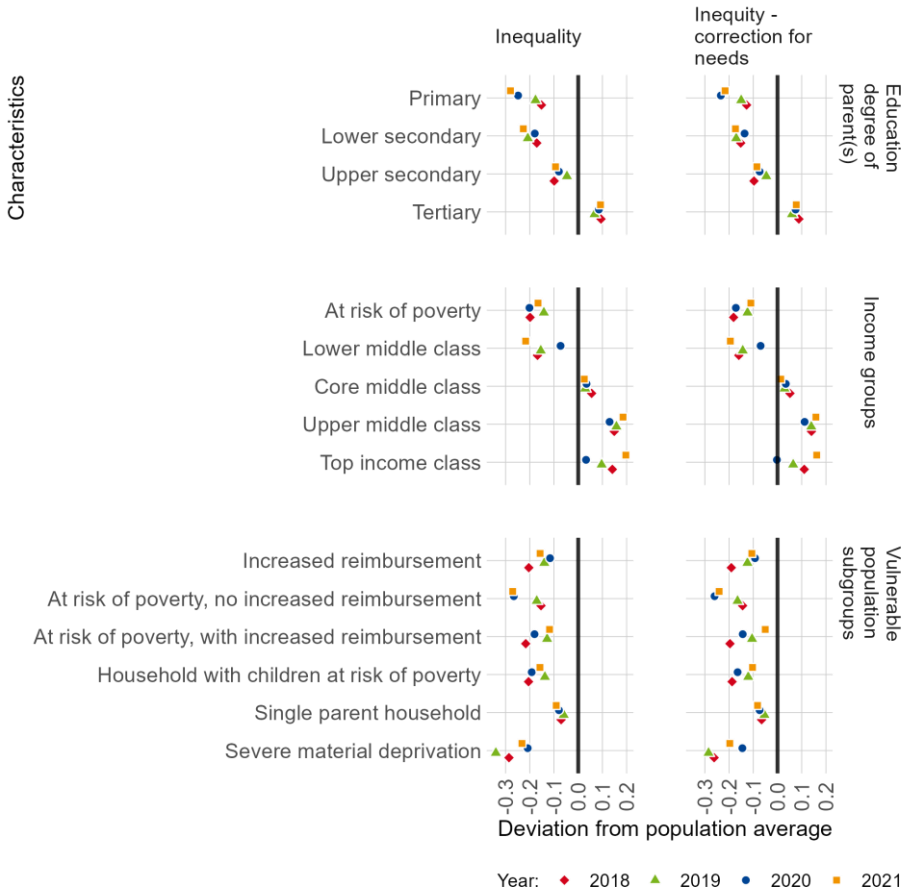
[d] The output of the regression analysis on which the correction is based is available upon request.

Figure 5 – Evolution (2018-2021) of the probability to have regular preventive dental visits for different subgroups and population groups at risk



Note: education degree refers to the highest education degree obtained by one of the child's parents.

Figure 6 – Inequality and inequity in the probability to have regular preventive dental visits in the past 3 years: difference between the general population and population subgroups based on education, income, and specific vulnerable population subgroups

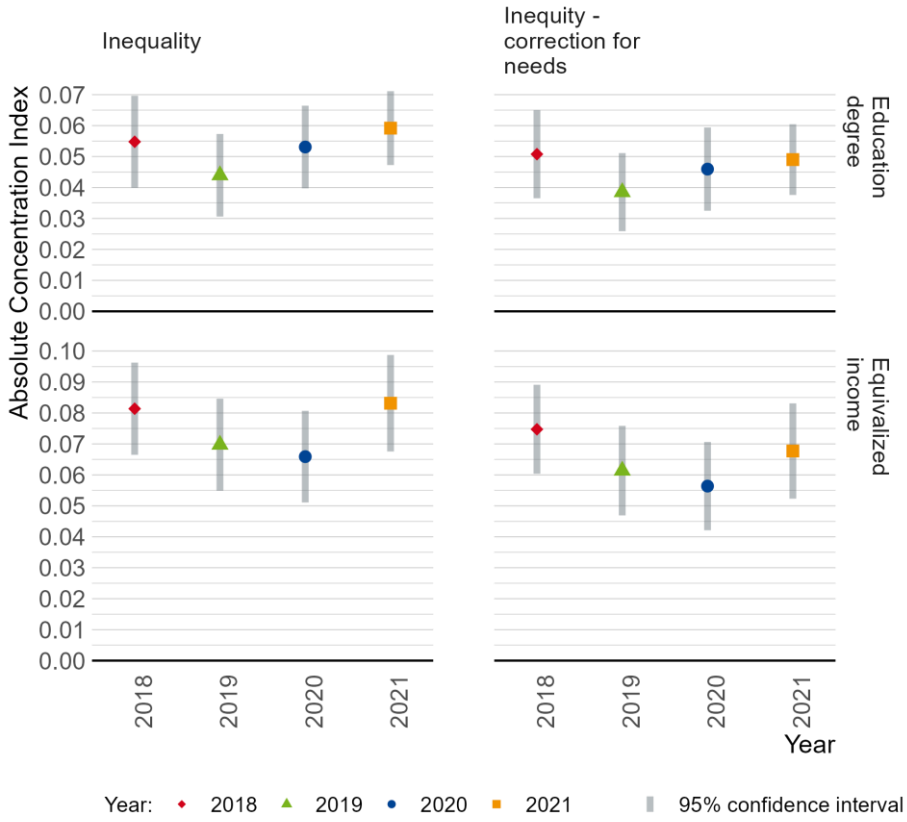


Systematic socioeconomic inequity as measured by the concentration index

Figure 7 shows the absolute concentration index of the needs-corrected probability to have regular preventive dental visits in the past 3 years to education and (equivalized) income. The absolute concentration index takes into account the entire distribution of care use in a similar way as the Gini index. Negative values of the concentration index should be interpreted as higher needs-corrected probabilities of having regular preventive dental visits concentrated among children whose parents are lower educated or live in households with lower income. Positive values indicate higher needs-corrected probabilities for children whose parents are higher educated or live in high-income households.

The results in Figure 7 reveal systematic and substantial socioeconomic inequalities and inequities in the probability to have regular preventive dental visits, with higher probabilities concentrated in children with high-educated parents and in high-income households. The inequities as measured by the concentration index were relatively stable over time.

Figure 7 – Evolution (2018-2021) of socioeconomic inequality and inequity in the probability to have regular preventive dental visits in the past 3 years as measured by the absolute concentration index for subgroups based on education and income



Key points

- **Preventive contact rates are low among the youngest children aged 3 to 4 years (6.7% in 2012 increasing to 11.3% in 2021), and higher in children aged 5 to 14 years (35.5% in 2012 increasing to 44.5% in 2021), and in adolescents aged 15 to 17 years (30.9% in 2012 increasing to 39.4% in 2021). Among children included in the EU-SILC/IMA-AIM sample, a markedly larger share has regularly visited a dentist for preventive dental care, in particularly among the youngest children. Higher preventive contact rates are observed in children in high-income households, and with high-educated parents.**
- **No specific variables are available to correct for dental care needs, hence only a correction is made for age and gender. Moreover, one could argue that regular dental care and in particular regular preventive dental care is recommended regardless of health status.**
- **After correction for age and gender, there are important socioeconomic inequities in the probability to have regular preventive dental visits. Clear social gradients are found with regard to income class and educational attainment with contact rates increasing with income and level of education of the parents. Inequities in the probability to have regular preventive dental visits are found for all financially vulnerable population subgroups and in particular for children in households with severe material deprivation and in households at risk of poverty without increased reimbursement.**
- **After correction for age and gender, lower contact rates are also found for beneficiaries of increased reimbursement.**
- **The concentration index demonstrates systematic and substantial inequities by income (pro-rich: in favour of children in high-income households) and educational attainment (in favour of children of high-educated parents). Inequities are relatively stable over time.**

References

1. Bouckaert N, Maertens de Noordhout C, Van de Voorde C. Health System Performance Assessment: how equitable is the Belgian health system? Health Services Research (HSR). Brussel: Belgian Health Care Knowledge Centre (KCE); 2020. KCE Reports 334 Available from: https://doi.org/10.57598/R334C
2. IMA-AIM Atlas. 2023. Available from: https://atlas.ima-aim.be/databanken/