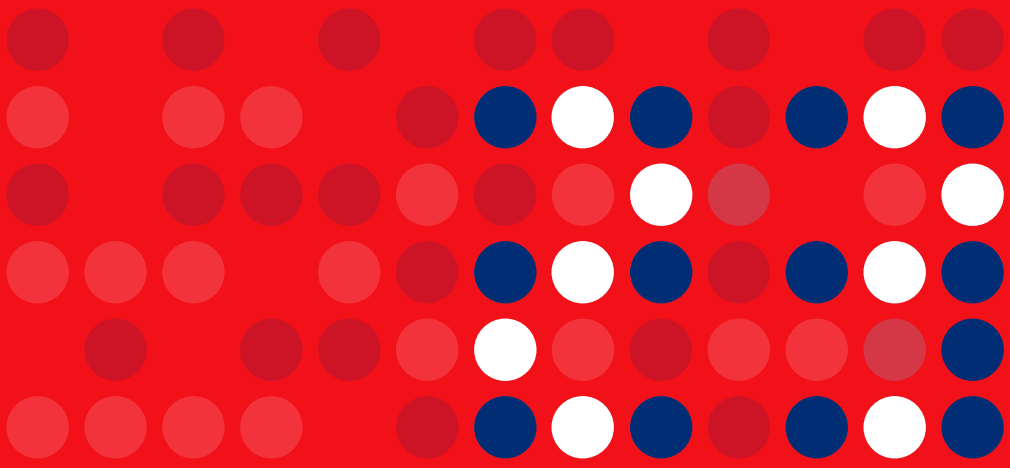
Human Immunodeficiency Virus (HIV)
Infection in the Netherlands

HIV Monitoring

HIV Monitoring Report 2023

Chapter 7: Quality of care



7. Quality of care

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Introduction

One of the missions of stichting hiv monitoring (shm) is to contribute to the quality of HIV care in the Netherlands. Via the collection of pseudonymised data from patients in outpatient care at the 24 dedicated treatment centres, shm can provide a nationwide overview of the outcome of care for patients. This unique overview allows shm to facilitate assessment of the quality of HIV care in the Netherlands.

The Dutch Association of HIV-Treating Physicians (*Nederlandse Vereniging van HIV Behandelaren*, NVHB) has issued a variety of indicators to reflect the quality of health care provided to individuals with HIV. These include, for example, HIV outcome indicators (e.g., the percentage with HIV viral suppression), and hepatitis B and C virus and syphilis screening for men who have sex with men (MSM). Given the broad range of indicators, shm, along with members of the Quality Commission from the NVHB, has decided to focus on only one set of key indicators that will be described in this year's report.

As individuals with HIV have increased their lifespans with the use of effective antiretroviral therapy, age-related comorbidities have increased in prevalence[1]. One of the more concerning comorbidities is cardiovascular disease[2]. As a result, we have decided to bring more focus to primary and secondary prevention of cardiovascular disease. These include whether or not centres have provided information on smoking and other items that are needed for cardiovascular disease screening, such as total cholesterol, HDL- and LDL-cholesterol and blood pressure. The SCORE-2 for individuals aged 40-69 years old and the SCORE2-OP for individuals 70 years old or older are often used in clinical care to understand the 10-year risk of developing a cardiovascular disease event among those who have not yet had such an event[3,4]. We also provide information on whether the SCORE2 or SCORE2-OP were able to be calculated for these age groups. For individuals with a 10-year risk of a cardiovascular disease event of 10% or higher, we report the percentage who received a prescription for statins and those with an LDL cholesterol at or below the recommended limits in European guidelines (i.e., target LDL cholesterol)[5]. Finally, we report the percentage of individuals who had high blood pressure and received a prescription for antihypertensive medication and, subsequently, the percentage of individuals who received an antihypertensive medication and had a blood pressure at or below the recommended limits

in European guidelines (i.e., target blood pressure)[5]. The full list of indicators, their definitions and in which populations these indicators were analyzed are provided in Box 7.1.

This analysis relates to all individuals who were diagnosed with HIV and who are currently in care at one of the 24 HIV treatment centres in the Netherlands. Considering that this chapter describes the role of the individual in a medical context, we describe all individuals with HIV who are receiving, or have received, medical care at an HIV treatment centre as patients. To facilitate presentation, we have decided to provide mostly figures describing changes over the last 5 years and comparison of indicators between individual centres and the national average. Indicators are reported for the 24 HIV treatment centres individually. Each HIV treatment centre is referenced by a number, which is used consistently across all figures in this chapter.

Box 7.1: Definitions of specific indicators and focus populations.

Indicator	Definition	Focus population
Information on smoking status		
Known smoking status	The percentage of patients who ever gave information on their smoking. status.	In care and by age group[1]
Information needed for cardiovascular disease screening		
Total cholesterol	The percentage of patients who had a total cholesterol measurement during the calendar year.	In care and by age group[1]
HDL cholesterol	The percentage of patients who had an HDL cholesterol measurement during the calendar year.	
LDL cholesterol	The percentage of patients who had an LDL cholesterol measurement during the calendar year.	
Blood pressure	The percentage of patients who had at least one blood pressure measurement during the calendar year.	

All cardiovascular parameters	The percentage of patients who had total, HDL and LDL cholesterol and blood pressure measurement during the calendar year.	
Information on cardiovascular event risk		
SCORE2	The percentage of patients who had enough information to have their SCORE2 cardiovascular risk assessment during the calendar year.	40-69 year olds without a history of CVD
SCORE2-OP	The percentage of patients who had enough information to have their SCORE2-OP cardiovascular risk assessment during the calendar year.	70 year old or older, without a history of CVD
Statin use	The percentage of patients who received a prescription for statins during the calendar year.	SCORE2 or SCORE2-OP predicted 10-year risk greater than 10%, without a history of CVD[2]
Target LDL cholesterol	The percentage of patients who had an LDL cholesterol level ≤1.8 mmol/mL during the calendar year.	SCORE2 or SCORE2-OP predicted 10-year risk greater than 10%, without a history of CVD[2]
Antihypertensive medication use	The percentage of patients who received a prescription for antihypertensive medication during the calendar year.	All patients with high blood pressure[3]
Target blood pressure	The percentage of patients who had a systolic blood pressure <130 mmHg and diastolic blood pressure <80 mmHg (for those 18-64 years old), or a systolic blood pressure <140 mmHg and diastolic blood pressure <80 mmHg (for those 65 years old or older).	All patients on antihypertensive medication

Abbreviations: HDL = high-density lipoprotein; LDL = low-density lipoprotein.

[1]Age groups refer to the following: 18-39 year olds, 40-69 year olds and 70 year old or older.

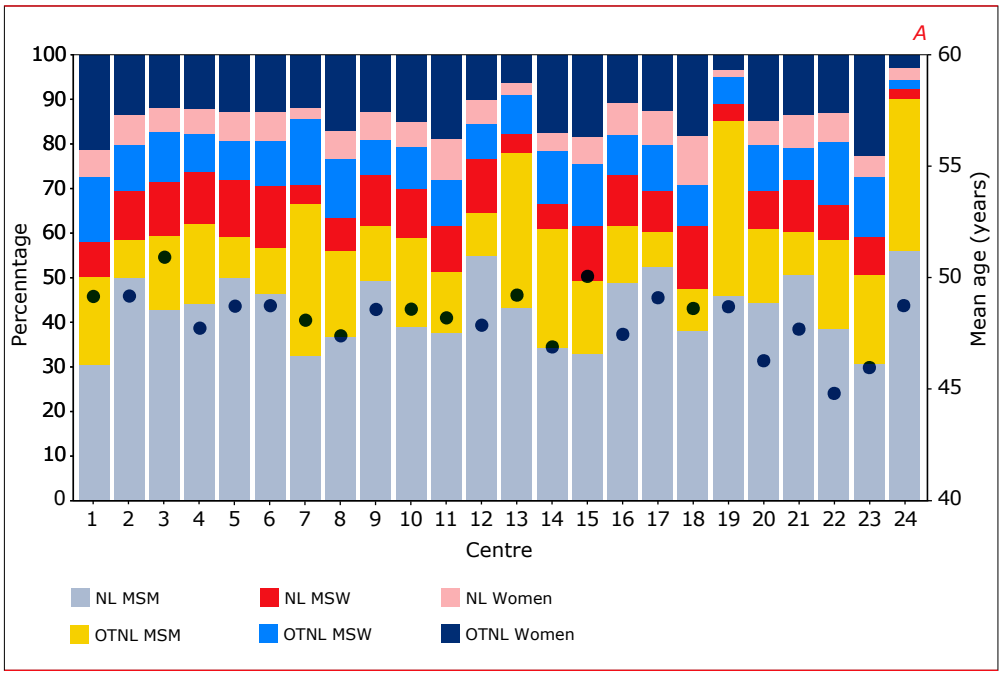
[2]Details on these scores can be found in the following website: https://u-prevent.com and also ref.[3,4]

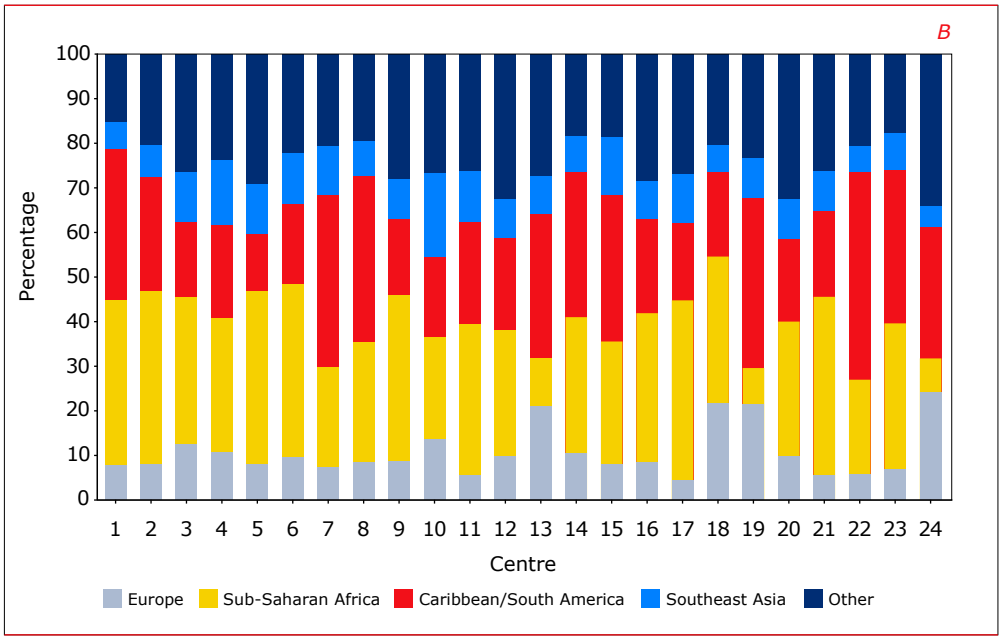
[3]Defined as a diastolic blood pressure ≥90 mmHg.

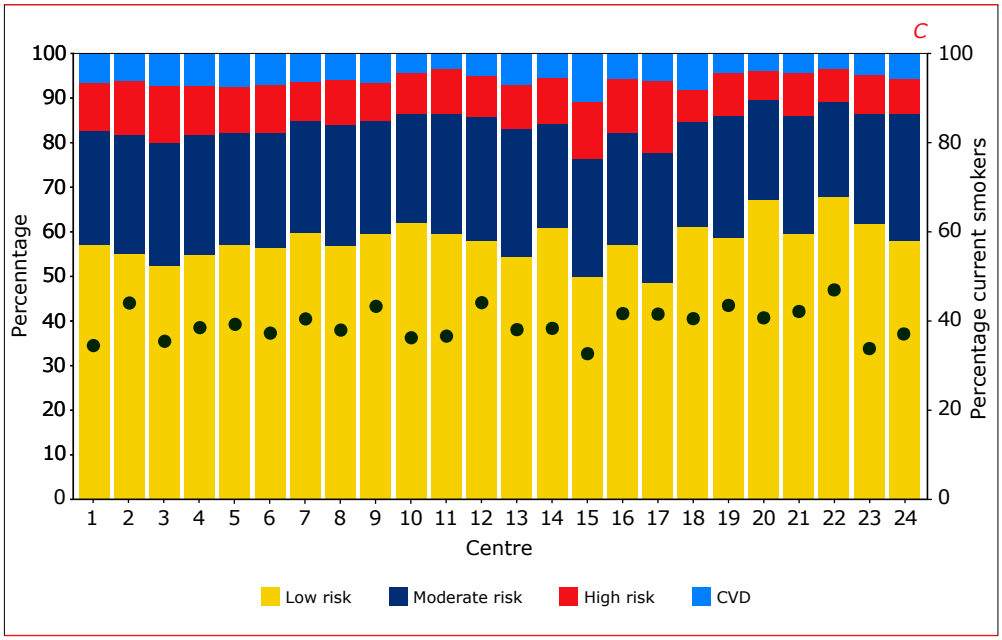
Centre overview

To provide an understanding of the patient 'mix' across centres, the distribution of geographical origin/mode of HIV acquisition/gender groups and age are provided for each centre (Figure 1A). For patients who are other than Dutch, the distribution of region of origin is also given for each treatment centre (Figure 1B). Finally, the distribution of patients with low (<5%), moderate (5-10%), and high (>10%) predicted 10-year risk of cardiovascular disease, for those who have not had a cardiovascular disease event, and the percentage with cardiovascular disease are also provided for each treatment centre (Figure 1C). Predicted 10-year cardiovascular risk was assessed with SCORE2 (for 40-69 year olds) or SCORE2-OP (for 70 year olds or older). These are presented alongside the percentage of patients who are currently smoking.

Figure 7.1: Description of the patient 'mix' (A), as well as distribution of region of origin for other than Dutch individuals (B), and cardiovascular disease risk and smoking status (C) among patients in care in 2022 in the Netherlands.







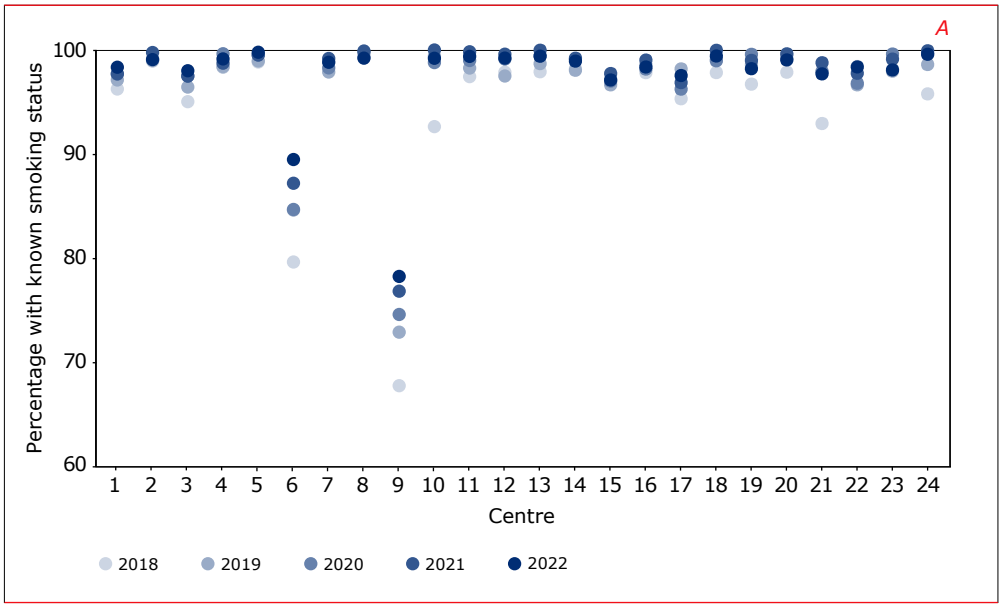
Note: *The bars in this chart show the percentage of individuals per centre. In A, black dots represent the mean age of patients in care at each centre. In C, black dots represent the percentage of current smokers of patients in care at each centre. This panel distinguishes those who already have cardiovascular disease (CVD) and those who have low, moderate or high risk according to the predicted 10-year cardiovascular risk were assessed with SCORE2 (for 40-69 year olds) or SCORE2-OP (for 70 year olds or older).*

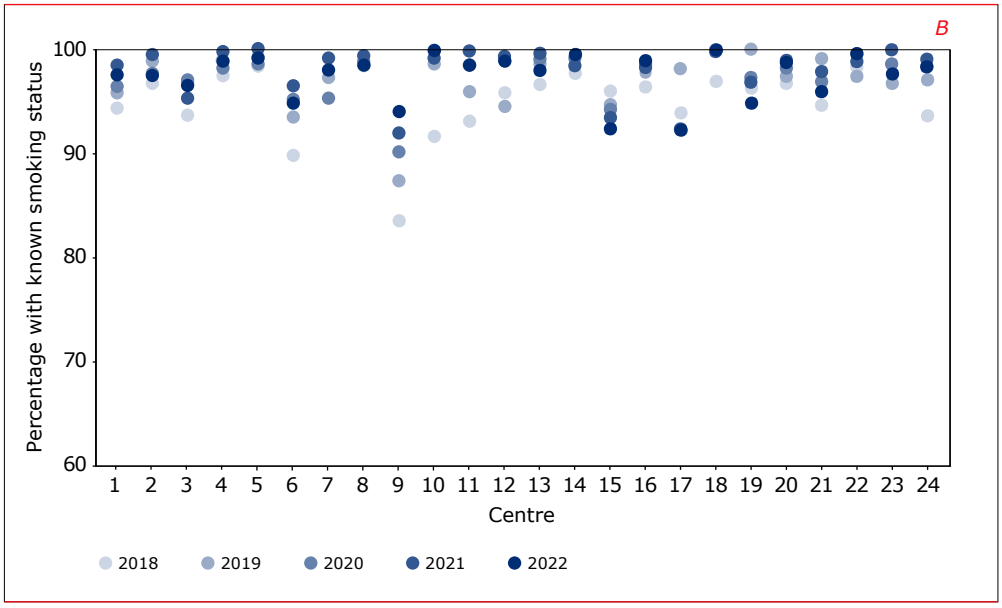
Legend: *CVD=cardiovascular disease; MSM = men who have sex with men; MSW = men who exclusively have sex with women; NL = Dutch; OTNL = other than Dutch.*

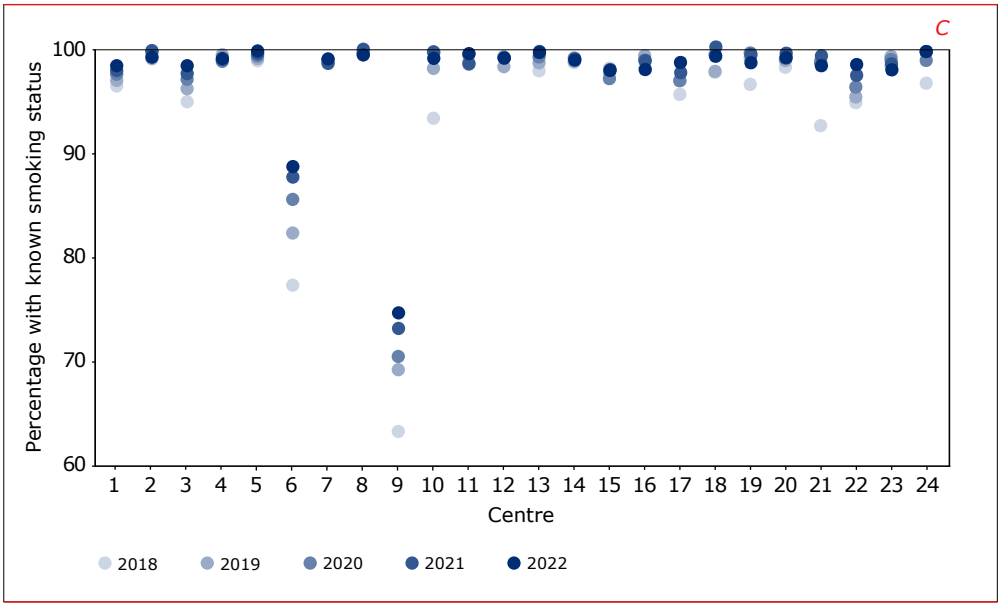
Evolution of indicators over time

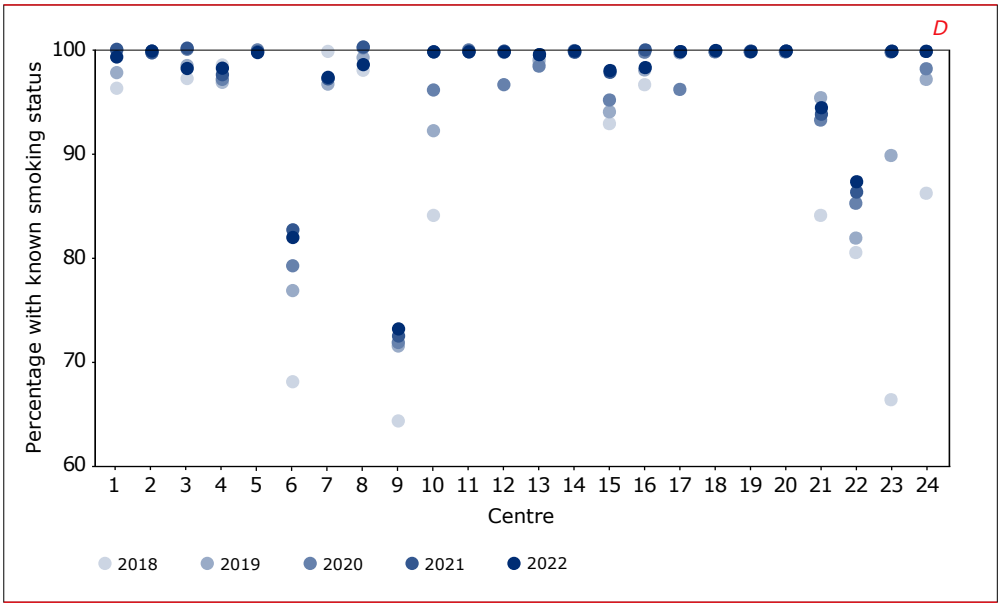
To provide an understanding of how indicators have evolved, each indicator in *Box 7.1* is reported for its corresponding focus population on an annual basis between 2018 and 2022. For example, the indicator 'information on smoking' is provided for individuals who were in care in 2018, 2019, 2020, 2021 and 2022.

Figure 7.2: Known smoking status; in other words, patients who ever had information on their smoking status during each year between 2018 and 2022.



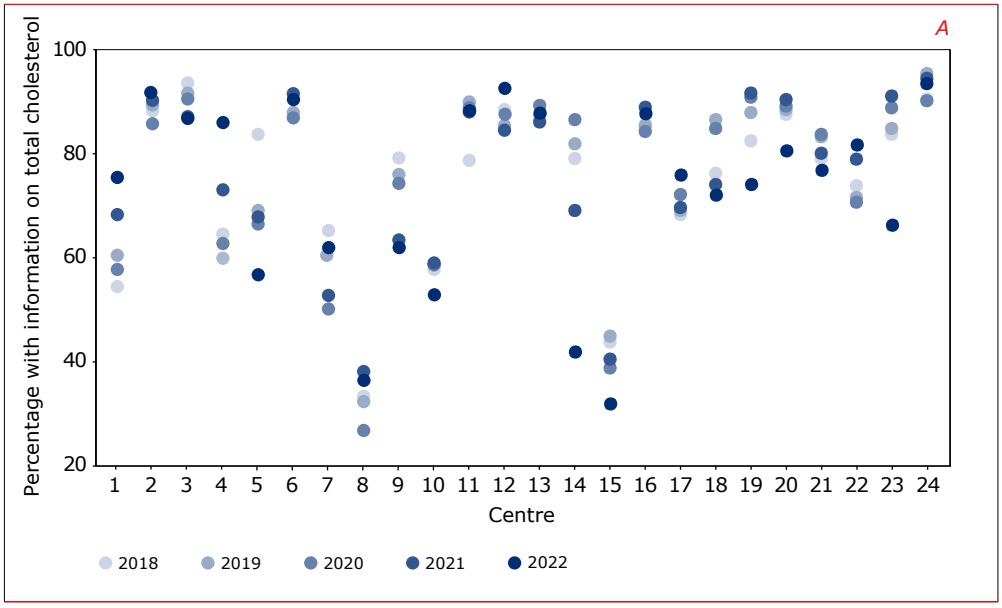


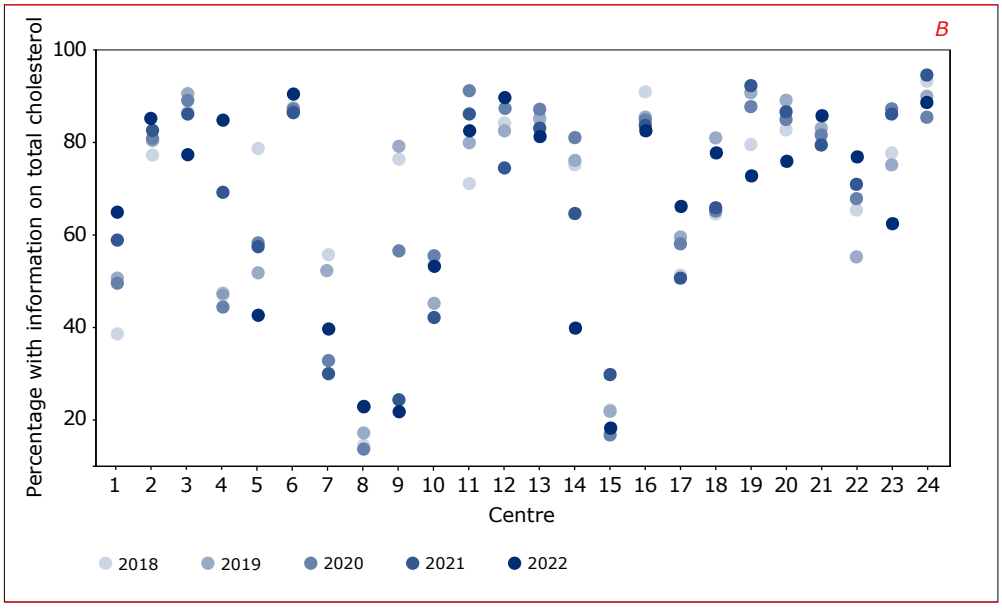


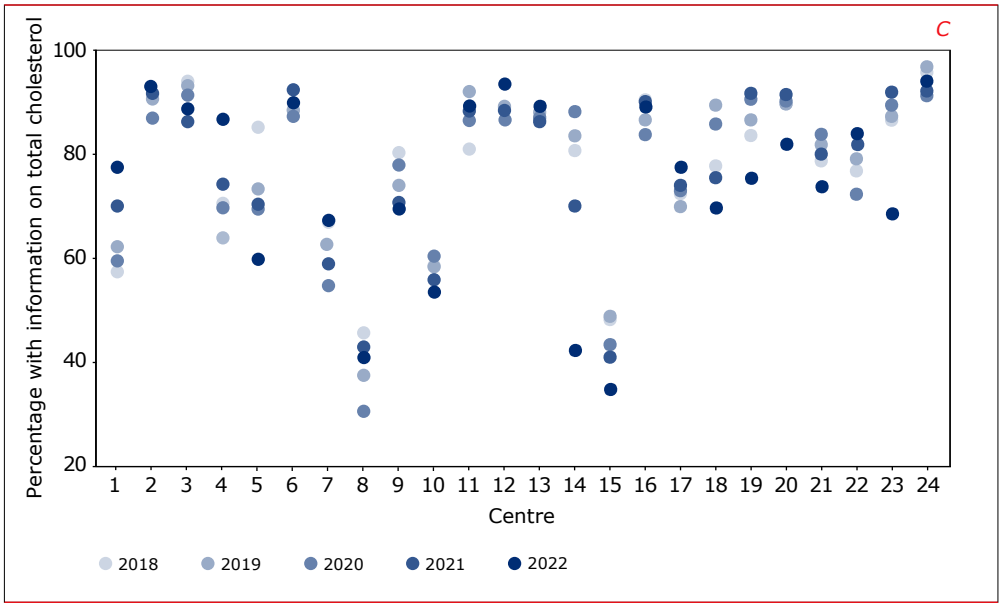


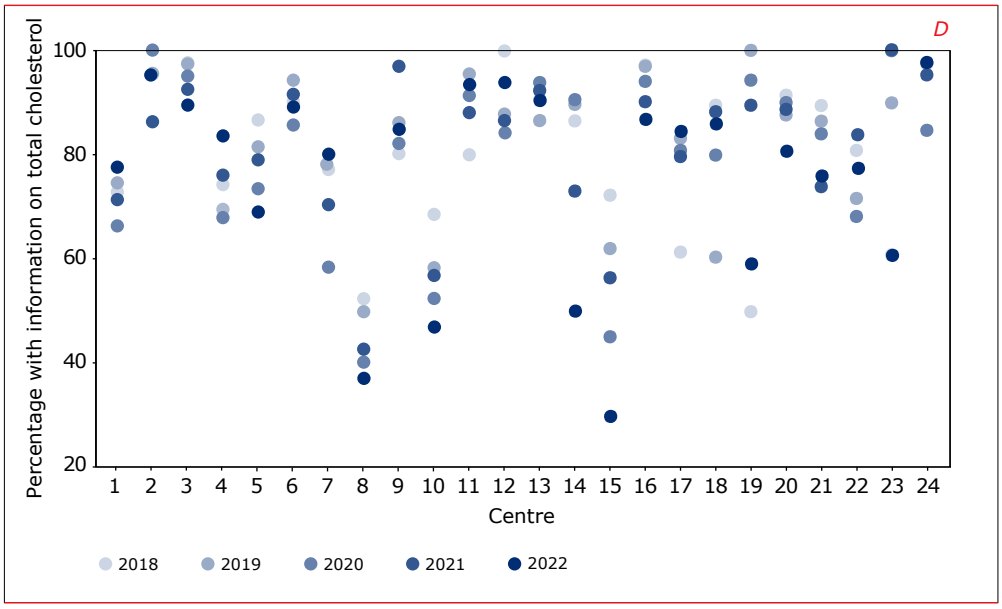
Legend: *Data are provided overall (A) and by age group: 18–39 year olds (B), 40–69 year olds (C) and 70 years old or older (D). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.3: Information on total cholesterol; in other words, patients who had a total cholesterol measurement during each year between 2018 and 2022. .



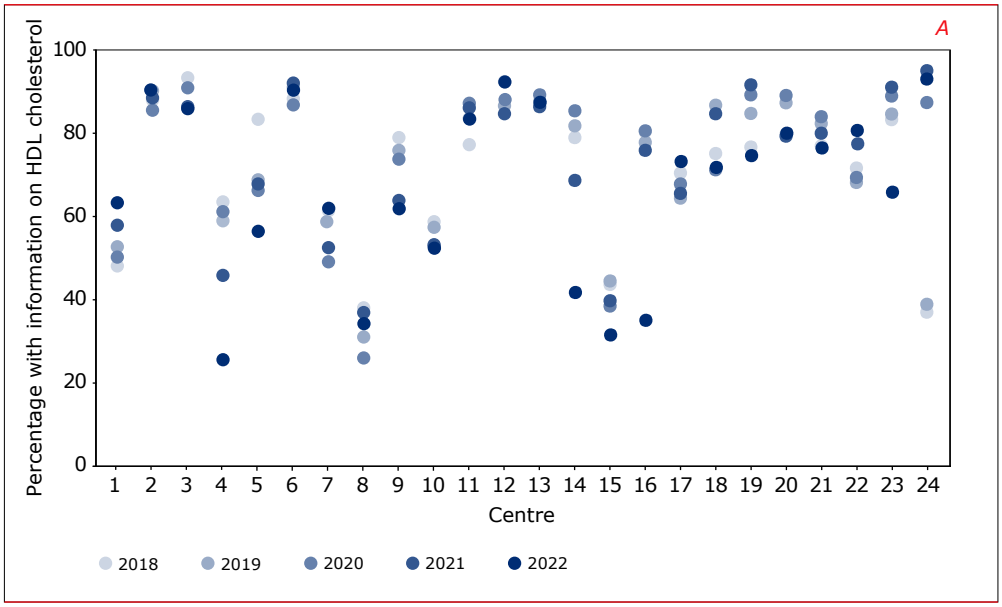


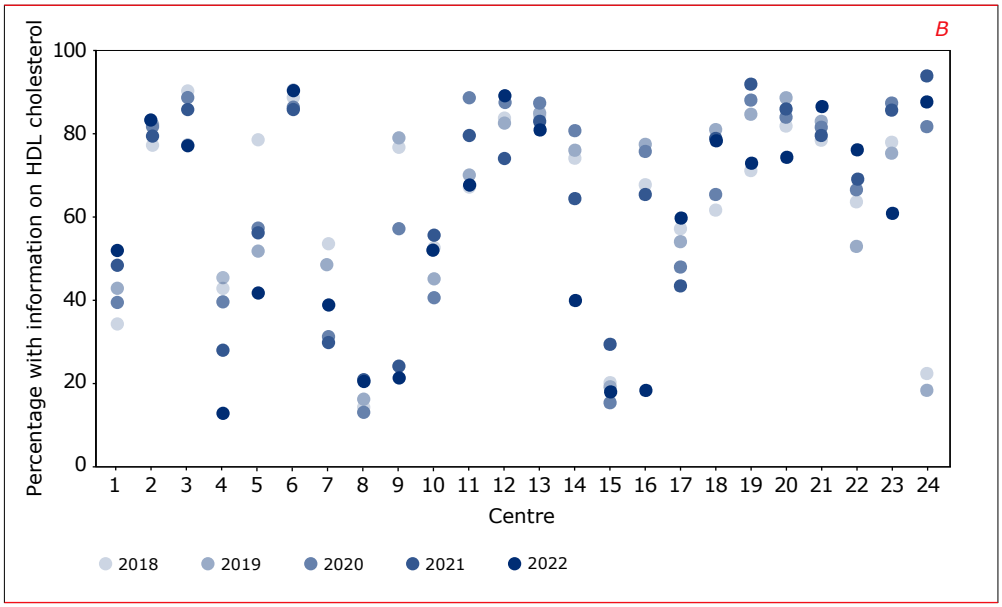


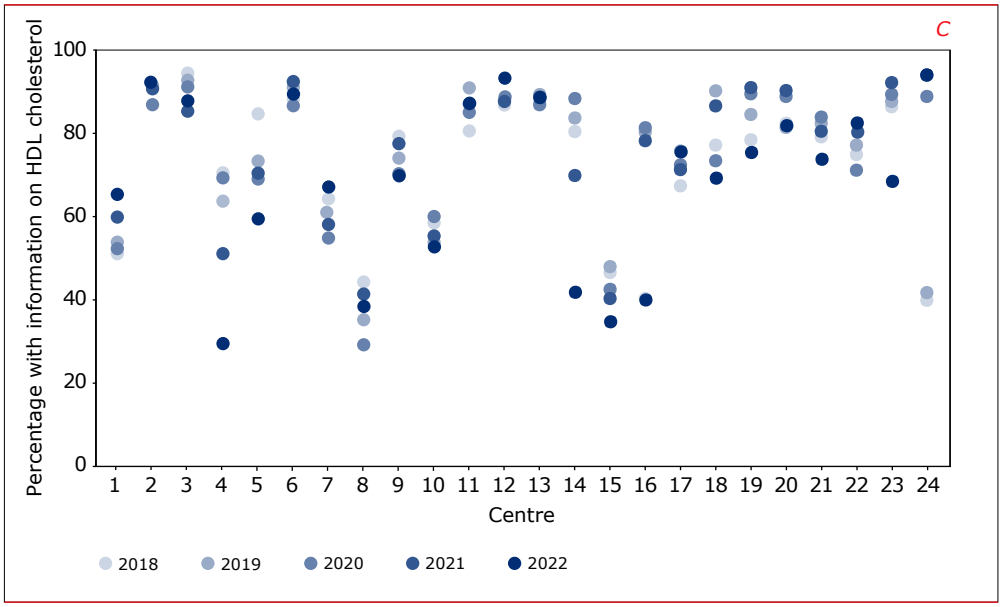


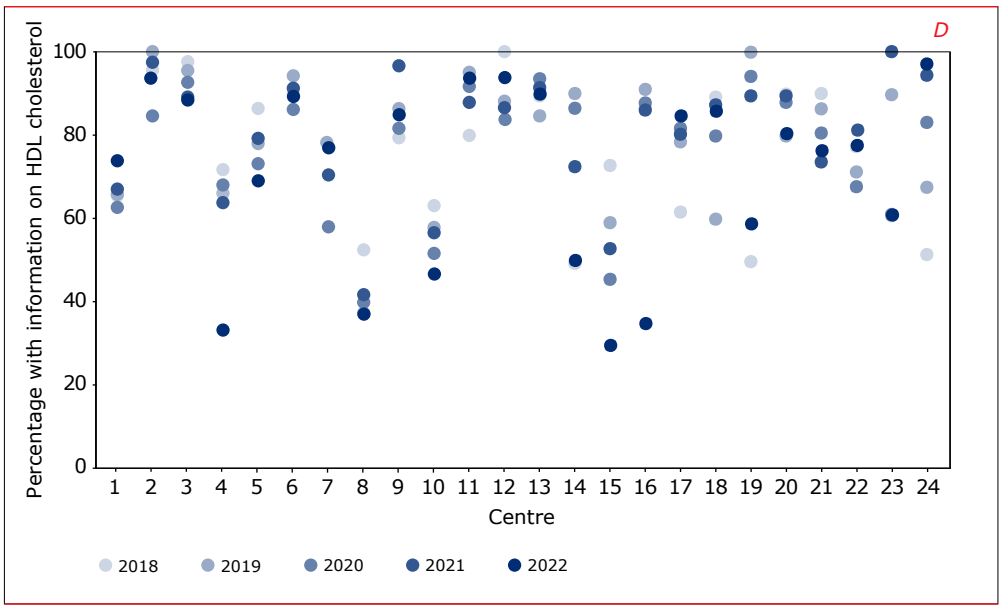
Legend: *Data are provided overall (A) and by age group: 18–39 year olds (B), 40–69 year olds (C) and 70 years old or older (D). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.4: Information on HDL cholesterol; in other words, patients who had an HDL cholesterol measurement during each year between 2018 and 2022.



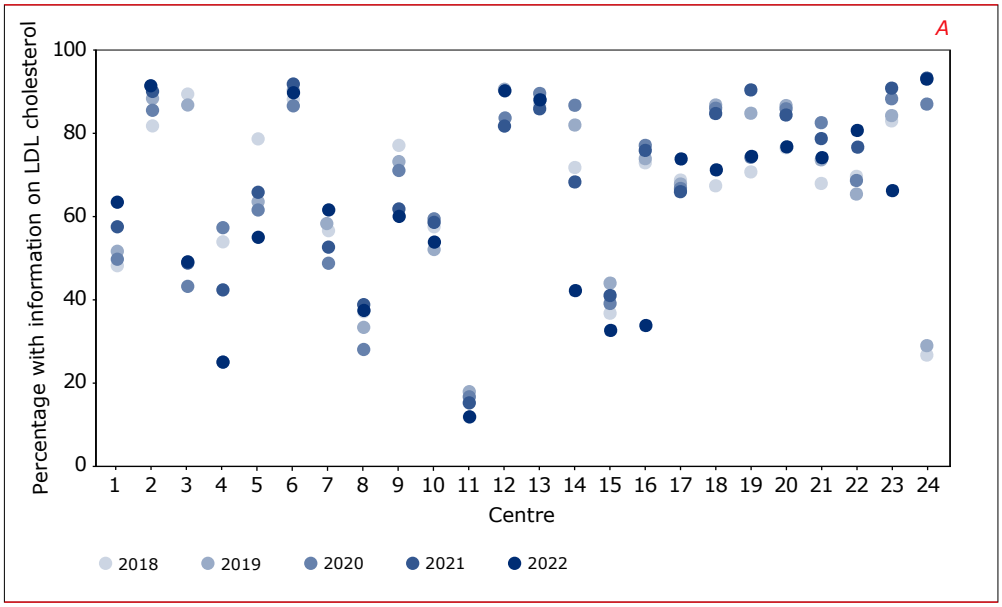


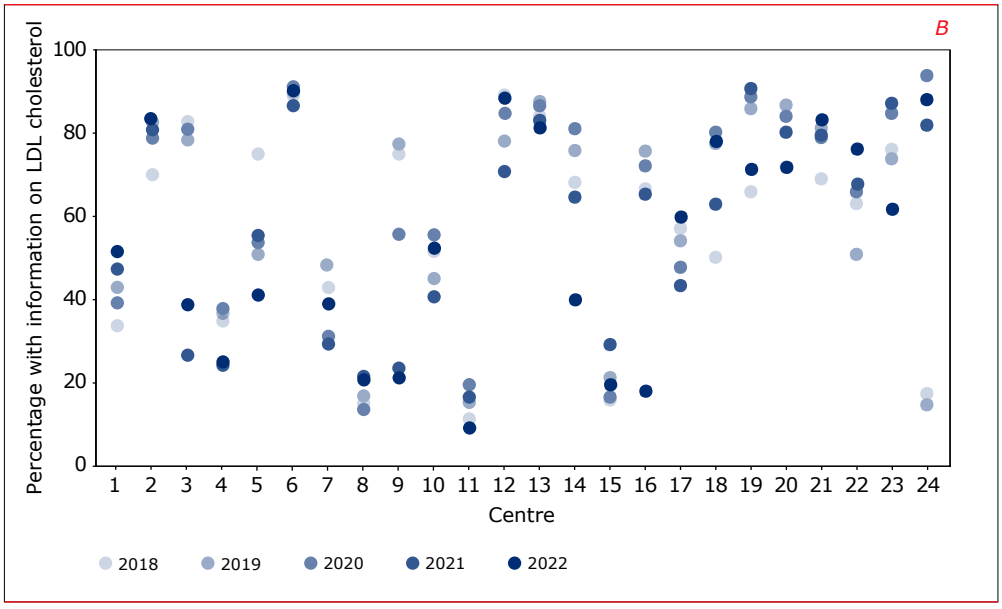


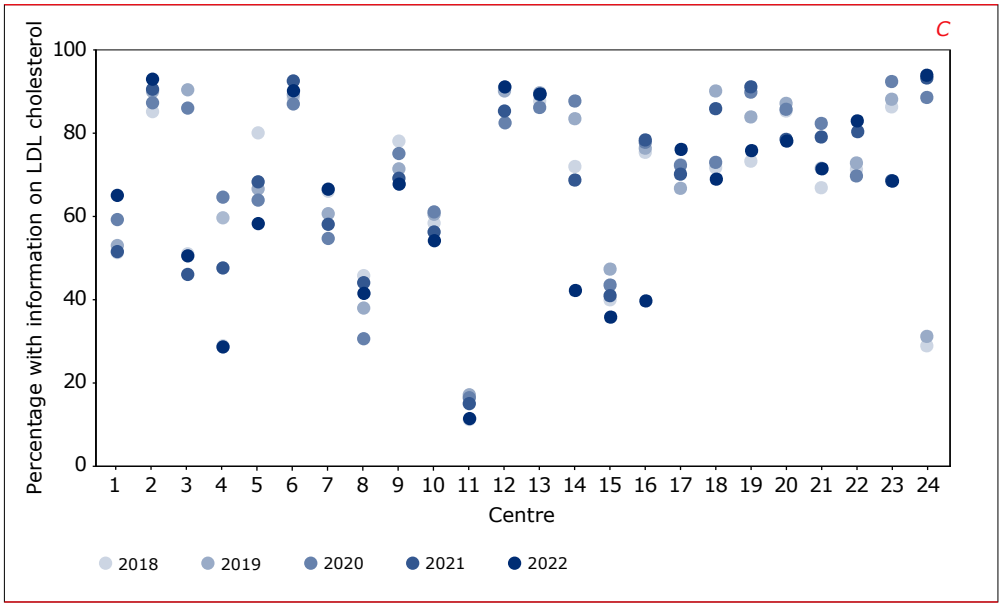


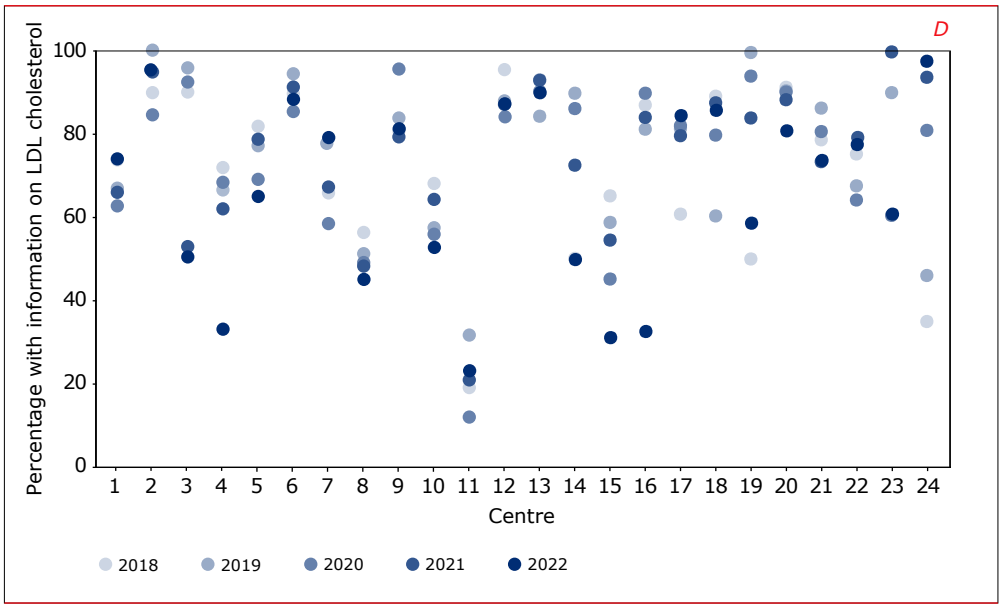
Legend: *Data are provided overall (A) and by age group: 18–39 year olds (B), 40–69 year olds (C) and 70 years old or older (D). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.5: Information on LDL cholesterol; in other words, patients who had an LDL cholesterol measurement during each year between 2018 and 2022.



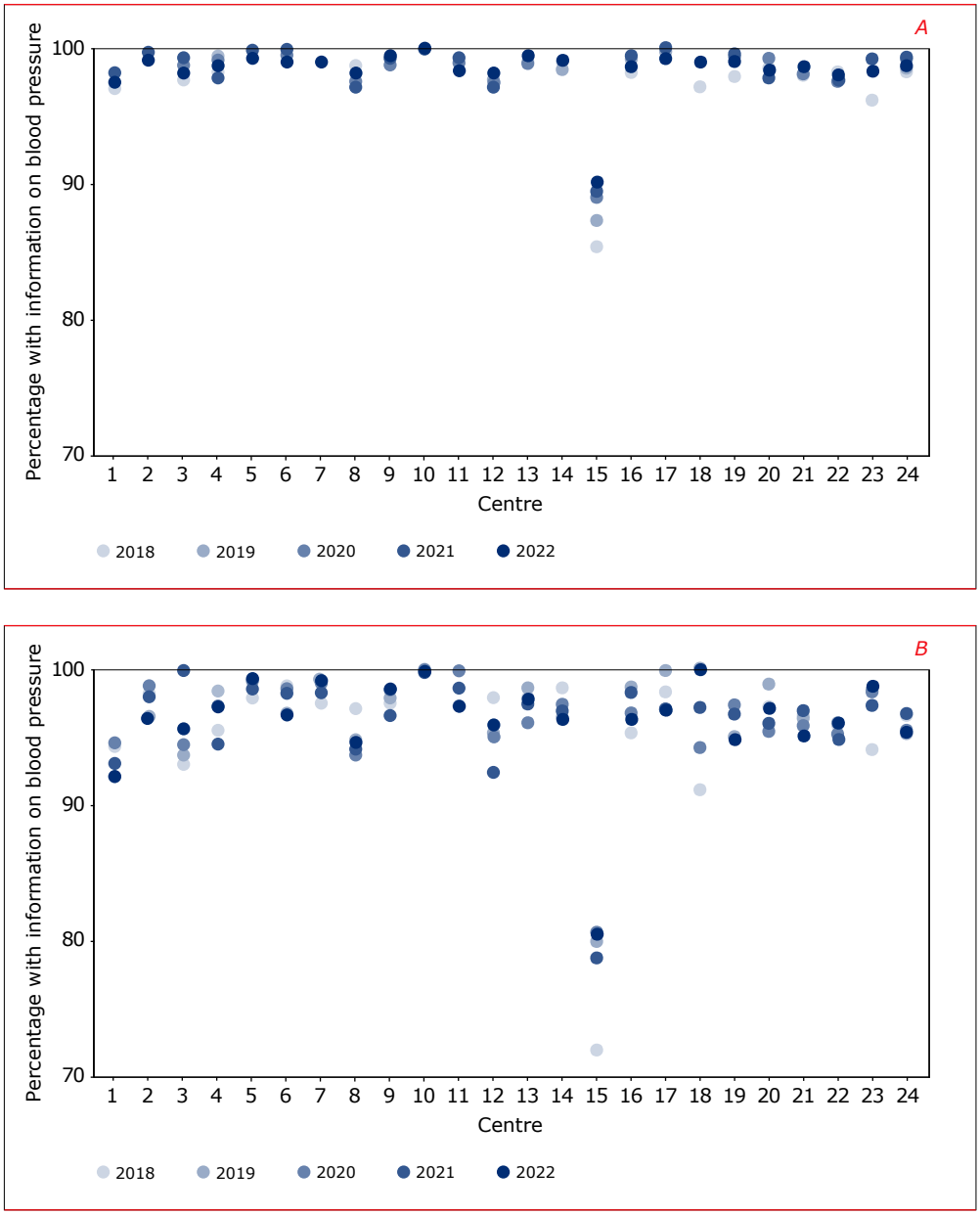


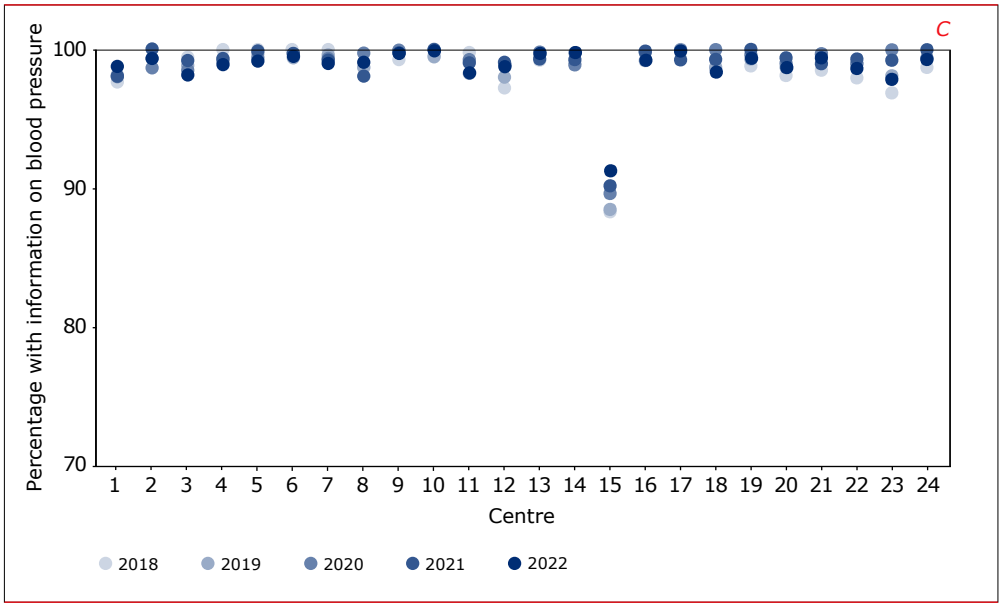


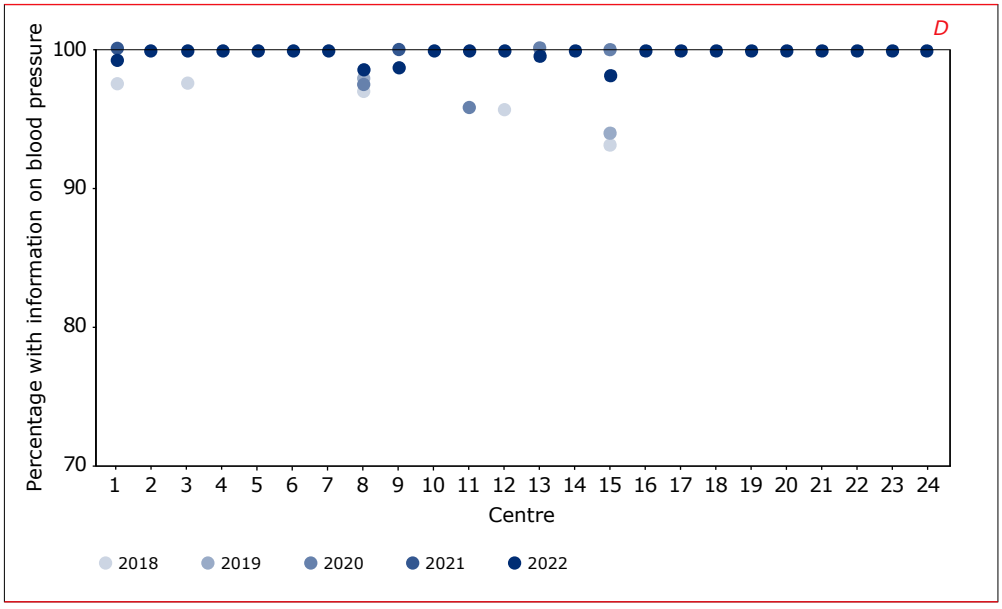


Legend: *Data are provided overall (A) and by age group: 18–39 year olds (B), 40–69 year olds (C) and 70 years old or older (D). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.6: Information on blood pressure; in other words, patients who had a blood pressure measurement during each year between 2018 and 2022.

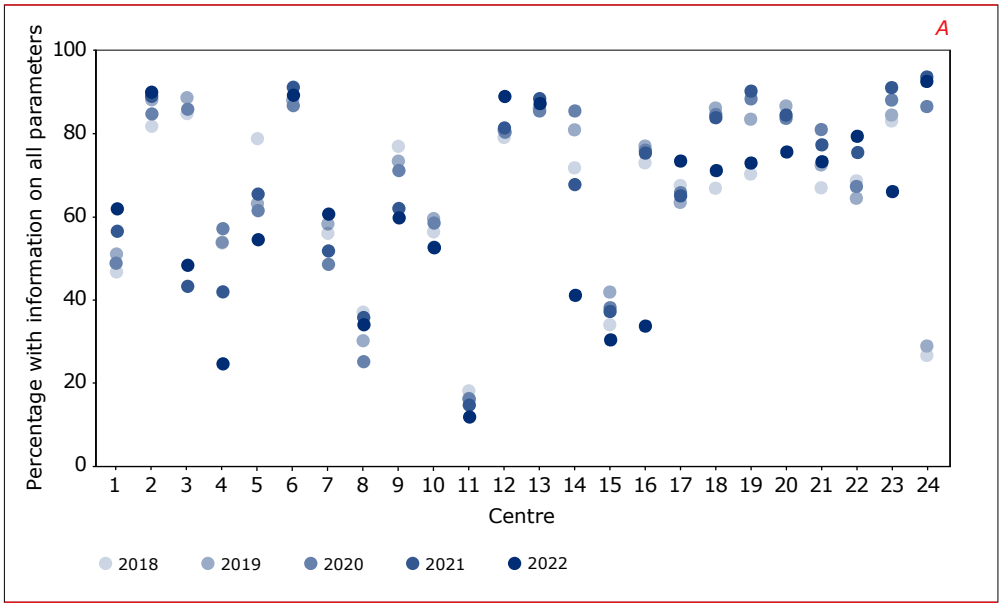


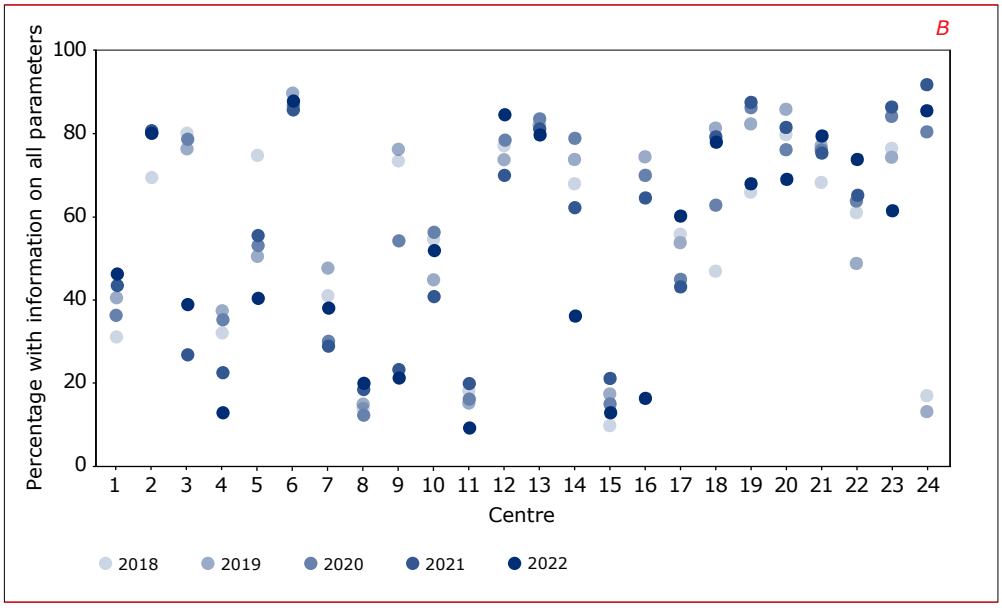


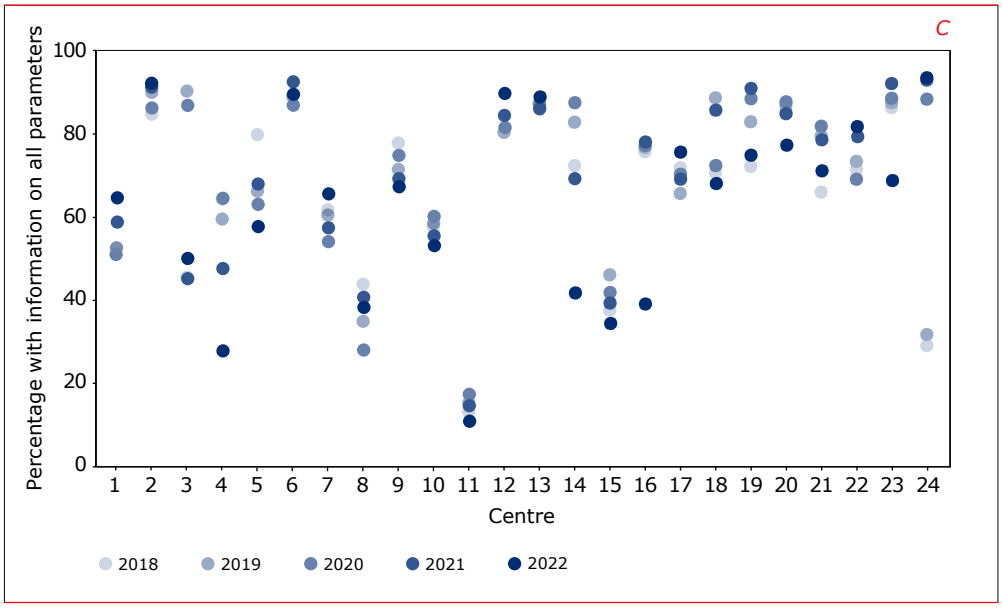


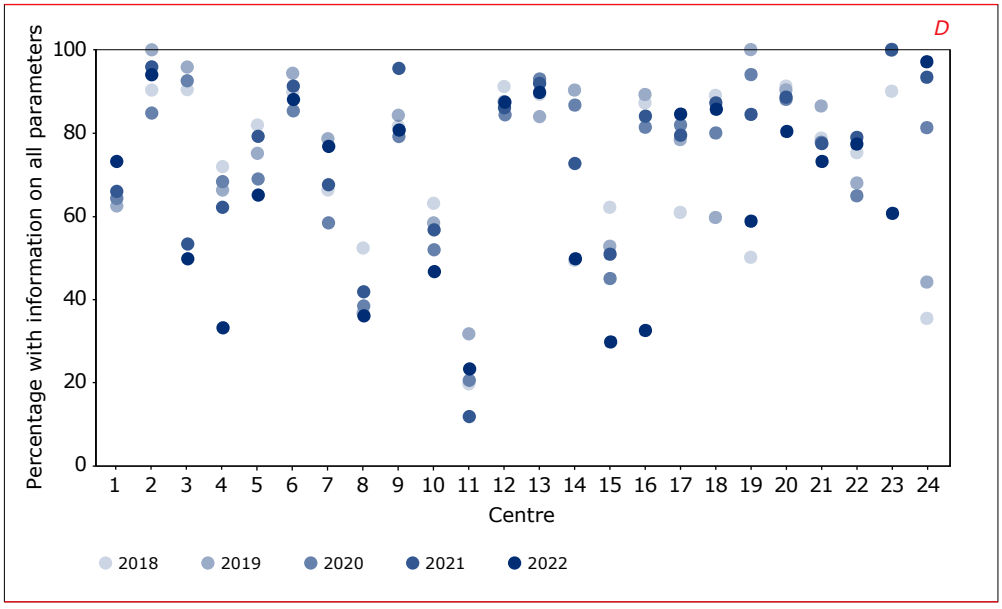
Legend: *Data are provided overall (A) and by age group: 18–39 year olds (B), 40–69 year olds (C) and 70 years old or older (D). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.7: Information on all cardiovascular parameters; in other words, patients who had total, HDL and LDL cholesterol and blood pressure measurement during each year between 2018 and 2022.



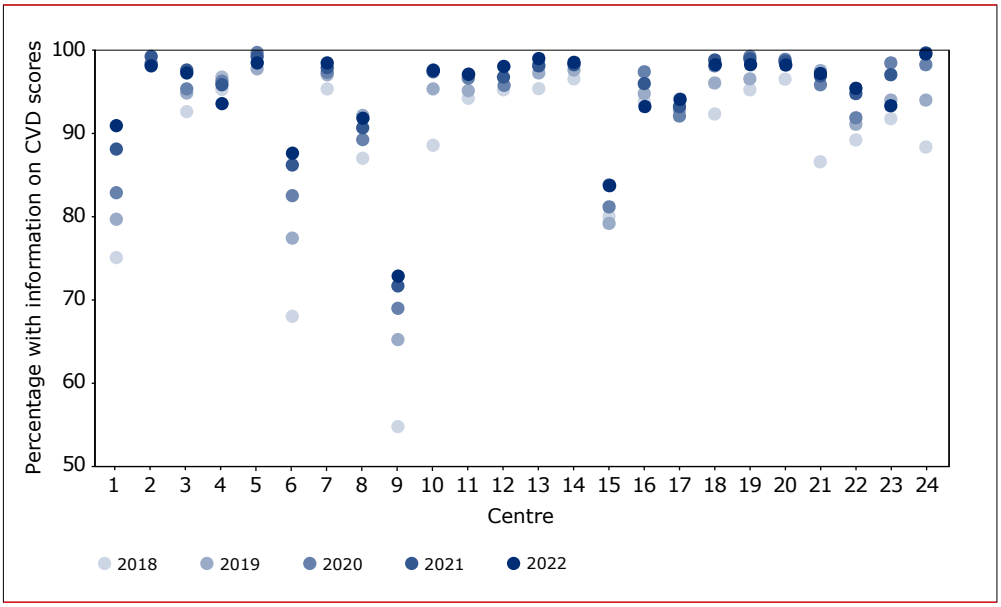






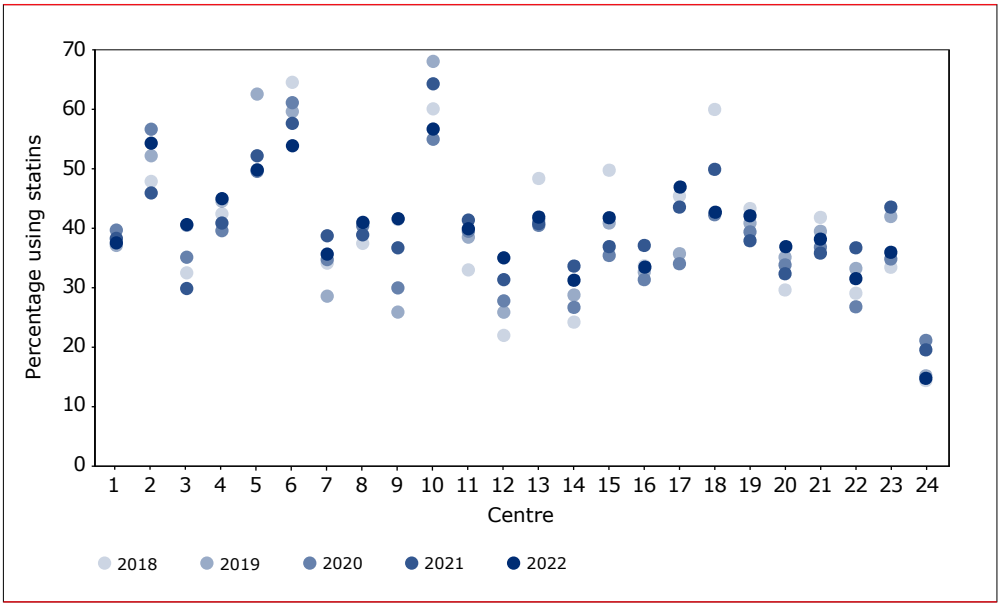
Legend: *Data are provided overall (A) and by age group: 18–39 year olds (B), 40–69 year olds (C) and 70 years old or older (D). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.8: *Information on cardiovascular event risk; in other words, patients who had enough information to have their SCORE2 (40–69 year olds) or SCORE2-OP (70 year olds or older) cardiovascular risk assessment during each year between 2018 and 2022.*



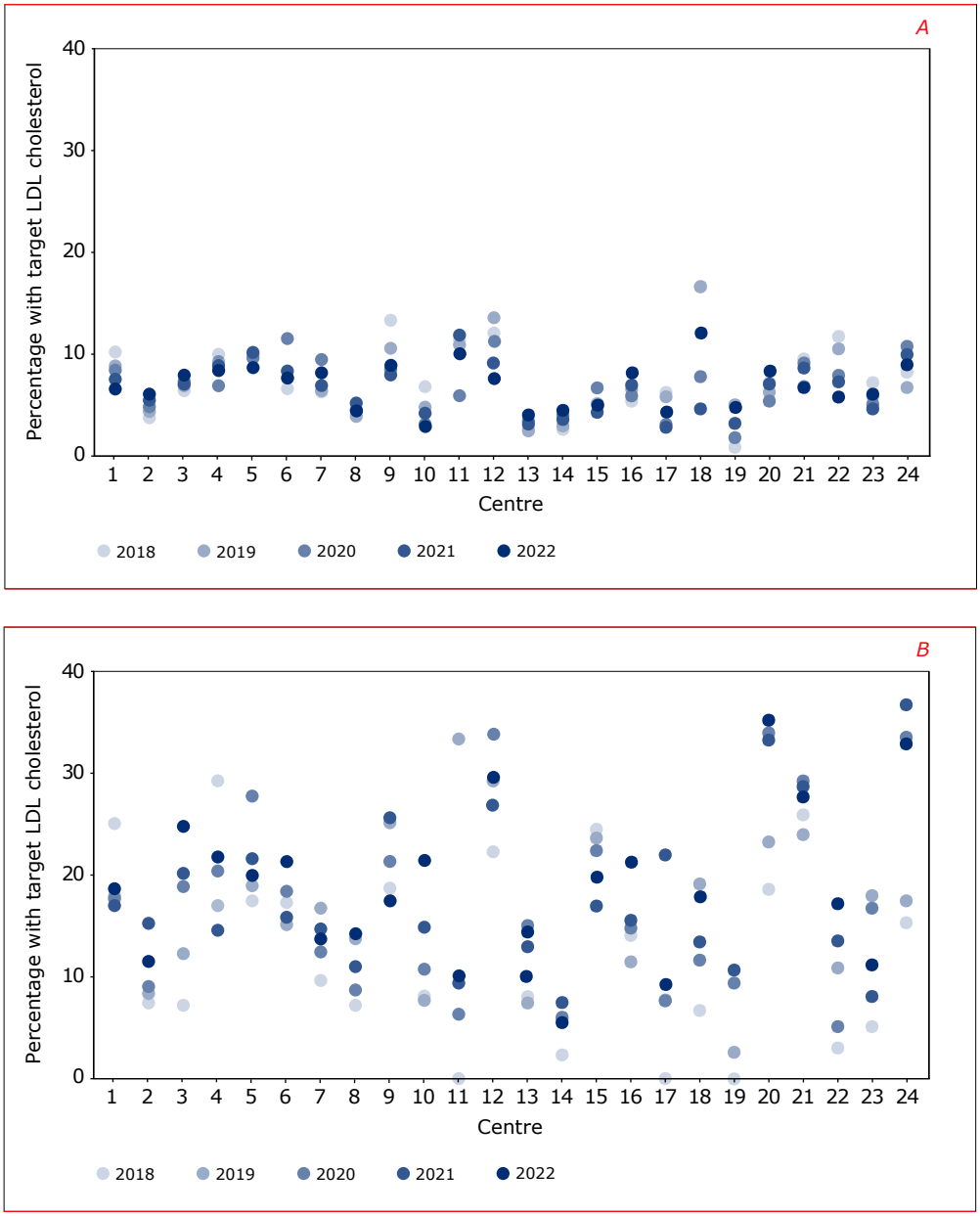
Legend: *Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.9: *Statin use; in other words, patients who had a predicted 10-year cardiovascular event risk-score greater than 10% and received a prescription for statins during each year between 2018 and 2022.*



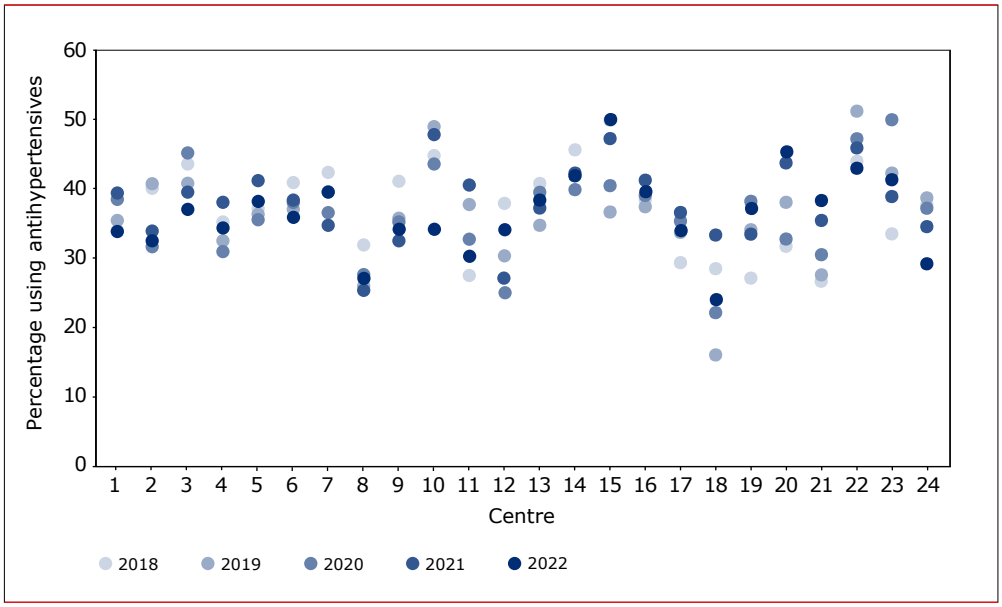
Legend: *Data are provided for those whose predicted 10-year cardiovascular risk were assessed with SCORE2 (for 40-69 year olds) or SCORE2-OP (for 70 year olds or older). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.10: *Target LDL cholesterol; in other words, patients who had a predicted 10-year cardiovascular event risk-score greater than 10% and had an LDL cholesterol level ≤1.8 mmol/mL during each year between 2018 and 2022.*



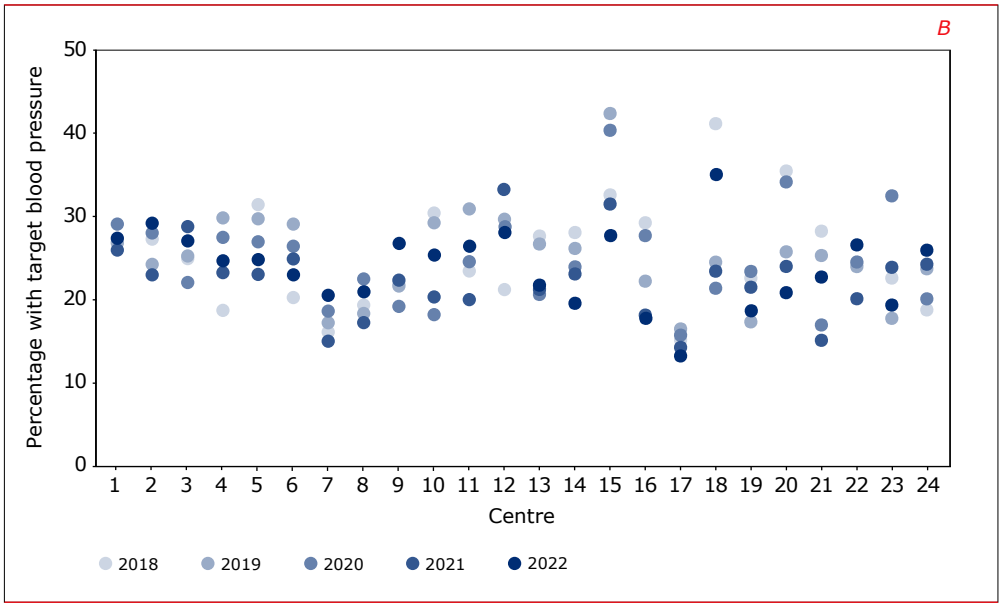
Legend: *Data are separated for those without and with a prescription for statins (A and B, respectively). Data are provided for those whose 10-year cardiovascular risk were assessed with SCORE2 (for 40-69 year olds) or SCORE2-OP (for 70 year olds or older). Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.11: *Antihypertensive medication use; in other words, patients who had high blood pressure and received a prescription for antihypertensive medication during each year between 2018 and 2022.*



Legend: *Data are provided for those who had high blood pressure, defined as ever having a diastolic blood pressure ≥90 mmHg. Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Figure 7.12: *Target blood pressure; in other words, patients who were receiving antihypertensive medication and had a blood pressure below age-specific thresholds during each year between 2018 and 2022*



Legend: *Age-specific thresholds refers to the following: systolic blood pressure <130 mmHg and diastolic blood pressure <80 mmHg (for those 18-64 years old), or a systolic blood pressure <140 mmHg and diastolic blood pressure <80 mmHg (for those 65 years old or older). Data are provided for those on antihypertensive medication. Data points from multiple years can overlap with one another. Centre numbers correspond to those used in Figure 7.1.*

Centre performance

As reported in earlier studies, both the number of patients in care (i.e., the centre 'volume'), and the patient characteristics of a given centre (i.e., the patient 'mix'), may have an impact on the reported indicators[6–9].

Regarding centre volume, a smaller number of patients in an HIV treatment centre can increase the chance that an indicator is more variable. When this occurs, it is difficult to distinguish whether a low-level indicator is the result of performing below expectations or having excessive variation. For this reason, we compare each centre's indicator to the national average and provide statistical guidance as to whether a given centre falls below the national average. This assessment depends on the number of patients included when calculating the indicator (an overview of this method is provided in *Box 7.2*). Statistical interpretation is unreliable when centre sizes are small, hence we do not draw conclusions on whether these particular centres fall below the national average.

Regarding patient mix, individual-level factors, such as age and mode of transmission, are known to be associated with several indicators. If performance indicators are different across centres, it could be that the variation in the characteristics of patients attending those centres is driving these differences. We have therefore adjusted all indicators by year of birth and geographical origin/mode of transmission/gender (*Box 7.2*). For this section, we have used all the indicators and populations defined in *Box 7.1*, while accounting for the issues described above. Only indicators from 2022 were considered in this analysis.

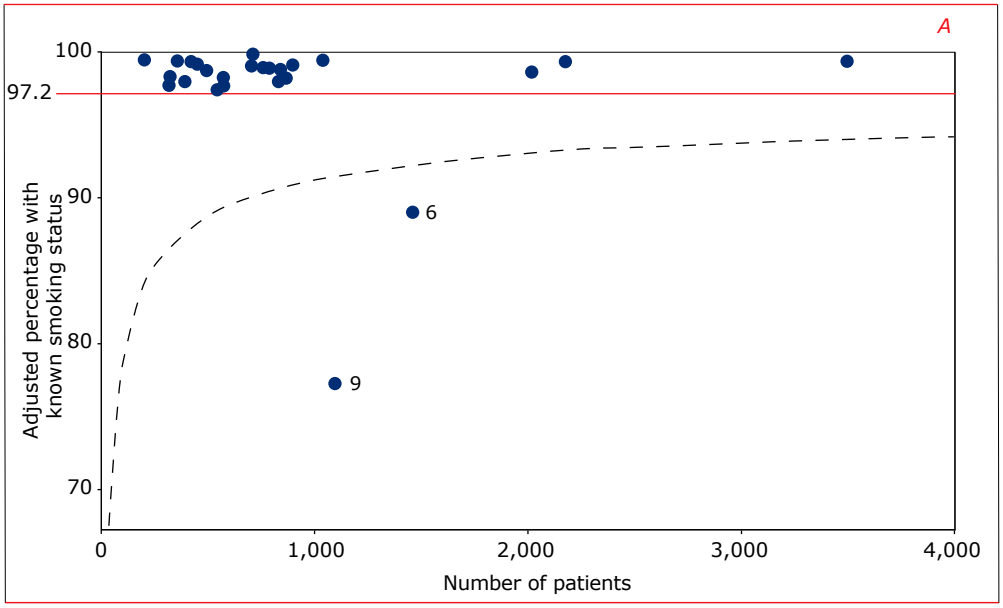
Box 7.2: Funnel plots to compare centres to the national average.

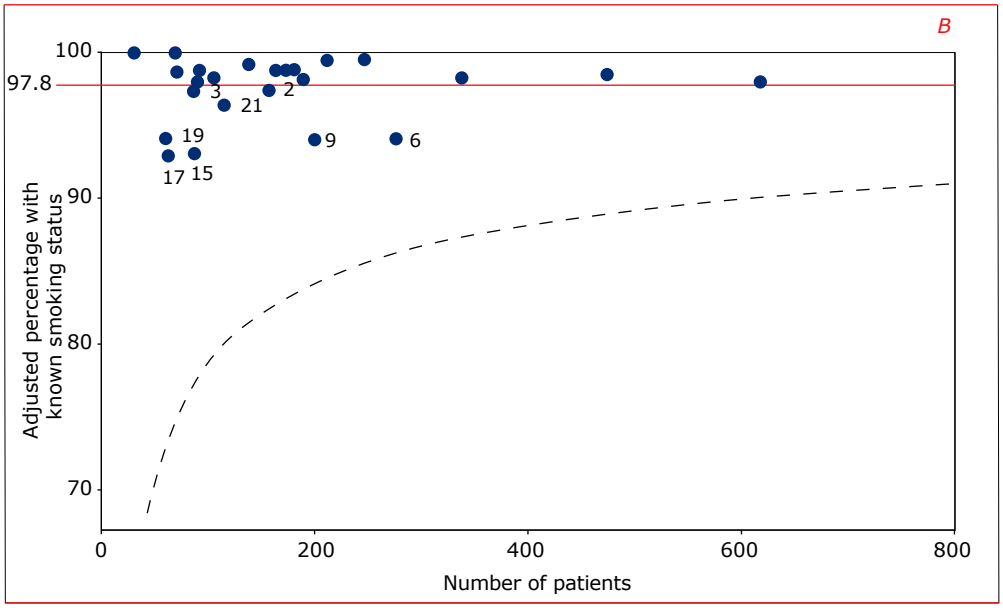
What types of problems occur when evaluating indicators?	
Centres with fewer patients	Centres of a smaller size are expected to have a wider variation in any given indicator. This variation makes it difficult to determine if the indicator is truly higher or lower than expected.
Patient mix	Individual-level factors, such as age and mode of transmission, are known to be associated with several indicators. If performance indicators differ across centres, it could be that the variation in patient characteristics between centres is driving these differences.
How can we account for these problems?	
Evaluating a centre's performance based on its size	We can determine whether the indicator of a centre (as a percentage) is *statistically* different to the national average. This statistical difference is partly determined by the number of individuals used to calculate the indicator.
Adjust for patient mix	We can adjust indicators based on several important features of the centre's patient population, such as year of birth and geographical origin/mode of HIV acquisition/gender (Dutch men who have sex with men [MSM], other than Dutch MSM, Dutch men who exclusively have sex with women [MSW], other than Dutch MSW, Dutch women, and other than Dutch women).

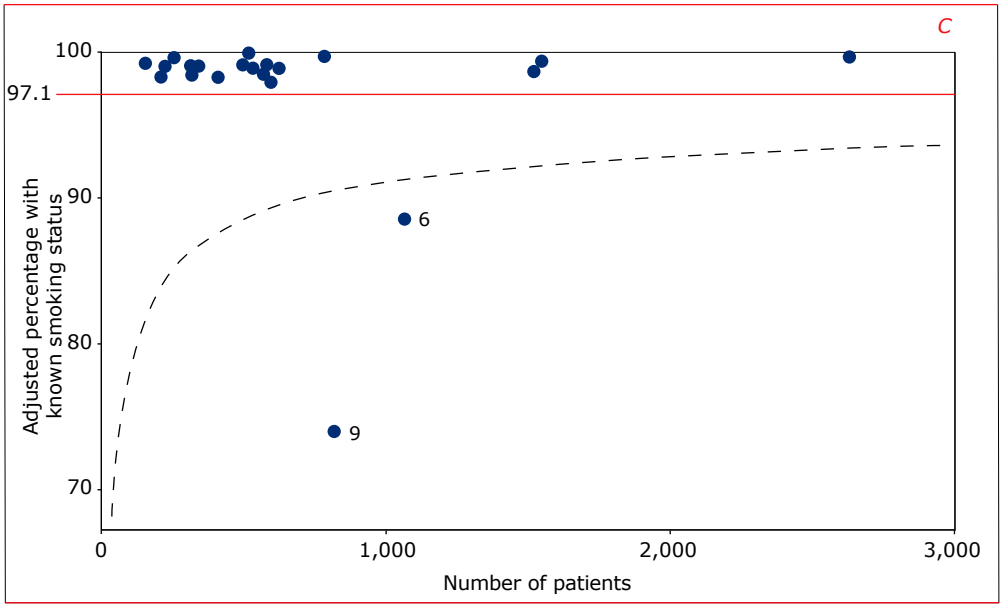
What is a funnel plot?
A funnel plot is a graphical depiction that allows us to compare a centre's indicator to the national average. It can help account for the problems listed above. The following are key components of this plot:

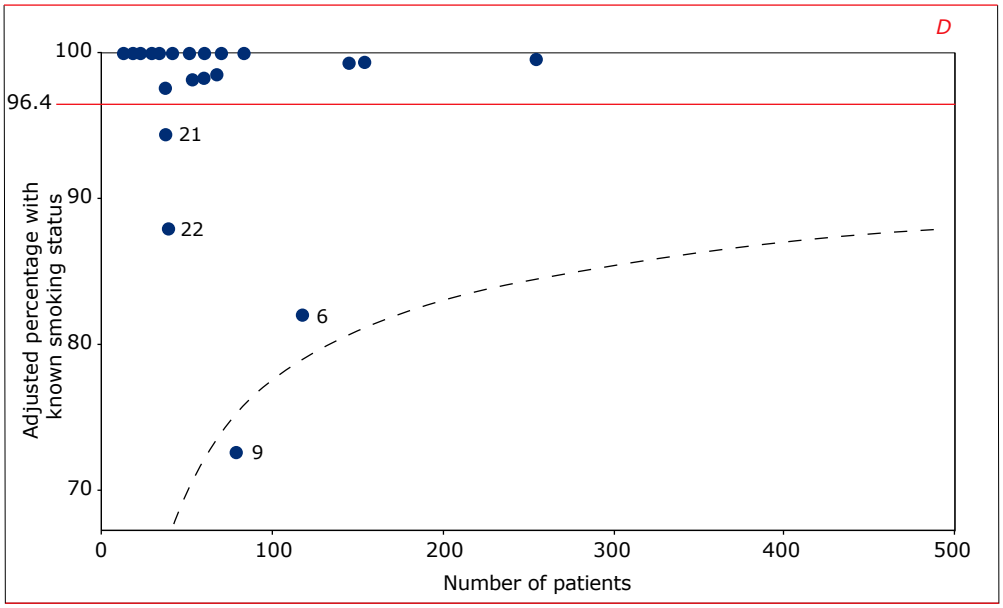
Patient size	The *x*-axis depicts the number of patients considered in a given indicator. For example, this number could be the total number of patients in care in 2022, etc.
Adjusted %	The *y*-axis depicts the percentage of patients who have achieved a given indicator. This indicator is adjusted for patient mix.
Centre's indicator	Dots depict each centre's indicator (adjusted %), which are plotted with respect to the number of patients included in the calculation of the indicator.
Comparison to the national average	A solid line depicts the national average. We can create boundaries that indicate (i) the highest indicator level a centre should achieve based on what we statistically expect from the national average ("upper" boundary), or (ii) the lowest indicator level a centre should achieve based on what we statistically expect from the national average ("lower" boundary). These boundaries make the form of a "funnel". The calculation of these boundaries is based on a statistical difference (±2 standard deviations) from the national average.
How is a funnel plot interpreted?	
When is an indicator lower than the national average?	If the centre's indicator falls below the "lower" boundary, then the centre has a lower-than-expected indicator compared to the national average.
When is an indicator higher than the national average?	This question will not be answered in this shm report. The indicators will be high (ranging from 80-100%), making the "upper" boundary difficult to interpret. We will only provide the "lower" boundary.

Figure 7.13: Known smoking status; in other words, patients who ever had information on their smoking status in 2022. The percentage with information on smoking has been adjusted for patient mix and is plotted as a function of the number of patients in care.



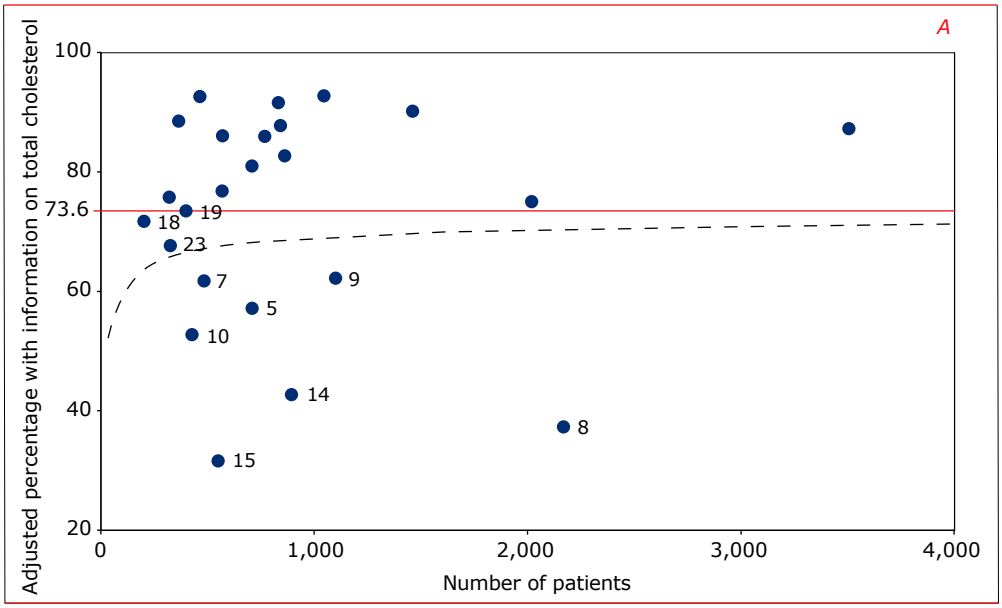


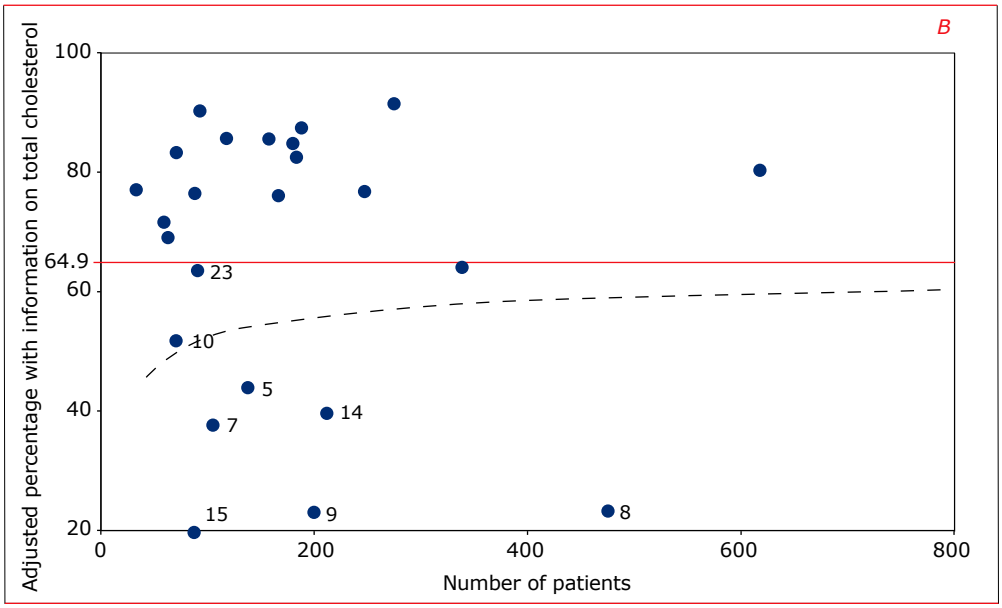


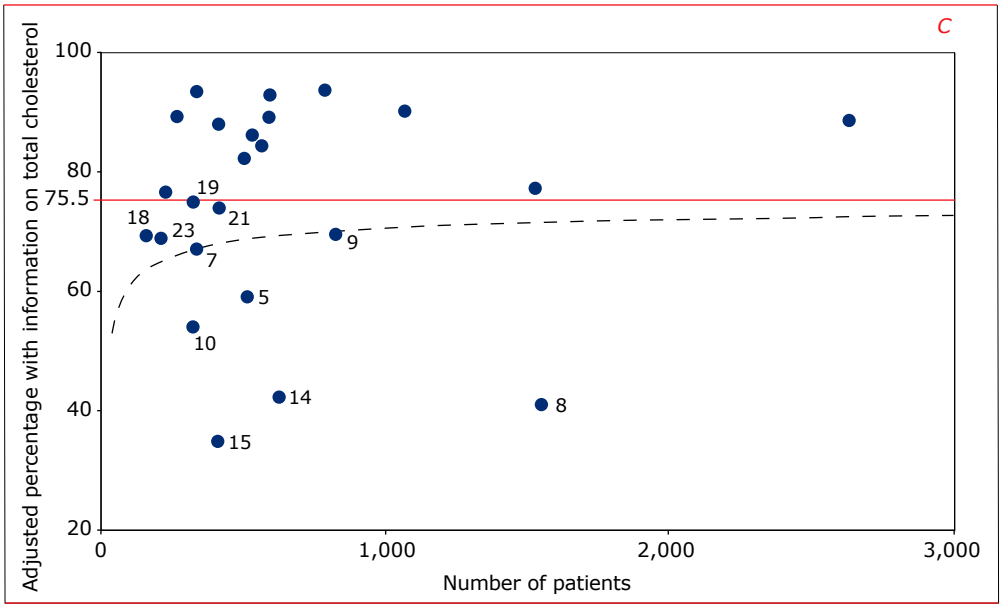


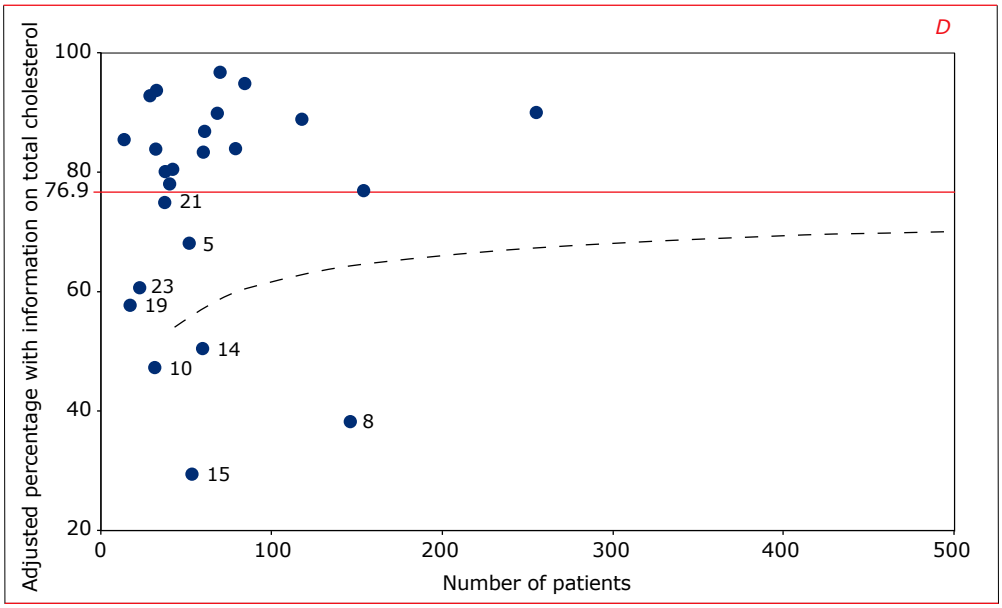
Legend: *Data are provided overall (A) and by age group: 18-39 year olds (B), 40-69 year olds (C) and 70 years old or older (D). Data points with centre numbers below the national average are labelled. Centre numbers correspond to those used in Figure 7.1. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.14: Information on total cholesterol; in other words, patients who had a total cholesterol measurement in 2022. The percentage with information on total cholesterol has been adjusted for patient mix and is plotted as a function of the number of patients in care.



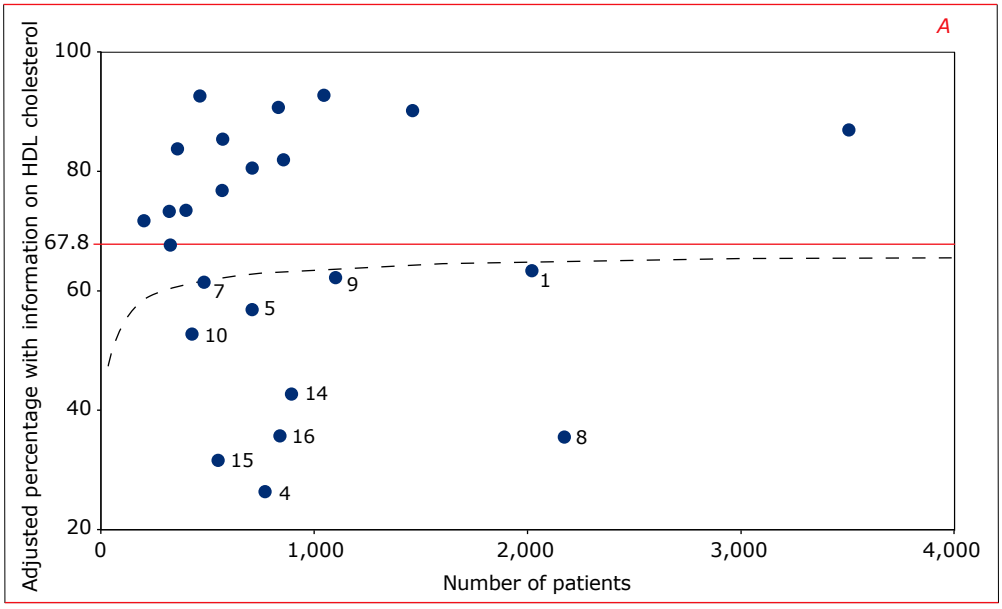


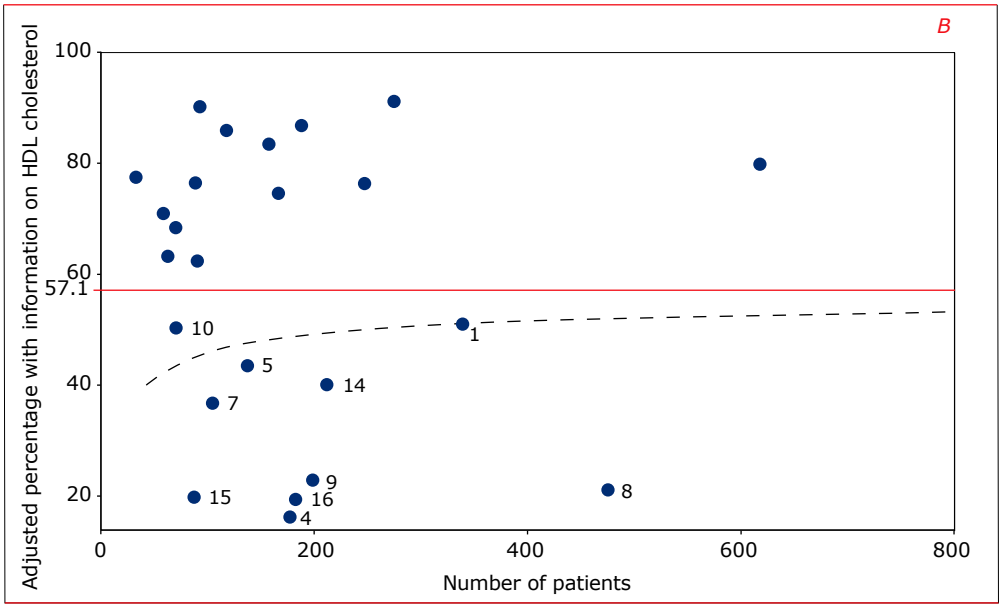


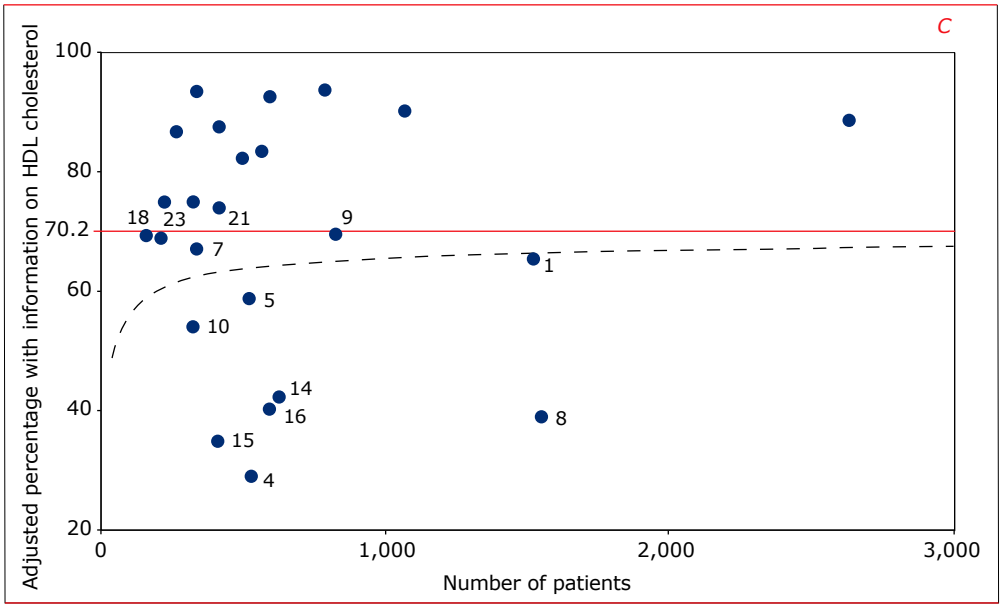


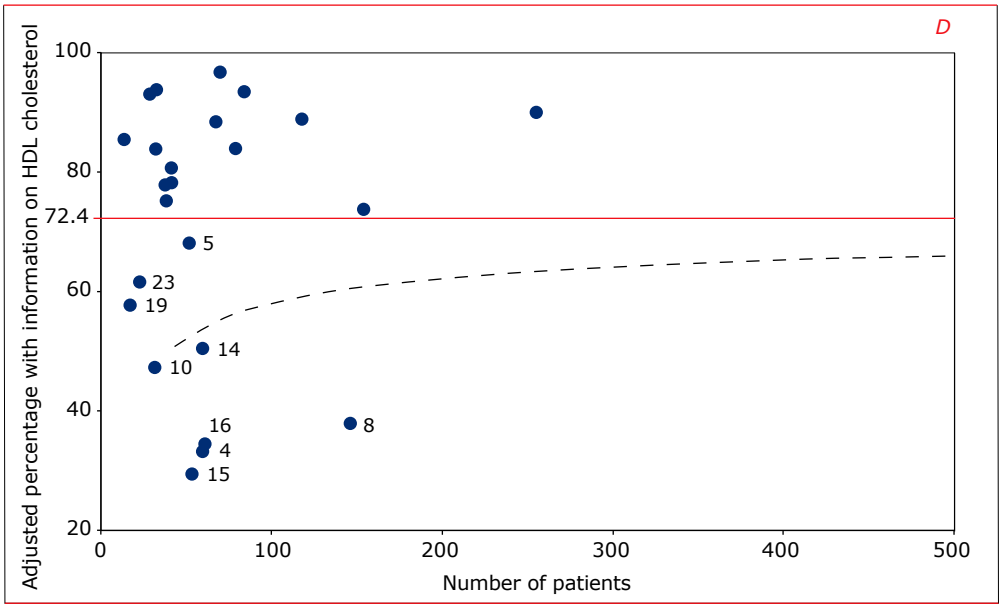
Legend: *Data are provided overall (A) and by age group: 18-39 year olds (B), 40-69 year olds (C) and 70 years old or older (D). Data points with centre numbers below the national average are labelled. Centre numbers correspond to those used in Figure 7.1. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.15: Information on HDL cholesterol; in other words, patients who had an HDL cholesterol measurement in 2022. The percentage with information on HDL cholesterol has been adjusted for patient mix and is plotted as a function of the number of patients in care.



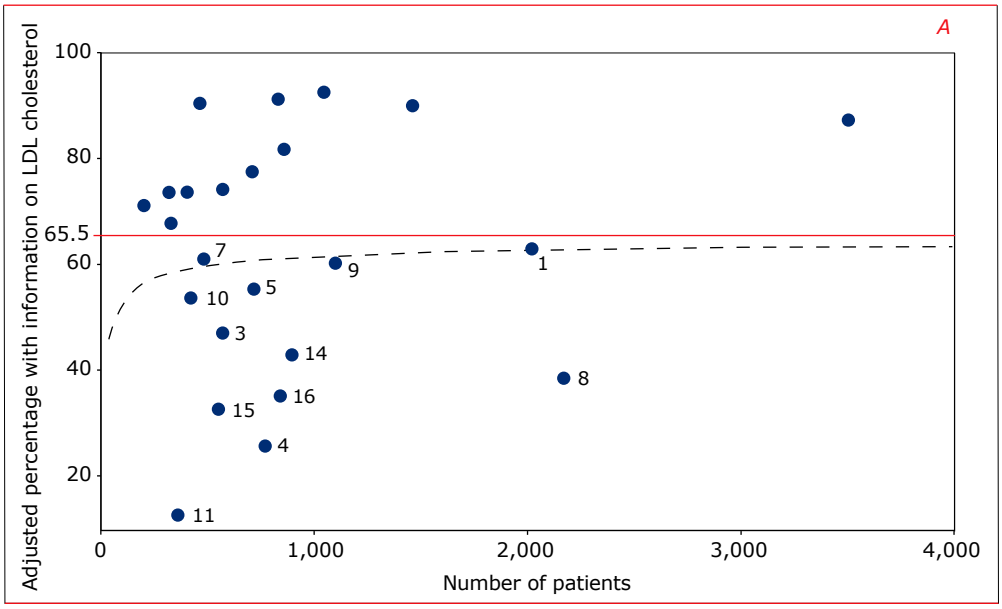


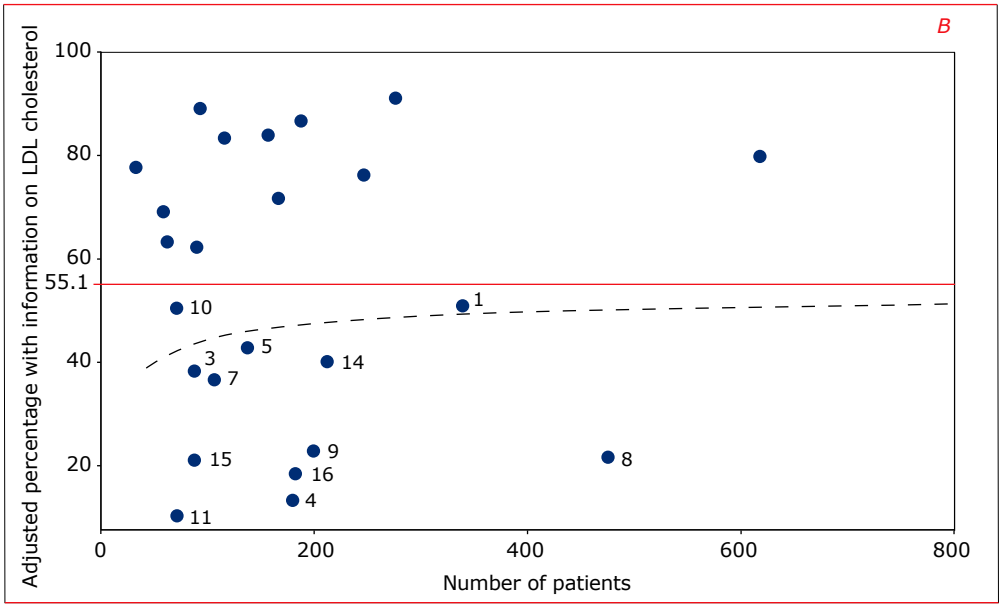


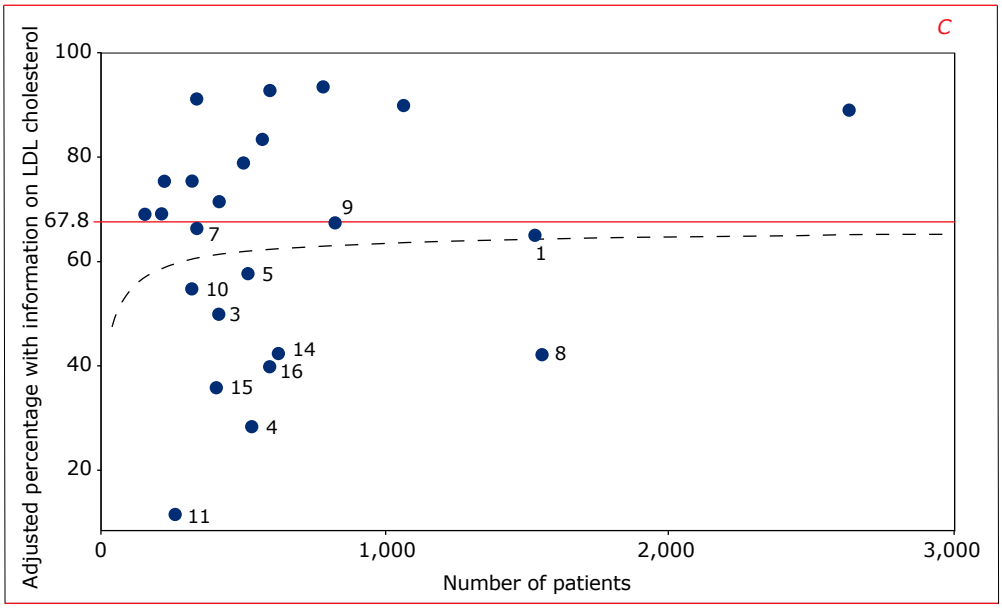


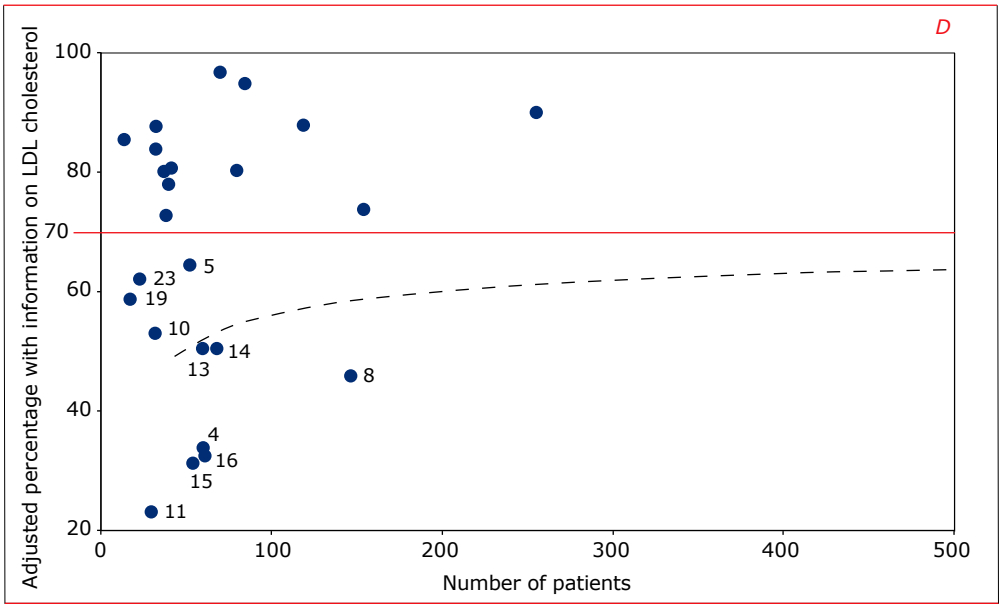
Legend: *Data are provided overall (A) and by age group: 18-39 year olds (B), 40-69 year olds (C) and 70 years old or older (D). Data points with centre numbers below the national average are labelled. Centre numbers correspond to those used in Figure 7.1. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.16: Information on LDL cholesterol; in other words, patients who had an LDL cholesterol measurement in 2022. The percentage with information on LDL cholesterol has been adjusted for patient mix and is plotted as a function of the number of patients in care.



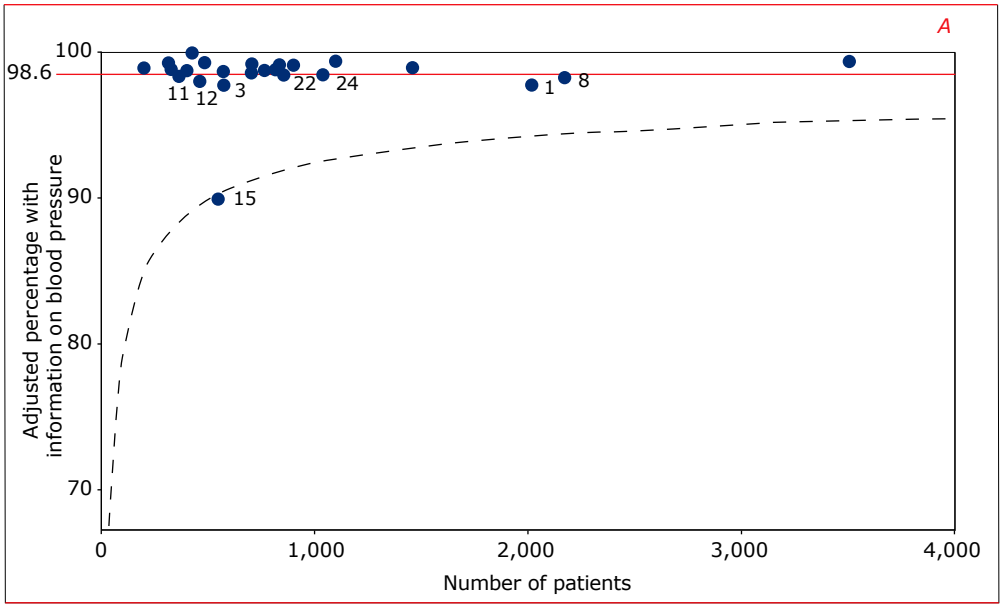


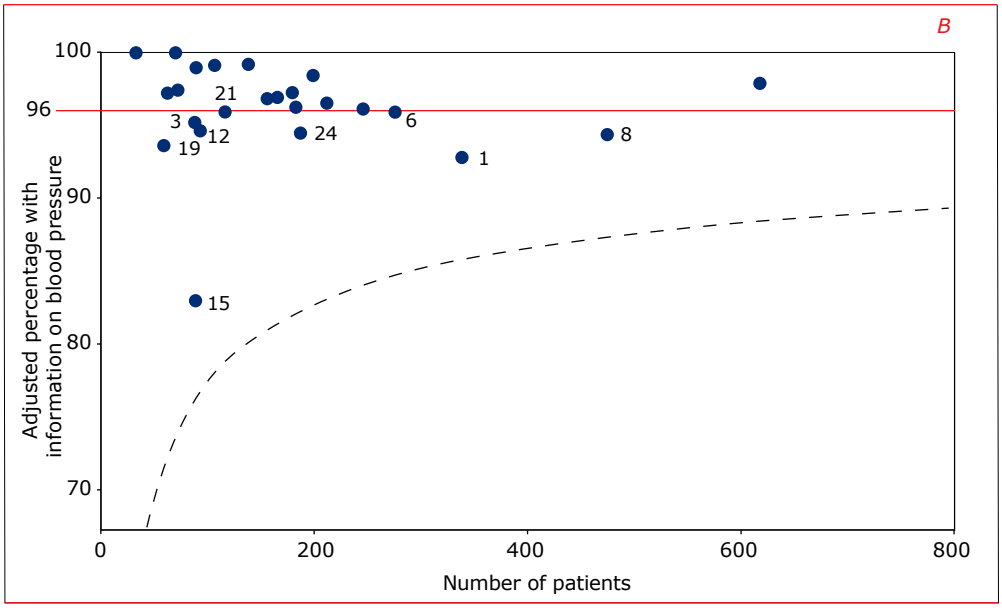


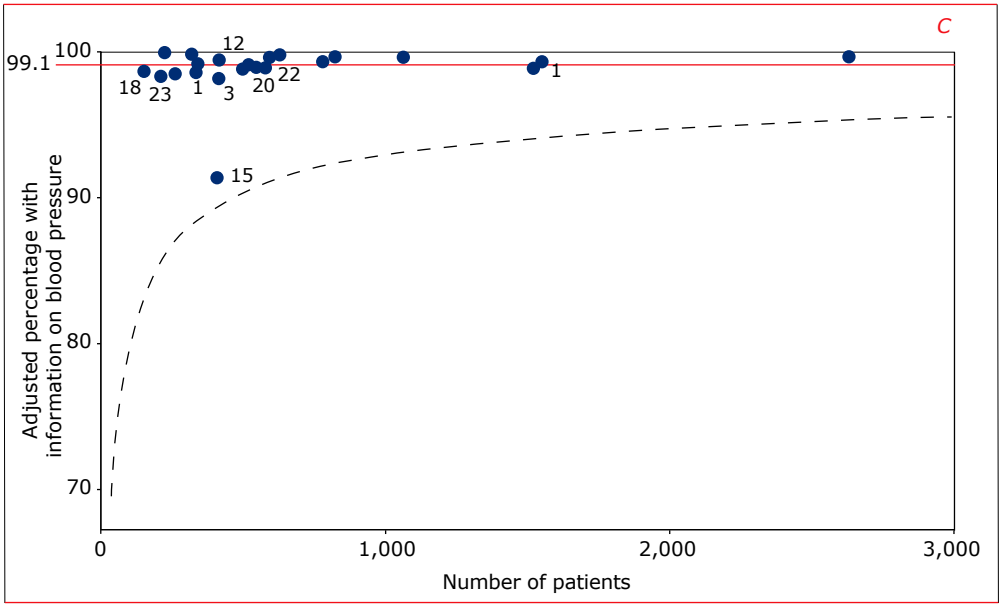


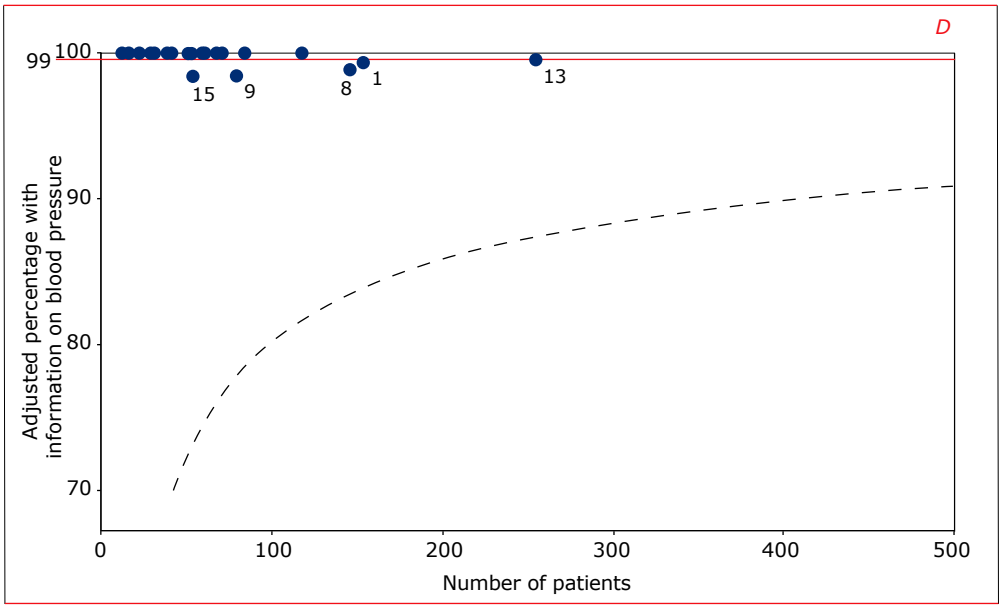
Legend: *Data are provided overall (A) and by age group: 18-39 year olds (B), 40-69 year olds (C) and 70 years old or older (D). Data points with centre numbers below the national average are labelled. Centre numbers correspond to those used in Figure 7.1. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.17: Information on blood pressure; in other words, patients who had a blood pressure measurement in 2022. The percentage with information on blood pressure has been adjusted for patient mix and is plotted as a function of the number of patients in care.



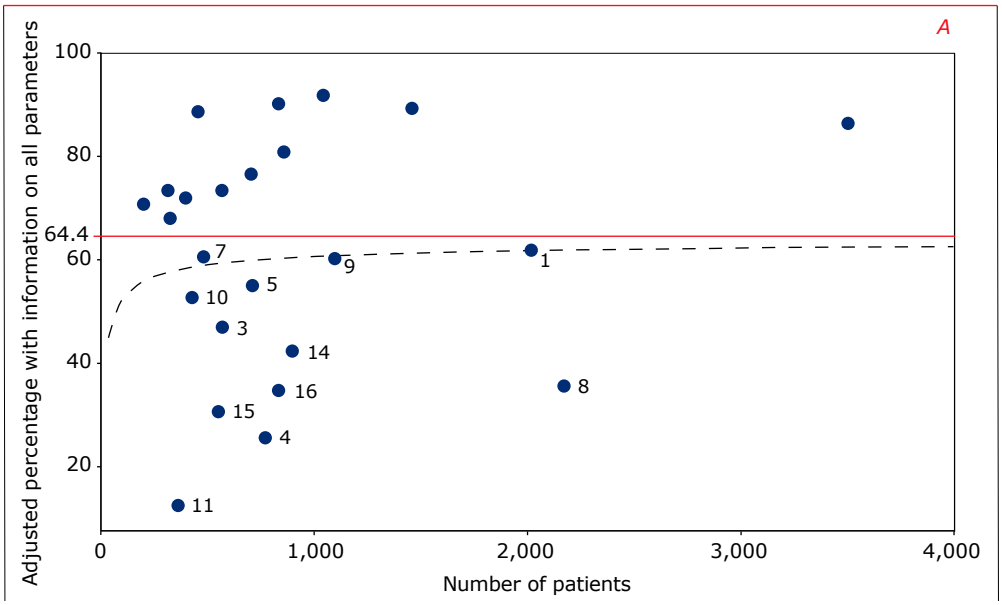


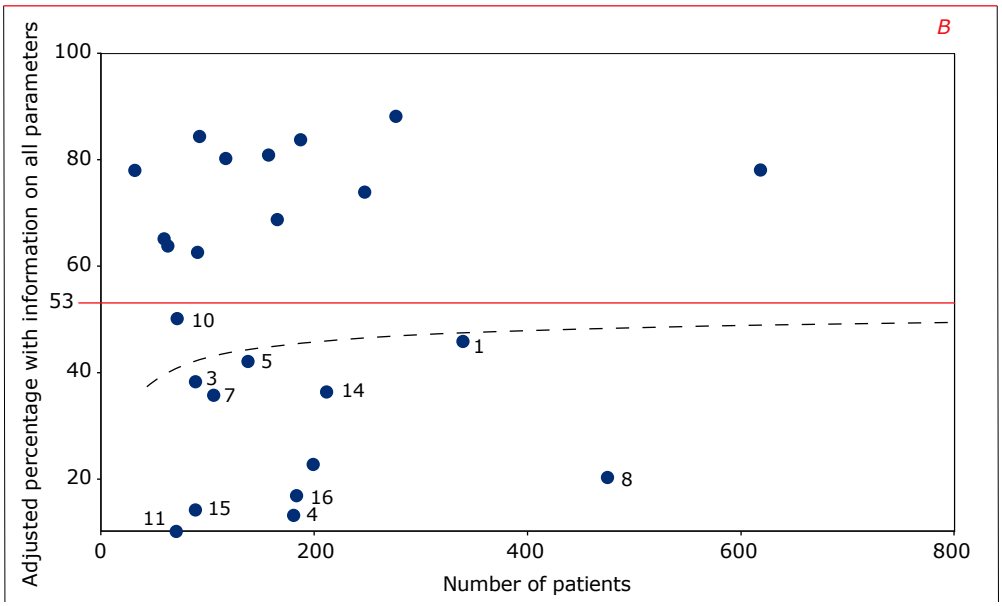


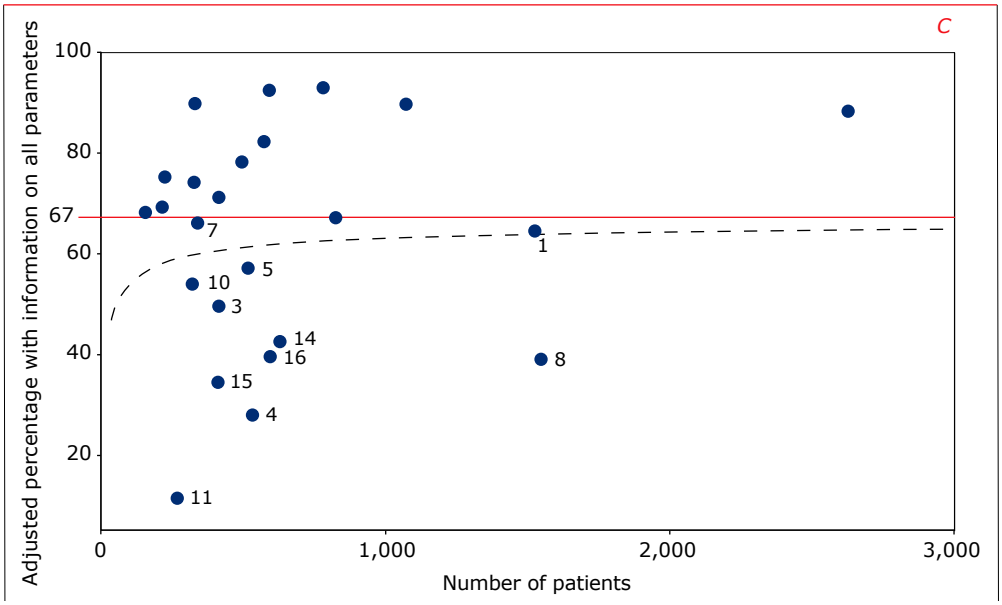


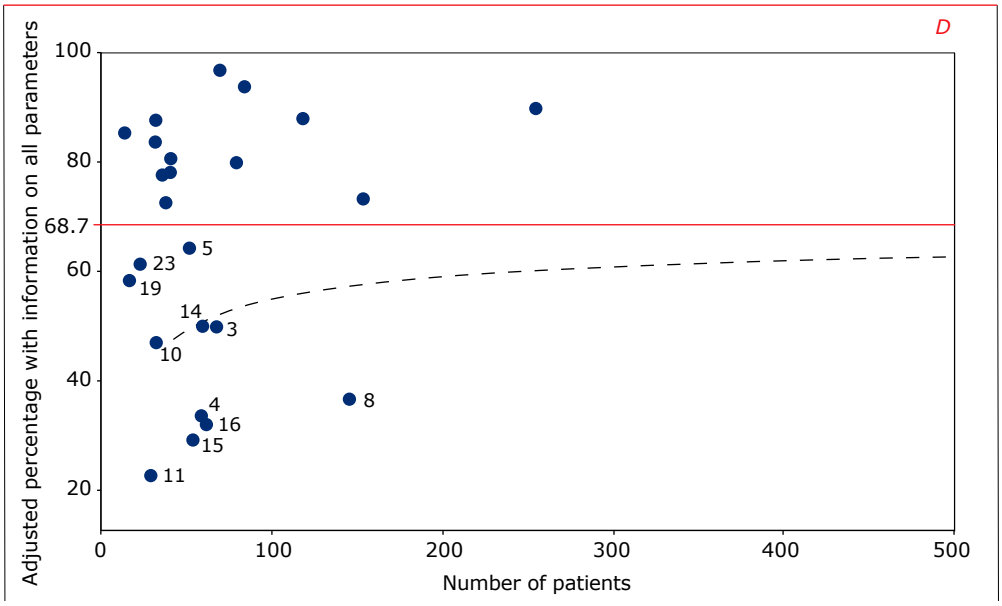
Legend: *Data are provided overall (A) and by age group: 18-39 year olds (B), 40-69 year olds (C) and 70 years old or older (D). Data points with centre numbers below the national average are labelled. Centre numbers correspond to those used in Figure 7.1. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.18: Information on all cardiovascular parameters; in other words, patients who had total, HDL and LDL cholesterol and blood pressure measurement in 2022. The percentage with information on all cardiovascular parameters has been adjusted for patient mix and is plotted as a function of the number of patients in care.



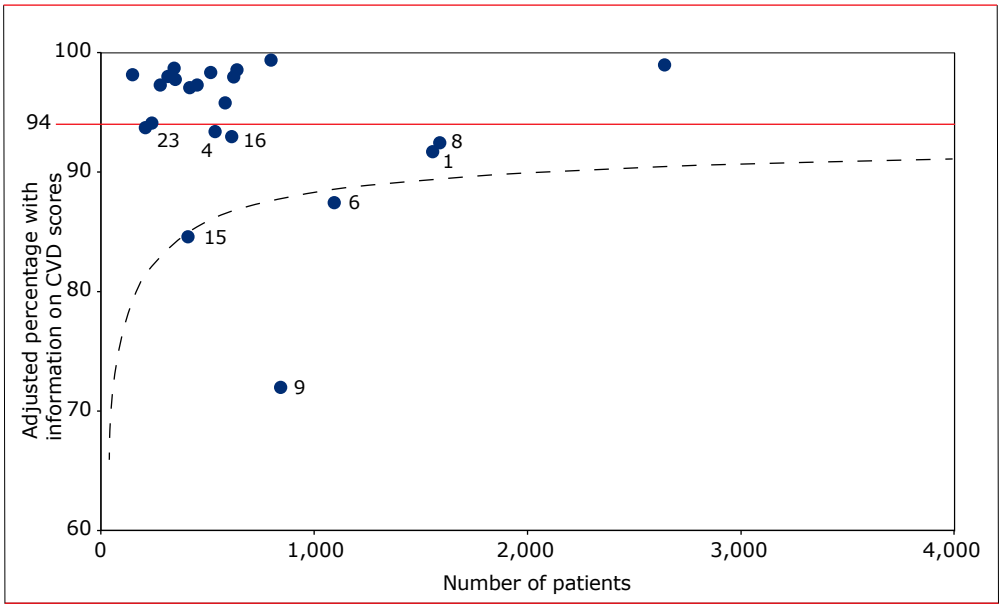






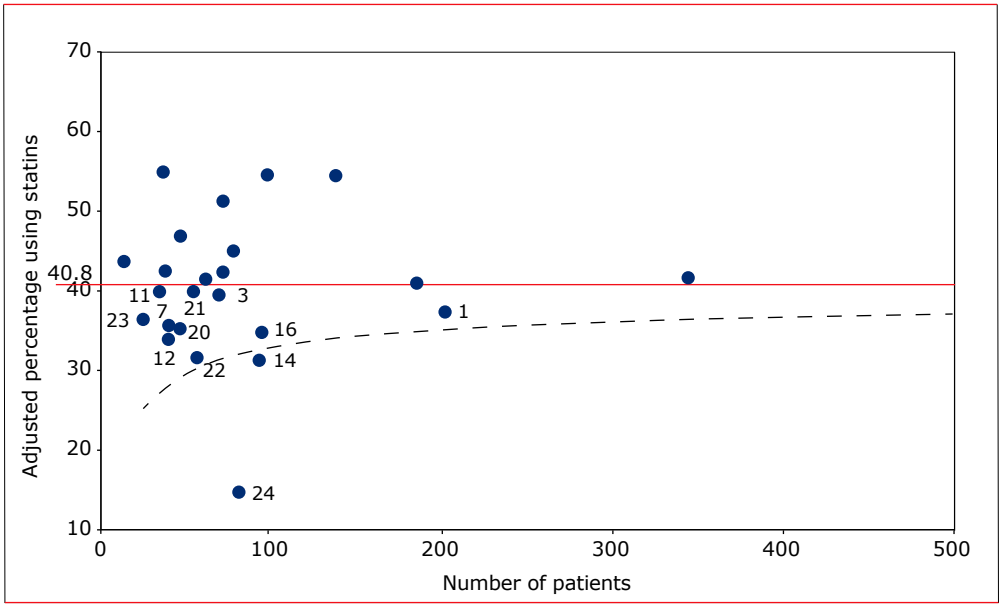
Legend: *Data are provided overall (A) and by age group: 18-39 year olds (B), 40-69 year olds (C) and 70 years old or older (D). Data points with centre numbers below the national average are labelled. Centre numbers correspond to those used in Figure 7.1. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.19: *Information on cardiovascular event risk; in other words, patients who had enough information to have their SCORE2 (40–69 year olds) or SCORE2-OP (70 year olds or older) cardiovascular risk assessment in 2022. The percentage with information on cardiovascular event risk assessment has been adjusted for patient mix and is plotted as a function of the number of patients in care.*



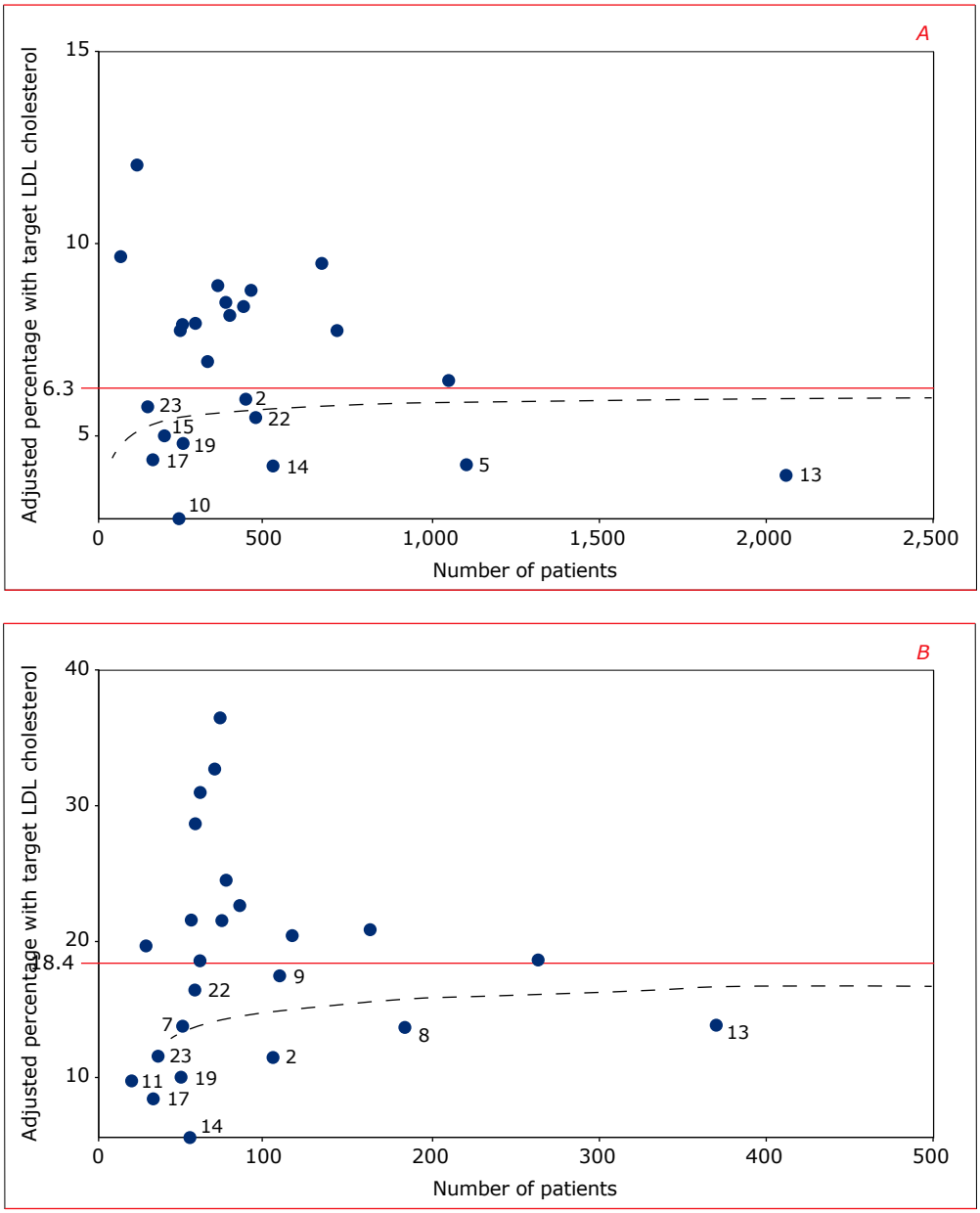
Legend: *Data points with centre numbers below the national average are labelled. Centre numbers correspond to those used in Figure 7.1. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.20: *Statin use; in other words, patients who had a predicted 10-year cardiovascular event risk-score greater than 10% and received a prescription for statins in 2022. The percentage with statin use has been adjusted for patient mix and is plotted as a function of the number of patients in care.*



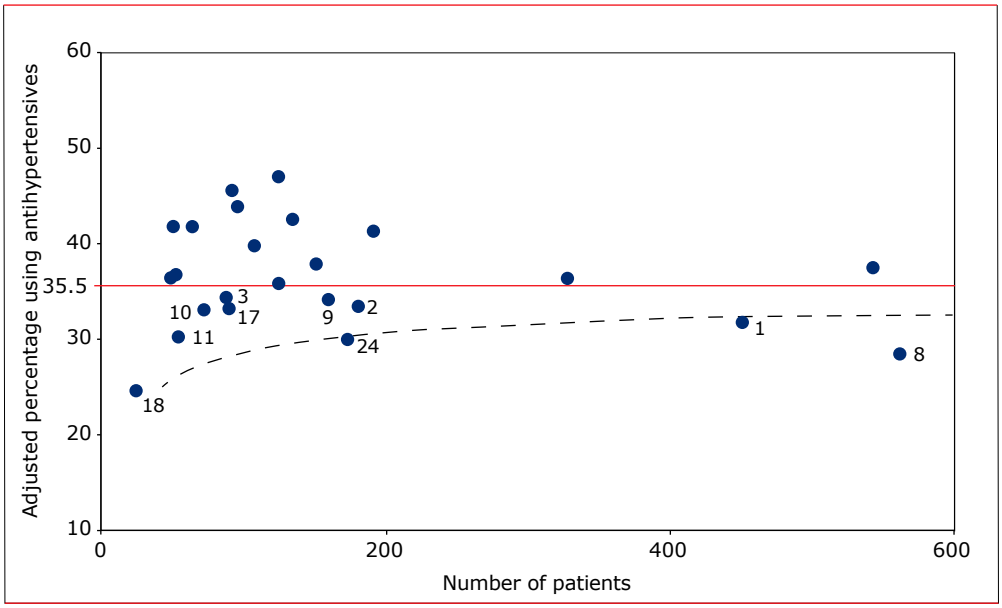
Legend: *Data are provided for those whose cardiovascular risk were assessed with SCORE2 (for 40-69 year olds) or SCORE2-OP (for 70 year olds or older). The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.21: *Target LDL cholesterol; in other words, patients who had a predicted 10-year cardiovascular event risk-score greater than 10% and had an LDL cholesterol level ≤1.8 mmol/mL in 2022. The percentage with target HDL cholesterol has been adjusted for patient mix and is plotted as a function of the number of patients in care.*



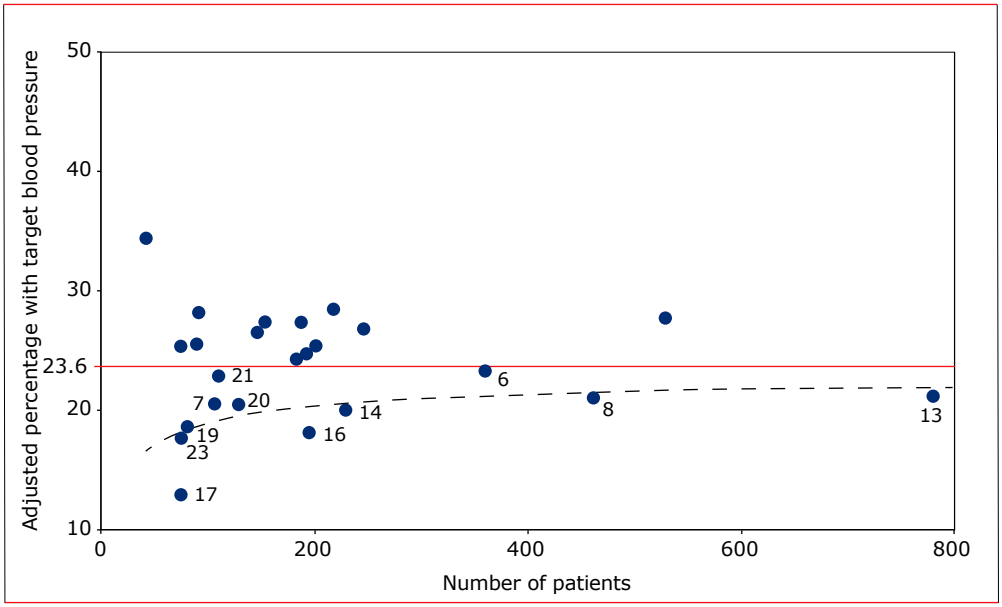
Legend: *Data are separated for those without and with a prescription for statins (A and B, respectively). Data are provided for those whose cardiovascular risk were assessed with SCORE2 (for 40-69 year olds) or SCORE2-OP (for 70 year olds or older). The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.22: *Antihypertensive medication use; in other words, patients who had high blood pressure and received a prescription for antihypertensive medication in 2022. The percentage with antihypertensive medication use has been adjusted for patient mix and is plotted as a function of the number of patients in care.*



Legend: *Data are provided for those who had high blood pressure, defined as ever having a diastolic blood pressure ≥90 mmHg. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Figure 7.23: *Target blood pressure; in other words, patients who were receiving antihypertensive medication and had a blood pressure below age-specific thresholds in 2022. The percentage with target blood pressure has been adjusted for patient mix and is plotted as a function of the number of patients in care.*



Legend: *Age-specific thresholds refers to the following: systolic blood pressure <130 mmHg and diastolic blood pressure <80 mmHg (for those 18-64 years old), or a systolic blood pressure <140 mmHg and diastolic blood pressure <80 mmHg (for those 65 years old or older). Data are provided for those on antihypertensive medication. The "lower" boundary of expected percentage (as compared to the national average) is indicated with a dashed line (Box 7.2).*

Key findings and conclusions

The most important findings of this comparison of cardiovascular disease indicators between HIV treatment centres in the Netherlands are as follows:

- Most centres had information on smoking status and blood pressure both overall and in older age groups. However, there was substantial variation in the percentage of patients with information on total-, HDL- and LDL- cholesterol. This led to a number of centres with percentages of information needed for cardiovascular disease screening that were much lower-than-expected compared to the national average. It should be noted that much of this variation was observed in individuals between the ages of 18 and 39. Screening for cholesterol is not necessarily warranted in this age group, and differences between centres more likely reflect centre-specific preferences.
- More than 80% of patients 40 years or older had information on their predicted 10-year risk of a cardiovascular disease event for all but one centre. For three centres, this percentage was much lower-than-expected compared to the national average. Nevertheless, many of the centres demonstrated marked improvement in this indicator over the past five years.
- Among those with a high (i.e., 10%) predicted 10-year risk of a cardiovascular disease event, there was substantial variation in the percentage who received a prescription for statins. Although some centres have shown increases in the percentage with high cardiovascular disease risk who received statins over the past five years, this percentage remains low nationally.
- Among those with a high predicted 10-year risk of a cardiovascular disease event, there was some variation in the percentage with target LDL cholesterol when patients had a prescription for statins. No centre, however, had a much lower-than-expected percentage with target LDL for this specific group. There was less variation in the percentage with target LDL cholesterol when patients did not receive a prescription for statins, but this percentage was high across all centres.
- There was also substantial between-centre variation in the percentage of patients with high blood pressure who received an antihypertensive prescription. Likewise, there was between-centre variation in the percentage of patients taking antihypertensive medication who had achieved a target blood pressure. For most centres, these percentages were similar over the last five years. Some of the larger HIV treatment centres had levels of these indicators that were much lower-than-expected when compared to the national average.

Care related to cardiovascular disease does have some variation across centres. Nevertheless, certain centres should strive to increase the percentage of patients with information on cholesterol measurements and risk assessment of cardiovascular disease events. Some centres may also want to think about increasing the percentage of patients on statins or antihypertensive medication, especially those who are at higher risk of a cardiovascular disease event. This analysis provides insight into the provision of cardiovascular diseases care at the different treatment centres. Nonetheless, data reliability remains an important issue, and it should be recognised that some of the reported variations may be due to missing data.

During a meeting of the NVHB in 2020-2021, it was decided that the monitoring of patient quality of care needed to be changed. The NVHB established several quality of care indicators based on the NVHB guidelines (https://nvhb.nl), which included aspects of care related to cardiovascular diseases. HIV treatment centres are expected to use these indicators as guidance for higher quality of care. The shm is responsible for providing information on these indicators to individual centres. In collaboration with *V&VN Verpleegkundig Consulenten HIV*, the NVHB organizes yearly audits with 3 different HIV treatment centres during which two auditors discuss aspects of quality of care, and results of the indicator report generated by the shm. These audits also serve as an opportunity to discuss difficulties in delivering care and best practices. HIV treatment centres are re-audited every 5 years. The data presented in this chapter are included in these audits and may additionally serve as a useful benchmark that centres can use to identify potential aspects for improvement.

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