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Government Report on the Diabetes Barometer 2025

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4 Executive summary: The Diabetes Barometer as a Strategic Policy Instrument

Towards data-driven and scalable quality improvement in primary care

4.1 Introduction: why the Diabetes Barometer is relevant for policy

Type 2 diabetes is one of the most prevalent chronic conditions in Belgium and poses major challenges for both healthcare providers and policymakers. Delivering high-quality, accessible and affordable care today requires not only strong engagement in clinical practice, but also **reliable and comparable data** that enable targeted policy action. In this context, the Diabetes Barometer represents an important and promising instrument.

The Diabetes Barometer is a NIHDI-supported, federated audit-and-feedback system that assesses the quality of diabetes care in Belgian general practices twice a year. By extracting standardized indicators directly from electronic medical records (EMRs) and feeding these back through user-friendly dashboards, the Barometer succeeds in linking **support for general practices, regional insights and policy-relevant information**. Belgium thus has a functioning, secure and reusable data infrastructure for quality monitoring in primary care.

4.2 Scope and representativeness: an exceptionally strong foundation

A first major strength of the Diabetes Barometer is its exceptionally high level of coverage. In the December 2024 data collection, information was included for **9,285,767 patients with a Global Medical Record (GMR)**, representing approximately **80% of the Belgian population**. This was made possible by the participation of **11,667 general practitioners from 4,157 practices**, spread across all provinces and regions.

Participation continues to grow strongly. Between December 2023 and December 2024, the number of participating practices increased by more than 30%, and the number of participating GPs by over 36%. This reflects broad support within general practice and underscores confidence in the Barometer as a tool supporting everyday clinical work. For policymakers, this means that the Diabetes Barometer is based on **highly representative data**, making it particularly well suited for policy preparation and evaluation.

4.3 What is measured and why this matters for policy

The Diabetes Barometer reports on both **practice population characteristics** and **eleven process indicators**, grouped into three domains:

- **Laboratory measurements** (HbA1c – a measure of average blood glucose levels over the past two to three months; eGFR – an estimate of kidney function; LDL “bad” cholesterol; albumin-to-creatinine ratio or ACR – a urine test detecting kidney damage),
- **Clinical examinations** (blood pressure, body mass index (BMI), waist circumference, foot examination),
- **Lifestyle and prevention** (smoking status, influenza vaccination).

These indicators are closely aligned with clinical guidelines and are primarily intended to provide feedback to general practitioners. In addition, they are highly relevant for policy as they allow:

- insight into variation between regions and practices,
- identification of priorities for quality improvement,
- monitoring of the impact of policy measures and implementation strategies.

A composite indicator ("all indicators achieved") is also calculated, providing insight into the extent to which integrated, guideline-concordant care is practically achievable within the current practice context.

The diabetes data collection also includes **outcome indicators** (e.g. the percentage of patients with diabetes under 70 years with an HbA1c <7%). However, it was a deliberate choice in the initial phase to provide feedback only on process indicators. Feedback on outcome indicators will be introduced once high average scores on process indicators have been achieved.

4.4 Key findings: strengths and clear opportunities for improvement

The December 2024 results present a differentiated yet encouraging picture. Automatically integrated laboratory measurements such as HbA1c, eGFR and LDL generally achieve the highest scores. This demonstrates that, where data are smoothly integrated into the EMR, large-scale quality monitoring is entirely feasible.

At the same time, several indicators consistently score lower, in particular:

- annual monitoring of the albumin-to-creatinine ratio, which is crucial for the early detection of diabetic kidney disease;
- registration of clinical examinations such as waist circumference and foot examination;
- and lifestyle and prevention elements, including smoking status and influenza vaccination.

These findings must be interpreted with nuance. The Barometer measures what is structurally recorded. Indicators requiring manual data entry are more susceptible to under-registration. Low scores therefore often reflect **workflow and system limitations** rather than a lack of delivered care. This insight is critical for policy: the core challenge lies not in motivation, but in implementation and support.

4.5 Regional differences as policy intelligence, not a value judgement

The Diabetes Barometer reveals clear regional differences, both in prevalence and indicator scores. For example, registered prevalence of type 2 diabetes varies substantially between provinces, as does the proportion of patients with increased reimbursement status. These differences reflect genuine socio-demographic contexts but are also influenced by variation in practice organisation, staff support and EMR software.

For policymakers, it is important that such differences are not interpreted normatively. The Barometer is **not a ranking tool**, but a **diagnostic instrument** that identifies where structural support can have the greatest impact. Planned multivariable analyses will further strengthen this approach and allow for fairer comparisons in the future.

4.6 From measurement to improvement: realistic targets

A particularly strong policy innovation within the Diabetes Barometer is the use of the **Achievable Benchmarks of Care (ABC™)** method. This approach focuses on the average performance of the top 10% of practices, making it possible to define **realistic and contextually achievable targets**.

The gap between the regional average and this benchmark is highly informative from a policy perspective:

- A large gap indicates **feasible improvement potential** within the current context.
- When both the average and the benchmark remain low, this indicates a **floor effect**, signalling the need for system-level interventions (such as better integration of registration in the EMR) before benchmarking becomes meaningful.

Based on this framework, indicators can be clustered into clear policy-action categories, enabling more targeted prioritisation and more efficient allocation of resources.

4.7 Policy implications: investing where it delivers value

The Diabetes Barometer demonstrates that Belgium currently has:

- a functioning federated data infrastructure,
- a strong collaborative partnership between government, healthcare providers, EMR vendors and knowledge institutions,
- and a unique instrument **to steer quality improvement in an evidence-informed manner**.

In the short term, indicators such as the **albumin-to-creatinine ratio** offer clear opportunities for national improvement campaigns. In the medium term, policy gains will mainly come from further **harmonisation of data elements and interoperability standards, improved usability of feedback tools**, and the collection of user data to better evaluate implementation effects.

4.8 Conclusion: a foundation for broader quality policy

The Diabetes Barometer proves that large-scale, practice-embedded quality monitoring in primary care is **both feasible and valuable**. It makes variation visible without stigmatisation and offers concrete guidance for policy action. With targeted investments in interoperability, implementation support and analytical refinement, this instrument can grow into a **cornerstone of data-driven health policy**.

Moreover, the Diabetes Barometer lays the foundation for potential expansion to other chronic conditions (for example, the chronic kidney disease barometer launched in 2024). As such, it provides not only insight into today's diabetes care, but also a **strategic framework for the healthcare system of tomorrow**.

5 Beleidssamenvatting: De Diabetesbarometer als strategisch beleidsinstrument

Naar data-gedreven en schaalbare kwaliteitsverbetering in de eerstelijnszorg

5.1 Inleiding: waarom de Diabetesbarometer beleidsmatig relevant is

Diabetes type 2 is een van de meest voorkomende chronische aandoeningen in België en stelt zowel zorgverleners als beleidsmakers voor grote uitdagingen. Kwalitatieve, toegankelijke en betaalbare zorg vereist vandaag niet alleen engagement op het terrein, maar ook **betrouwbare en vergelijkbare data** die toelaten om gericht beleid te voeren. In dat licht vormt de **Diabetesbarometer** een belangrijk en veelbelovend instrument.

De Diabetesbarometer is een door het RIZIV ondersteund, gefedereerd audit- en feedbacksysteem dat tweemaal per jaar de kwaliteit van diabeteszorg in de Belgische huisartsenpraktijken in kaart brengt. Door gestandaardiseerde indicatoren rechtstreeks te extraheren uit elektronische medische dossiers (EMD's) en deze terug te koppelen via gebruiksvriendelijke dashboards, slaagt de barometer erin om **ondersteuning van huisartsenpraktijken, regionale inzichten en beleidsrelevante informatie** met elkaar te verbinden. België beschikt hiermee over een werkende, veilige en herbruikbare data-infrastructuur voor kwaliteitsmonitoring in de eerstelijnszorg.

5.2 Reikwijdte en representativiteit: een bijzonder sterke basis

Een eerste grote meerwaarde van de Diabetesbarometer is haar **uitzonderlijk hoge dekkingsgraad**. In de datacollectie van december 2024 werden gegevens opgenomen van **9.285.767 patiënten met een Globaal Medisch Dossier (GMD)**, goed voor ongeveer **80% van de Belgische bevolking**. Dit werd mogelijk gemaakt door de deelname van **11.667 huisartsen uit 4.157 praktijken**, verspreid over alle provincies en gewesten.

De deelname blijft bovendien sterk groeien. Tussen december 2023 en december 2024 steeg het aantal deelnemende praktijken met meer dan 30%, en het aantal aangesloten huisartsen met ruim 36%. Dit wijst op een breed draagvlak binnen de huisartsgeneeskunde en benadrukt het vertrouwen in de barometer als ondersteuning van de dagelijkse praktijk. Voor beleidsmakers betekent dit dat de Diabetesbarometer gebaseerd is op **zeer representatieve data**, wat haar bijzonder geschikt maakt voor beleidsvoorbereiding en -evaluatie.

5.3 Wat wordt gemeten en waarom dat belangrijk is voor beleid

De Diabetesbarometer rapporteert over zowel **praktijkpopulatiekenmerken** als **elf procesindicatoren**, verdeeld over drie domeinen:

- **Laboratoriummetingen** (HbA1c (maatstaf voor de gemiddelde bloedsuikerspiegel over de afgelopen twee tot drie maanden), eGFR (schatting van de nierfunctie), LDL ('slechte' cholesterol), albumine-creatinineratio of ACR (urinetest om nierschade op te sporen)),
- **Klinisch onderzoek** (bloeddruk, body mass index (BMI), buikomtrek, voetonderzoek),
- **Levensstijl en preventie** (rookstatus, griepvaccinatie).

Deze indicatoren zijn nauw afgestemd op klinische richtlijnen en in eerste instantie van belang om huisartsen feedback te geven, maar zijn bovendien beleidsmatig relevant omdat ze toelaten om:

- inzicht te krijgen in **variatie tussen regio's en praktijken**,
- prioriteiten voor **kwaliteitsverbetering** te identificeren,
- en de **impact van beleidsmaatregelen en implementatiestrategieën** op te volgen.

Daarnaast wordt ook een samengestelde indicator ("alle indicatoren gehaald") berekend, die vooral inzicht geeft in de mate waarin geïntegreerde, richtlijnconforme zorg praktisch haalbaar is binnen de huidige praktijkcontext.

De diabetes datacollectie bevat ook **uitkomstindicatoren** (bv percentage diabetespatiënten jonger 70 jaar met een HbA1c <7%), maar er werd bewust gekozen om in de eerste fase enkel feedback te geven over de procesindicatoren, en pas wanneer gemiddeld genomen hoge scores behaald worden op de procesindicatoren dan ook feedback over de uitkomstindicatoren te voorzien.

5.4 Belangrijkste bevindingen: sterke punten en duidelijke verbeterkansen

De resultaten van december 2024 tonen een **gedifferentieerd maar hoopgevend beeld**. Automatisch geïntegreerde labometingen zoals HbA1c, eGFR en LDL scoren over het algemeen het best. Dit toont aan dat, waar data vlot in het EMD geïntegreerd worden, **kwaliteitsopvolging op schaal perfect mogelijk is**.

Tegelijkertijd zijn er indicatoren die systematisch lager scoren, met name:

- de jaarlijkse opvolging van **albumine-creatinineratio**, cruciaal voor vroege detectie van diabetische nierschade;
- de registratie van **klinische onderzoeken** zoals buikomtrek en voetonderzoek;
- en elementen rond **levensstijl en preventie**, waaronder rookstatus en griepvaccinatie.

Deze bevindingen moeten echter genuanceerd geïnterpreteerd worden. De barometer meet wat **gestructureerd geregistreerd** is. Indicatoren die manuele invoer vereisen, zijn gevoeliger voor onderregistratie. Lage scores wijzen dus vaak eerder op **workflow- en systeembeperkingen** dan op een gebrek aan geleverde zorg. Dit inzicht is cruciaal voor beleid: het probleem is niet primair motivatie, maar **implementatie en ondersteuning**.

5.5 Regionale verschillen als beleidsinformatie, niet als waardeoordeel

De Diabetesbarometer toont duidelijke regionale verschillen, zowel in prevalenties als in indicatorenscores. Zo varieert de geregistreerde prevalentie van type 2 diabetes sterk tussen provincies, net als het aandeel patiënten met verhoogde tegemoetkoming. Deze verschillen weerspiegelen reële socio-demografische contexten, maar worden ook beïnvloed door variatie in praktijkorganisatie, personele ondersteuning en EMD-software.

Voor beleidsmakers is het belangrijk dat deze verschillen **niet normatief** geïnterpreteerd worden. De barometer is geen ranglijst, maar een **diagnostisch instrument** dat blootlegt waar structurele ondersteuning het meeste effect kan hebben. De geplande multivariabele analyses zullen dit in de toekomst nog versterken en faire vergelijkingen mogelijk maken.

5.6 Van meten naar verbeteren: realistische streefwaarden

Een bijzonder sterke beleidsmatige innovatie binnen de Diabetesbarometer is het gebruik van de **Achievable Benchmarks of Care (ABC™)**-methode. Hierbij wordt gekeken naar het gemiddelde van de 10% best presterende praktijken. Dit maakt het mogelijk om **realistische en contextueel haalbare streefwaarden** te formuleren.

De kloof tussen het regionale gemiddelde en deze benchmark is beleidsmatig zeer informatief:

- Een grote kloof wijst op **haalbaar verbeterpotentieel** binnen de bestaande context.
- Wanneer zowel gemiddelde als benchmark laag zijn, duidt dit op een **bodemeffect** en dus op nood aan systeeminterventies (bijvoorbeeld betere integratie van registratie in het EMD) vóór benchmarking zinvol wordt.

Op basis hiervan kunnen indicatoren worden geclusterd in duidelijke beleidsactiecategorieën, wat toelaat om inspanningen gericht te prioriteren en middelen efficiënter in te zetten.

5.7 Beleidsimplicaties: investeren waar het loont

De Diabetesbarometer toont aan dat België vandaag beschikt over:

- een werkende gefedereerde data-infrastructuur,
- een sterk samenwerkingsverband tussen overheid, zorgverleners, EMD-leveranciers en kennisinstellingen,
- en een uniek instrument om **kwaliteitsverbetering evidence-informed te sturen**.

Op korte termijn bieden indicatoren zoals **albumine-creatineratio** duidelijke opportuniteiten voor nationale verbetercampagnes. Op middellange termijn ligt de beleidswinst vooral in verdere **harmonisatie van data-elementen en interoperabiliteitsstandaarden**, verbeterde gebruiksvriendelijkheid van feedbacktools en het capteren van gebruikersgegevens om implementatie-effecten beter te kunnen evalueren.

5.8 Conclusie: fundament voor breder kwaliteitsbeleid

De Diabetesbarometer bewijst dat grootschalige, praktijkgerichte kwaliteitsmonitoring in de eerstelijnszorg **haalbaar én waardevol** is. Ze maakt variatie zichtbaar, zonder te stigmatiseren, en biedt een concreet handelingsperspectief voor beleid. Met gerichte investeringen in interoperabiliteit, implementatieondersteuning en analytische verfijning kan dit instrument uitgroeien tot een **hoeksteen van data-gedreven gezondheidsbeleid**.

Bovendien legt de Diabetesbarometer het fundament voor een mogelijke uitbreiding naar andere chronische aandoeningen (in 2024 werd bv de chronische nierinsufficiëntiebarometer gestart). Daarmee biedt zij niet alleen inzicht in de diabeteszorg van vandaag, maar ook een **strategisch kader voor de zorg van morgen**.

6 Résumé exécutif : Le Baromètre du diabète comme instrument stratégique de politique publique

Vers une amélioration de la qualité des soins de première ligne fondée sur les données et extensible

6.1 Introduction : pourquoi le Baromètre du diabète est pertinent pour les politiques publiques

Le diabète de type 2 est l'une des maladies chroniques les plus fréquentes en Belgique et représente un défi majeur tant pour les prestataires de soins que pour les décideurs publics. Offrir des soins de qualité, accessibles et abordables requiert aujourd'hui non seulement un engagement sur le terrain, mais aussi **des données fiables et comparables** permettant de mener des politiques ciblées. Dans ce contexte, le Baromètre du diabète constitue un instrument important et prometteur.

Le Baromètre du diabète est un système fédéré d'audit et de feedback, soutenu par l'INAMI, qui évalue deux fois par an la qualité des soins du diabète dans les cabinets de médecine générale en Belgique. En extrayant des indicateurs standardisés directement à partir des dossiers médicaux informatisés (DMI) et en les restituant via des tableaux de bord conviviaux, le Baromètre parvient à relier **le soutien aux cabinets de médecins généralistes, les analyses régionales et l'information pertinente pour les politiques publiques**. La Belgique dispose ainsi d'une infrastructure de données opérationnelle, sécurisée et réutilisable pour le suivi de la qualité des soins de première ligne.

6.2 Portée et représentativité : une base exceptionnellement solide

L'un des principaux atouts du Baromètre du diabète réside dans son taux de couverture exceptionnellement élevé. Lors de la collecte de données de décembre 2024, des informations concernant **9 285 767 patients disposant d'un Dossier Médical Global (DMG)** ont été intégrées, soit environ **80 % de la population belge**. Cette couverture est rendue possible grâce à la participation de **11 667 médecins généralistes issus de 4 157 cabinets**, répartis sur l'ensemble des provinces et des régions.

La participation continue d'augmenter fortement. Entre décembre 2023 et décembre 2024, le nombre de cabinets participants a progressé de plus de 30 % et celui des médecins généralistes de plus de 36 %. Cela témoigne d'un large soutien au sein de la médecine générale et souligne la confiance accordée au Baromètre comme outil de soutien à la pratique quotidienne. Pour les décideurs, cela signifie que le Baromètre du diabète repose sur **des données hautement représentatives**, ce qui le rend particulièrement pertinent pour la préparation et l'évaluation des politiques publiques.

6.3 Ce qui est mesuré et pourquoi cela importe pour l'action publique

Le Baromètre du diabète fournit des informations sur les **caractéristiques des populations suivies en cabinet** ainsi que sur **onze indicateurs de processus**, répartis en trois domaines :

- **Examens biologiques** (HbA1c – indicateur de la glycémie moyenne sur les deux à trois derniers mois ; eGFR – estimation de la fonction rénale ; LDL cholestérol « mauvais » ; ratio albumine-créatinine ou ACR – test urinaire de dépistage des atteintes rénales),

- **Examens cliniques** (pression artérielle, indice de masse corporelle (IMC), tour de taille, examen des pieds),
- **Mode de vie et prévention** (statut tabagique, vaccination antigrippale).

Ces indicateurs sont étroitement alignés sur les recommandations cliniques et visent en premier lieu à fournir un feedback aux médecins généralistes. Ils sont toutefois également très pertinents pour les politiques publiques car ils permettent :

- de mieux comprendre les variations entre régions et cabinets,
- d'identifier les priorités en matière d'amélioration de la qualité,
- et de suivre l'impact des mesures politiques et des stratégies de mise en œuvre.

Un indicateur composite (« tous les indicateurs atteints ») est également calculé, offrant un aperçu du degré de faisabilité pratique d'une prise en charge intégrée et conforme aux recommandations dans le contexte actuel des soins de première ligne.

La collecte de données sur le diabète comprend aussi des **indicateurs de résultats** (par exemple, la proportion de patients diabétiques de moins de 70 ans présentant une HbA1c < 7 %). Toutefois, il a été délibérément choisi, dans une première phase, de ne fournir un feedback que sur les indicateurs de processus. Le feedback sur les indicateurs de résultats sera introduit lorsque des scores élevés auront été atteints, en moyenne, sur les indicateurs de processus.

6.4 Principaux résultats : points forts et marges d'amélioration

Les résultats de décembre 2024 présentent un tableau différencié mais globalement encourageant. Les examens biologiques intégrés automatiquement, tels que l'HbA1c, l'eGFR et le LDL, obtiennent généralement les scores les plus élevés. Cela montre que, lorsque les données sont bien intégrées dans le DME, le suivi de la qualité à grande échelle est **parfaitement réalisable**.

Parallèlement, certains indicateurs affichent des scores systématiquement plus faibles, notamment :

- le suivi annuel du ratio albumine-créatinine, essentiel pour la détection précoce de la néphropathie diabétique ;
- l'enregistrement de certains examens cliniques, comme le tour de taille et l'examen des pieds ;
- et les éléments liés au mode de vie et à la prévention, tels que le statut tabagique et la vaccination antigrippale.

Ces constats doivent être interprétés avec nuance. Le Baromètre mesure ce qui est structuré et enregistré. Les indicateurs nécessitant une saisie manuelle sont plus exposés à la sous-documentation. Des scores faibles reflètent donc souvent des **limitations liées aux workflows et aux systèmes**, plutôt qu'un manque de soins effectivement prodigués. D'un point de vue politique, cela est essentiel : le problème central ne relève pas de la motivation, mais bien de la mise en œuvre et du soutien structurel.

6.5 Les différences régionales comme information stratégique, non comme jugement de valeur

Le Baromètre du diabète met en évidence des différences régionales marquées, tant en termes de prévalence que de scores sur les indicateurs. Ainsi, la prévalence enregistrée du diabète de type 2 varie fortement entre les provinces, tout comme la proportion de patients bénéficiant d'une intervention majorée. Ces écarts reflètent des contextes socio-démographiques réels, mais sont également influencés par l'organisation des cabinets, le soutien du personnel et les logiciels de DMI utilisés.

Il est important que ces différences ne soient pas interprétées de manière normative. Le Baromètre n'est **pas un outil de classement**, mais un **outil diagnostique** qui permet d'identifier les domaines dans lesquels un soutien structurel peut produire le plus grand impact. Les analyses multivariables prévues renforceront encore cette approche et permettront des comparaisons plus équitables à l'avenir.

6.6 Du suivi à l'amélioration : des objectifs réalistes

Une innovation politique particulièrement forte du Baromètre du diabète est l'utilisation de la méthode des **Achievable Benchmarks of Care (ABC™)**. Celle-ci se base sur les performances moyennes des 10 % de cabinets les plus performants et permet de définir **des objectifs réalistes et atteignables dans le contexte actuel**.

L'écart entre la moyenne régionale et ce benchmark est très instructif pour l'action publique :

- un écart important indique un **potentiel d'amélioration concret et réalisable** ;
- lorsque la moyenne et le benchmark restent tous deux faibles, cela traduit un **effet de plancher**, indiquant la nécessité d'interventions systémiques (par exemple une meilleure intégration des enregistrements dans le DME) avant que le benchmarking ne devienne pertinent.

Sur cette base, les indicateurs peuvent être regroupés en catégories d'action politique claires, ce qui permet de mieux cibler les priorités et d'allouer les ressources de manière plus efficiente.

6.7 Implications pour les politiques publiques : investir là où l'impact est maximal

Le Baromètre du diabète montre que la Belgique dispose aujourd'hui :

- d'une infrastructure de données fédérée fonctionnelle,
- d'un partenariat solide entre pouvoirs publics, prestataires de soins, fournisseurs de DMI et institutions de connaissance,
- et d'un instrument unique permettant de piloter l'amélioration de la qualité de manière fondée sur les preuves.

À court terme, certains indicateurs comme le **ratio albumine-créatinine** offrent des opportunités claires pour des campagnes nationales d'amélioration. À moyen terme, les gains politiques se situent principalement dans une **harmonisation accrue des éléments de données et des standards**

d’interopérabilité, une meilleure ergonomie des outils de feedback et la collecte de données d’usage afin de mieux évaluer les effets de la mise en œuvre.

6.8 Conclusion : un socle pour une politique de qualité plus large

Le Baromètre du diabète démontre que le suivi de la qualité à grande échelle, intégré à la pratique des soins de première ligne, est **à la fois faisable et porteur de valeur**. Il rend visibles les variations sans stigmatisation et offre un cadre concret pour l’action publique. Moyennant des investissements ciblés dans l’interopérabilité, le soutien à la mise en œuvre et l’approfondissement analytique, ce dispositif peut devenir un **pilier central d’une politique de santé fondée sur les données**.

En outre, le Baromètre du diabète constitue la base d’une extension vers d’autres maladies chroniques (par exemple, le lancement en 2024 du baromètre de l’insuffisance rénale chronique). Il n’apporte donc pas seulement des éclairages sur la prise en charge actuelle du diabète, mais propose également un **cadre stratégique pour le système de santé de demain**.

7 Introduction

Diabetes mellitus is a major chronic illness that continues to increase in prevalence worldwide, imposing a heavy physical, social, and economic burden (1). The International Diabetes Foundation estimates that over 589 million adults are currently living with diabetes, with the vast majority affected by type 2 diabetes (2). In Belgium, the Intermutualistic Agency (IMA) states that in 2023, 7.6% of the population, representing 880,000 Belgians, were treated for diabetes. Among Belgians with a vulnerable socioeconomic status, the proportion of treated individuals with diabetes increases to 12% (3).

Diabetes is closely linked to serious health complications which greatly impact patients' well-being and quality of life (4). General practitioners (GPs) are central figures who oversee ongoing care and coordinate treatment. Their role is vital in ensuring that care aligns with national and international standards (5). Despite this, research has highlighted that many patients do not achieve the recommended treatment targets. One of the reasons for this gap is the limited awareness of or adherence to clinical guidelines among physicians, which hinders optimal care delivery (6–8).

The Diabetes Barometer is an implementation of an automated audit and feedback (A&F) intervention in general practice for diabetes care. A&F is a well-studied intervention that has demonstrated its effectiveness in improving the quality of healthcare (9). For example, A&F interventions have shown an added value in the follow-up of chronic illnesses, such as diabetes (9–11). The Diabetes Barometer aims to be a formative tool that supports general practitioners in improving diabetes care by providing visual feedback based on electronic health record (EHR) data. In the audit part of the intervention, aspects of diabetes care are automatically extracted (measured) using evidence-based and EHR-extractable quality indicators. These quality indicators are based on international guidelines and incorporate the patients' point of view (12). Visual feedback is then provided for each indicator on the practice level, which is described in more detail below.

Finally, in order to strengthen the Diabetes Barometer as a tool for population health management, 'follow-up queries' are also integrated into the Belgian EHR systems. These queries are designed to identify patients needing specific care actions, such as overdue eGFR testing. This enables GPs to create targeted care plans and take timely action for their own practice population (13). The Diabetes Barometer thus helps GPs to identify and correct 'blind spots' in their provision of diabetes care and facilitates the shift to more proactive care.

The aim of this report is to describe the participation in the Diabetes Barometer and to elaborate on the process indicators in general practice for diabetes.

8 Methods

8.1 Feedback to general practitioners

The formative feedback is provided twice a year to GPs and incorporates features such as benchmarking, low cognitive load and a link to the guidelines (14). A geographical benchmark is available to compare the own practice with the province, district (arrondissement/district) or first line zone (eerstelijnszone / zone de première ligne). Furthermore, the Achievable Benchmarks of Care (ABC™), which display the average of the 10% best performing practices, are used to provide a realistic target to improve one's own practice performance (15–17). Color codes highlight the practice performance compared to quartiles. The feedback can be consulted on the Healthstat platform. An example of the visual feedback is shown in Figure 1.

Figure 1 Example of color-coded feedback visualizations and benchmarking for a given quality indicator.

8.2 Data collection

8.2.1 Quality indicators

The Diabetes Barometer currently assesses the prevalence of diabetes, the number of patients with an increased financial compensation (Verhoogde tegemoetkoming / Intervention majorée) and 11 indicators that were previously developed (12). Although both process and outcome indicators were developed and collected, the current feedback of the barometer only contains process indicators. Process indicators measure whether the recommended care processes are carried out, while outcome indicators measure the actual outcome of care for patients (14). Increasing the number of measurements in the initial phase enhances the reliability of the results in subsequent phases. The queries in the audit are already foreseen to enlarge the barometer with the outcome indicators from the moment the registration and process indicators are on point. (Table 1)

Table 1 Overview of indicators included in the Diabetes Barometer.

Indicator	Description
Prevalence of diabetes / increased compensation	Percentage of patients with a global medical record (GMR) [globaal medisch dossier (GMD) / dossier médical global (DMG)] and a registered diagnosis of diabetes or increased compensation, compared to all patients with a GMR in the practice

HbA1c	Number of patients aged 40+ with a coded diagnosis of diabetes who received an HbA1c measurement in the past year
Albuminuria	Number of patients aged 40+ with a coded diagnosis of diabetes who received an albuminuria test in the past year
eGFR	Number of patients aged 40+ with a coded diagnosis of diabetes who received an eGFR measurement in the past year
Blood pressure	Number of patients aged 40+ with a coded diagnosis of diabetes for whom a blood pressure measurement was registered in the past 6 months
BMI	Number of patients aged 40+ with a coded diagnosis of diabetes for whom BMI was recorded in the past year
Waist circumference	Number of patients aged 40+ with a coded diagnosis of diabetes for whom a waist circumference measurement was recorded in the past year
LDL Cholesterol	Number of patients aged 40+ with a coded diagnosis of diabetes who received an LDL cholesterol measurement in the past year
Feet examination	Number of patients aged 40+ with a coded diagnosis of diabetes for whom a foot examination was recorded in the past year
Smoke status	Number of patients aged 40+ with a coded diagnosis of diabetes for whom smoking status was recorded
Influenza vaccination	Number of patients aged 40+ with a coded diagnosis of diabetes who received an influenza vaccination in the past year
All indicators	Number of patients aged 40+ with a coded diagnosis of diabetes who meet all of the above criteria

In addition to content-specific indicators, each barometer collects general practice information. These queries offer insights into the characteristics of the participating practices, such as their location, practice type, and number of GPs working there.

8.2.2 Intervention period and data flow

As part of the Diabetes Barometer initiative, data are collected twice a year, on May 28th and November 28th. The first data collection was conducted in November 2023. Data extraction is performed by the software providers of the participating GP practices, who run predefined queries within the EMRs at the practice level for 11 quality indicators related to diabetes care. They are given five working days to transmit the collected data to Healthdata.be via the secure way (the eHealth boxes). Healthdata.be securely stores the data and provides access to Intego. The Intego team then further processes and analyses the data to generate a feedback report with suggestions for each practice for improvement. Through the Healthstat platform these reports are made available to GPs by Healthdata.be (Figure 2).

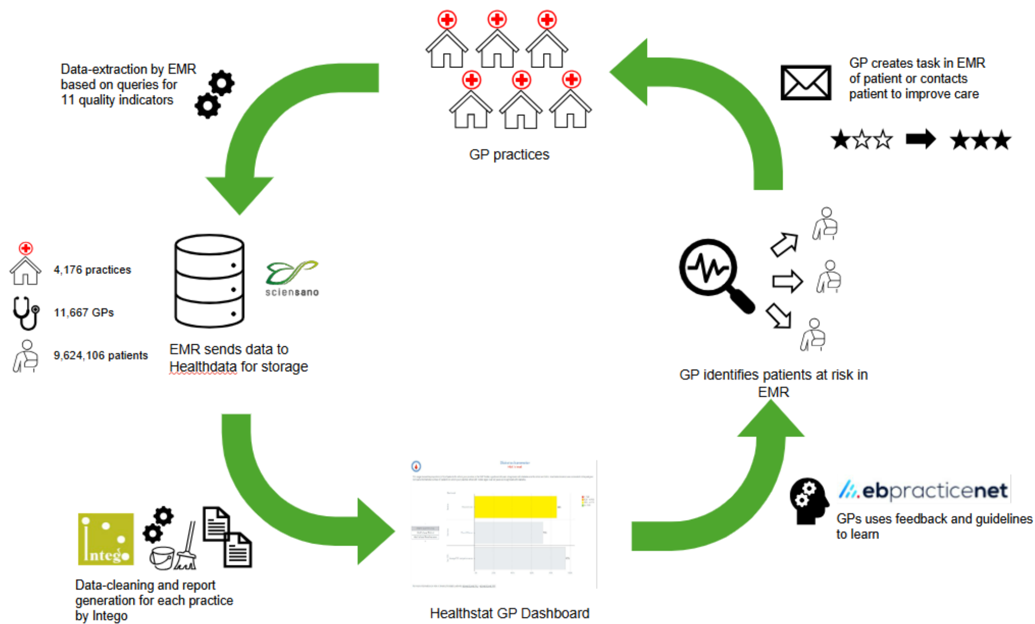


Figure 2 The diagram illustrates the cyclical process of the Diabetes barometer.

Data on 11 quality indicators is extracted from electronic medical records (EMRs) in GP practices and sent to Healthdata.be for secure storage. Intego performs data cleaning and generates practice-level reports, which are displayed in the Healthstat GP Dashboard. GPs review these dashboards, identify patients at risk, and use evidence-based guidelines from ebpracticenet to improve care. Actions include creating EMR tasks or contacting patients, closing the feedback loop to enhance quality of diabetes management.

8.3 Statistical analysis

For this report the practice data of the general care practices participating in the Diabetes Barometer were aggregated by arrondissement and province. Data cleaning and validation were performed within a secure Healthdata.be processing environment prior to analysis.

Descriptive statistics were used to summarize practice characteristics (e.g., size, type, presence of nurses or assistants). Continuous variables were reported as means, medians, interquartile ranges (p25–p75), and minimum/maximum values; categorical variables were expressed as counts and percentages.

Indicator performance was assessed longitudinally across four time points (December 2023, June 2024, Dec 2024, June 2025) and stratified by province. For each indicator, we calculated the proportion of eligible patients meeting the criterion within each practice and aggregated these proportions using weighted means. For prevalence of diabetes and increased compensation it was compared to all patients with a GMR in the practice. For all other indicators it was compared to all patients with a GMR in the practice aged 40+ with a coded diagnosis of diabetes. Five-point summaries (min, max, p25, p75, mean, median) were generated for each indicator and time point. To ensure consistency and completeness, the cross-sectional analysis in this report is based on the data collection of December 2024. This round was selected because it represents the most recent fully validated dataset. For the collection of June 2025 one software provider failed to send in all data on time resulting in missing data for 450 practices. The necessary actions have been taken in collaboration with the software developers and Healthdata to prevent this issue from occurring in the future.

For the longitudinal analysis, we examined trends across all previous data collections up to Dec 2024, as well as the last data collection of June 2025. This approach allowed us to capture the evolution of participation, practice characteristics, and indicator performance over time.

The Achievable Benchmarks of Care (ABC™) methodology was used to calculate benchmarks for the eleven quality indicators. The benchmarks were calculated as the mean of the practices in the 10th upper percentile of performance in each region. The ABC™ approach is a benchmarking method that sets “real world” goals. It defines “top performance” using the “paired mean”, defined as the average performance of the subset of those providers with the highest scores for the indicator under consideration (15-17).

Comparisons over time were visualized using line plots and boxplots. Trends were evaluated descriptively; Missing data were handled by complete-case analysis at the indicator level. All analyses were conducted in SAS (version 8.3) and R (version 4.4.2).

9 Results

9.1 Cross-sectional analysis

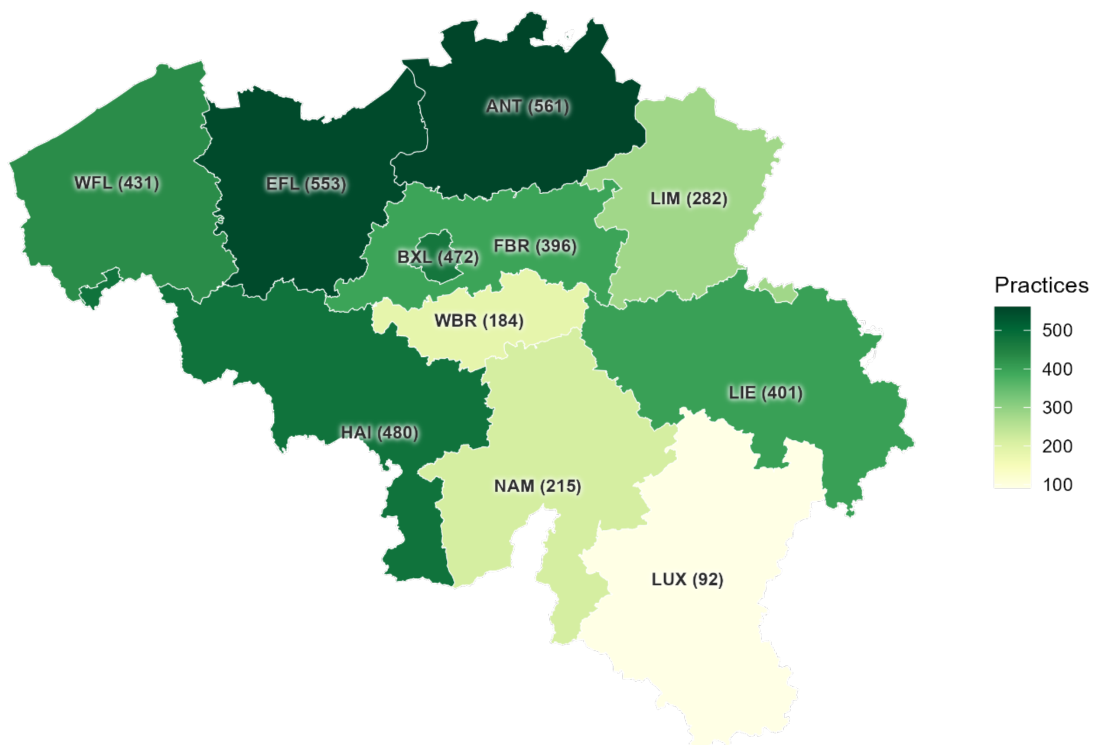
9.1.1 Practice participation

Table 2 presents aggregated data by province, including: barometer participation (number of practices and total GPs), practice characteristics (type and size, …), and population context (diabetes prevalence and proportion of patients with increased financial compensation.

Figure 3 and Figure 4 demonstrate provincial participation in the barometer. In total, 4157 general practices and 11 667 GPs contributed data to the Diabetes Barometer during the December 2024 collection. Participation was not evenly distributed across regions. Flanders accounted for the largest share, with 2223 practices (53.5%) and 6737 GPs (57.8%). Wallonia contributed 1372 practices (33.0%) and 3167 GPs (27.1%), while the Brussels-Capital Region represented 472 practices (11.3%) and 1304 GPs (11.2%).

At the provincial level, Antwerp (561 practices, 1819 GPs) and East Flanders (553 practices, 1604 GPs) had the highest absolute participation, followed by West Flanders (431 practices, 1167 GPs) and Flemish Brabant (396 practices, 1144 GPs). In Wallonia, Hainaut (480 practices, 959 GPs) and Liège (401 practices, 1038 GPs) were the largest contributors, while Namur (215 practices, 497 GPs) and Luxembourg (92 practices, 254 GPs) had the lowest absolute participation.

Number of practices per province



Data from NIHDI Diabetes Barometer

Figure 3 Number of participating practices per province in the Diabetes Barometer (Dec 2024). Abbreviations*:* WFL = West Flanders; EFL = East Flanders; ANT = Antwerp; FBR = Flemish Brabant; LIM = Limburg; HAI = Hainaut; WBR = Walloon Brabant; NAM = Namur; LUX = Luxembourg; LIE = Liège; BXL = Brussels-Capital Region.

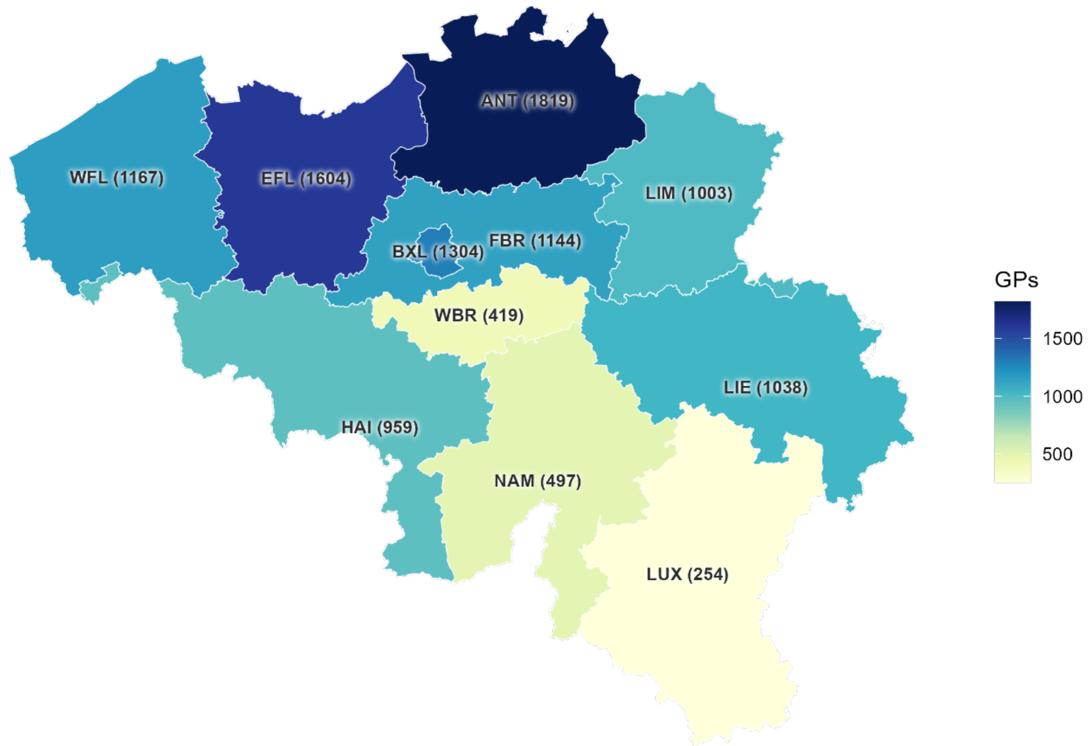


Figure 4 Number of participating general practitioners per province in the Diabetes Barometer (Dec 2024). See earlier caption for province abbreviations.

The picture changes somewhat when we look at relative regional participation by dividing the absolute numbers by the number of inhabitants per province (source Statbel 2024). When we look at the number of practices per 100 000 inhabitants (Figure 5), the leading provinces are Walloon Brabant (±44) and Namur (±43), followed by Brussels (±38); most other provinces cluster between 31–36, with Antwerp at the lower end (±29). GP participation per 100 000 inhabitants (Figure 6) by contrast, is highest in Limburg (±111) and Walloon Brabant (±112), with East Flanders and Namur also performing strongly (around the 100 mark). Brussels-Capital and Luxembourg sit in the mid-range (±86), while Hainaut shows the lowest GP participation (±70) per 100 000.

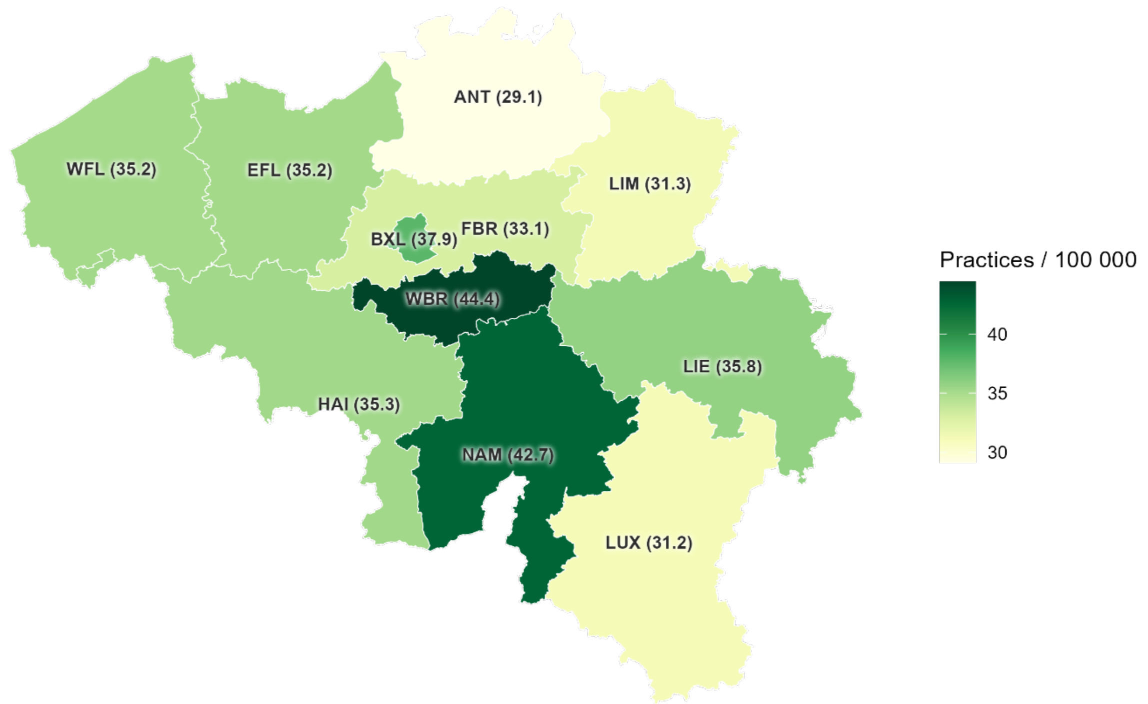


Figure 5 Number of participating practices per province per 100 000 inhabitants in the Diabetes Barometer (Dec 2024). See earlier caption for province abbreviations.

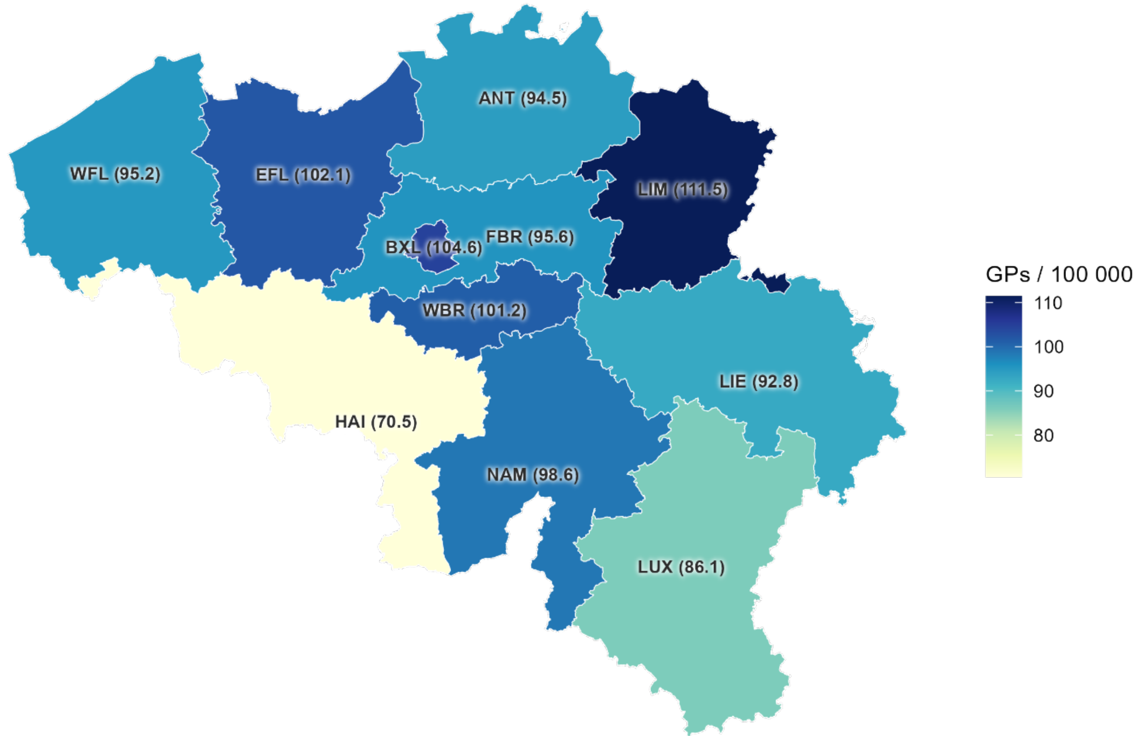
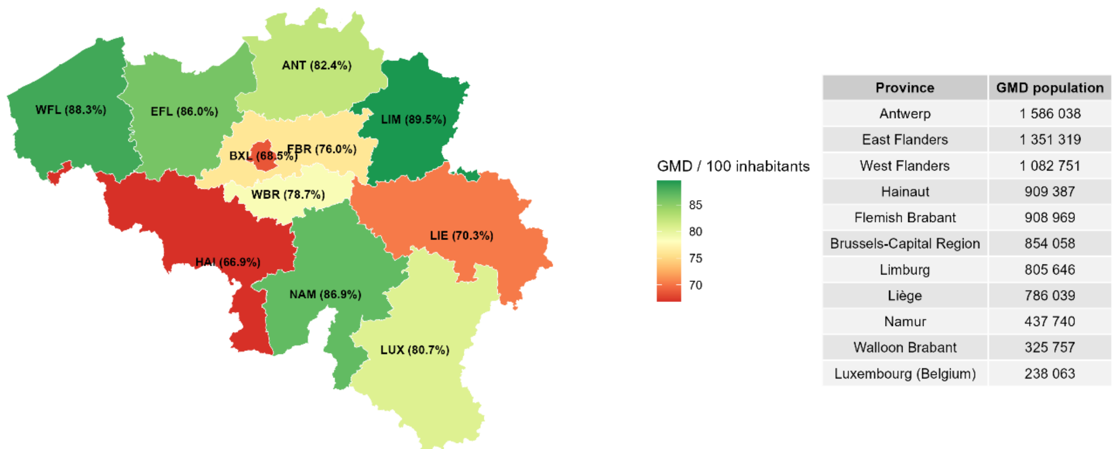


Figure 6 Number of participating general practitioners (GPs) per province per 100 000 inhabitants in the Diabetes Barometer (December 2024). See earlier caption for province abbreviations.

The proportional coverage of the total Belgian population in the December 2024 data collection is demonstrated in Figure 7. At the national level, the December 2024 collection pooled 9 285 767 patients with a global medical record (GMD) across provinces, corresponding to 78.99% of the resident population in 2024 (11 755 841) and leaving an absolute gap of 2 470 074 inhabitants without a GMD in participating practices at that date.



Province	GMD population
Antwerp	1 586 038
East Flanders	1 351 319
West Flanders	1 082 751
Hainaut	909 387
Flemish Brabant	908 969
Brussels-Capital Region	854 058
Limburg	805 646
Liège	786 039
Namur	437 740
Walloon Brabant	325 757
Luxembourg (Belgium)	238 063

Figure 7 Proportional coverage of the population by the Diabetes Barometer as measured by the total number of patients with a recorded global medical record (GMD) in December 2024 divided by the total

registered province population in 2024 (source Statbel). The attached table shows the total number of patients with a GMD covered by the December 2024 data collection. Provinces are ordered by the number of GMDs collected. See earlier captions for province abbreviations.

Overall coverage of patients with a global medical record (GMD) is high across Belgium, but notable provincial differences persist. West Flanders (88.3%), Limburg (89.5%), Namur (86.9%) and East Flanders (86.0%) score high, while Antwerp also scores strongly at 82.4%. In contrast, coverage is relatively low in Hainaut (66.9%), Brussels-Capital Region (68.5%) and Liège (70.3%), with the Brabant region scoring mid-range.

9.1.2 Characteristics of participating practices

9.1.2.1 Practice types

The distribution of practice types varies substantially across provinces, reflecting regional differences in organization of primary care. In Flanders, solo practices remain common but are somewhat less dominant than in Wallonia. For example, West Flanders and East Flanders report solo practice shares around 44%, while Antwerp and Flemish Brabant show slightly lower proportions (±39–44%), with a notable presence of group practices (38–43%). Limburg stands out with the highest proportion of group practices (48%).

In contrast, Walloon provinces exhibit a markedly higher prevalence of solo practices. Hainaut leads with 61% solo practices, and Namur and Luxembourg also exceed 50%. Group practices are less frequent in these provinces, typically ranging between 18–22%, while WGC (Wijkgezondheidscentra or community health centers) remain rare outside Brussels.

The Brussels-Capital Region presents a distinct profile: solo practices account for about 49%, but WGCs represent 16.5%, far higher than in any other province.

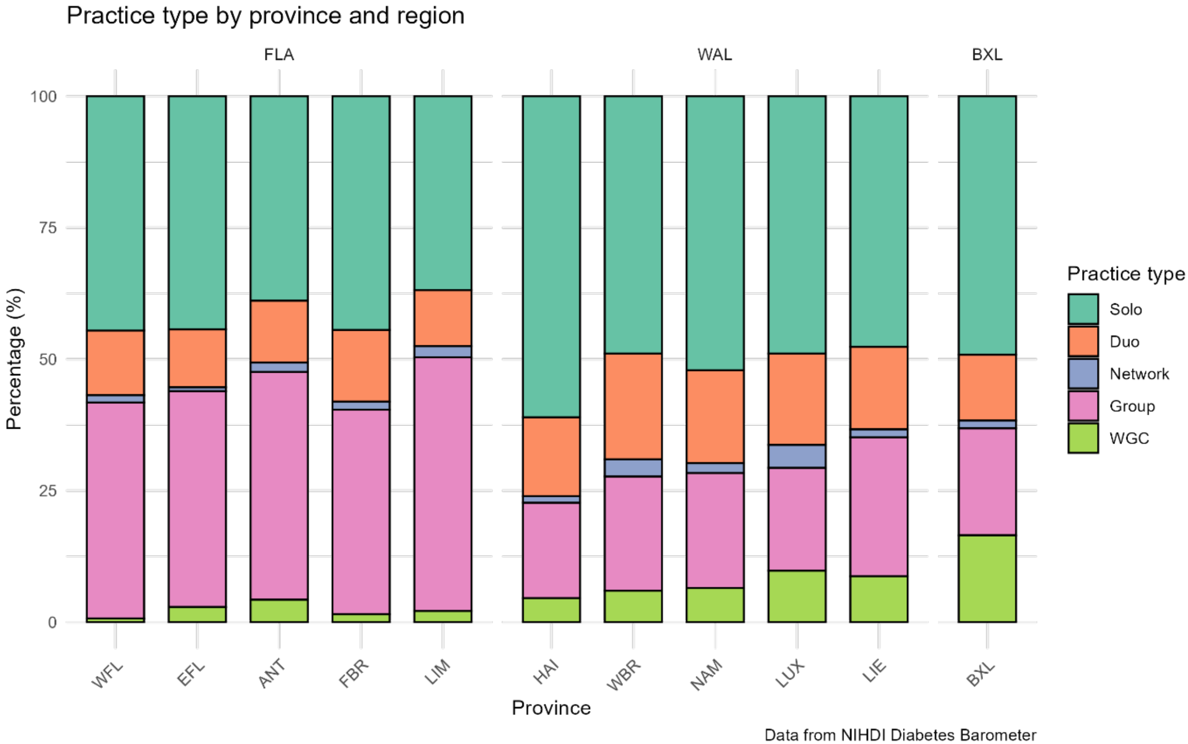


Figure 8 Distribution of practice types by province in the Diabetes Barometer (December 2024). The figure compares the proportion of solo, duo, network, group, and WGC (Wijkgezondheidscentrum) practices across provinces. See earlier captions for province abbreviations

9.1.2.2 Practice sizes

Figure 9 shows the distribution of practice sizes, measured by counting the total number of GPs and GPs in training, by province and region. The size of participating practices closely mirrors the patterns

observed in practice type. Provinces with a higher share of group practices—such as Limburg, Antwerp, and East Flanders—also report larger teams, with many practices hosting 3–5 GPs and a notable proportion in the 6–10 GP category. Limburg stands out with the highest share of large practices, including some with more than 20 GPs. Conversely, provinces dominated by solo practices, such as Hainaut, Namur, and Luxembourg, show very small team sizes: over half of practices consist of a single GP, and practices with more than three GPs are rare. Walloon Brabant follows a similar pattern, with slightly more duo practices but still predominantly small-scale. The Brussels-Capital Region reflects its unique urban context: while solo practices remain common, Brussels includes a significant proportion of very large practices and WGCs, some hosting 11–20 GPs, which is exceptional compared to other provinces.

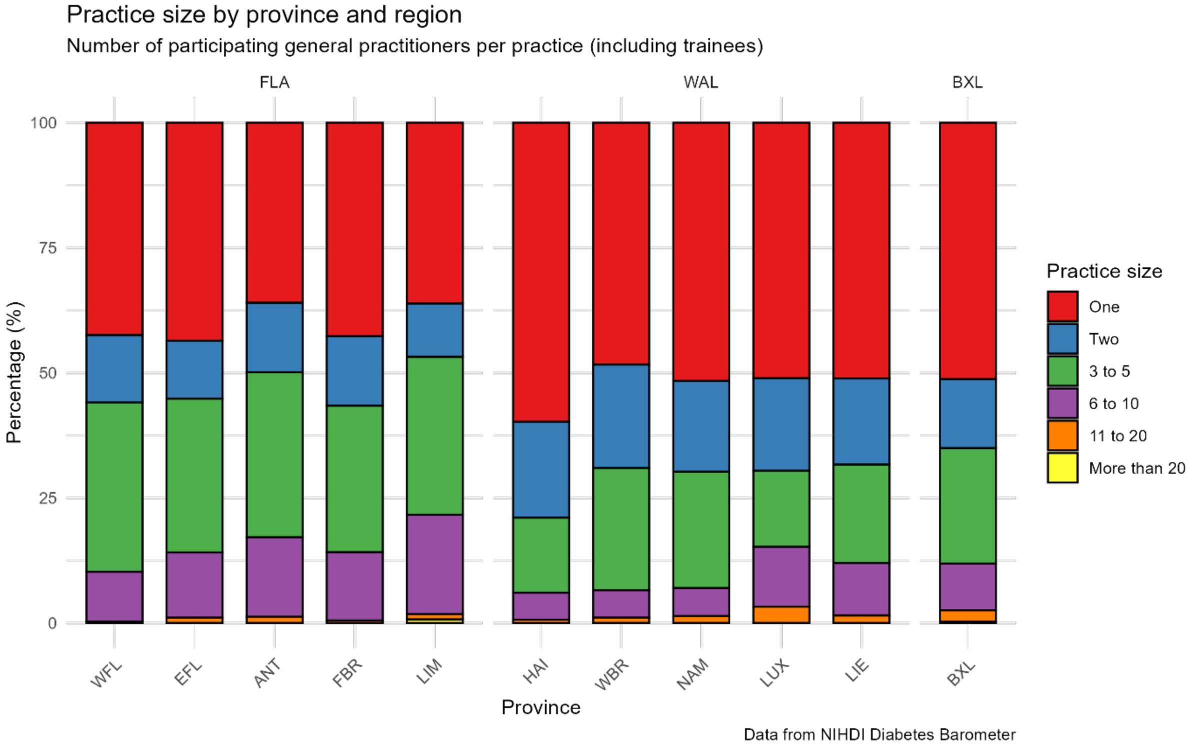


Figure 9 Distribution of practice size by province in the Diabetes Barometer (December 2024). See earlier captions for province abbreviations.

9.1.2.3 Age profile of participating general practitioners

Figure 10 shows the age distribution of participating GPs. These reflect and reinforce the organizational patterns observed in practice type and size. Provinces with larger, group-based practices—such as Limburg and Walloon Brabant—tend to have a younger workforce than surrounding provinces, with a higher proportion of GPs in the 36–45 and 46–55 age brackets.

Generally, Flemish provinces seem to have an older GP profile, which is somewhat counterintuitive keeping in mind the relatively larger proportion of group-based and multidisciplinary practices. The Brussels-Capital Region presents a mixed picture: while solo practices remain common, the presence of large multidisciplinary centers and WGCs seems to attract a younger cohort, balancing the age profile compared to Walloon provinces. Still, Brussels retains a notable proportion of older GPs, reflecting its heterogeneous practice landscape.

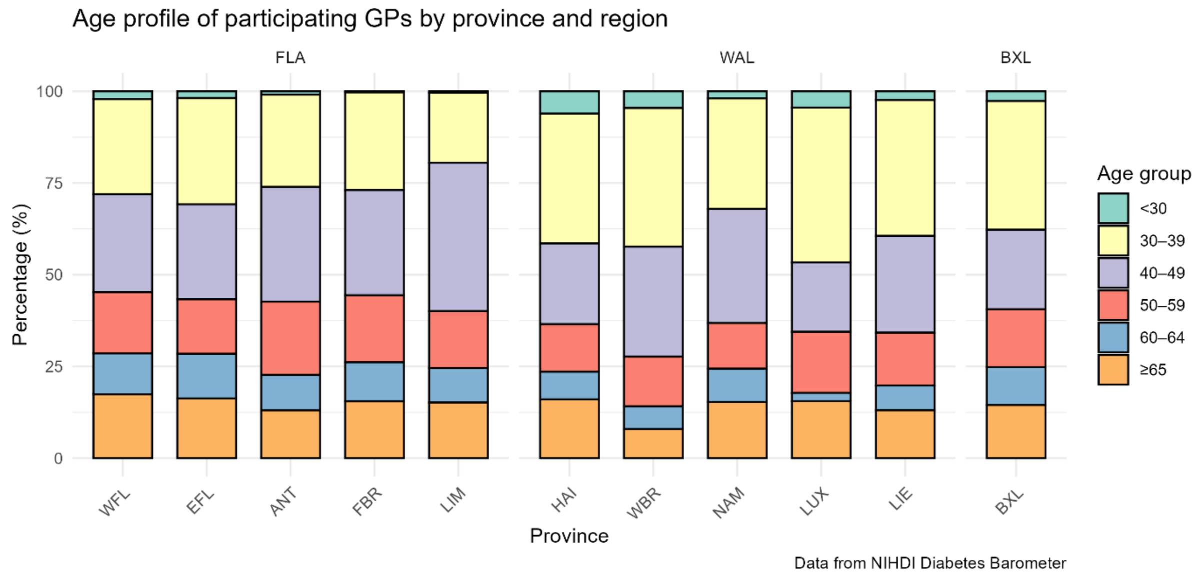


Figure 10 Age distribution of participating GPs by province in the Diabetes Barometer (December 2024). The figure shows the proportion of GPs in six age categories: <30, 30–39, 40–49, 50–59, 60–64, and ≥65 years. See earlier captions for province abbreviations.

9.1.2.4 Supporting staff in participating practices

Figure 10 shows the availability of supporting staff in participating practices. This varies widely across provinces and reflects the organizational patterns discussed earlier. Provinces with larger, group-based practices, such as Antwerp, East Flanders, and Limburg, report the highest presence of both assistants and nurses. For example, in these provinces, more than half of practices have an (administrative) assistant, and up to 25% include a nurse practitioner, reinforcing the trend toward multidisciplinary care in Flemish regions.

In contrast, Walloon provinces, where solo practices dominate, show much lower staff availability. Hainaut, Namur, and Luxembourg have the smallest proportions of practices with assistants or nurses, often below 35% for assistants and under 15% for nurses. This limited support structure aligns with the smaller team sizes and older GP profiles observed earlier.

The Brussels-Capital Region occupies an intermediate position: while solo practices remain common, the presence of WGCs and large multidisciplinary practices boosts staff availability, particularly assistants, though nurse presence remains modest compared to Flemish provinces.

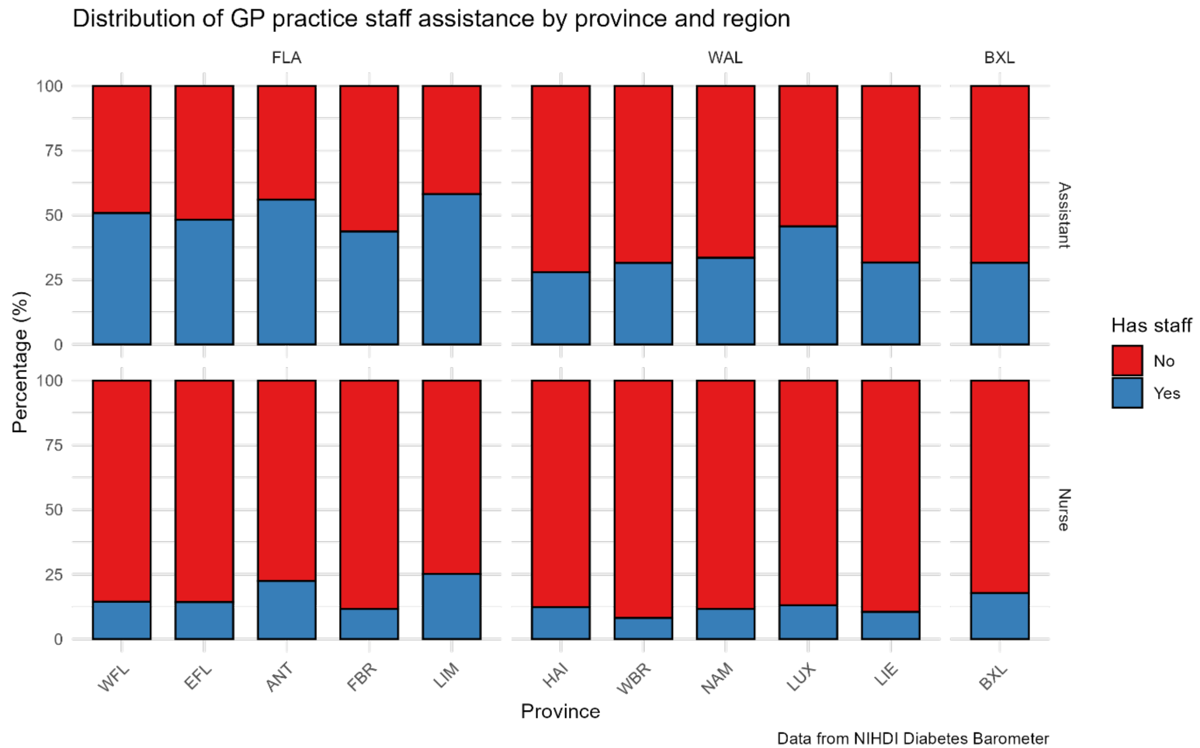


Figure 11 Distribution of supporting staff in participating practices by province in the Diabetes Barometer (December 2024). See earlier captions for province abbreviations.

9.1.2.5 Electronic health record systems used in participating practices

The distribution of EMR systems shows strong regional clustering and reflects historical market penetration and practice organization. In Flanders, one dominant software provider (Software 1) accounts for the vast majority of practices—often exceeding 60% in provinces such as West Flanders, East Flanders, and Antwerp. Smaller shares of Software 2 and Software 3 appear in Flemish Brabant and Limburg, with Limburg showing the greatest diversity, including minor use of Software 6.

In Wallonia, the picture is more fragmented. Software 1 remains present but at much lower levels (±25–40%), while Software 3 and Software 5 dominate in several provinces, particularly Hainaut, Namur, and Luxembourg. Walloon Brabant shows a mix of Software 1, 3, and 5, reflecting the absence of a single dominant provider.

The Brussels-Capital Region stands out for its diversity: while Software 1 retains a significant share, Software 5 and Software 3 are widely used, and smaller shares of other systems are present. This diversity might mirror the region's heterogeneous practice landscape, including solo practices, group practices, and WGCs.

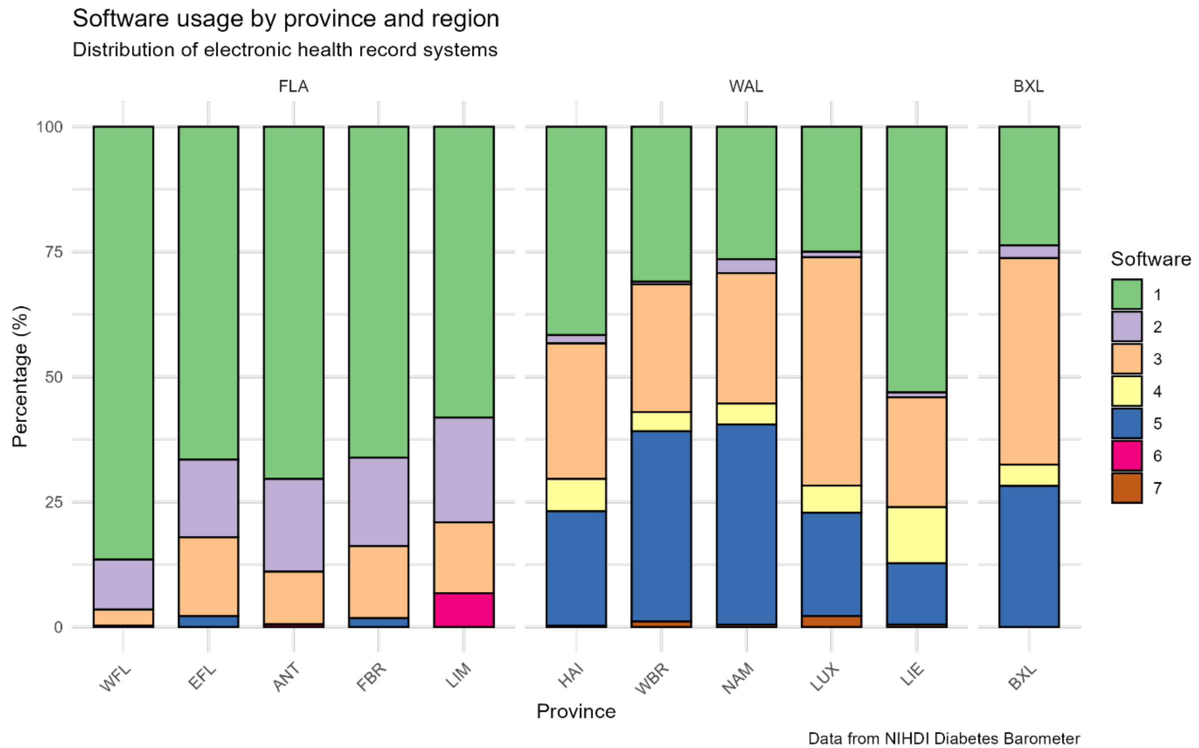


Figure 12 Distribution of software vendor usage by province and region. Software vendors are given a pseudonymized integer code. Province abbreviations as in earlier captions.

9.1.3 Population context of practices within the province

The population characteristics of practices reveal important contextual differences across provinces. The prevalence of diabetes among patients with a global medical record (GMR) (Figure 13) varies from 3.6% in Walloon Brabant and 3.8% in Luxembourg to 6.4% in West Flanders, the highest observed rate. Flemish provinces generally report higher prevalence (5.1–6.4%) than Walloon provinces (3.6–4.6%), with Brussels (BXL) at 4.2%, close to the Walloon average.

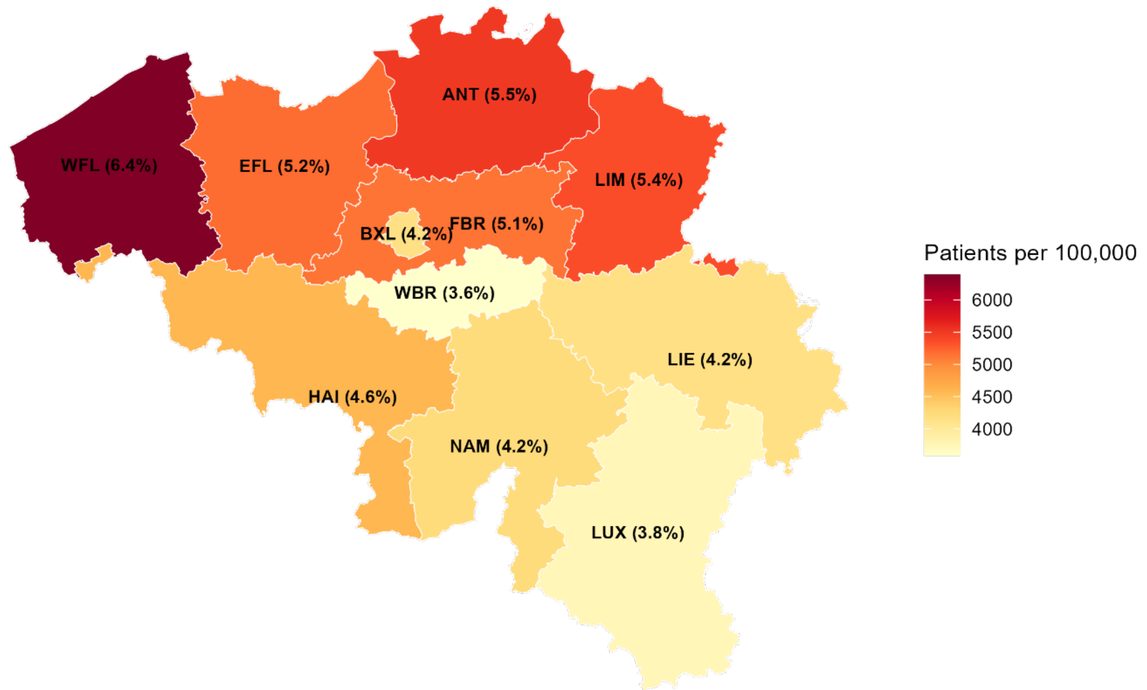


Figure 13 Prevalence of diabetes among patients with a global medical record (GMR) by province in the Diabetes Barometer (December 2024). See earlier captions for province abbreviations.

The share of patients with increased financial compensation, a proxy for socioeconomic vulnerability, shows an inverse pattern. Brussels exhibits the highest proportion (27.9%), followed by Hainaut (24.1%) and Liège (21.9%), while Flemish provinces report substantially lower rates (12.7–18.8%). Walloon Brabant (14.5%) and Namur (21.1%) fall in between.

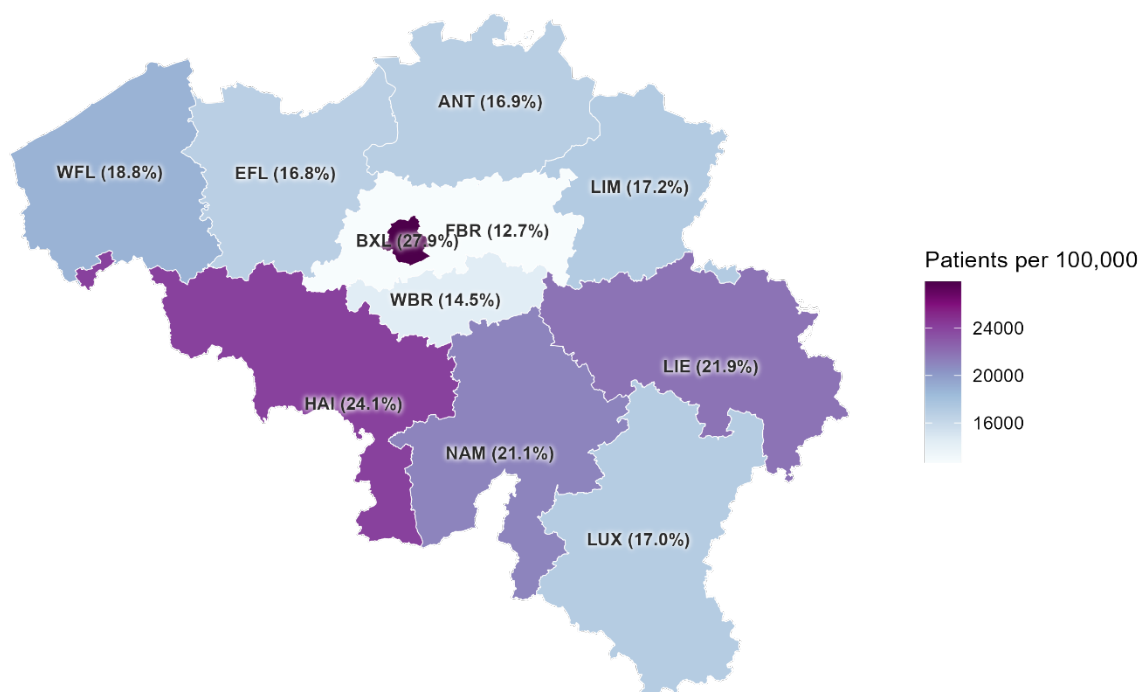


Figure 14 Proportion of patients with increased reimbursement by province in the Diabetes Barometer (December 2024). See earlier captions for province abbreviations.

9.1.4 Indicator performance

Figure 15 displays the weighted provincial analysis of performance on the quality indicators collected in the Diabetes Barometer. This analysis reveals substantial regional and provincial variation across indicators. Flemish provinces consistently outperform Wallonia and Brussels on laboratory-based indicators, such as HbA1c, eGFR, and LDL cholesterol. For example, Limburg and West Flanders exceed 77% for HbA1c and eGFR, while Antwerp and Flemish Brabant also score above 70%, indicating strong adherence to recommended monitoring. In contrast, Walloon provinces such as Hainaut and Liège remain below 50% for HbA1c and show particularly low eGFR performance (<35%). Brussels-Capital Region performs similarly to Wallonia on these indicators, with HbA1c around 38% and eGFR near 22%.

Clinical examination indicators, such as blood pressure and Body Mass Index (BMI), show narrower differences across regions, with most provinces achieving 45–55% for blood pressure. However, waist circumference and feet examination remain very low everywhere (<5%), highlighting a systemic challenge in implementing these assessments. For other indicators, influenza vaccination coverage is highest in Flemish provinces (35–38%), while smoking status registration varies widely, reaching 26% in Antwerp and West Flanders but remaining below 14% in most Walloon provinces. The overall composite indicator remains extremely low (<1% in all provinces), underscoring the difficulty of meeting all quality criteria simultaneously.

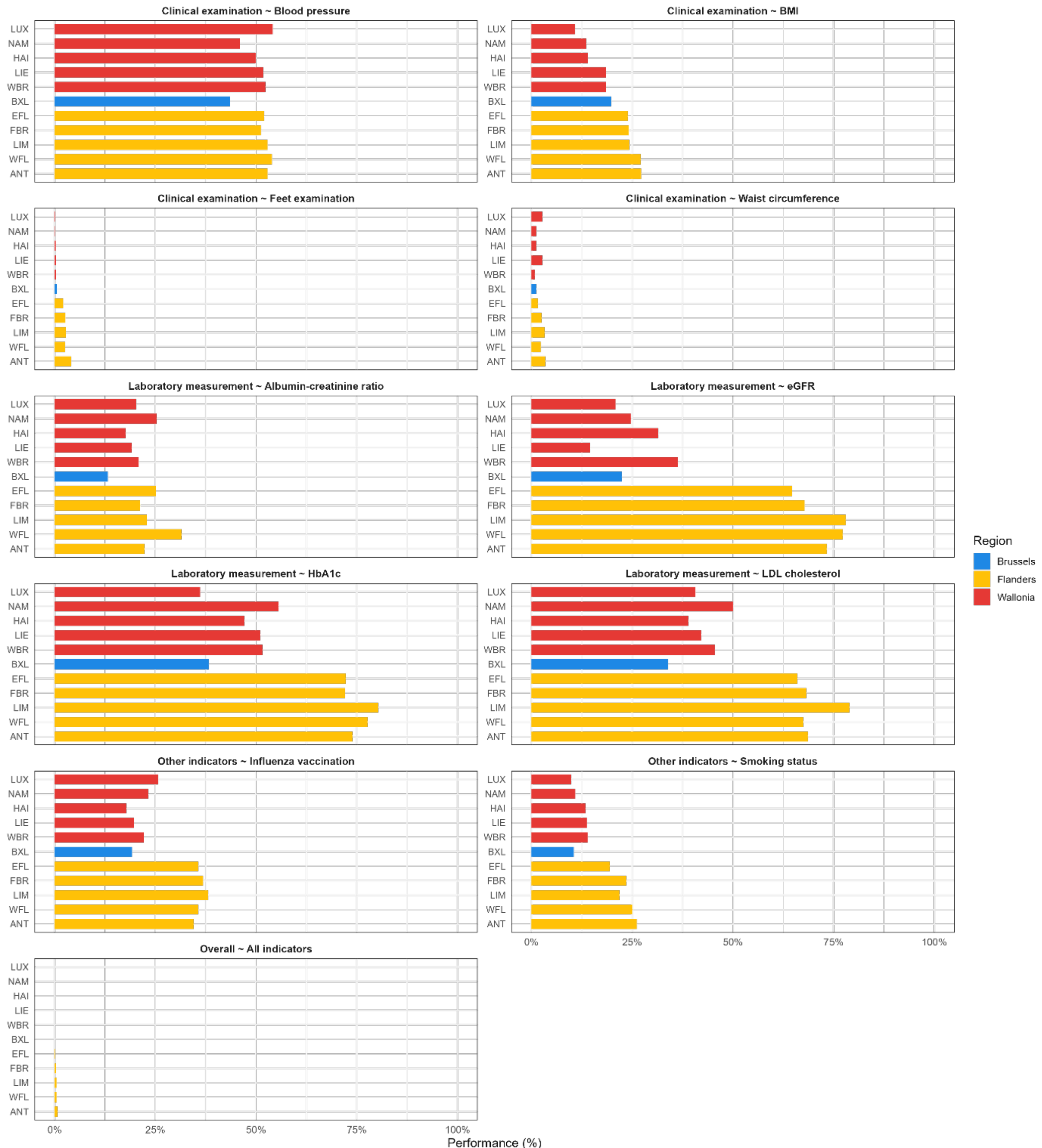


Figure 15 Weighted indicator performance by province in the Diabetes Barometer (December 2024). The figure displays provincial performance across laboratory measurements (HbA1c, albumin-creatinine ratio, eGFR, LDL cholesterol), clinical examinations (blood pressure, BMI, waist circumference, feet examination), and other indicators (smoking status, influenza vaccination), as well as the overall composite indicator (for practices that reached all indicator targets). See earlier captions for province abbreviations.

Table 2 Summary of practice characteristics and contextual factors for participating general practices in the Diabetes Barometer (December 2024).

Region	FLA					WAL					BXL
Province	WFL	EFL	ANT	FBR	LIM	HAI	WBR	NAM	LUX	LIE	BXL
Barometer participation											
Number of practices	431	553	561	396	282	450	184	68	92	312	472
Total number of GPs	1167	1604	1819	1144	1003	883	419	137	254	788	1304
Practice characteristics											
Practice type											
• Solo	192 (44.5%)	245 (44.3%)	218 (38.9%)	176 (44.4%)	104 (36.9%)	293 (61%)	90 (48.9%)	112 (52.1%)	45 (48.9%)	191 (47.6%)	232 (49.2%)
• Duo	53 (12.3%)	61 (11%)	66 (11.8%)	54 (13.6%)	30 (10.6%)	72 (15%)	37 (20.1%)	38 (17.7%)	16 (17.4%)	63 (15.7%)	59 (12.5%)
• Network	6 (1.4%)	4 (0.7%)	10 (1.8%)	6 (1.5%)	6 (2.1%)	6 (1.2%)	6 (3.3%)	4 (1.9%)	4 (4.3%)	6 (1.5%)	7 (1.5%)
• Group	177 (41.1%)	227 (41%)	243 (43.3%)	154 (38.9%)	136 (48.2%)	87 (18.1%)	40 (21.7%)	47 (21.9%)	18 (19.6%)	106 (26.4%)	96 (20.3%)
• WGC	3 (0.7%)	16 (2.9%)	24 (4.3%)	6 (1.5%)	6 (2.1%)	22 (4.6%)	11 (6%)	14 (6.5%)	9 (9.8%)	35 (8.7%)	78 (16.5%)
Practice size (n°GPs)											
• One	183 (42.5%)	241 (43.6%)	202 (36%)	169 (42.7%)	102 (36.2%)	269 (59.8%)	89 (48.4%)	38 (55.9%)	47 (51.1%)	161 (51.6%)	242 (51.3%)
• Two	58 (13.5%)	64 (11.6%)	78 (13.9%)	55 (13.9%)	30 (10.6%)	88 (19.6%)	38 (20.7%)	12 (17.6%)	17 (18.5%)	56 (17.9%)	65 (13.8%)

Region	FLA					WAL					BXL
Province	WFL	EFL	ANT	FBR	LIM	HAI	WBR	NAM	LUX	LIE	BXL
• 3-5	146 (33.9%)	170 (30.7%)	185 (33%)	116 (29.3%)	89 (31.6%)	68 (15.1%)	45 (24.5%)	15 (22.1%)	14 (15.2%)	58 (18.6%)	109 (23.1%)
• 6-10	43 (10%)	72 (13%)	89 (15.9%)	54 (13.6%)	56 (19.9%)	23 (5.1%)	10 (5.4%)	3 (4.4%)	11 (12%)	34 (10.9%)	44 (9.3%)
• 11-20	1 (0.2%)	6 (1.1%)	7 (1.2%)	2 (0.5%)	3 (1.1%)	2 (0.4%)	2 (1.1%)	0 (0%)	3 (3.3%)	3 (1%)	11 (2.3%)
• >20	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (0.7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.2%)
GPs' age profile											
• <30	9 (2.1%)	10 (1.8%)	5 (0.9%)	1 (0.3%)	1 (0.4%)	28 (5.8%)	8 (4.3%)	4 (1.9%)	4 (4.3%)	9 (2.2%)	12 (2.5%)
• 30-39	112 (26%)	160 (28.9%)	141 (25.1%)	105 (26.5%)	53 (18.8%)	164 (34.2%)	67 (36.4%)	63 (29.3%)	38 (41.3%)	142 (35.4%)	160 (33.9%)
• 40-49	115 (26.7%)	143 (25.9%)	175 (31.2%)	113 (28.5%)	112 (39.7%)	102 (21.2%)	53 (28.8%)	65 (30.2%)	17 (18.5%)	101 (25.2%)	99 (21%)
• 50-59	72 (16.7%)	82 (14.8%)	112 (20%)	72 (18.2%)	43 (15.2%)	60 (12.5%)	24 (13%)	26 (12.1%)	15 (16.3%)	55 (13.7%)	72 (15.3%)
• 60-64	48 (11.1%)	67 (12.1%)	54 (9.6%)	42 (10.6%)	26 (9.2%)	35 (7.3%)	11 (6%)	19 (8.8%)	2 (2.2%)	26 (6.5%)	47 (10%)
• ≥65	75 (17.4%)	90 (16.3%)	73 (13%)	61 (15.4%)	42 (14.9%)	74 (15.4%)	14 (7.6%)	32 (14.9%)	14 (15.2%)	50 (12.5%)	66 (14%)
• Missing	0 (0%)	1 (0.2%)	1 (0.2%)	2 (0.5%)	5 (1.8%)	17 (3.5%)	7 (3.8%)	6 (2.8%)	2 (2.2%)	18 (4.5%)	16 (3.4%)
GPs' staff											
• Practice nurse practitioner	62 (14.4%)	79 (14.3%)	126 (22.5%)	46 (11.6%)	71 (25.2%)	59 (12.3%)	15 (8.2%)	25 (11.6%)	12 (13%)	42 (10.5%)	84 (17.8%)

Region	FLA					WAL					BXL
Province	WFL	EFL	ANT	FBR	LIM	HAI	WBR	NAM	LUX	LIE	BXL
• Practice assistant	219 (50.8%)	267 (48.3%)	314 (56%)	173 (43.7%)	164 (58.2%)	134 (27.9%)	58 (31.5%)	72 (33.5%)	42 (45.7%)	127 (31.7%)	149 (31.6%)
GPs' EHR system											
• 1	373 (86.5%)	368 (66.5%)	395 (70.4%)	262 (66.2%)	164 (58.2%)	200 (41.7%)	57 (31%)	57 (26.5%)	23 (25%)	213 (53.1%)	112 (23.7%)
• 2	43 (10%)	86 (15.6%)	104 (18.5%)	70 (17.7%)	59 (20.9%)	8 (1.7%)	1 (0.5%)	6 (2.8%)	1 (1.1%)	4 (1%)	12 (2.5%)
• 3	14 (3.2%)	87 (15.7%)	59 (10.5%)	57 (14.4%)	40 (14.2%)	130 (27.1%)	47 (25.5%)	56 (26%)	42 (45.7%)	88 (21.9%)	195 (41.3%)
• 4	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	31 (6.5%)	7 (3.8%)	9 (4.2%)	5 (5.4%)	45 (11.2%)	20 (4.2%)
• 5	0 (0%)	12 (2.2%)	0 (0%)	7 (1.8%)	0 (0%)	110 (22.9%)	70 (38%)	86 (40%)	19 (20.7%)	49 (12.2%)	133 (28.2%)
• 6	1 (0.2%)	0 (0%)	3 (0.5%)	0 (0%)	19 (6.7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
• 7	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.2%)	2 (1.1%)	1 (0.5%)	2 (2.2%)	2 (0.5%)	0 (0%)
Population context											
• Prevalence of diabetes	6.4%	5.2%	5.5%	5.1%	5.4%	4.6%	3.6%	4.2%	3.8%	4.7%	4.2%
• Prevalence of increased reimbursement	18.8%	16.8%	16.9%	12.7%	17.2%	24.8%	14.5%	21.6%	17%	22%	27.9%

9.2 Longitudinal analysis

9.2.1 Practice participation

The evolution of participation in the Diabetes Barometer across different timepoints is visualized in Figure 16. Participation increased between Dec 2023 and Dec 2024 in almost all provinces for both practices and GPs. In Flanders, absolute counts are highest throughout: Antwerp, East Flanders and West Flanders rise to peaks in Dec 2024 (e.g., Antwerp practices 420→482→563; GPs 1,383→1,610→1,842), followed by a slight decline in Jun 2025 in several provinces (Antwerp and Flemish Brabant; Limburg more pronounced for GPs). In Wallonia, participation steadily grows across the series: Liège shows the largest increase (practices 292→341→407→440; GPs 802→902→1,085→1,170), Hainaut rises and then stabilizes between the last two waves, and Namur, Walloon Brabant and Luxembourg show incremental gains. Brussels-Capital Region also increases to Dec 2024 (practices 340→415→483; GPs 958→1,158→1,386) with a small dip in Jun 2025. Overall, regional differences are visible in the higher absolute participation in Flanders, intermediate and growing participation in Walloon Region, and Brussels-Capital Region trending upwards to late 2024 with a modest fallback in the final timepoint.

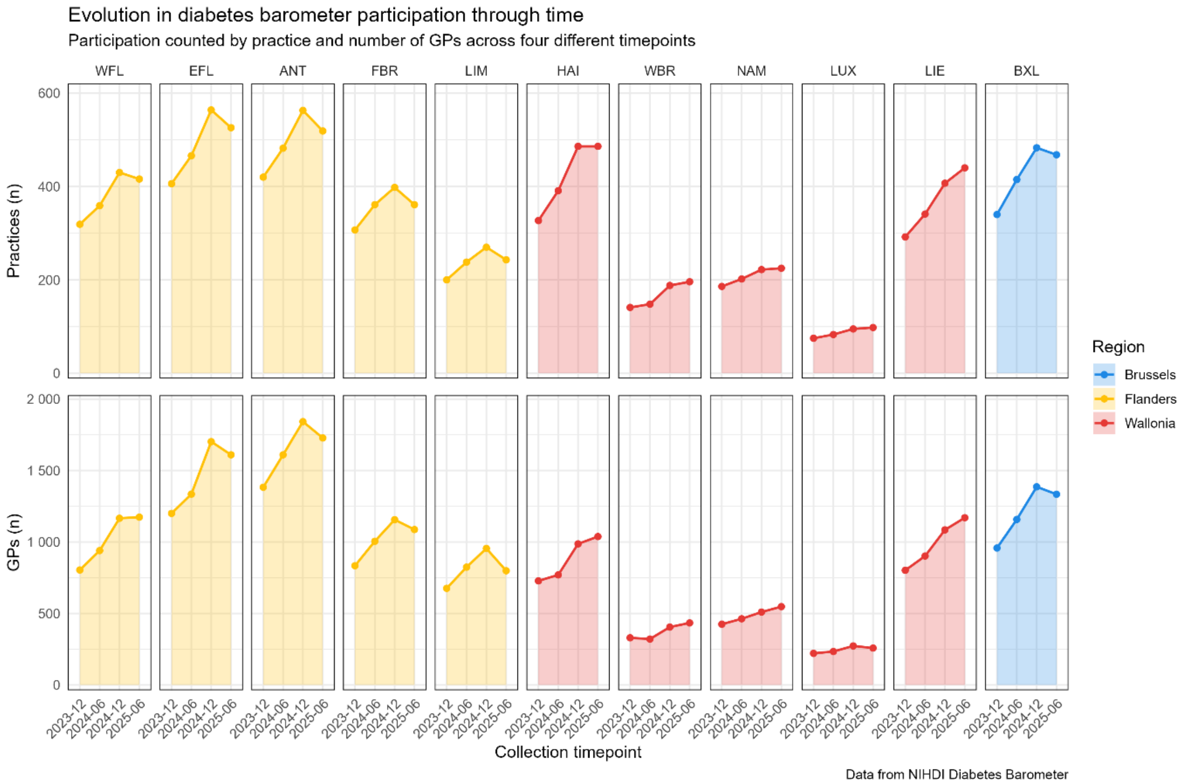


Figure 16 Evolution in Diabetes Barometer participation across four data collections (2023-12, 2024-06, 2024-12, 2025-06) for both the number of practices and number of general practitioners. Provinces are ordered west-to-east: WFL = West Flanders, EFL = East Flanders, ANT = Antwerp, FBR = Flemish Brabant, LIM = Limburg, HAI = Hainaut, WBR = Walloon Brabant, NAM = Namur, LUX = Luxembourg, LIE = Liège, BXL = Brussels-Capital Region. Lines and points are colored by region (Flanders = yellow, Wallonia = red, Brussels = blue). Practices with unknown province are excluded from the display.

9.2.2 Indicator performance

9.2.2.1 Clinical examination

Clinical examination indicators show substantial variation in performance and adoption (Figure 17). Among these, blood pressure measurement consistently achieves the highest coverage, with median values ranging from approximately 50–70% across provinces. BMI measurement follows at lower levels, typically between 20–40%, while feet examination and waist circumference remain near zero in most provinces throughout all timepoints.

Across all regions, blood pressure and BMI indicators demonstrate incremental improvement over the four collection points (Figure 18). However, waist circumference and feet examination show negligible progress, with medians close to zero even in the latest timepoint.

9.2.2.2 Laboratory measurement

Laboratory indicators show higher overall performance compared to clinical examination measures, but with notable variation across indicators (Figure 19). HbA1c (glycohemoglobin) and LDL (low-density lipoprotein) cholesterol consistently achieve the highest coverage, with median values often exceeding 70% in Flanders and remaining relatively stable over time. Albumin-creatinin ratio (ACR) and estimated Global Filtration Rate (eGFR), display lower performance levels, and across regions medians frequently fall below 30%.

Flanders has a relatively consistent performance across all laboratory indicators, maintaining high medians for HbA1c and LDL and showing gradual improvement for ACR and eGFR. Wallonia exhibits greater heterogeneity: provinces such as Namur and Walloon Brabant show upward trends for ACR and eGFR, while Hainaut and Liège remain at lower levels. Brussels lags behind both regions, especially for ACR and eGFR, where performance remains minimal throughout the observation period.

Across all regions, HbA1c and LDL indicators remain stable at high levels (Figure 20), suggesting these tests are well integrated into routine diabetes and cardiovascular care. In contrast, ACR and eGFR show modest improvements over time, particularly in Wallonia, but remain far from optimal.

9.2.2.3 Other indicators

Performance for other indicators is markedly lower compared to laboratory and clinical measures (Figure 21). Influenza vaccination shows moderate uptake, with median values around 40–50% in Flanders and substantially lower in Wallonia and Brussels, where medians hover near 20–30%. Smoking status recording remains the least implemented indicator, with medians below 30% even in the best-performing provinces.

As for previous indicators, Flanders shows a relatively consistent performance for influenza vaccination and gradual improvement for smoking status documentation. Wallonia scores lower, with considerable variability between provinces: Namur and Walloon Brabant exhibit slightly better performance than Hainaut and Liège.

Influenza vaccination coverage demonstrates cyclical variation across collection points, but overall trends remain stable in Flanders and modestly upward in Wallonia (Figure 22). In Flanders, this pattern may reflect the pull integration between Vaccinnet and GP EHRs via Vitalink webservices: vaccinations administered in pharmacies, residential care homes, or hospitals are registered in Vaccinnet, and only surface in the GP record once the EHR actively queries Vitalink—typically when the GP opens the patient file during a later contact. This workflow can produce apparent increases in coverage in spring (e.g., May) as winter vaccinations are retrospectively synchronized, rather than indicating late vaccination. Smoking status recording shows incremental improvement in most provinces, yet remains far from optimal, indicating persistent gaps in lifestyle risk factor documentation.

9.2.2.4 Overall

Overall completeness—defined as achieving all quality indicators for eligible patients—remains extremely low across all regions and provinces. Median values are effectively zero throughout the observation period, indicating that almost no practices consistently meet all recommended indicators simultaneously.

9.2.2.5 Achievable Benchmarks of Care

Performance for each indicator in the top 10% best performing practices in comparison with the overall average performance per region is shown in Figure 23. These benchmarks show realistic goals for the measured indicators in each region. The performances in the top practices in each region were comparable for most indicators, although slightly higher in Flanders. In general, the performances were high for blood pressure measuring and laboratory indicators like HbA1C, LDL and eGFR (ABC™ performance >75%). They also set real-world goals for indicators that showed lower average

performances in each region, like measuring ACR, influenza vaccination, and BMI and smoking registration (ABC™ performance 50-75%). On the other hand, challenges also remain in top performing practices for indicators like waist circumference and feet examination (ABC™ performance <50%).

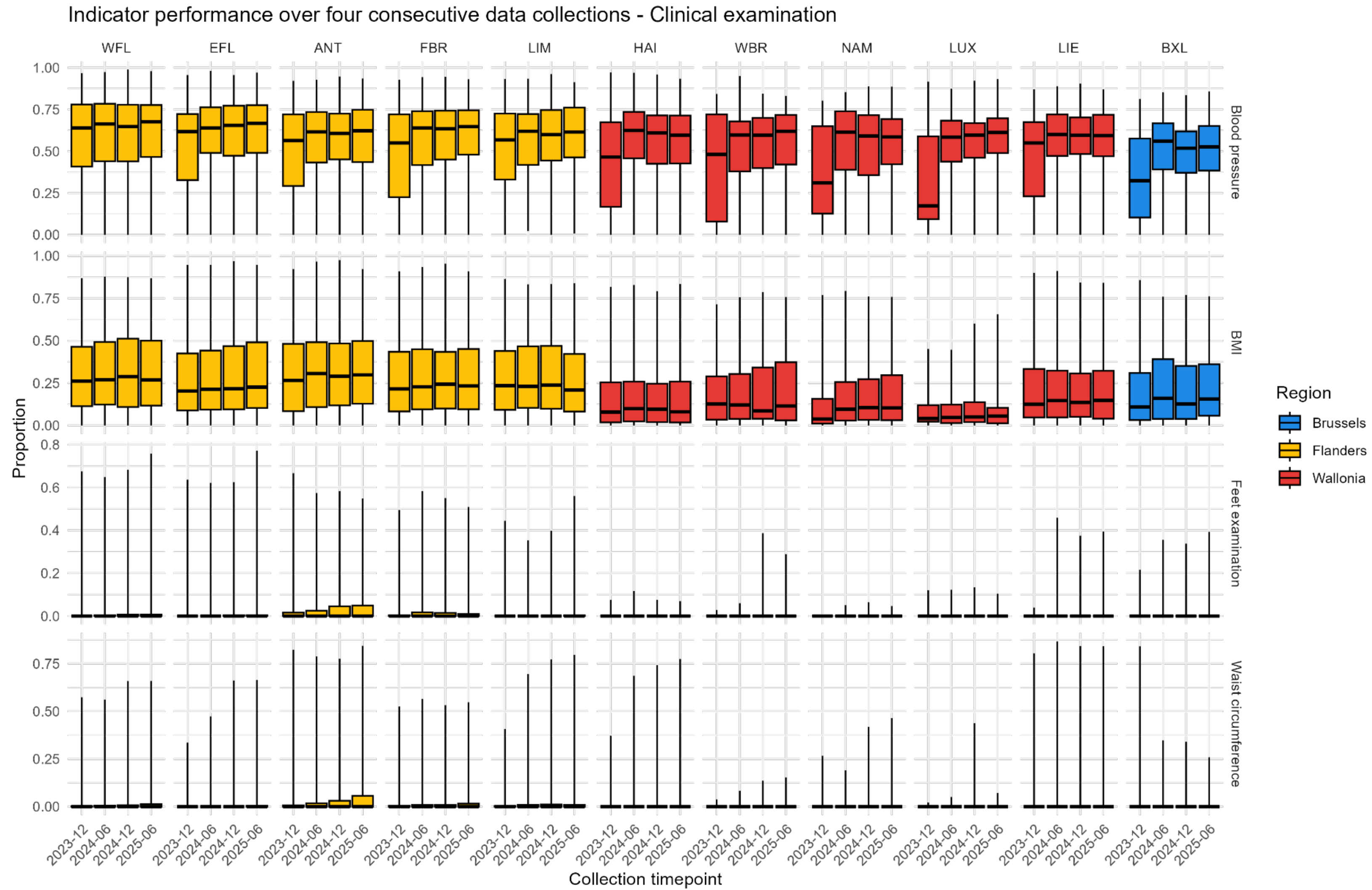


Figure 17 Indicator performance over four consecutive data collections for clinical examination indicators. Each boxplot shows the distribution of practice performance across provinces for four timepoints (2023-12, 2024-06, 2024-12, 2025-06). Indicators include Blood pressure, BMI (Body Mass Index), Feet examination, and Waist circumference. See earlier captions for province abbreviations.

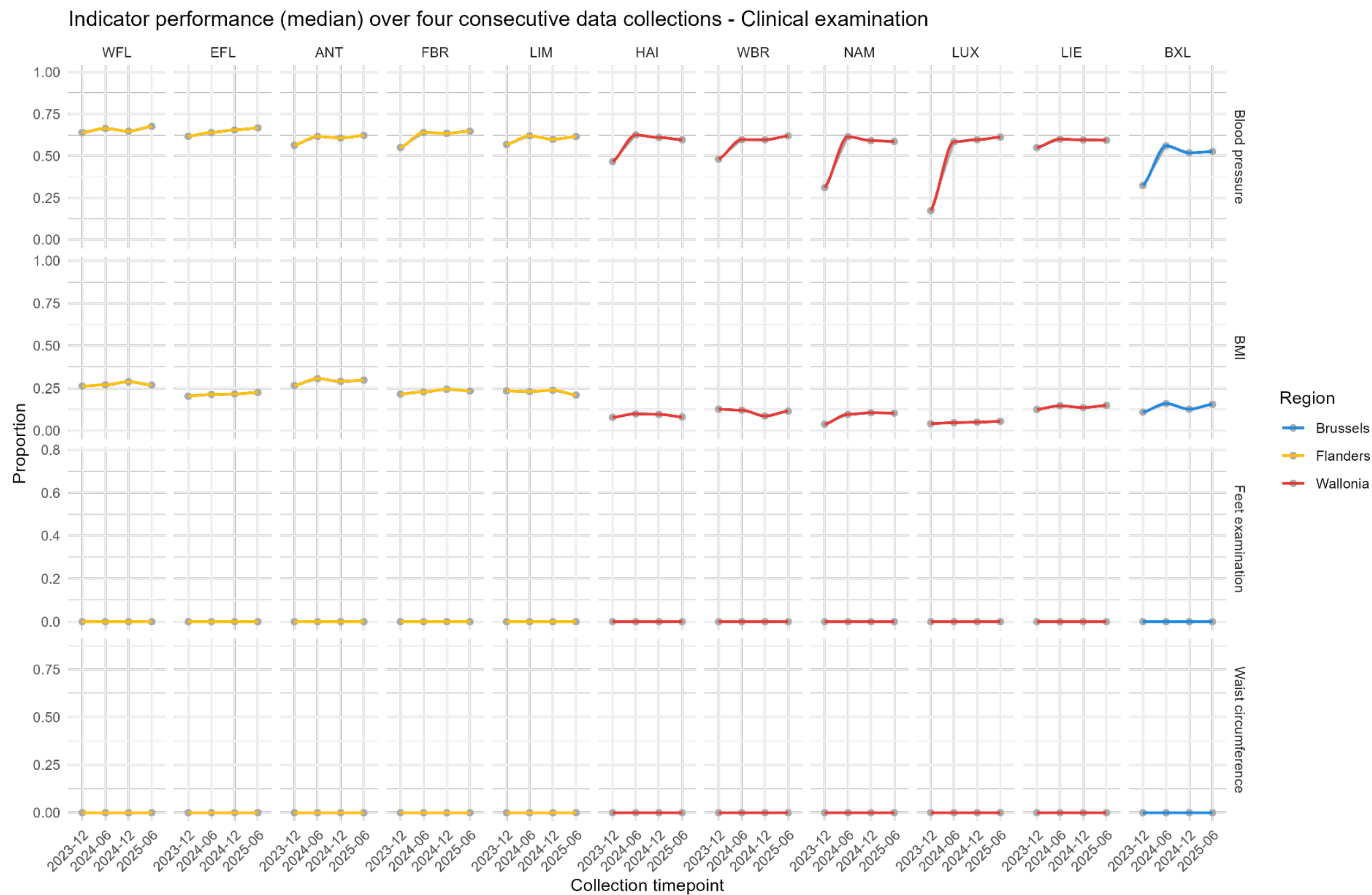


Figure 18 Median performance of clinical examination indicators across four consecutive data collections. Lines connect median values per province over time, with LOESS regression trends by region. Indicators include Blood pressure, BMI, Feet examination, and Waist circumference. See earlier captions for province abbreviations.

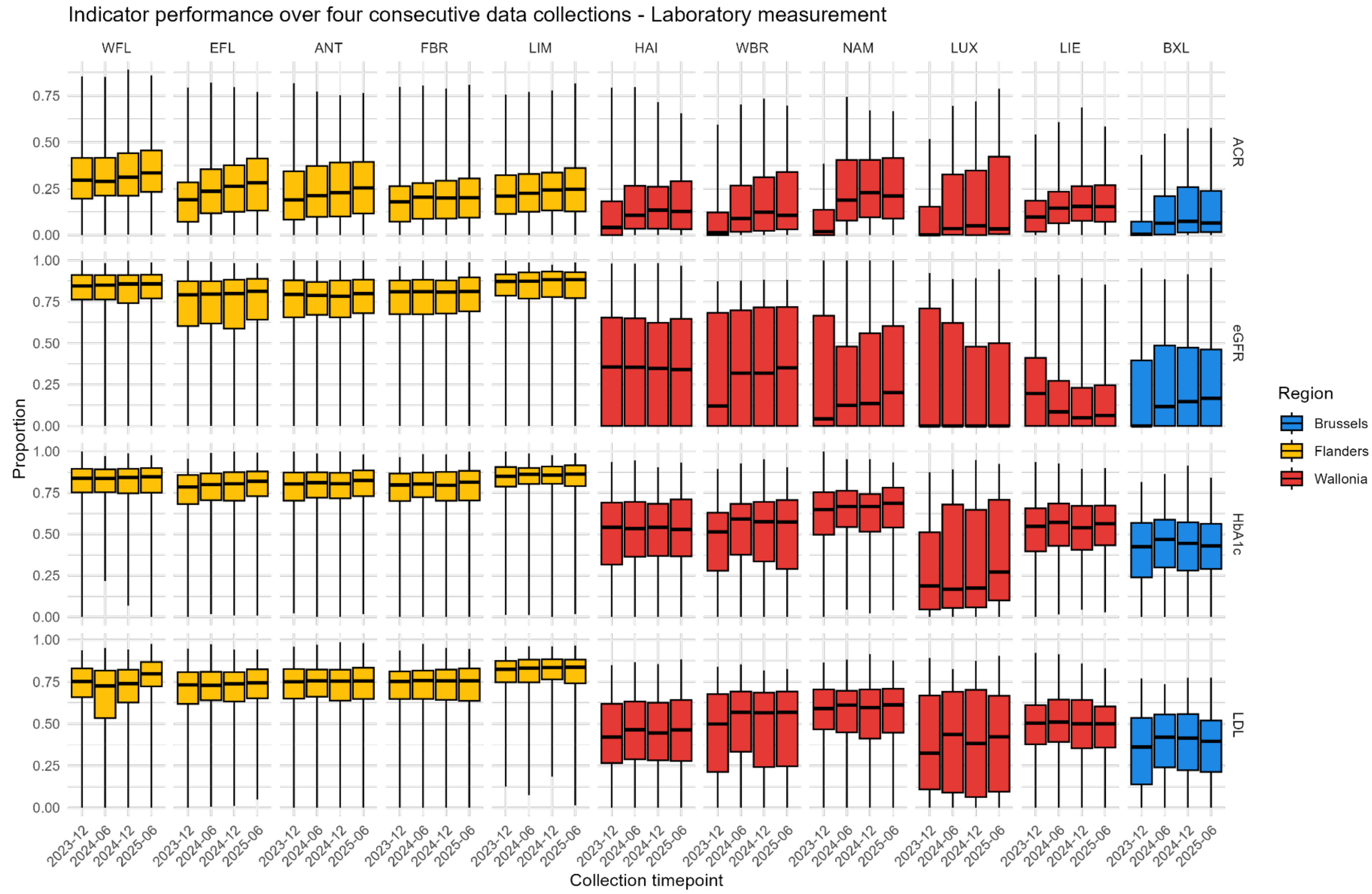


Figure 19 Indicator performance over four consecutive data collections for laboratory measurement indicators. Each boxplot shows the distribution of practice performance across provinces for four timepoints (2023-12, 2024-06, 2024-12, 2025-06). Indicators include HbA1c, ACR (albumin-creatinine ratio), eGFR (estimated glomerular filtration rate), and LDL (low-density lipoprotein cholesterol). See earlier captions for province abbreviations.

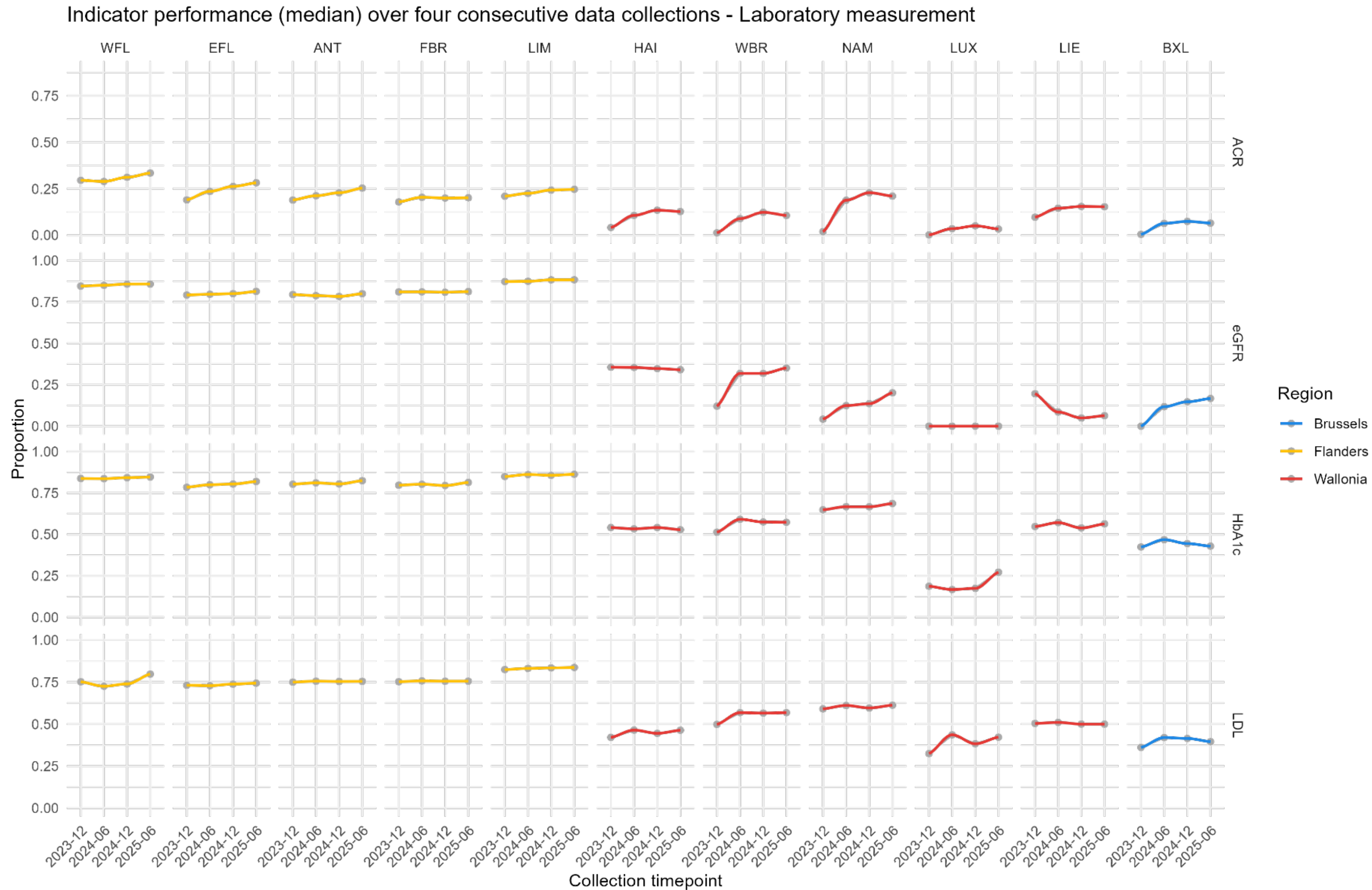


Figure 20 Median performance of laboratory measurement indicators across four consecutive data collections. Lines connect median values per province over time, with LOESS regression trends by region. Indicators include HbA1c, ACR, eGFR, and LDL. Indicators include HbA1c, ACR (albumin-creatinine ratio), eGFR (estimated glomerular filtration rate), and LDL (low-density lipoprotein cholesterol). See earlier captions for province abbreviations.

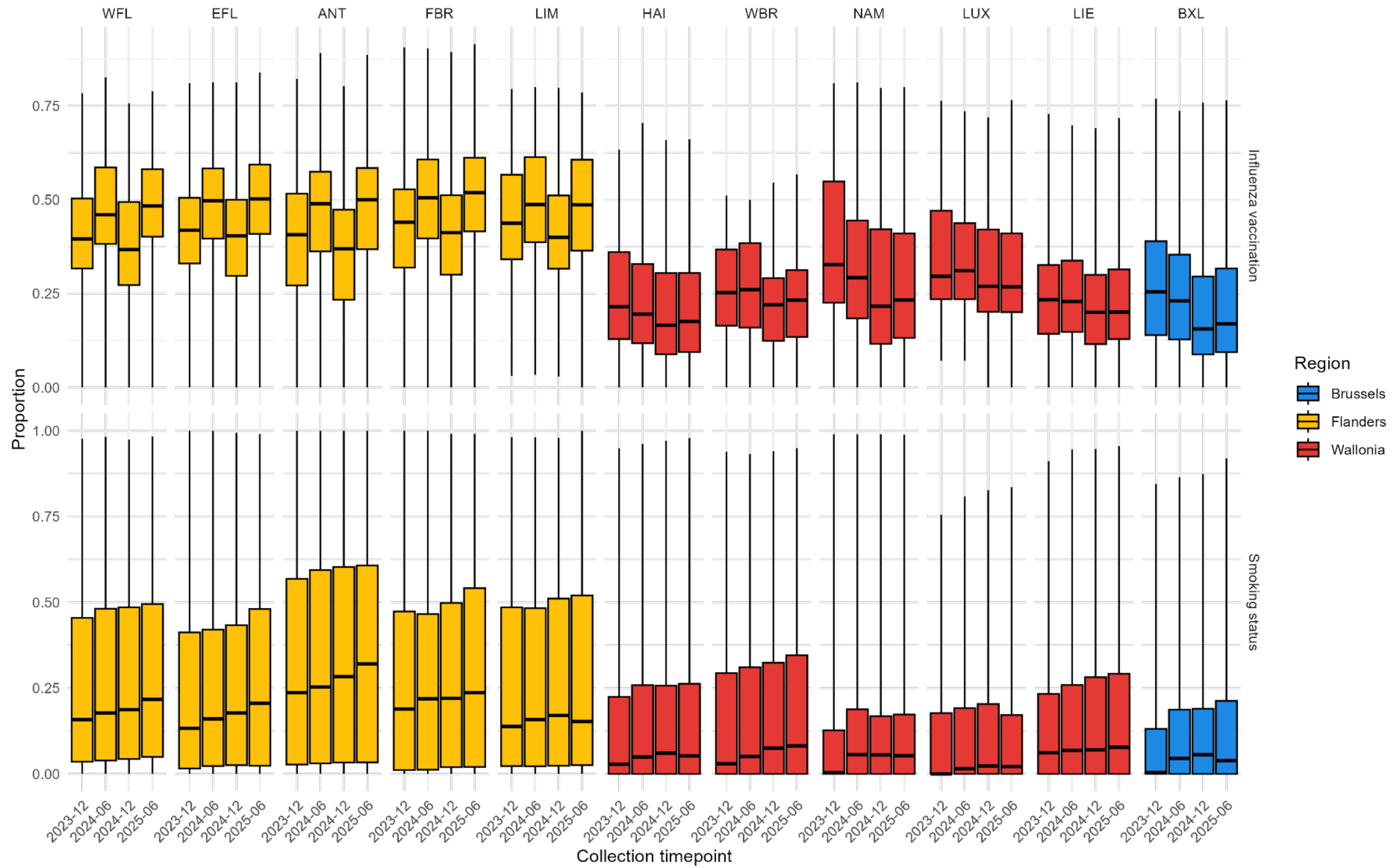


Figure 21 Indicator performance over four consecutive data collections for other indicators. Each boxplot shows the distribution of practice performance across provinces for four timepoints (2023-12, 2024-06, 2024-12, 2025-06). Indicators include Influenza vaccination and Smoking status. See earlier captions for province abbreviations.

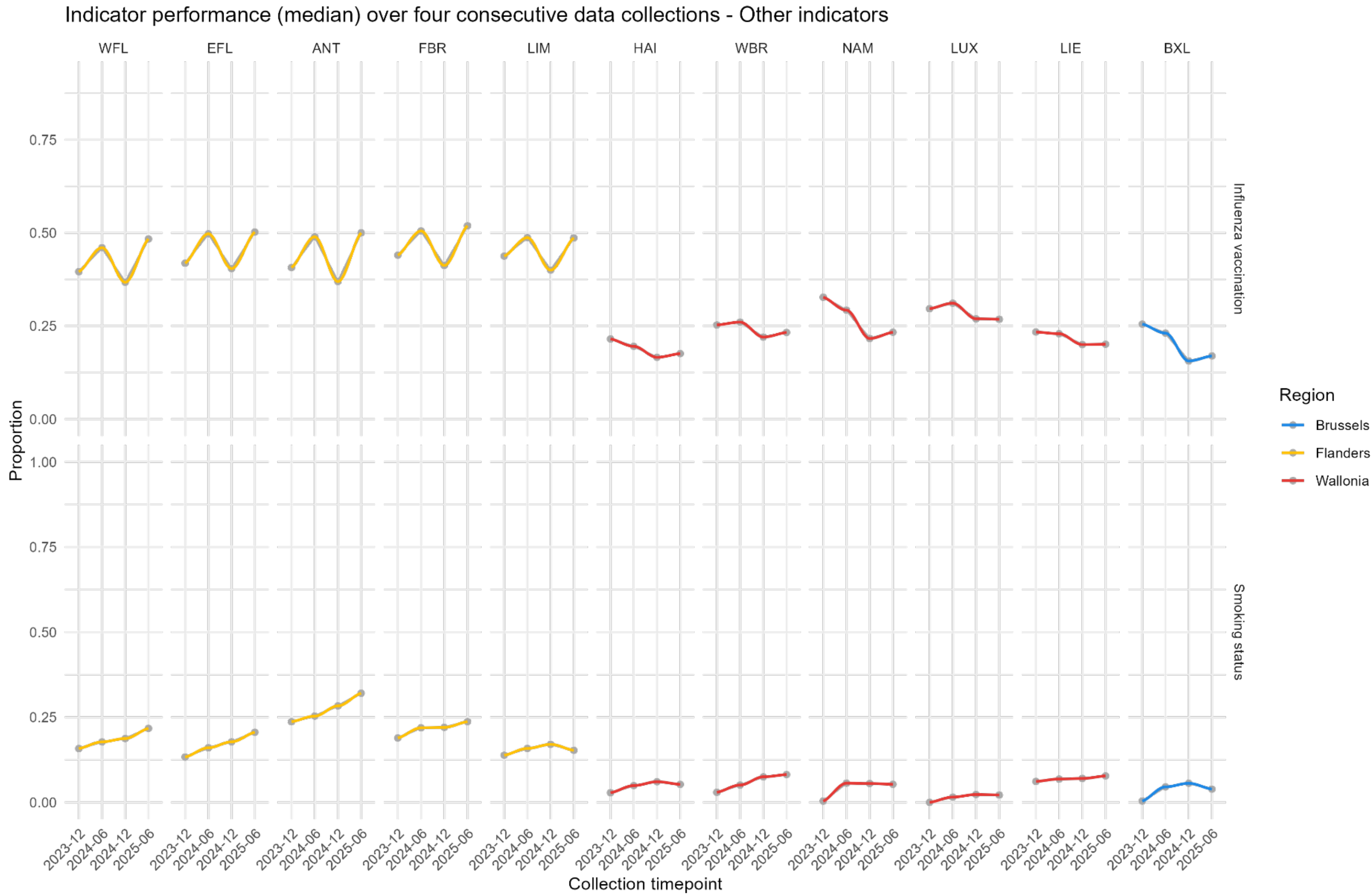


Figure 22 Median performance of other indicators across four consecutive data collections. Lines connect median values per province over time, with LOESS regression trends by region. Indicators include Influenza vaccination and Smoking status. See earlier captions for province abbreviations.

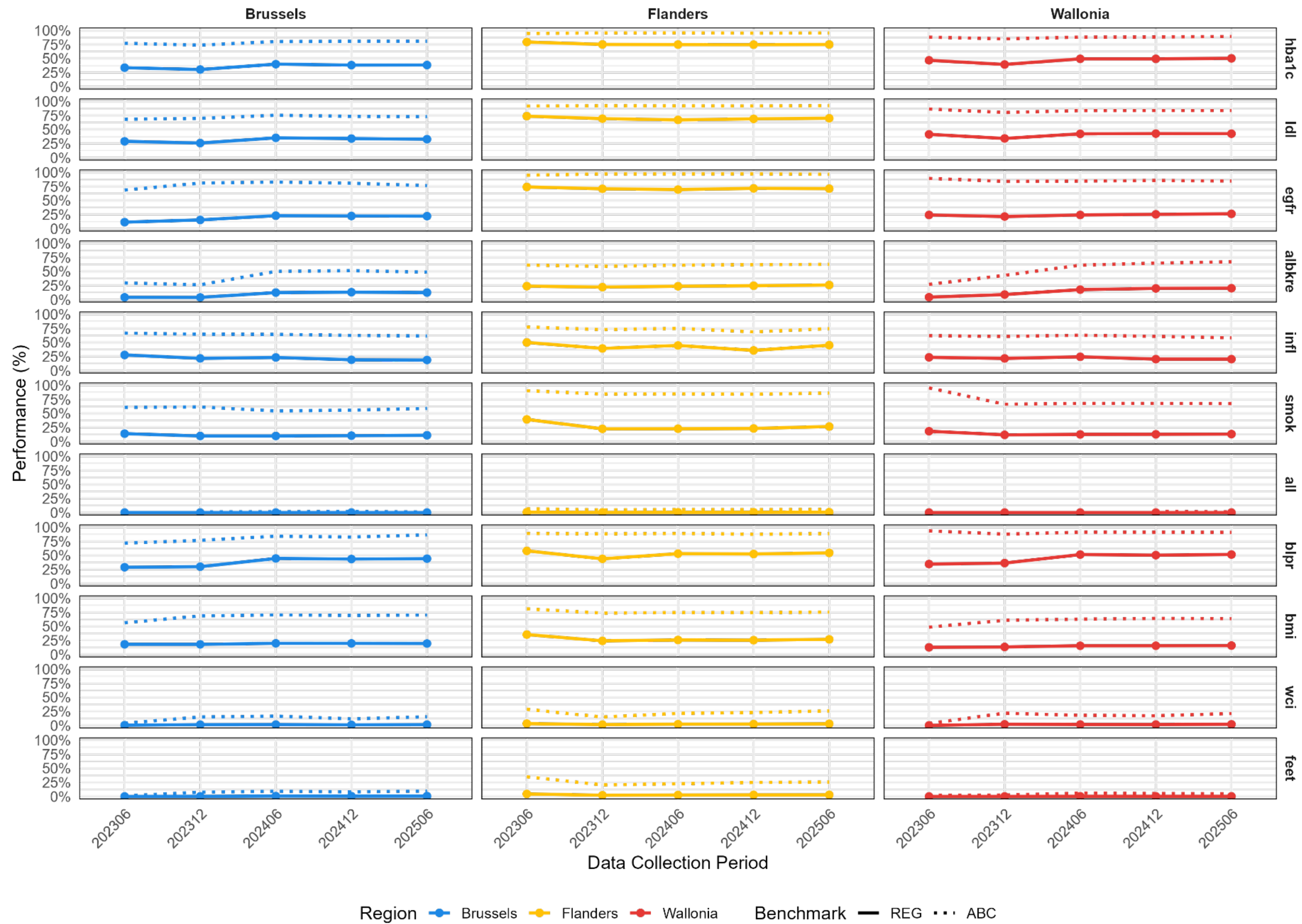


Figure 23 Mean performance and mean performance for the ABC per region on the indicators across four consecutive data collections. Lines connect median values per region over time.

10 Discussion

The December 2024 data collection of the Diabetes Barometer is perhaps the most comprehensive snapshot of diabetes care processes ever collected for Belgian primary care. In this collection, 4157 practices and 11 667 general practitioners contributed data, covering approximately 9.3 million Belgians with a global medical record (GMR), thus representing around 79% of the Belgian population. To our knowledge, such a comprehensive primary care federated data collection process is without peer internationally. Looking beyond participation, there are clear regional differences in practice characteristics, population profiles and indicator performance. Flemish provinces generally report higher adherence to laboratory-based indicators, while other regions show lower registration rates, particularly for kidney function and lifestyle-related parameters. These differences coincide with marked heterogeneity in practice organization (solo vs. group), staffing and electronic health record (EHR) systems, all of which very likely influence indicator completeness. Encouragingly, longitudinal trends are generally positive, with a steady increase across successive data collections. This might signal growing engagement and technical refinement within practices.

There are several lessons to be drawn from this. First, beyond its scale, the Diabetes Barometer demonstrates that it is possible to implement and operate a federated, twice-yearly quality-monitoring infrastructure across very heterogeneous general practices and EHR systems. This is very much a testament to the continued engagement of all different governmental and industry stakeholders. By aligning these partners around a shared indicator set and secure data pipeline, the Barometer delivers standardized, practice-level extracts with low cognitive load for participating practices (single sign-on). Crucially, and this is a major innovation for Belgian health care, by combining care process quality indicators with practice characteristics (type, size, staffing, EHR, age profile) and population context (diabetes prevalence, increased reimbursement) it forges this instrument into an important policy instrument that can be used to support and evaluate primary care in better diabetes care. The embedded geographic benchmarking and translated follow-up queries integrated in EHR systems that generate patient lists translate feedback into actionable workflows and enable active outreach within practices and first-line zones. As a result, the Barometer presents a repeatable granular snapshot of diabetes care quality comparable across diverse administrative sectors that can inform incentive design, interoperability priorities for EHR (e.g. FHIR (Fast Healthcare Interoperability Resources) and SNOMED-CT (Systematized Nomenclature of Medicine – Clinical Terms) adoption), and support packages for practices with greater registration or organizational constraints.

Second, the interpretation of indicator performance has to take into account the substantial heterogeneity in practice organization, workforce and support, EHR ecosystems, and population context revealed by the Diabetes Barometer. Practice models differ markedly by region: solo practices dominate in Wallonia (e.g. 61% in Hainaut) whereas group practices are more prevalent in Flanders (e.g. Limburg 48%) and Brussels has a distinctive profile with a markedly larger proportion of community health centers (WGC) at 16.5%. These profiles are compounded by the provincial variation in GMR coverage, which ranges from more than 85% in Limburg and West Flanders to less than 70% in Hainaut and Brussels. Lower GMR uptake reduces the size and completeness of eligible patient cohorts and thus influences indicator denominators and comparability. In addition, these patterns naturally extend to the staffing choices made by practices: the share of practices with an administrative assistant in Antwerp and Limburg (55% and 58%) is almost twice that of the share in Hainaut and Liège (27.9% and 31.7%). The same goes for a practice nurse (25.2% in Limburg, 10% in Liège). Crucially, due to its relation with the data pipeline, the EHR landscape is highly fragmented as well. A single vendor covers >80% of West-Flanders and >70% of Antwerp, whereas Brussels and Wallonia show more diverse provider mixes, highlighting historical differences in consolidation and market penetration. It is hard to not link the higher percentage of diabetes prevalence in West-Flanders to this EHR predominance, although an older population density in coastal municipalities could also play a role. The proportion of patients with increased reimbursement reflects the socio-economic north-south gradient, with peaks in Brussels (27.9%) and Hainaut (24.8%). Finally, all these disparities can be amplified by coverage gaps, as practices in low-GMR provinces manage smaller registered cohorts. For a fair comparison between regions, and possibly benchmarking as well, future results should be stratified by practice model, staffing, type of EHR and vulnerability of the underlying population. We therefore plan on quantifying these effects using regression modelling before attributing differences to care quality alone.

Taking these reservations into account, a look at the different indicators nonetheless offers a third interesting lesson. Across Belgium, laboratory indicators are consistently the strongest performers while clinical examinations and lifestyle documentation lag behind. In the December 2024 data collection, provincial averages for HbA1c and LDL-cholesterol are commonly in the 60% to 80% range in Flanders, and are lower in Brussels (HbA1c 38.3%, LDL 33.9%) and parts of Wallonia (e.g., Hainaut HbA1c 47.1%, LDL 39.0%). The same goes for monitoring of renal function, where eGFR scores between 70% and 80% in Flanders, but 22% in Brussels. Albumin-creatin ratio measuring is low everywhere (10% to 31% across provinces) indicating a system-wide gap in follow-up. Among clinical examinations, blood pressure measurements are relatively high (around 50% in most provinces), but registration of waist circumference and feet examination is almost non-existent. With regard to lifestyle and prevention, smoking status is rarely documented and even in high scoring provinces influenza vaccination reaches only a third of all eligible patients. The composite "overall" score is almost equal to zero, showing how difficult it is to meet every single process indicator for every eligible patient. There are two practical explanations for these patterns. First, lab results are typically integrated automatically into the EHR via electronic messaging, so once a test is ordered (by GP or specialist) and the interface functions correctly, registration is automatic. Second, registration of clinical details or lifestyle items often demand structured, manual entry during busy consultations. Without prompts or streamlined fields, these data are more likely to be under-recorded, even when care was actually delivered. It is possible that in the future, integrated speech-to-text "AI scribe" tools paired with structured concept extraction and clinician validation could reduce documentation burden for smoking status, feet checks and biometric data.

These lessons have some important policy implications. First, continued support for interoperability and coding alignment for lab flows (for example, stable mappings and conformance across vendors), as well as structured capture aids for lifestyle data remain warranted. This entails an acceleration of vendor-neutral adoption of FHIR-based messaging and SNOMED CT for structured concepts and conformance tests (for example, stable LOINC (Logical Observation, Identifiers, Names and Codes) mappings for HBA1c, LDL, eGFR and ACR; explicit fields for feet examination, smoking status and biometric information). Second, continued investment in low-friction documentation inside EHRs, ideally with visually striking and intuitive dashboards that enable high-level management of risk populations. Third, targeted engagement strategies to ensure full population coverage in regions with low baseline GMD coverage such as Hainaut, Brussels and Liège. And fourth, targeted organization support where solo practice models and limited staffing correlate with lower registration rates.

10.1 Conclusion

Taken together, the findings from the Diabetes Barometer show that Belgium now has a repeatable, federated infrastructure capable of monitoring diabetes care processes at scale. This can serve as the foundation for actionable improvement of quality of care in general practice. As of now, the Barometer data collections show widespread participation and some clear signals for action: further work on the integration of laboratory information in the electronic health record, support for the documentation of lifestyle and clinical information and addressing heterogeneity in local characteristics and EHR ecosystems through fair benchmarking. With these steps, as well as the planned evolution toward outcome indicators and integrated EHR dashboard, the Barometer can serve as a national learning and governance platform for diabetes, and by extension, other chronic conditions. This will cement its role as an important policy instrument to guide quality improvement for diabetes in the next decade.

11 References

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