

Recommendations to Improve Screening for Diabetes-Related Nephropathy and Retinopathy



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Health Collaborative**

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Executive Summary

Diabetes and diabetes-related complications are a leading cause of morbidity and death in the United States and Kentucky. As of 2023 in Kentucky, 13.7% of the population (482,202 people) have diabetes (type 1 and type 2), and an additional 380,916 people have prediabetes, meaning they are at risk for developing the disease. Diabetes is a significant financial and health care burden in the Commonwealth and disproportionately impacts people covered by Medicaid and those living in rural areas. Health care providers and people with diabetes report limited understanding of screening practices for diabetes-related complications, including retinopathy and nephropathy. Understanding current practices, barriers, and opportunities can provide a foundation for developing and implementing data-driven strategies to improve the system of care for people in Kentucky who are experiencing diabetes and/or diabetes-related complications.

This report summarizes findings from diverse sources, including a review of the literature and national and state-level trends related to diabetes-related retinopathy and nephropathy screening. The report also summarizes relevant data from the Kentuckiana Health Collaborative's Consolidated Measurement Reports, data collected from a cross-sectional survey of healthcare providers and administrators in Kentucky, and qualitative data from roundtable discussions with multi-sector stakeholders. The purpose of this report is to synthesize data and knowledge on these topics and present recommendations to improve the system of care for people in Kentucky who have diabetes and/or are experiencing diabetes-related complications.

Background

Trends in Diabetes in the United States and Kentucky

Diabetes is a leading cause of death in the United States. In 2023, there were 95,190 deaths attributed to diabetes, representing 3.1% of overall deaths nationally.¹ An estimated 40.1 million people (12% of the population) in the United States have diagnosed or undiagnosed diabetes, with higher rates among men (14.9% vs. 12.4% among women), non-Hispanic Black populations (20.7% vs. 11.2% among white), and those with less than a high school education (23.2% vs. 12.0% among those with more than high school).²

As of 2023, in Kentucky, 482,202 people (13.7%) were estimated to have diabetes, with an additional 380,916 people with prediabetes, meaning they were at-risk for developing diabetes in the future. Kentucky has the 9th highest rate of diabetes-related mortality in the country.³

In 2023, the diabetes prevalence rate for Black populations in Kentucky was 19.4% compared to 17% for Hispanic and 13.7% for white populations. Further, the prevalence of diabetes is disproportionately higher among adults covered by Medicaid (14.3%) compared to the overall state rate of 13.7%. Among those with Medicaid, prevalence is highest in non-metro rural areas (16.9%) and lowest in metro areas (12.3%). Appalachian Kentucky has a rate of 20.4%, compared to 11.5% in non-Appalachian Kentucky.³ Overall, the total annual direct cost of diabetes to Kentucky (2023) is an estimated \$6.4 billion, with Medicaid costs of \$2.0 billion and Medicare costs of \$1.97 billion.⁵ Racial, socioeconomic, and geographic disparities in diabetes-related morbidity and mortality reflect structural differences in access to high-quality care, differences in patient and provider knowledge and awareness, economic development, and differences in access to innovations in diabetes treatments.⁴

Screenings for People with Diabetes

Diabetes contributes to increased risk for morbidities such as nephropathy (kidney disease), neuropathy (nerve damage), and retinopathy (eye disease).⁶ The United States Department for Health and Human Services has established Healthy People 2030 goals for reducing vision loss from diabetic retinopathy (2023: 48.4 per 1,000 adults; target: 28.9 per 1,000 adults), increasing the proportion of adults with diabetes who have annual vision screenings (2023: 66%; target: 70.3%), and increasing the percentage of adults with diabetes who receive an annual urinary test to prevent end-stage kidney disease (2022: 52.7%; target: 66.4%).⁷

Without proper screening, diabetes-related complications can go undetected until they reach advanced, costly stages with potentially irreversible outcomes. Increasing screening rates can

reduce the incidence and severity of preventable kidney and eye diseases and enhance the quality of life for people with diabetes in Kentucky. There is an opportunity to increase screening rates for diabetes-related kidney and eye disease in the Commonwealth.

Eye Screening

Diabetic retinopathy, a progressive disease of the blood vessels in the retina, is the leading cause of blindness in American adults of working age.⁸ Regular eye exams are the best prevention for reducing the risk of vision loss in people with diabetes (PWD). The American Diabetes Association (ADA) recommends that adults with type 1 and type 2 diabetes have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist within five years of diabetes onset (type 1) or at the time of diagnosis (type 2). Screening every one to two years is recommended if there is no evidence of retinopathy from one or more annual eye exams and glycemic indicators are within range.⁹

Kidney Screening

Chronic kidney disease (CKD) is common among PWD and often goes undetected until advanced stages. Once CKD has advanced, dialysis or a kidney transplant is required to survive. Regular screenings for kidney health are the best prevention for long-term morbidities and/or mortality.¹⁰ The ADA recommends that kidney function be assessed through a urine albumin and estimated glomerular filtration rate (eGFR) in people who have had type 1 diabetes for five years or greater and in all people with type 2 diabetes, regardless of treatment. Among those with established CKD, urinary albumin and eGFR is recommended one to four times annually depending on the stage of the disease.¹¹

Purpose of this Report

In response to low screening rates for diabetes-related eye and kidney disease in the commonwealth, the Kentucky Diabetes Prevention and Control Program within the Kentucky Department for Public Health (KDPH) and the Kentuckiana Health Collaborative (KHC) partnered to develop an action plan. To support plan development, the KHC collected primary data from healthcare providers and administrators and convened stakeholders for a roundtable discussion to begin informing and developing recommendations. This report outlines the methodologies used for data collection and analysis, presents findings from the survey and roundtable discussions, and provides recommendations to increase eye and kidney health screenings for people with diabetes.

Methodology

This report includes data collected from three sources: 1) KHC's Consolidated Measurement Reports (CMR); 2) an online survey of Kentucky-based healthcare providers and healthcare practice administrators; and 3) a roundtable discussion of multi-stakeholders on recommendations to improve diabetes-related kidney and eye disease screening.

Data from the CMR is from KHC's statewide collaborative efforts to measure and document healthcare quality in Kentucky.¹² Data from the CMR is collected from healthcare claims data reported to KHC from Aetna Better Health of Kentucky, Anthem Blue Cross Blue Shield, Humana Health Plan of Kentucky, Passport by Molina Healthcare of Kentucky, and WellCare Health Plan of Kentucky. Data was last collected in 2022.

A cross-sectional survey was used to collect data from Kentucky-based healthcare providers and healthcare practice administrators regarding their current practices in diabetes-related kidney and eye screening. The purpose of the survey was to identify barriers that may prevent people with diabetes from regular screening for kidney and eye disease. The survey, which was implemented online using Survey Monkey, opened on April 22, 2025, and closed on June 30, 2025. The survey invitation was distributed via email through social and professional networks such as the KHC Membership, Kentucky Primary Care Association, Kentucky Hospital Association, Kentucky Health Center Network, and the Kentucky Diabetes Network. The survey took approximately 15 minutes to complete. Multiple respondents from the same organization were allowed to complete the survey. Survey questions were developed using screening recommendations from the ADA as a framework and finalized following expert reviews.^{9,11} The survey was designed for the purposes of this project and has not undergone formal clinical validation. The final survey included 24 questions, which consisted of multiple-choice and open-ended questions. The survey questions can be found in Appendix B.

Survey findings were presented by KHC at an in-person stakeholder roundtable on March 19, 2026. Individuals with expertise and/or lived experience with diabetes, eye, and kidney health, as well as healthcare and public health professionals, were invited to participate. A total of 25 people attended the roundtable, which took place over a five-hour period. The purpose of the roundtable was to present data from the survey and engage with healthcare leaders and community stakeholders to begin creating recommendations for improving diabetes-related kidney and eye disease screening in Kentucky. Roundtable attendees heard a presentation from the Kentucky Diabetes Prevention and Control Program (KDPCP) on the role of kidney and eye screening in improving diabetes outcomes and work that has been done by the KDPCP on the topic to-date. Attendees also heard a presentation from the KHC on the findings from the CMR

and Provider and Healthcare Administrator Survey. Following the presentations, attendees participated in two rotations of roundtable discussions. The first rotation focused on eye screening and the second on kidney screening. Sub-topics for each rotation included: care coordination and referral, payment and costs, patient engagement, health-related social needs, data and technology, and quality measurement. Discussion notes were collected, and conclusions are shared in the recommendations section.

Findings

Consolidated Measurement Reports

Trends in diabetes care eye exam and kidney health evaluation for people with diabetes (PWD) were assessed using the Consolidated Measurement Reports and data from the National Committee for Quality Assurance (Appendix A).^{12,14}

Between 2018 and 2022, the screening rate for diabetes care eye exams declined for populations covered by both Kentucky commercial insurance and Medicaid (Appendix A, Figure 1). Both the 2022 Kentucky commercial rate for diabetes care eye exam screening (23%) and the Kentucky Medicaid rate (22%) were lower than the state average (29%) and the Kentucky benchmark (37%). Benchmarks are determined by the Kentuckiana Health Collaborative's Measure Strategy Team as part of the CMR reporting process and reflect the average rate of the highest-performing eligible providers (n>14), whose combined patient populations represent 10% of the total population among eligible providers. Diabetes care eye exam screening among those with Medicaid coverage in Kentucky (22% in 2022) is substantially lower than the national average for Medicaid (52% in 2022) (Appendix A, Figure 2). Screening rates for Kentucky commercial (23% in 2022) are also lower than the national average Preferred Provider Organization (PPO) (49% in 2022) (Appendix A, Figure 3).

Across Kentucky Area Development Districts (ADD), rates of diabetes care eye exam scores have consistently declined, with steep declines observed between 2021 and 2022 (Appendix A, Figure 4). Generally, the lowest rates were observed in the FIVCO ADD (Boyd, Carter, Elliott, Greenup, and Lawrence Counties).

Rates of kidney health evaluation screenings for PWD in Kentucky are low for both commercial insurance (38% in 2022) and Medicaid (26% in 2022) (Appendix A, Figure 5). The Kentucky commercial rate increased from 36% in 2021 to 38% in 2022. Similar trends were observed in the national PPO rate, which increased from 39.6% to 40.1% during the same period (Appendix A, Figure 6). Screening rates for PWD with Medicaid coverage decreased from 27% to 26% between 2021 and 2022 (Appendix A, Figure 7).

Across ADDs, the lowest rates of kidney health evaluation screenings for PWD were observed in FIVCO and Kentucky River (Breathitt, Knott, Lee, Leslie, Letcher, Owsley, Perry, and Wolfe Counties) (Appendix A, Figure 8).

Provider and Healthcare Administrator Survey

Provider survey questions can be found in Appendix B. Frequency tables for all survey questions can be found in Appendix C. Overall, 34 providers completed the online survey. Most survey respondents were nurse practitioners (n=13, 38.2%), followed by physicians (n=7, 20.6%), and registered nurses (n=4, 11.8%) (Appendix C, Table 1). Most respondents (n=15, 44.1%) practiced in a Federally Qualified Health Center, while just over a quarter (n=9, 26.5%) practiced in a primary care clinic. The highest proportion of respondents practiced in the Kentuckiana Regional Planning and Development Agency (n=11, 33.3%), followed by Lake Cumberland (n=8, 24.2%) and Bluegrass (n=7, 21.2%) Area Development Districts. Respondents were asked to describe their majority patient population. Most respondents served people with lower incomes (n=28, 84.9%), people with lower educational attainment (n=25, 75.7%), and people who live in rural areas (n=23, 69.7%). Just over half (n=17, 51.5%) served people aged 65 and older and people with food insecurity. About 12% (n=4) served a majority of Appalachian PWD.

Recommendations

Recommendation 1: Strengthen Education for Providers and People with Diabetes

Context

There are gaps in knowledge and awareness about the severity of diabetes complications and recommended screening guidelines for diabetes-related conditions. People with diabetes (PWD) and providers need additional education to improve their awareness of the most updated screening guidelines, appropriate screening tools, and recommended screening timelines. The benefits of early, regular kidney and eye screening may not be fully understood by PWD. Providers suggested that PWD need more education about the importance of screening and how to be more proactive about screening to improve early detection and management of diabetes, chronic kidney disease, and eye disease.

When educational resources for PWD do exist, they may not meet their needs, including considerations related to language, literacy, and cultural norms. Providers reported variability in the consistent use of appropriate tests to screen for kidney (e.g., eGFR and

uACR) and eye disease. While most providers followed ADA recommendations and used both eGFR and uACR for kidney disease screening (n=26, 78.8%), 6.1% (n=2) used only eGFR, 3.0% (n=1) used only uACR, and 12.1% (n=4) were unsure of the screening tools used in their practice (Appendix C, Table 2). Over half (53.2%) of providers reported that unfamiliarity with screening guidelines for kidney disease was a barrier to screening in their practice (Appendix B, Table 6). Additionally, 59.4% of providers reported unfamiliarity with eye disease screening guidelines as a barrier (Appendix C, Table 11). The ADA recommends that uACR and eGFR be monitored one to four times per year, depending on the stage of kidney disease.¹¹ Overall, providers reported appropriate timing of kidney function monitoring for PWD with established chronic kidney disease (Appendix C, Table 3). Most providers reported monitoring kidney function among low-risk PWD either every 3-6 months (n=10, 41.7%) or annually (n=13, 54.2%). Among high and very high-risk PWD, monthly monitoring (very high risk: n=6, 27.3%) or monitoring every 3-6 months (high risk: n=17, 77.3%; very high risk: n=12, 54.5%) was common (Appendix C, Table 3). Current recommendations from the American Academy of Ophthalmology are annual diabetic retinopathy screenings for people with Type 1 diabetes beginning five years after the onset of disease and prompt screening at the time of diagnosis and yearly screening thereafter for people with Type 2 diabetes.¹³ Most providers reported following these guidelines, with 29% (n=9) referring people with type 2 diabetes for screening at the time of diagnosis and 35.5%

“The majority of [people with diabetes] do not realize they need to ask for a specific [diabetes] eye exam when they see a vision provider.”

*Provider and Healthcare Administrator
Survey Respondent*

(n=11) referring within three months of diagnosis (Appendix C, Table 8). Most providers reported referring people with type 1 diabetes to retinopathy screening within one year of diagnosis (n=26, 83.9%) (Appendix C, Table 7). Providers suggested that, by having more education about screening guidelines and timelines, they can better educate PWD.

Action Items

- Create culturally tailored, multilingual materials explaining diabetes-related screening recommendations and their importance in diabetes outcomes.
- Embed educational materials into visit summaries and patient portals for patient accessibility.
- Distribute educational materials through easily reached and trusted locations, such as primary care clinics, pharmacies, community centers, and libraries.
- Incorporate kidney and eye screening education into existing educational programs, such as Diabetes Self-Management Education and Support (DSMES).
- Distribute diabetes care checklists to people with diabetes for use during routine visits, including kidney and eye screening recommendations.
- Provide provider education, such as through clinical guideline summaries and Continuing Medical Education (CME) sessions on recommended screening timelines.

Impact

Improving patient and provider education can increase screening completion, support earlier detection of diabetes-related complications, and enable timely intervention to slow disease progression. Clear guidance for providers and easily reached information for PWD can improve shared decision-making and reduce confusion about screening expectations.

Recommendation 2: Improve Care Coordination and Navigation

Context

Breakdowns occur between identifying PWD who need kidney and eye screening and completing the screening. People may experience knowledge barriers when navigating the complex healthcare system, including scheduling appointments, identifying appropriate providers and services, and understanding health insurance coverage. Additionally, PWD experience challenges as it relates to navigating the healthcare system, including socioeconomic barriers such as transportation challenges, difficulty taking time off work, childcare needs, and the cost of healthcare. Without dedicated support, these barriers can prevent PWD from completing recommended screenings. Expectations for referral and follow-up are not always clearly communicated or consistent. Within the healthcare ecosystem,

referral processes between providers are often fragmented and lack standardization, leading to missed or delayed screenings.

Breakdowns during care transitions are common, including gaps in communication between primary care, specialists, and labs. Most providers reported that difficulty coordinating care with other providers and specialists was a “very” or “somewhat” influential barrier to screening for eye and kidney disease (Appendix C, Tables 6 and 11). For example, lab results may not be consistently shared with the appropriate providers, and follow-up responsibilities may be unclear. In addition, providers often lack visibility into patient-specific barriers, limiting their ability to proactively address challenges or engage other care team members in supporting screening completion.

“We utilize the RetinaVue camera here in our office. We still have [people with diabetes] who let us know they are having it done with their eye care provider and refuse to do it here, even if their eye provider did not complete the dilated eye exam/retina photo.”

*Provider and Healthcare Administrator
Survey Respondent*

Action Items

- Embed Community Health Workers or care coordinators in primary care clinics to schedule screenings, address barriers, and follow up on incomplete referrals
- Implement standardized referral workflows that include required labs, imaging, documentation, and follow-up steps
- Establish warm handoff protocols between primary care and specialists, including nephrology and eye care providers, with shared referral templates and direct scheduling
- Implement reminder protocols using text, phone, or portal messages based on patient preference
- Incorporate all care team members into outreach and screening reminders
- Leverage peer support groups to normalize screening

Impact

Improving care coordination and navigation can reduce incomplete referrals, increase screening completion, and ensure timely follow-up on results. Embedding care team support and standardizing workflows can create clearer accountability across providers and reduce breakdowns during care transitions. Proactive outreach and reminder systems can improve patient engagement and adherence to recommended screening. In addition, addressing

patient-level barriers through navigation support can reduce disparities in access and enable more equitable screening outcomes.

Recommendation 3: Optimize Data Infrastructure

Context

Providers reported using electronic health records (EHRs), including HER-integrated analytics such as eCube and Azara, to assess diabetes-related kidney and eye disease screening rates in their patient population. Providers also reported using population-based health reporting measures such as HEDIS metrics and data from the ADA to compare screening rates in their practice with benchmarks. Overall, most providers felt confident in the reliability and accuracy of the data sources they currently use (Appendix C, Table 12). Providers frequently mentioned that difficulty with EHRs was a “very” or “somewhat” influential barrier to kidney (n=25, 75.8%) and eye disease screening (n=21, 63.7%) (Appendix C, Tables 6 and 11). EHRs have the potential to support completion of recommended screenings for diabetes-related complications; however, their functionality is not consistently optimized across settings. Screening data is often not standardized or easily available across HER platforms, making it difficult to accurately assess screening necessity and completion, particularly for people who receive care from multiple providers or health systems. In addition, clinical decision support tools are not consistently implemented or used. Providers may not receive real-time prompts during patient visits, resulting in missed opportunities to order appropriate screening. Documentation practices may also vary, leading to incomplete or inaccurate capture of screening data. Without reliable data infrastructure, standardized workflows, and actionable insights, providers and care teams are limited in their ability to proactively identify PWD due for screening, conduct outreach, and track completion. For example, 60.6% of providers (n=20) reported that they document the completion of a comprehensive eye exam after patient referral, while 18.2% (n=6) do not, and 21.2% (n=7) are unsure about whether they are documented (Appendix C, Table 10).

Action Items

- Build automated HER alerts that trigger when PWD are due for screenings, including UACR, eGFR, and eye exams
- Implement standing orders within the HER allowing staff to order screenings
- Develop clinic- and provider-level dashboards to monitor screening rates and identify care gaps
- Use patient registries to generate outreach lists for PWD due for screening
- Standardize coding and documentation fields to ensure screening completion and results are captured and reportable

Impact

Optimizing HER functionality can enable more consistent and proactive identification of people who are due for screening. Automated alerts and standing orders can reduce missed opportunities during clinical encounters by prompting care teams to act in real time and supporting screening within routine workflows. Standardizing coding and documentation can improve the accuracy and completeness of screening data, ensuring results are captured and reportable across systems. In addition, dashboards and patient registries support care teams in identifying care gaps, prioritizing outreach, and monitoring screening performance at the provider and clinic level.

Recommendation 4: Expand Community-Based Screening Access

Context

Providers cited that difficulty with travel to referrals and/or follow-up appointments, lack of follow-through with appointments, and social and environmental barriers were very influential in eye disease and chronic kidney disease screening (Appendix C, Tables 6 and 11). Barriers such as long travel times to specialists, lack of transportation, and no or limited time off work to go to appointments disproportionately affect individuals living in communities with fewer resources. At the clinic-level, 63.6% (n=21) of providers stated that a lack of referral opportunities was “very” or “somewhat” influential in eye disease screening (Appendix C, Table 11).

Traditional screening models rely on people attending in-clinic visits or separate laboratory appointments, which can create additional challenges and delays. Opportunities to provide screening in nearby community-based settings are not consistently available. Without patient-centered, community-based approaches to screening, rates may remain low, particularly among populations facing the greatest barriers to care.

Action Items

- Partner with community-based organizations to host screening events using portable urine testing and lab collection services
- Deploy mobile screening units to high-need communities and coordinate with primary care practices for follow-up
- Offer transportation assistance to routine visits through vouchers, ride services, or community partnerships
- Distribute at-home urine screening kits with clear instructions and defined follow-up instructions to connect with a provider
- Coordinate screening opportunities at workplaces, pharmacies, and community health events

Impact

Expanding community-based screening access can reduce logistical and structural barriers and make it easier for PWD to complete recommended screenings. Providing screening through community organizations, mobile units, workplaces, and pharmacies can increase convenience and reach people who may not be able to engage in traditional clinical settings. At-home urine testing can support initial screening for albuminuria (UACR); however, PWD will still require blood testing to assess eGFR, making clear follow-up pathways essential. Coordinating these efforts with primary care practices and establishing clear follow-up workflows can ensure that results are communicated and appropriate next steps are taken.

Recommendation 5: Align Quality Improvement Activities and Incentives

Context

Variation in quality measurement contributes to inconsistent kidney screening practices. Screening expectations are not always aligned across health plans and health systems, creating confusion in performance measurement. Kidney screening is not consistently embedded within diabetes quality metrics, which limits how routinely it is tracked and prioritized in clinical practice. In addition, differences in documentation practices and measure definitions can make it difficult to accurately capture and report screening completion. Without standardized measures and reliable data, health systems and providers may lack visibility into performance gaps and opportunities for improvement.

Action Items

- Standardize kidney screening measures across payers and health systems to align expectations for providers
- Integrate health-related social needs screening into visits and connect PWD to navigation support
- Expand access to point-of-care testing and in-house lab services to allow same-day screening
- Implement retinal eye exam machines in primary care clinics
- Complete screenings during routine medical visits instead of referring out or scheduling later
- Utilize quality improvement partners to assess clinic practices and identify screening improvement strategies

Impact

Aligning quality measures can improve consistency in screening practices and increase visibility into performance across providers and systems. When screening is clearly defined and routinely measured, providers and health systems are better able to prioritize performance and close

care gaps. Standardization also improves data reliability and enables more effective tracking and benchmarking across settings. Integrating health-related social needs screening into quality improvement efforts can help identify and address barriers that affect screening rates.

Recommendation 6: Reduce Financial Barriers to Care

Context

Financial dynamics within the healthcare system create barriers for both PWD and providers in completing recommended screenings. Uncertainty about, or inability to afford, out-of-pocket costs can prevent people from accessing care and fully engaging with clinical recommendations. These costs may include provider visits, laboratory services, medications, and other resources required based on diagnosis. Providers are also affected by these financial dynamics. The opaque nature of healthcare pricing and coverage limits their ability to proactively inform people about the cost of care. In addition, the prevailing fee-for-service model can restrict provider capacity to deliver comprehensive care. Because reimbursement is often tied to visit volume, time during appointments may be limited, making it difficult to address the full spectrum of patient needs, including clinical evaluation, assessment of social barriers, and coordination of follow-up care. Nearly two-thirds of providers noted that low reimbursement from insurance providers was a barrier to kidney and eye disease screening (Appendix C, Tables 6 and 11).

Action Items

- Provide people with health coverage benefits summaries specific to their diabetes
- Direct PWD to cost estimator tools that can inform them of out-of-pocket costs related to their care in advance
- Identify patient assistance programs or low-cost options that may ease the financial burden of care
- Incorporate kidney screening into diabetes value-based contracts
- Implement financial incentives or recognition programs for clinics that improve screening rates

Impact

Access to transparent, easy-to-understand information about the expected costs of care can reduce uncertainty for PWD and support informed decision-making. For people facing financial barriers, access to services that reduce or offset costs can help ensure they receive necessary care, preventing delays, disease progression, and adverse outcomes. When screening is tied to accountability and financial incentives, providers and health systems are more likely to prioritize performance and close care gaps. Incorporating screening into value-based care arrangements can strengthen accountability while shifting focus from volume to outcomes. This approach supports providers in delivering more comprehensive care without the time and

volume constraints of fee-for-service models. Financial incentives and recognition programs can further reinforce performance improvement and sustain focus over time.

Limitations

The findings in this report are not without limitations. Due to contracting processes and delays at the federal level, there was a six-month pause in data collection, which resulted in lost momentum and participation in the provider survey. Additionally, the survey included 34 healthcare providers and practice administrators, which may affect the generalizability of the results. While there was at least one response from each ADD, the greatest representation (33.3%) of respondents was from the Kentuckiana Regional Planning and Development Agency (Bullitt, Henry, Jefferson, Oldham, Shelby, Spencer, and Trimble counties). Additionally, the most recent data available from the Consolidated Measurement Reports (CMRs) is from 2022, reflecting a lag in current screening rate information. Finally, the recommendations presented are intended as general guidance and may not address all considerations, requiring additional planning at the group level.

Conclusions

Given the low screening rates for eye disease and kidney health evaluation in people with diabetes in Kentucky, and the growing number of people with diabetes, it is imperative to use data to drive collective action towards improvements. This report provides six diverse and comprehensive recommendations that can serve as a foundation for establishing a directive and driving momentum forward. Stakeholders across the healthcare ecosystem are encouraged to review these recommendations and assess their application within their own organization's operations. Organizations may also benefit from evaluating their own data to identify screening performance trends and opportunities for quality improvement. Leveraging both new and existing partnerships is strongly encouraged to reduce fragmentation of efforts and maximize the impact of available resources.

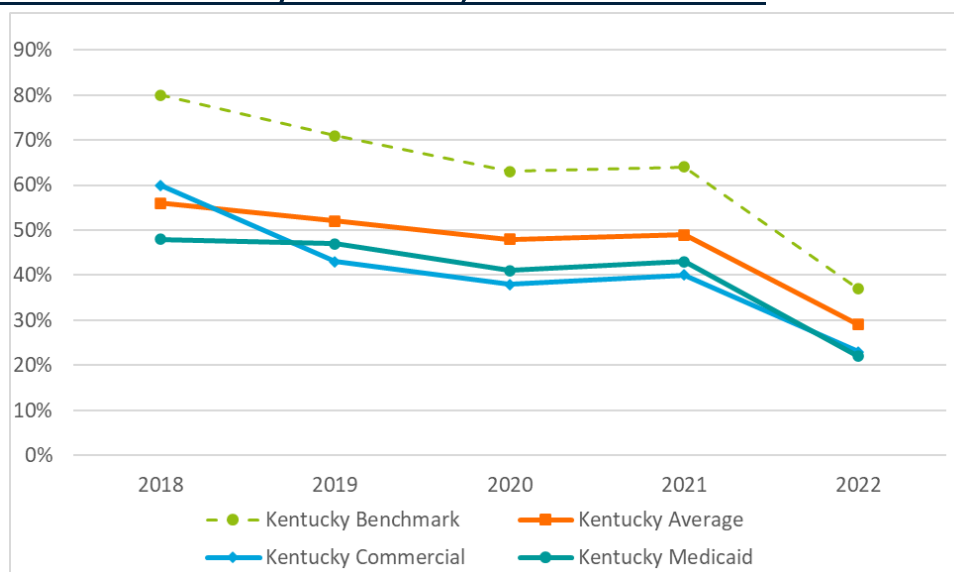
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Appendix A: Figures from Consolidated Measurement Reports

Figure 1. Trends in Diabetes Care Eye Exam Scores in Kentucky, Kentucky Commercial vs. Kentucky Medicaid, 2018-2022^{1,2,3,4,5}

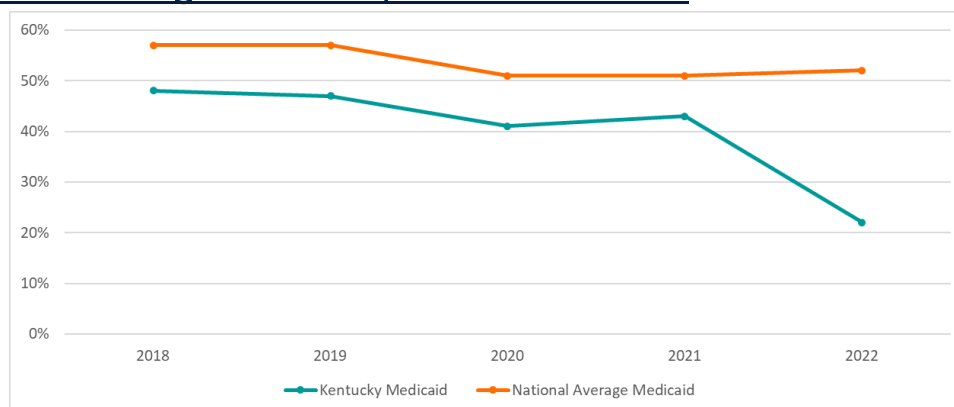


^aBenchmark is defined as the average rate for the top-ranked eligible providers (n>14), whose combined patients account for 10% of the total population among eligible providers.

^b2018-2021 Kentucky average includes commercial, Medicare, and Medicaid data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, and WellCare Health Plan of Kentucky.

^c2022 Kentucky average includes commercial, Medicare, and Medicaid data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, WellCare Health Plan, and Passport by Molina Healthcare of Kentucky.

Figure 2. Trends in Diabetes Care Eye Exam Scores, Kentucky Medicaid vs. National Average Medicaid, 2018-2022^{1,2,3,4,5}

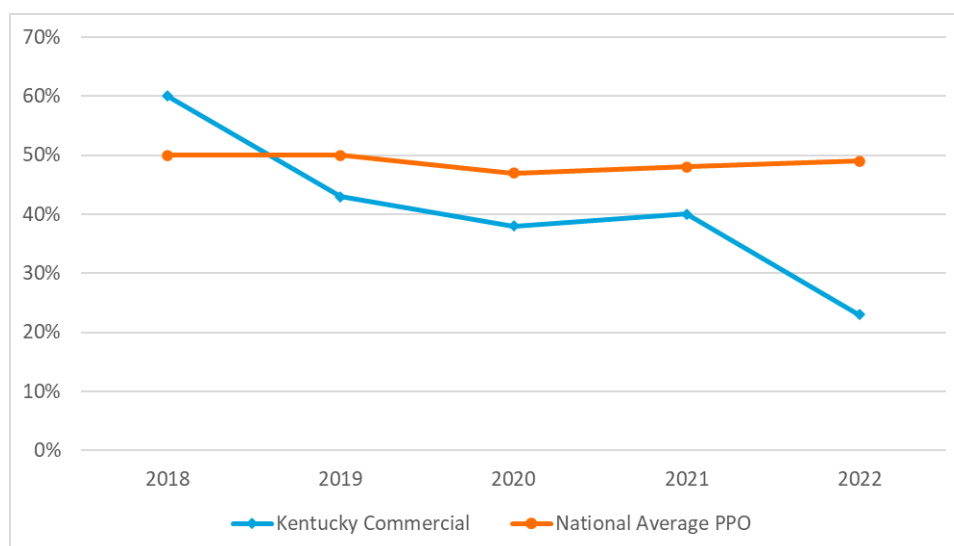


^a2018-2021 Kentucky Medicaid rate includes data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, and WellCare Health Plan.

^b2022 Kentucky Medicaid rate includes data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, WellCare Health Plan, and Passport by Molina Healthcare of Kentucky.

^cNational averages can be found on NCQA's website, <http://www.ncqa.org>.

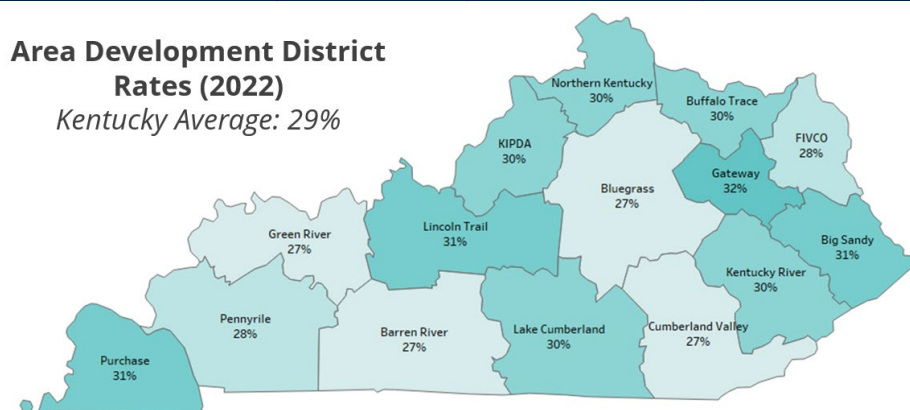
Figure 3. Trends in Diabetes Care Eye Exam Scores, Kentucky Commercial vs. National Average PPO, 2018-2022^{1,2,3,4,5}



^a2018-2022 Kentucky Commercial rate includes data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, and Humana Health Plan of Kentucky.

^cNational averages can be found on NCQA's website, <http://www.ncqa.org>.

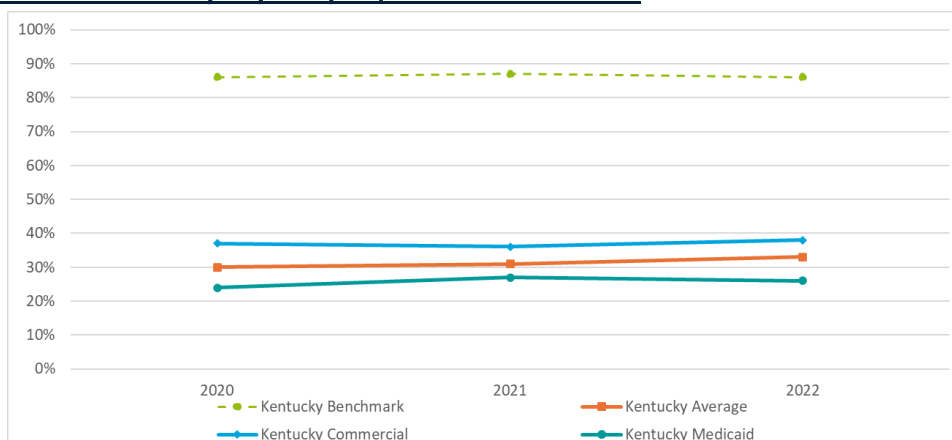
Figure 4. Diabetes Care Eye Exams by Area Development District, 2022¹



^a2022 Kentucky average includes commercial and Medicaid data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, WellCare Health Plan, and Passport by Molina Healthcare of Kentucky.

^bA listing of counties included in each Area Development District (ADD) can be found at <https://dlg.ky.gov/grants/state/add/Pages/default.aspx>.

Figure 5. Trends in Kidney Health Evaluation Scores for People with Diabetes in Kentucky by Payer, 2020-2022^{1,2,3}

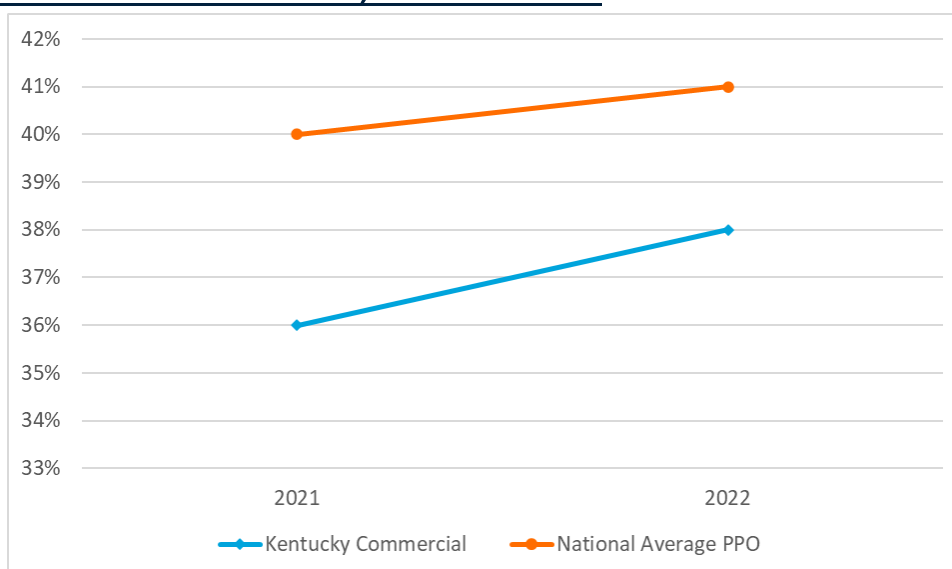


^a Benchmark defined as the average rate for the top-ranked eligible (n>14) providers, whose combined patients account for 10% of the total population among eligible providers

^b2020-2021 Kentucky average includes commercial, Medicare, and Medicaid data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, and WellCare Health Plan.

^c2022 Kentucky average includes commercial, Medicare, and Medicaid data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, WellCare Health Plan, and Passport by Molina Healthcare of Kentucky.

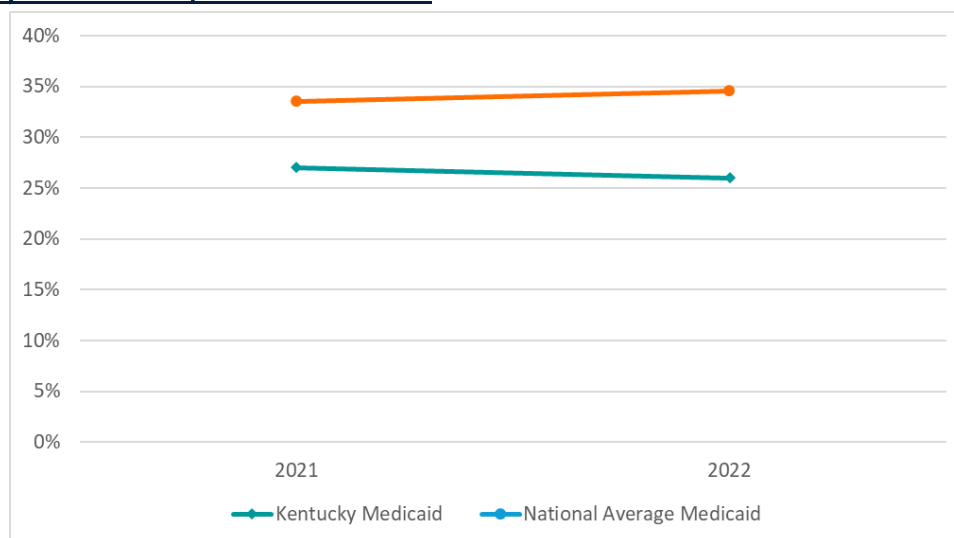
Figure 6. Trends in Kidney Health Evaluation Scores, Kentucky Commercial vs. National PPO, 2021-2022^{1,2}



^a2021-2022 Kentucky Commercial rate includes data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, and Humana Health Plan of Kentucky.

^bNational averages can be found on NCQA's website, <http://www.ncqa.org>.

Figure 7. Kidney Health Evaluation Scores for People with Diabetes, Kentucky Medicaid, 2021-2022^{1,2}

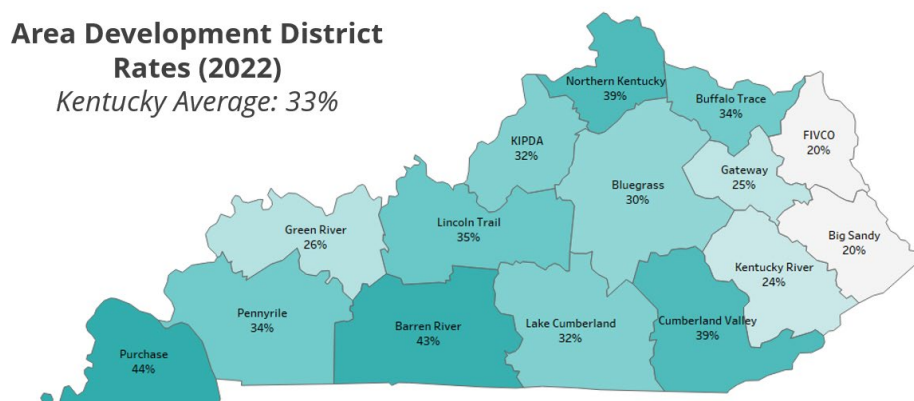


¹2021 Kentucky Medicaid rate includes data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, and WellCare Health Plan.

²2022 Kentucky Medicaid rate includes data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, WellCare Health Plan, and Passport by Molina Healthcare of Kentucky.

³National averages can be found on NCQA's website, <http://www.ncqa.org>.

Figure 8. Kidney Health Evaluation for People with Diabetes by ADD, 2022¹



¹2022 Kentucky average includes commercial and Medicaid data submitted from Anthem Blue Cross Blue Shield, Aetna Health Plan, Humana Health Plan of Kentucky, WellCare Health Plan, and Passport by Molina Healthcare of Kentucky.

²A listing of counties included in each Area Development District (ADD) can be found at

<https://dlg.ky.gov/grants/state/add/Pages/default.aspx>.

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²Kentuckiana Health Collaborative. (2021) *Consolidated Measurement Report*. <https://khcollaborative.org/wp-content/uploads/2024/05/MY-2021-State-of-Kentucky-Community-Level.pdf>

³Kentuckiana Health Collaborative. (2020) *Consolidated Measurement Report*. <https://khcollaborative.org/wp-content/uploads/2023/01/Kentucky-KHC-Consolidated-Measurement-Reports-MY2020.pdf>

⁴Kentuckiana Health Collaborative. (2019) *Consolidated Measurement Report*. <https://khcollaborative.org/wp-content/uploads/2022/02/Kentucky-KHC-Consolidated-Measurement-Reports-MY2019.pdf>

⁵Kentuckiana Health Collaborative. (2018) *Consolidated Measurement Report*.

Appendix B: Provider and Healthcare Administrator Survey Questions

What is your professional role?

- Physician
- Nurse Practitioner
- Registered Nurse
- Endocrinologist
- Ophthalmologist
- Optometrist
- Nephrologist
- Other (specify)

What Area Development Districts (ADD) do you practice in Kentucky? Select all that apply.

- Northern Kentucky Area Development District (Boone, Campbell, Carroll, Gallatin, Grant, Kenton, Owen, and Pendleton counties)
- Kentuckiana Regional Planning and Development Agency (Bullitt, Henry, Jefferson, Oldham, Shelby, Spencer, and Trimble counties)
- Buffalo Trace Area Development District (Bracken, Fleming, Lewis, Mason, and Robertson counties)
- FIVCO Area Development District (Boyd, Carter, Elliott, Greenup, and Lawrence counties)
- Gateway Area Development District (Bath, Menifee, Montgomery, Morgan, and Rowan counties)
- Bluegrass Area Development District (Anderson, Bourbon, Boyle, Clark, Estill, Fayette, Franklin, Garrard, Harrison, Jessamine, Lincoln, Madison, Mercer, Nicholas, Powell, Scott, and Woodford counties)
- Lincoln Trail Area Development District (Breckinridge, Grayson, Hardin, LaRue, Marion, Meade, Nelson, and Washington counties)
- Big Sandy Area Development District (Floyd, Johnson, Magoffin, Martin, and Pike counties)
- Kentucky River Area Development District (Breathitt, Knott, Lee, Leslie, Letcher, Owsley, Perry, and Wolfe counties)
- Pennyryle Area Development District (Caldwell, Christian, Crittenden, Hopkins, Livingston, Lyon, Muhlenberg, Todd, and Trigg counties)
- Barren River Area Development District (Allen, Barren, Butler, Edmonson, Hart, Logan, Metcalfe, Monroe, Simpson, and Warren counties)

- Lake Cumberland Area Development District (Adair, Casey, Clinton, Cumberland, Green, McCreary, Pulaski, Russell, Taylor, and Wayne counties)
- Cumberland Valley Area Development District (Bell, Clay, Harlan, Jackson, Knox, Laurel, Rockcastle, and Whitley counties)
- Purchase Area Development District (Ballard, Calloway, Carlisle, Fulton, Graves, Hickman, Marshall, and McCracken counties)
- Green River Area Development District (Daviess, Hancock, Henderson, McLean, Ohio, Union, and Webster counties)

What healthcare setting do you practice in?

- Primary Care Clinic
- Federally Qualified Health Center
- Hospital
- Specialty Care Clinic
- Other

Select all characteristics that are common in your patient population.

- Black/ African American persons
- Hispanic/ Latino persons
- People aged 65 and older
- People with lower incomes
- People with lower education
- People with food insecurity
- People with low broadband access
- People who live in Appalachian area(s)
- People who live in rural area(s)
- People who live in urban area(s)

Diabetes-Related Nephropathy

Do you or your practice use both estimated glomerular filtration rate (eGFR) and urine albumin-creatinine ratio (uACR) to screen people with diabetes?

- Yes
- No, I use eGFR only
- No, I use UACR only
- Unsure

How often do you monitor kidney function in people with established CKD based on their risk classification?

- Low Risk: ____
- Moderately Increased Risk: ____
- High Risk: ____
- Very High Risk: ____

For people with type 1 diabetes, when do you or your practice initially screen for kidney function after their diabetes diagnosis?

- Within 1 year
- Within 3 years
- Within 5 years
- Other (please specify)

For people with type 2 diabetes, when do you or your practice initially screen for kidney function after their diabetes diagnosis?

- Within 1 year
- Within 3 years
- Within 5 years
- Other (please specify)

For people with type 2 diabetes, how often do you or your practice screen for kidney function after the initial screening?

- Annually
- Every 6 months
- Every 2 years
- Other (please specify)

Barriers to Screening for Kidney Disease

Using the table below, indicate how influential you find the listed clinical or patient-related barriers on your ability to screen for kidney disease among people with diabetes.

	Very Influential	Somewhat Influential	Not Influential
Clinical Barriers			
Low reimbursement rates from insurance providers			
Unfamiliar with screening recommendations			
No standardized care protocol established in practice			
Difficulty coordinating care with other providers/specialists			

Lacking in referral opportunities			
Difficulty with the Electronic Health Record (EHR) (i.e., data flow, reminders, care documentation)			
Billing codes			
Difficulty in meeting staffing needs			
Patient-Related Barriers			
Out-of-pocket costs of tests			
Nonadherence to screening recommendations			
Lack of follow-through with referrals			
Social or environmental barriers			
Difficulty with travel to referrals or follow-up appointments			
Avoidance of diagnosis and subsequent treatment			

Diabetes-Related Retinopathy

For Adults with Type 1 Diabetes:

For people with type 1 diabetes, when do you or your practice initially screen or refer them for a dilated and comprehensive eye exam after their diabetes diagnosis?

- Within 1 year
- Within 3 years
- Within 5 years
- Other (please specify)

How frequently do you or your practice refer adults with type 1 diabetes who have no evidence of retinopathy and whose glycemic indicators are within goal range for dilated eye exams?

- Annually
- Every 1-2 years
- Every 3 years
- Other (please specify)

For people with type 2 diabetes, when do you or your practice initially screen or refer them for a dilated and comprehensive eye exam after their diabetes diagnosis?

- Within 1 month
- Within 3 months

- At the time of diagnosis
- Other (please specify)

How frequently do you or your practice refer adults with type 2 diabetes who have no evidence of retinopathy and whose glycemic indicators are within goal range for dilated eye exams?

- Annually
- Every 1-2 years
- Every 3 years
- Other (please specify)

How frequently do you or your practice recommend dilated eye exams for people with progressing or sight-threatening diabetic retinopathy?

- Every 3 months
- Every 6 months
- Annually
- Other (please specify)

Do you record the completion of a comprehensive eye exam after someone has been referred for it?

- Yes
- No
- Unsure

Barriers to Screening for Eye Disease

Using the table below, indicate how influential you find the listed clinical or patient-related barriers on your ability to screen for eye disease among people with diabetes.

	Very Influential	Somewhat Influential	Not Influential
Clinical Barriers			
Low reimbursement rates from insurance providers			
Unfamiliar with screening recommendations			
No standardized care protocol has been established in practice			
Difficulty coordinating care with other providers/specialists			
Lacking providers to refer people to for screening			

Difficulty with the Electronic Health Record (EHR) (i.e., data flow, reminders, care documentation)			
Difficulty in meeting staffing needs			
Patient-Related Barriers			
Out-of-pocket costs of tests			
Nonadherence to screening recommendations			
Lack of follow-through with referrals			
Social or environmental barriers			
Difficulty with travel to referrals or follow-up appointments			
Avoidance of diagnosis and subsequent treatment			

Other Comments:

- What data sources do you use to assess your practice's screening rates for diabetes-related kidney and eye disease?
- How accurate and reliable do you feel that your current data sources are? Rate your response on a scale from 1-10, with 1 being not at all accurate and reliable and 10 being entirely accurate and reliable.
- What is one recommendation you have to improve screening for diabetes-related kidney disease?
- What is one recommendation you have to improve screening for diabetes-related eye disease?
- Is there anything else you would like to share regarding the topic of screening for diabetes-related kidney and eye disease?

Appendix C: Provider and Healthcare Administrator Survey Results Tables

Section 1: Provider Demographics and Practice Characteristics

Table 1. Provider Survey Respondent Characteristics

Characteristic	N (%)
Professional Role	
Nurse Practitioner	13 (38.2)
Physician	7 (20.6)
Registered Nurse	4 (11.8)
Physician Assistant	3 (8.8)
Health Educator	2 (5.9)
Pharmacist	2 (5.9)
Social Worker	1 (2.9)
Case Manager	1 (2.9)
Respiratory Therapist	1 (2.9)
Total	34 (99.9)
Practice Setting	
Federally Qualified Health Center	15 (44.1)
Primary Care Clinic	9 (26.5)
Hospital	3 (8.8)
Specialty Care Clinic	3 (8.8)
Other: Local Health Department	1 (2.9)
Other: Rural Health Clinic	1 (2.9)
Other: Private Office	1 (2.9)
Other: Medicaid Nurse Case Manager	1 (2.9)
Total	34 (99.8)
Practice Location: Area Development District (ADD)**	
Kentuckiana Regional Planning and Development Agency	11 (33.3)
Lake Cumberland	8 (24.2)
Bluegrass	7 (21.2)
Northern Kentucky	4 (12.1)
Pennyrile	4 (12.1)
Lincoln Trail	3 (9.1)
Barren River	3 (9.1)
Purchase	3 (9.1)
Buffalo Trace	1 (3.0)

FIVCO	1 (3.0)
Gateway	1 (3.0)
Big Sandy	1 (3.0)
Kentucky River	1 (3.0)
Cumberland Valley	1 (3.0)
Green River	1 (3.0)
Total Respondents**	33 (100.0)
Majority Representation of Patient Population**	
People with lower incomes	28 (84.9)
People with lower education	25 (75.7)
People who live in rural area(s)	23 (69.7)
People aged 65 and older	17 (51.5)
People with food insecurity	17 (51.5)
Black/African American persons	14 (42.4)
People with low broadband access	14 (42.4)
People who live in urban area(s)	13 (39.4)
Hispanic/Latino persons	10 (30.3)
People who live in Appalachian area(s)	4 (12.1)
Total Respondents	33 (100.0)

*Totals may not equal 100% due to rounding

**Respondents could select all options that applied

Section 2: Diabetes-Related Nephropathy Screening and Practices

Table 2. Kidney Disease Screening Tools Used for People with Diabetes

Screening Tool	N (%)
Estimated glomerular filtration rate (eGFR) only	2 (6.1)
Urine albumin-creatinine ratio (uACR) only	1 (3.0)
Both eGRF and uACR	26 (78.8)
Unsure	4 (12.1)
Total	33 (100.0)

Table 3. Frequency of Kidney Function Monitoring in People with Established Chronic Kidney Disease by Risk Classification

Frequency	Risk Classification N (%)			
	Low	Moderately Increased	High	Very High
Monthly	0 (0.0)	0 (0.0)	0 (0.0)	6 (27.3)

Every 3-6 months	10 (41.7)	17 (73.9)	17 (77.3)	12 (54.5)
Annually	13 (54.2)	4 (17.4)	1 (4.5)	1 (4.5)
Other	1 (4.2)	2 (8.7)	3 (18.2)	3 (13.6)
Total	24 (100.0)	23 (100.0)	22 (100.0)	22 (100.0)

Table 4. Kidney Function Screening Practices by Diabetes Type

When do you or your practice initially screen for kidney function after their diabetes diagnosis?	
Type 1 Diabetes	
	N (%)
Within 1 year	27 (87.1)
Within 3 years	3 (9.7)
Within 5 years	0 (0.0)
Other	1 (3.2)
Total	31 (100.0)
Type 2 Diabetes	
	N (%)
Every 6 months	9 (29.0)
Annually	17 (54.8)
Every two years	2 (6.5)
Other	3 (9.7)
Total	31 (100.0)

Table 5. Frequency of Kidney Function Screening for People with Type 2 Diabetes

For people with Type 2 diabetes, how often do you or your practice screen for kidney function after the initial screening?	
	N (%)
Every 6 months	13 (39.4)
Annually	15 (45.5)
Every 2 years	1 (3.0)
Other	4 (12.1)
Total	33 (100.0)

Table 6. Influence of Clinic and Client-Related Barriers to Kidney Disease Screening Among People with Diabetes

	Level of Influence
--	--------------------

	N (%)			
Clinic-Related Barriers				
	Very	Somewhat	Not	Total
Low reimbursement rates from insurance providers	9 (27.3)	12 (36.4)	12 (36.4)	33 (100.0)
Unfamiliar with screening recommendations	6 (18.8)	11 (34.4)	15 (46.9)	32 (100.0)
No standardized care protocol established in practice	6 (18.8)	10 (31.3)	16 (50.0)	32 (100.0)
Difficulty coordinating care with other providers/specialists	13 (40.6)	13 (40.6)	6 (18.8)	32 (100.0)
Lacking in referral opportunities	7 (22.6)	13 (41.9)	11 (35.5)	31 (100.0)
Difficulty with the Electronic Health Record (EHR) (i.e, data flow, reminders, care documentation)	12 (36.4)	13 (39.4)	8 (24.2)	33 (100.0)
Billing codes	6 (18.2)	10 (30.3)	17 (51.5)	33 (100.0)
Difficulty in meeting staffing needs	7 (21.9)	12 (37.5)	13 (40.6)	32 (100.0)
Patient-Related Barriers				
Out-of-pocket costs of tests	14 (42.4)	10 (30.3)	9 (27.3)	33 (100.0)
Nonadherence to screening recommendations	17 (51.5)	12 (36.4)	4 (12.1)	33 (100.0)
Lack of follow through with referrals	15 (45.5)	15 (45.5)	3 (9.1)	33 (100.0)
Social or environmental barriers	17 (51.5)	13 (39.4)	3 (9.1)	33 (100.0)
Difficulty with travel to referrals or follow-up appointments	20 (60.6)	10 (30.3)	3 (9.1)	33 (100.0)
Avoidance of diagnosis and subsequent treatment	11 (33.3)	18 (54.6)	4 (12.1)	33 (100.0)

Section 3: Diabetes-Related Retinopathy Screening and Practices

Table 7. Frequency of Screening and Referral for Dilated and Comprehensive Eye Exam for People with Type 1 Diabetes

When do you or your practice initially screen or refer them to a dilated and comprehensive eye exam after their diabetes diagnosis?	
Frequency	N (%)
Within 1 year	26 (83.9)
Within 3 years	3 (9.7)
Within 5 years	1 (3.2)

Other	1 (3.2)
Total	31 (100.0)
How frequently do you or your practice refer adults with type 1 diabetes who have no evidence of retinopathy and whose glycemic indicators are within goal range for dilated eye exams?	
Annually	26 (81.3)
Every 1-2 years	3 (9.4)
Every 3 years	1 (3.1)
Other	2 (6.3)
Total	32 (100)

Table 8. Frequency of Screening and Referral for Dilated and Comprehensive Eye Exam for People with Type 2 Diabetes

When do you or your practice initially screen or refer them for a dilated and comprehensive eye exam after their diabetes diagnosis?	
Within 1 month	6 (19.4)
Within 3 months	11 (35.5)
At the time of diagnosis	9 (29.0)
Other	5 (16.1)
Total	31 (100.0)
How frequently do you or your practice refer adults with type 2 diabetes who have no evidence of retinopathy and whose glycemic indicators are within goal range for dilated eye exams?	
Annually	27 (84.4)
Every 1-2 years	4 (12.5)
Every 3 years	0 (0.0)
Other	1 (3.1)
Total	32 (100.0)

Table 9. Frequency of You or Your Practice's Recommendation for Dilated Eye Exams for People with Progressing or Sight-Threatening Diabetic Retinopathy

Frequency	N (%)
Every 3 months	3 (9.7)
Every 6 months	12 (38.7)
Annually	5 (16.1)
Other	11 (35.5)
Total	31 (100.0)

Table 10. Providers who Record the Completion of a Comprehensive Eye Exam after Patient Referral

Do you record the completion of a comprehensive eye exam after someone has been referred for it?	N (%)
Yes	20 (60.6)
No	6 (18.2)
Unsure	7 (21.2)
Total	33 (100.0)

Table 11. Influence of Clinic and Patient-Related Barriers to Screening for Eye Disease Among People with Diabetes

	Level of Influence N (%)			
Clinic-Related Barriers	Very	Somewhat	Not	Total
Low reimbursement rates from insurance providers	8 (24.2)	13 (39.4)	12 (36.4)	33 (100.0)
Unfamiliar with screening recommendations	7 (21.9)	12 (37.5)	13 (40.6)	32 (100.0)
No standardized care protocol est. in practice	8 (24.2)	10 (30.3)	15 (45.5)	33 (100.0)
Difficulty coordinating care with other providers	13 (39.4)	13 (39.4)	7 (21.2)	33 (100.0)
Lacking in referral opportunities	8 (24.2)	13 (39.4)	12 (36.4)	33 (100.0)
Difficulty with the EHR	12 (36.4)	9 (27.3)	12 (36.4)	33 (100.0)
Difficulty meeting staffing needs	6 (18.2)	14 (42.4)	12 (36.4)	33 (100.0)
Patient-Related Barriers				
Out-of-pocket costs of tests	18 (54.6)	11 (33.3)	4 (12.1)	33 (100.0)
Nonadherence to screening recommendations	20 (60.6)	13 (39.4)	0 (0.0)	33 (100.0)
Lack of follow through with referrals	21 (63.6)	12 (36.4)	0 (0.0)	33 (100.0)
Social or environmental barriers	21 (63.6)	11 (33.3)	1 (3.0)	33 (100.0)
Difficulty with travel to referrals or follow-up appointments	24 (72.7)	7 (21.2)	2 (6.1)	33 (100.0)
Avoidance of diagnosis and subsequent treatment	11 (33.3)	19 (57.6)	3 (9.1)	33 (100.0)

Table 12. Data Sources Used to Assess Practice's Screening Rates for Diabetes-Related Kidney and Eye Disease and Respondent Rating of Reliability and Accuracy

Data Source	Number of Respondents*
Clinic Chart/EHR Review	12
EHR-Related analytics tools (e.g. Azara, Greenway, eCube)	8
Population-based health reporting measures (HEDIS measures, American Diabetes Association)	7
Care gap reports from payers	3
Other	3
Unsure	2
None	1
Rating of Reliability and Accuracy of Data Sources**	
Mean and standard deviation (7.01 ± 2.2)	33 (100.0)
** Respondents were asked, "How accurate and reliable do you feel that your current data sources are? Rate your response between 1-10, with 1 being not at all accurate and reliable and 10 being entirely accurate and reliable.	