MILKEN INSTITUTE
CENTER FOR PUBLIC HEALTH

Chronic Kidney Disease:

Roadmap to Prevention, Earlier Detection, and Management

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About the Milken Institute

The Milken Institute is a nonprofit, nonpartisan think tank focused on accelerating measurable progress on the path to a meaningful life. With a focus on financial, physical, mental, and environmental health, we bring together the best ideas and innovative resourcing to develop blueprints for tackling some of our most critical global issues through the lens of what's pressing now and what's coming next.

About the Center for Public Health

The Milken Institute Center for Public Health develops research, programs, and initiatives designed to envision and activate sustainable solutions leading to better health for individuals and communities worldwide.

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Introduction

In the United States, the rapid increase in the number of adults with type II diabetes and obesity has reached epidemic proportions.[1] These preventable chronic conditions and the aging of the US population, combined with the effects of COVID-19 such as increased diabetes risk, kidney injury, and disruptions in access to health care, have a significant impact on the prevalence of kidney disease in the country. The devastating health consequences of CKD and the historically high prevalence of the disease in its early stages necessitate the development and implementation of public health strategies that facilitate prevention, earlier disease detection, and management to prevent its complications and progression to kidney failure. As articulated by a CKD thought leader during a virtual workshop hosted by the Milken Institute Center for Public Health, "CKD is a mirror of so many things that are wrong with the health-care system."

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In fall 2021, informed by two roundtable workshops with key actors involved in health-care delivery, public health, and CKD research, the Center for Public Health set out to uncover the existing gaps and opportunities surrounding CKD and to identify clear areas for stakeholders across sectors to create actionable change to detect, diagnose, and manage CKD at earlier stages.

As a result, the authors, with support from thought leaders, identified emerging trends in the areas of biomedical innovation, public health interventions, care delivery models, and cross-sector partnerships that indicate that we have entered a new era in CKD with tremendous opportunities to create and sustain system-level change to improve kidney health. To further this vision of finding a path to earlier detection and diagnosis of CKD, applying the three-tiered Public Health Prevention Framework is imperative.

Eight broad opportunity areas emerged that centered our focus for this roadmap:

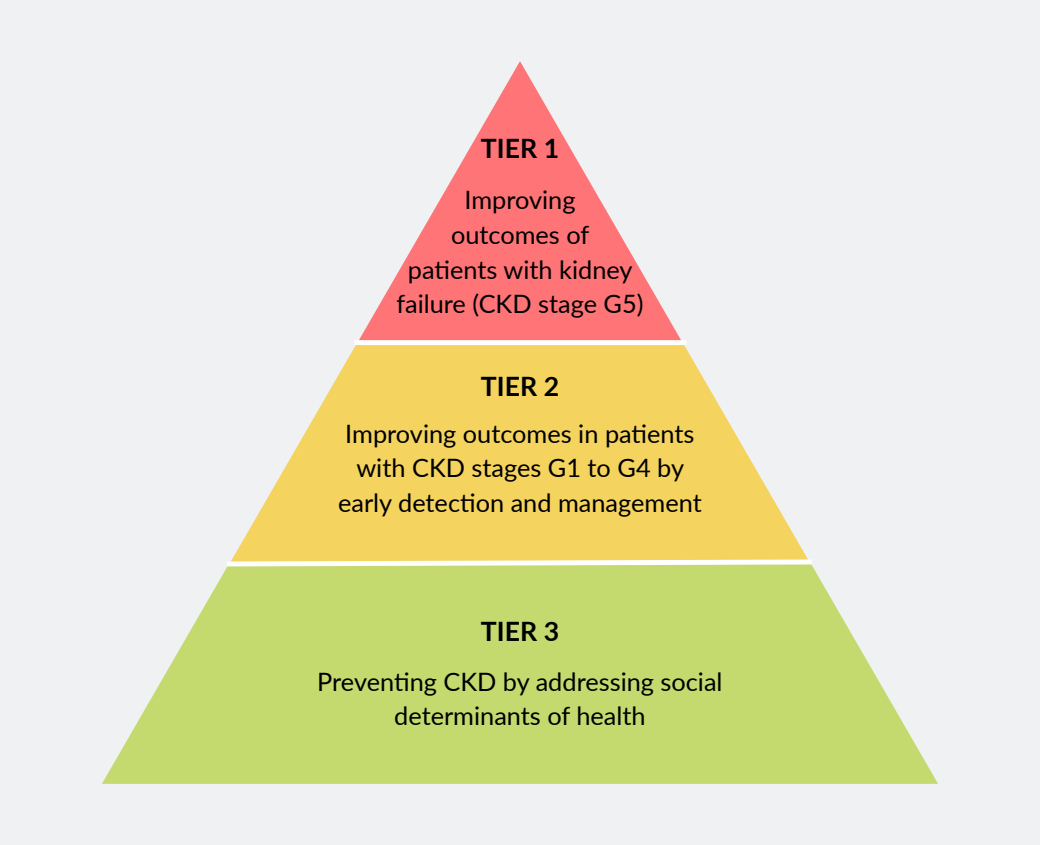
1. **root causes of health inequity that contribute to CKD**
2. **nutritional services**
3. **primary care infrastructure**
4. **preventive screening**
5. **education, health communication, and literacy**
6. **telehealth services**
7. **accountability in care**
8. **value-based care**

CHRONIC KIDNEY DISEASE (CKD) FACTS AT A GLANCE

- CKD affects more than one in seven American adults, an estimated 37 million people.
- Commonly known as a "silent killer," the symptoms of CKD often do not appear until kidney function has been significantly impaired.
- CKD ranks as the eighth leading cause of death in the country; however, as many as 9 out of 10 American adults with CKD are unaware of their condition.
- This health condition disproportionately affects historically underserved communities, imposing further social and financial burdens on these communities.

Each of these opportunities and actionable steps is organized and prioritized based on Tier 1 (primary) and Tier 2 (secondary) prevention and is discussed in detail in the Milken Institute's Center for Public Health companion report: **Chronic Kidney Disease: Finding a Path to Prevention, Earlier Detection, and Management**.

Figure 1: Public Health Prevention Framework



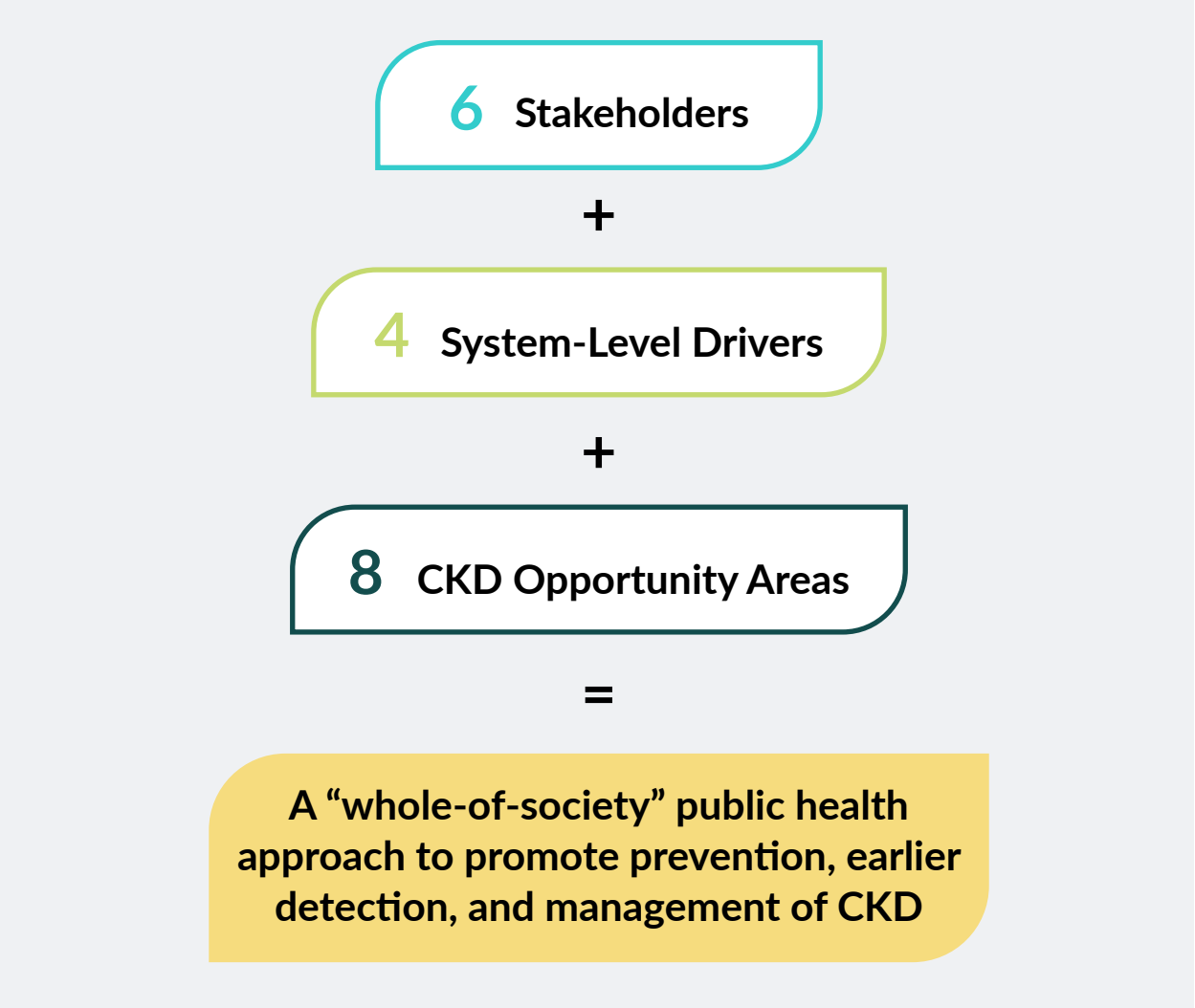
Source: Milken Institute (2022), adapted from National Academies Press (2017)

Tackling this public health issue requires a whole-of-society effort. In this roadmap, we call on policymakers (federal, state, and local), government agencies, health-care delivery actors (providers, allied health professionals, and administrators), payers, community-based organizations (CBOs), and members of the community to catalyze change and advance health equity for those with or at-risk for CKD by adopting a public health approach.

The Ideal Pathway to CKD Prevention, Earlier Detection, and Management

In the path to prevention, earlier detection, and management of CKD, high-quality care interventions should be safe, effective, person-centered, timely, efficient, and equitable.[2] Four system-level drivers are critical for advancing the health of communities and developing public health systems capable of addressing longstanding shortcomings and disparities in the CKD ecosystem. To catalyze systems-level change, the strategies identified in the sections below will help lay the foundation needed to achieve a greater focus on disease prevention, increase health equity in kidney care, and bolster the nation's public health infrastructure to better respond to CKD-specific challenges. In addition to addressing these large-scale barriers to effective kidney care, it is essential to capitalize on eight micro-level opportunity areas that will further strengthen the ability of the six identified stakeholders to achieve prevention, earlier detection, and management of CKD.

Figure 2: CKD Public Health Approach



Source: Milken Institute (2022)

The Case for Meaningful Stakeholder Engagement in Chronic Kidney Disease

Each stakeholder in the CKD ecosystem has an important role in promoting earlier detection and diagnosis of CKD, advancing the national dialogue around CKD prevention, and prioritizing health equity for people with or at risk for CKD. Stakeholders need to engage meaningfully by assuming leadership and supportive roles to realize this vision. Here is how six stakeholders can support this cause:

Policymakers—federal, state, and local

Policymakers are uniquely positioned to implement policies and address social determinants that impact health and well-being. They must shape the health-care and public health ecosystems by funding and advocating for health promotion, prevention, and treatment activities.

Government Agencies—federal, state, and local

Government agencies (federal, state, and local) conduct and support research related to CKD to create knowledge about and treatments for the disease and promote CKD initiatives through public health strategies. State agencies have overarching goals for the health of their citizens, while local agencies have goals and responsibilities as they relate to the region, county, or city and its citizens. All tiers of government agencies must come together to promote kidney health and make health care safer, higher quality, more accessible, equitable, and affordable.

Payers—Medicaid, Medicare, and commercial insurance providers

Payers are critical in moving the needle toward prevention by changing how they pay providers. This shift can be done by increasing the utilization of preventive services. All health plan providers must align and work toward establishing requirements for quality measures for kidney disease.

Health-Care Providers, Allied Health Professionals, and Health-Care Administrators

Health-care providers, allied health professionals, and health-care administrators represent the foundation of prevention and management efforts. Health-care administrators and providers carry significant weight in shifting the dialogue from disease-centered treatment to person-centered prevention and management. By utilizing new therapies, creating health promotion opportunities for patients, and improving day-to-day clinical practices and care coordination, they must aid in changing how health care approaches CKD.

Community-Based Organizations (CBOs)

Community leaders are trusted stewards and have the understanding to support, communicate, and effectively inform the needs of the community. Additionally, community health workers are an idea or a bridge between providers and community members, who are champions and peer navigators and help patients and family members. As a public voice for their community, CBOs, including nonprofit organizations and local chapters of national associations, must work closely with community members to identify and address issues beyond the reach of health-care providers and the health-care system.

Members of the Community

All members of the community, including people with or at risk for CKD, their support system and social network, and advocacy groups, have essential roles to play in creating paths to earlier detection, diagnosis, and management of CKD. Members of a community must unite to identify the root causes and find upstream solutions to prevent becoming a CKD patient because health promotion and prevention are dependent on the community's involvement and engagement.[3]

Driving System-Level Change for CKD Prevention, Earlier Detection, and Management

In an ideal world, stakeholders would work to create a robust infrastructure conducive to upstream, prevention-focused CKD strategies and efforts across sectors and communities with a partnership point of view. Adopting this foundation will result in shifts in the health-care and public health system and environments, including transformative system-level changes and modifications that advance health equity in CKD care and for individuals at risk or living with CKD. Four system-level changes that would drive prevention, earlier detection, and management to impact CKD are discussed below.

System-Level Driver 1: Invest in Upstream Public Health Infrastructure to Build and Sustain Healthy Communities

Achieving better health outcomes and reducing health disparities are critical to improving the nation's health and require support from all sectors. To create healthy communities, all stakeholders must prioritize the mission of reducing the prevalence of CKD and align on a shared vision to achieve it as collaborative partners.

Strategies for Driving System-Level Change

- Establish state-funded task forces with a diverse group of stakeholders to make recommendations and sustain efforts on prevention, detection, management, education, and awareness of CKD.
- Support and participate in collaboratives designed to strengthen cross-sector and community-driven partnerships to advance health equity, such as the Build Health Challenge. Engage in award program initiatives as an underwriter or a participant to focus on upstream factors driving structural and social determinants of health to advance the creation of healthy community policies, programs, and practices.
- Invest in platform technologies, such as personalized community referral networks, that connect people to community and social services resources to promote wellness, meet basic needs, and manage care for illness.
- Launch mass media efforts, including public service announcements, to shed light on the growing public health impact of CKD and ways to engage in upstream prevention.
- Design and implement frameworks to evaluate the effects of public health interventions.
- Obtain perspectives of patients and their families to inform program and policy development, prevent and manage CKD, and advance health equity.

System-Level Driver 2: Modernize Public Health Data and Surveillance

Implementation of interventions, research, and innovation necessitates the ability to accurately analyze and act on available data. In public health, data drive decisions and policies such as an increase in CKD funding and resources. Public health data can aid in resolving many health challenges equitably. The nation's overall data collection and surveillance systems are outdated and need modernization and innovation.

Strategies for Driving System-Level Change

- Invest and sustain **efforts** to modernize data and surveillance infrastructure across the state and federal public health ecosystem by appropriating $250 million to support the Centers for Disease Control and Prevention's (CDC) Data Modernization Initiative.
- Develop methods and tools to disaggregate data by populations disproportionately affected by or at risk for CKD.
- Expand CDC public health data surveillance capabilities for CKD and establish a hub for CKD data collection, analysis, and reporting.
- Increase funding to support expanded CDC CKD Surveillance System capabilities.
- Ensure that the contract for the United States Renal Data System, the national data system that collects, analyzes, and distributes information about CKD and ESRD, is consistently and adequately funded.

System-Level Driver 3: Address Public Health and CKD Research Funding Gaps

Funding is required to bring about change. Public health efforts to prevent and manage CKD are severely underfunded in the US federal annual budget. Policy interventions and government support are vital in advancing CKD care toward earlier diagnosis and management. Stakeholders must advocate for Congress to significantly increase and sustain funding for CKD awareness, education, early detection, prevention, surveillance, and management activities.

Strategies for Driving System-Level Change

- Increase and sustain **federal funding** for federal agencies to address public health infrastructure and chronic disease (specifically CKD) related activities and expand activities that address social determinants of health.
    - Expand CDC's capabilities to implement activities that address social determinants of health in state, local, tribal, and territorial regions and reduce health disparities by appropriating $153 million in FY 2023.
    - Appropriate $1 billion in FY 2023 to assist CDC in its efforts to build state, local, tribal, and territorial capacity to respond to public health needs, including workforce development, public health emergency response, and sustainability of core public health capabilities.
    - Increase CDC's funding to $170 million in FY 2023 to support state public health agencies in addressing emerging issues and gaps related to chronic diseases.
    - Support the **Kidney Interagency Coordinating Committee** through sustained funding to coordinate a robust federal response to CKD, including surveillance, professional education and outreach, public education and outreach, quality improvement/evidence of therapy, and research.
- Encourage the US Department of Health and Human Services to update its regulations and appropriation language to dedicate a portion of its funds to addressing CKD.

System-Level Driver 4: Build a Sustainable and Diverse Workforce for Healthy Communities

Workforce shortages continue to remain a challenge across all disciplines. Over the past decade, the public health workforce has shrunk significantly due to lack of funding. Similarly, the nation faces a shortage of renal specialists and primary care physicians (PCPs), a problem exacerbated by increased demand and physician burnout. The growing and aging population demands an immediate solution to the issues of low pay in the public health sector, massive educational debt in the health-care sector, and burnout/workload issues in both sectors.

Strategies for Driving System-Level Change

- Equip the workforce with the necessary skills and knowledge to support community needs related to kidney health through training and continuing education by leveraging federally funded programs such as Health Resources and Services Administration's **Community Worker Health Training Program**.
- Bolster the primary care infrastructure by creating incentives for the physician workforce to enter the field of primary care medicine.
- Integrate and elevate the role of health-care navigators in chronic disease into the person-centered care models that prioritize upstream interventions.
- Expand the number of health-care navigators through **grant awards** to help people with or at risk for CKD to manage their health conditions and access appropriate health services.
- Bolster the health-care and public health workforce by offering tuition reimbursement, higher education debt relief, loan repayment, and competitive salaries to pursue careers related to public health, community health, nutrition, primary care, and/or nephrology.
- Support legislation to protect the health-care and public health workforce from violence, harassment, and threats modeled after **18 U.S.C. § 46504**.

Transforming Chronic Kidney Disease Prevention, Earlier Detection, and Management Challenges into Eight Opportunity Areas

1 CKD Opportunity 1: Collaborate Across Sectors to Combat Root Causes of Health Inequity That Contribute to CKD

Stakeholders have an opportunity to improve health, address root causes that contribute to longstanding disparities, and advance health equity. To create healthy communities, stakeholders must mutually agree on the mission to prevent the onset of CKD and coordinate efforts to achieve it.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
1. Design and implement community-centered programs to help health-care and community partners better understand and address social determinants of health and non-clinical risk factors that impact quality of life.		●		●	●	●
2. Assess social needs when developing community-centered programs using evidence-based models and tools, such as the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experience (PRAPARE) and the Accountable Health Communities Health-Related Social Needs Screening Tool.		●			●	
3. Operationalize programs that are guided by principles that foster diversity, equity, and inclusion and consider approaches such as the Participatory Planning Approach that includes various stakeholders from all backgrounds and sectors of a community in planning, implementing, and evaluating health promotion or prevention activities.		●		●	●	●
4. Adopt the Health in All Policies (HiAP) community approach that integrates health considerations and factors across all sectors and implement policies in non-health sectors to impact kidney health and health equity. • Examples include implementing community and school gardens, supporting consumption of nutritious foods in school, advocating for sustainable SNAP funding, and establishing permanent supportive housing.	●	●	●	●	●	
5. Initiate collaboration between rural providers and community health leaders to establish and sustainably fund rural provider safety nets in the form of community health centers, rural health clinics, school-based clinics, and Centers for Medicare & Medicaid Services (CMS)-designated critical access hospitals.	●	●	●	●	●	
6. Provide essential community-based services such as screenings for CKD.		●	●	●	●	
7. Expand broadband infrastructure in rural areas to enable access to digital apps and virtual platforms for prevention, management, and treatment of kidney disease.	●	●				

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2 CKD Opportunity 2: Optimize Nutritional Services to Slow CKD Progression

Medical nutrition therapy (MNT) now sits near the periphery of CKD care because its utilization remains low despite its promise for slowing disease progression. Addressing the issues of cost awareness and access to nutritional services can help bring these interventions to people with CKD and improve their quality of life. Doing so requires implementing solutions at the patient and health-care provider levels as well as instituting system-wide changes in payment structures and reimbursement practices.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
8. Increase patient and provider awareness about Medicare coverage of MNT to help address some of the cost barriers associated with the treatment and improve its utilization in people with CKD.		●	●	●		●
9. Educate beneficiaries to understand current patient access benefits and policies for MNT services.			●	●	●	
10. Utilize resources such as those from the Academy of Nutrition of Dietetics to learn how to obtain coverage and maximize reimbursement.				●		
11. Advocate to appropriate payers for changes in payment structures that can mitigate the costs of MNT and incentivize its use in CKD care.	●			●	●	●
12. Provide continuing education opportunities to equip generalist registered dieticians with skills and knowledge needed to counsel patients with CKD. Refer to National Institute of Diabetes and Digestive and Kidney Diseases resources such as CKD Nutrition Management Training Program.		●	●			

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3 CKD Opportunity 3: Repurpose US Primary Care Infrastructure to Drive Person-Centered Coordinated Care

It is essential to invest in a well-functioning primary care system to help health care achieve its quadruple aim to (1) enhance patient experience, (2) improve population health, (3) reduce costs of care, and (4) improve the health care team experience.[4] To do so, stakeholders must implement the following action steps and drive forward person-centered care.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
13. Create provider checklists that require PCPs to discuss patient/family history related to CKD as well as share and prescribe the most recent innovative therapies that slow disease progression in a timely manner.				●		

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
14. Utilize risk-prediction instruments now available to assess risk of kidney failure and cardiovascular disease in CKD to permit directing of interventions to patients at higher risk, particularly vulnerable populations.				●		
15. Adopt a shared decision-making approach to help individuals make informed health decisions with the support and guidance of health and public health professionals.				●	●	●
16. Integrate a robust referral management system into existing physician workflows to help coordinate care.		●		●		
17. Utilize electronic health records (EHRs) to share patient data in a Health Insurance Portability and Accountability Act (HIPAA)-compliant manner.				●		
18. Use EHRs to send/receive referrals with other members of the care team to facilitate a smooth transition of care, lower specialty care costs, better manage referrals, and reduce burden on physicians or patients.				●		

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4 CKD Opportunity 4: Update CKD Screening Guidelines and Promote Their Universal Adherence

CKD is associated with morbidity, impaired quality of life, and excessive health-care costs. Stakeholders have an opportunity to update the guidelines as well as establish consensus on early screening and universal adherence to improve disease detection and management, reduce health-care costs, and improve the overall health and well-being of people affected by CKD.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
19. Build consensus on an updated screening guideline for individuals with risk factors for CKD among multidisciplinary health-care providers (PCPs, nephrologists, endocrinologists, cardiologists, and other specialists) as well as other key stakeholder advocates (manufacturers, patient advocates).	●	●		●	●	
20. Participate in public comment opportunities to inform the outcome of the US Preventive Services Task Force (USPSTF) recommendation process for CKD: a. draft research plan b. draft evidence review c. draft recommendation statement	●			●	●	●
21. Advocate for USPSTF to publish its final recommendation statement for CKD before the end of 2023.	●			●	●	●

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
22. Promote awareness of the coverage benefits for USPSTF-recommended preventive services mandated under the Affordable Care Act.		●	●	●	●	

5

CKD Opportunity 5: Invest in Education and Health Communication Platforms to Improve Health Literacy for CKD

The health-care system must change the way it approaches people rather than expecting people to change. Developing creative ways for people to participate in their health can significantly increase patient knowledge in a short period of time. Each stakeholder must work collaboratively to empower and involve communities in decision-making processes to improve the community's health.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
23. Host community-based education programs that raise awareness and increase knowledge about kidney disease, risk factors, prevention, and management. • Disseminate materials that are easy to read and linguistically, culturally, and age-appropriate and provide community-based resource information such as where to access nutritious foods. Share toolkits that help community members have a conversation with their health-care providers. • Share NKF brochures and NKF education materials. • Encourage tips for maintaining a healthy lifestyle that include regular physical activity, limiting alcohol consumption, managing risk factors and comorbidities, and reducing environmental stress.		●	●	●	●	
24. Identify engaging ways for people to understand and participate in their health. Interact with people impacted by CKD via online platforms such as Responsum Health's Patient Empowerment app.		●		●	●	●
25. Develop self-management education programs tailored to an individual's needs, requirements, and goals to help people with or at risk for CKD manage their condition better. Refer to CDC's Managing Diabetes program, which can serve as a model for enabling people with or at risk for CKD to manage their condition better.		●		●	●	●
26. Use the teach-back and show-me method to ensure that patients have accurately understood the information and CKD care instructions offered by their provider.				●		

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6 CKD Opportunity 6: Leverage Telehealth and Innovative Care Models to Improve Information Exchange and Peer Support

High-quality care can be achieved if providers use telehealth and peer support platforms to collaborate and gain insights about an individual's health condition from other members of the care team. Therefore, stakeholders must collaborate to identify strategies that improve the information exchange process and provide high-quality care and response.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
27. Advocate to the appropriate government agencies for telehealth to be integrated into health systems as a permanent option, especially for patients and health-care providers who need it.	●			●	●	●
28. Adopt telehealth and telemedicine strategies to improve access to specialized care for both people and providers, particularly in underserved areas.				●		
29. Utilize peer support platforms such as Project ECHO to create pathways linking primary and specialty care to provide PCPs with the knowledge, resources, and tools they need to help reduce health-care utilization and improve health outcomes.				●		
30. Provide nutritional services through telehealth to reduce access barriers.				●		
31. Provide appropriate reimbursement to the originating and distant sites for telehealth services.		●	●			
32. Ensure licenses and certifications for physicians, nurse practitioners, physician assistants, and registered dietitians who treat patients in other states via telehealth/telemedicine.		●			●	

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7 CKD Opportunity 7: Establish and Measure Accountability in CKD Care

Successfully preventing CKD and its progression requires measures that allow health-care providers to demonstrate the efficacy of interventions. Advances such as the availability of new CKD treatments and the gradual rise of value-based payment structures illustrate the need to establish a greater number of quality metrics around the secondary prevention of CKD. Continually refining these metrics and integrating them into kidney care delivery require the involvement of multiple stakeholders.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
33. Advocate new quality measures (in addition to updating existing metrics) for secondary prevention to facilitate upstream person-centered improvements and promote better implementation of current effective therapies that slow CKD progression				●	●	●

34. Develop CKD-specific quality measures to help with fair reimbursement, increase provider accountability, evaluate care/performance, improve health outcomes, and advance health equity.		●				

8 CKD Opportunity 8: Incentivize High-Quality Care through Value-Based Care Models

Achieving high-value and high-quality care for patients must be the goal of all health-care delivery systems. Value-based programs are beneficial in incentivizing providers for the quality of care they provide. To move away from quantity to quality care, stakeholders must reform payment as well as models and invest in preventing CKD progression.

Recommended Actionable Steps	PM	GA	PE	HCP	CBO	CM
35. Develop and endorse policies and regulations to reform payment and delivery to move away from fee for service (FFS) to pay-for-performance.	●	●				
36. Evolve CMS' Kidney Care Choices model to include earlier stages of CKD and reward providers for upstream interventions.	●	●	●	●		
37. Monitor milestones of the Primary Care First model and evaluate the prevention impact potential for CKD.	●	●	●	●	●	
38. Form partnerships to support systems transformation, including establishing interoperable EHRs and data systems, revising revenue streams, and developing robust provider workflows.	●	●	●	●		
39. Encourage health-care providers to adopt a population health mentality necessary for value-based care.				●		
40. Identify patient population and design appropriate care management models.				●		

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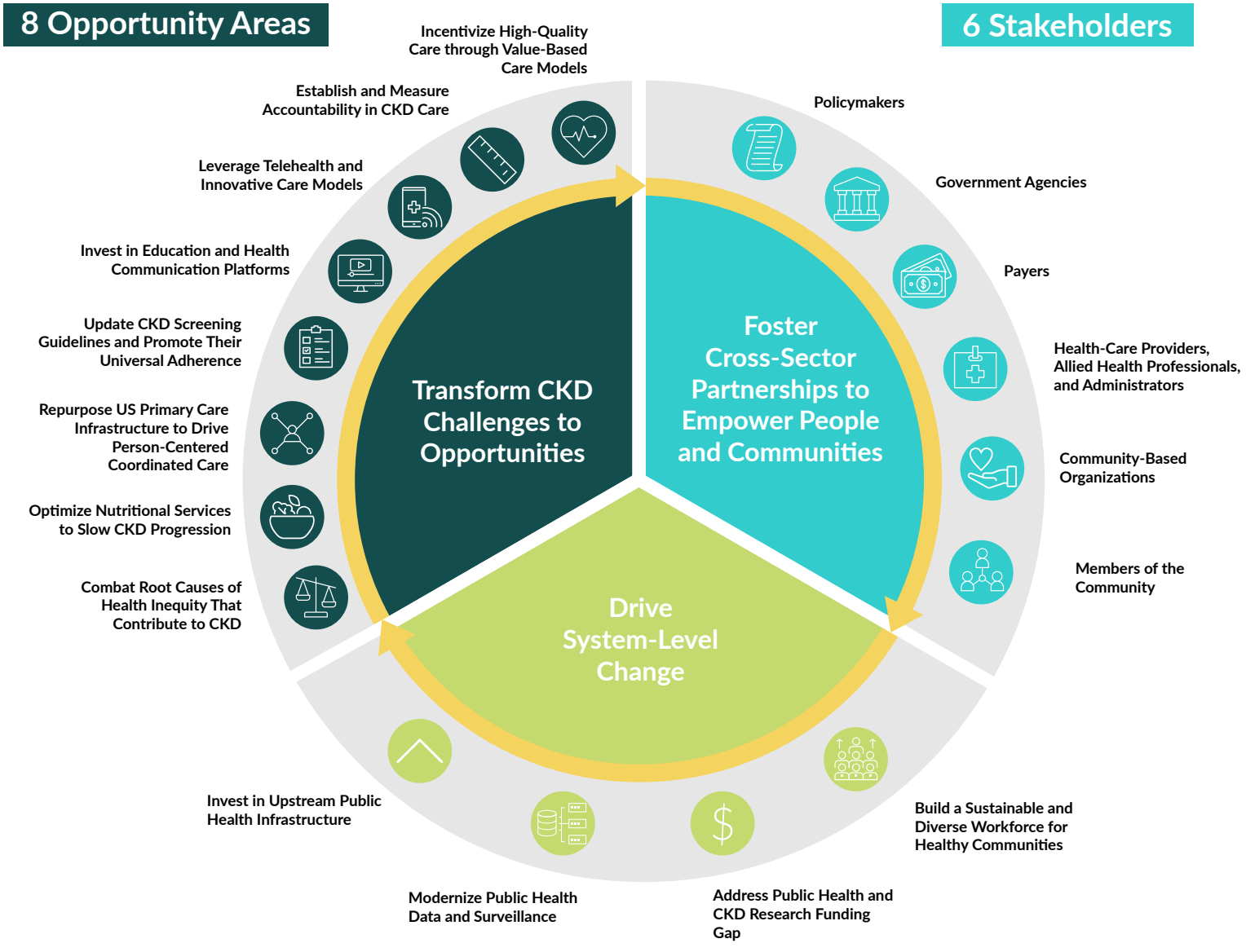
Call to Action

Now more than ever, stakeholders must come together to implement a strong public health response for CKD prevention, earlier detection, and management. To address this growing public health issue, a collective effort from all sectors of society will be required, and it must be handled with urgency. The public, health-care, and private sectors have an opportunity to engage with community leaders and members to develop strategies that combat the root causes of health disparities that contribute to CKD, repurpose the primary care and public health infrastructure, and promote health education and literacy for community members. These opportunities will not be realized unless a solid foundation of structured partnerships, a sustainable health-care and public health workforce, and adequate funding for CKD prevention, surveillance, and management activities are established.

Figure 3: Pathway to Catalyze Change In The CKD Ecosystem



Source: Milken Institute (2022)

Conclusion

To address the hidden epidemic of CKD effectively, our nation must bolster its prevention, early detection, and management capabilities. There is an urgent need to develop and implement public health strategies to detect and diagnose CKD earlier and prevent its progression to kidney failure. This roadmap outlines recommendations for various stakeholders on how to overcome these obstacles to achieve the shared vision of a world free of kidney disease. The roadmap serves as a guide for implementing practical, evidence-based strategies that will advance engagement and progress equitably.

Curbing the ever-increasing rate of CKD requires implementing these efforts now. The Milken Institute's Center for Public Health stands ready to catalyze this public health approach to tackling the shortcomings of CKD prevention and management and ultimately move the field closer to achieving equitable, effective health care for all.

Endnotes

1. "How to Avoid Being Part of the Growing Diabetes 'Epidemic'." University Hospitals, accessed April 28, 2022, https://www.uhhospitals.org/Healthy-at-UH/articles/2017/12/the-diabetes-epidemic.
2. "Six Domains of Health Care Quality," Agency for Healthcare Research and Quality, accessed March 21, 2022, https://www.ahrq.gov/talkingquality/measures/six-domains.html.
3. "Community Organization Model," *Rural Health Information* Hub, https://www.ruralhealthinfo.org/toolkits/health-promotion/2/program-models/community-organization#:~:text=Successful%20health%20promotion%20and%20disease,the%20program%20to%20affect%20change.
4. "Quadruple Aim," Strategies for Quality Care, accessed March 15, 2022, https://www.strategiesforqualitycare.com/quadruple-aim/.

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