Strengthening Chronic Kidney Disease Prevention Through Routine Screening: A Public Health Policy Brief for Central Visayas, Philippines

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INTRODUCTION

Chronic kidney disease (CKD) is a major global public health concern, affecting approximately 850 million people worldwide. It is characterized by progressive impairment of kidney function and is commonly associated with diabetes mellitus and hypertension. Often asymptomatic in its early stages, CKD may progress to end-stage renal disease (ESRD), requiring renal replacement therapy (RRT), including dialysis. The increasing burden of CKD highlights the importance of early detection, prevention, and timely intervention.

In the Philippines, CKD is among the leading causes of death and disability, ranking as the fourth leading cause of mortality according to the 2019 Global Burden of Disease Study. A 2023 publication in *The Lancet Regional Health – Western Pacific* reported a CKD prevalence estimate of 35.94% in the Philippines (Pajimna et al., 2023). However, this figure should be interpreted in the context of its underlying data and methodology and should not automatically be considered a nationally representative population-based prevalence estimate. The growing burden of CKD poses significant challenges to healthcare delivery, particularly in terms of treatment accessibility, resource allocation, and financial sustainability.

In Central Visayas, DOH-Philippine Renal Disease Registry (PRDR) data documented 3,806 new dialysis patients aged 21 years and above from 2022–2023. Among these patients, 41% had diabetes mellitus and 30% had hypertension. Most registered cases were aged 51–70 years, although dialysis cases among younger adults aged 21–40 years reportedly increased by 37.37% compared with the previous year. These findings indicate an increasing regional burden of dialysis and underscore the need for targeted CKD prevention and management. It is important to note that these figures represent registered dialysis cases rather than population-based CKD prevalence.

CKD also imposes a substantial economic burden on patients and the healthcare system. Hemodialysis typically requires three sessions weekly, equivalent to 156 sessions annually, with an estimated treatment cost of PHP 624,000 per patient per year at PHP 4,000 per session. Despite expanded PhilHealth coverage, patients continue to incur additional expenses for transportation, medications, food, and other treatment-related needs, potentially resulting in financial hardship. Given the increasing burden of CKD-related dialysis in Central Visayas, this study aims to examine the trends and characteristics of registered dialysis patients, particularly their age distribution and associated comorbidities. The findings may provide evidence to support regional health planning, resource allocation, and the development of targeted CKD prevention and management strategies.

Keywords - Chronic Kidney Disease (CKD), End Stage Renal Disease (ESRD), hypertension, diabetes mellitus, Philippine Renal Disease Registry (PRDR)

METHODOLOGY

The global and local rise in CKD is driven by increasing rates of diabetes, hypertension, and other factors. CKD often remains undetected until advanced stages, with many patients diagnosed only after symptoms appear,

reducing the chances of prevention. Early detection through routine screening is not only crucial to preventing progression to ESRD and related complications but to avoid economic burden as well.

This study is a secondary-data analysis and public health policy assessment. It uses existing administrative registry information through the DOH PRDR system and published literature to describe the regional dialysis burden and assess policy options for strengthening routine CKD screening. No primary interviews, focus group discussions, surveys, or other primary qualitative data collection are described in the materials provided.

2.1 Study Design

A descriptive secondary-data analysis was undertaken using DOH-PRDR records summarized for Central Visayas, complemented by a narrative review of relevant published and policy literature. The quantitative component describes registered dialysis cases, age distribution, and recorded comorbidities. The literature component provides clinical, health-system, and policy context for the proposed screening recommendations. The two evidence sources were synthesized narratively to develop policy implications; no participant-level qualitative analysis was conducted.

2.2 Study Setting and Population

The geographic setting is the Central Visayas region covered by the DOH-PRDR extracted on July 29, 2024 used for this analysis. The available manuscript describes the regional coverage as Cebu, Bohol, Negros Oriental, Siquijor, and the Highly Urbanized Cities namely Cebu City, Mandaue City and Lapu-Lapu City. The population represented in the quantitative analysis consists of individuals aged 21 years and older recorded as new dialysis patients in the regional registry during 2022–2023.

2.3 Data Sources and Collection Period

The primary quantitative source was the DOH-PRDR Online System. The verified dataset contains annual counts of new dialysis patients aged 21 years and older for 2022 and 2023, including recorded comorbidities and age-disaggregated counts across seven age groups. The age table was provided with a reporting or extraction reference of July 29, 2024; however, the age counts presented in this analysis cover only Calendar Year 2022 to 2023.

2.4 Inclusion and Exclusion Criteria

For the registry analysis, the intended inclusion criteria were records identified in the DOH-PRDR extract as new dialysis patients, aged 21 years and older, and assigned to the Central Visayas geographic coverage during 2022 up to 2023. For the literature component, sources were considered when they addressed CKD prevalence, risk factors, screening, dialysis burden, treatment costs, primary healthcare, or relevant Philippine health related policies specifically on Lifestyle Related Diseases.

2.5 Variables and Operational Definitions

The variables analyzed were year of registration, annual number of new dialysis patients, and recorded comorbidities, specifically diabetes mellitus (DM) and hypertension (HPN). For the two-year summary, the denominator for the reported comorbidity percentages was 3,806 new dialysis patients (1,572/3,806 = 41.30% for DM; 1,155/3,806 = 30.35% for HPN). The comorbidity categories may overlap because an individual may have both DM and HPN.

2.6 Quantitative Data Analysis

The data were analyzed descriptively using counts, percentages, and year-to-year percentage change. The percentage of patients with each recorded comorbidity was calculated by dividing the total number recorded with that condition across 2022 to 2023 by the combined number of new dialysis patients for the same period (n = 3,806), then multiplying by 100. The year-to-year percentage change in new dialysis patients was calculated

as the difference between the 2023 and 2022 counts divided by the 2022 count, multiplied by 100. New dialysis registrations increased from 1,511 in 2022 to 2,295 in 2023, equivalent to a 51.89% increase. Because the source is a registry of dialysis patients rather than a population-based survey of CKD, the analysis does not estimate CKD prevalence in the general population and does not calculate population prevalence rates. The analysis was descriptive and no inferential statistical testing was undertaken.

2.7 Qualitative Literature Review and Integration of Evidence

Published literature and policy documents were reviewed to provide context on CKD risk factors, screening, treatment burden, and the Philippine health-system response. The literature was used as documentary evidence for policy assessment and was not treated as primary qualitative data.

Integration was undertaken through narrative synthesis culled out findings from the PRDR were used to describe the regional profile of registered dialysis patients, while published studies and policy documents were used to interpret the implications for prevention, screening, referral, and health financing. The synthesis informed the policy recommendations but did not involve coding or thematic analysis of interview or focus-group transcripts.

2.8 Ethical Considerations and Data Confidentiality

The analysis relied on secondary registry data and published or publicly available documents. No direct contact with patients or collection of new identifiable patient information was described.

RESULTS AND DISCUSSION

3.1 Regional Profile of Registered Dialysis Patients

The verified DOH-PRDR dataset recorded 1,511 new dialysis patients in 2022 and 2,295 in 2023, for a combined total of 3,806 new dialysis patients in Central Visayas. This represents a 51.89% increase in the number of new dialysis registrations from 2022 to 2023. These figures are counts of registered new dialysis patients, not estimates of CKD prevalence in the regional population. The annual counts and the two-year total are presented in Table 1.

Table 1. New dialysis patients and recorded comorbidities, Central Visayas, 2022–2023.

Year	Diabetes Mellitus (DM)	Hypertension (HPN)	New Dialysis Patients	Percent Increased
2022	599	442	1,511	
2023	973	713	2,295	51.89%
Total	**1,572**	**1,155**	**3,806**	

Source: DOH–Philippine Renal Disease Registry (PRDR), verified dataset for 2022–2023

3.2 Recorded Comorbidities

In Central Visayas alone, there were 3,806 new dialysis patients documented between 2022 and 2023, with a notable rise in younger adults aged 21 to 40 presenting with CKD.

Across 2022–2023, the registry recorded 1,572 patients with diabetes mellitus (41.30%) and 1,155 patients with hypertension (30.35%), using the combined 3,806 new dialysis patients as the denominator. The annual counts were 599 and 973 for diabetes mellitus in 2022 and 2023, respectively, and 442 and 713 for hypertension. Patients may have both conditions; therefore, the two percentages are not mutually exclusive and should not be added together.

3.3 Age Distribution and Younger Adult Cases

The verified age-disaggregated DOH-PRDR data show that patients aged 51 to 60 years and 61 to 70 years were the largest age groups, with 962 patients each across 2022 to 2023. Together, these groups accounted for 1,924

of the 3,806 registered new dialysis patients (50.55%). Among younger adults aged 21–40 years, registrations increased from 281 in 2022 to 386 in 2023, an increase of 105 patients or 37.37%. Specifically, registrations among those aged 21 up to 30 years old increased from 107 to 148 (38.32%), while those aged 31 up to 40 years old increased from 174 to 238 (36.78%). The data therefore support an increase among younger adults, but the increase between 2022 and 2023 was 37.37%. The age distribution and year-to-year changes are presented.

Table 2. Frequency and Distribution of new dialysis patients according to age group, Central Visayas, 2022–2023.

Age in Years	2022	2023	Total
21–30	107	148	255
31–40	174	238	412
41–50	263	357	620
51–60	374	588	**962**
61–70	370	592	**962**
71–80	173	274	447
81 above	50	98	148
Total	1,511	2,295	3,806

Source: DOH–Philippine Renal Disease Registry (PRDR), verified age-disaggregated dataset for 2022–2023; reporting or extraction reference provided as July 29, 2024.

Table 3. Distribution and Percentage Increase of Patients Aged 21–40 Years Old, 2022–2023

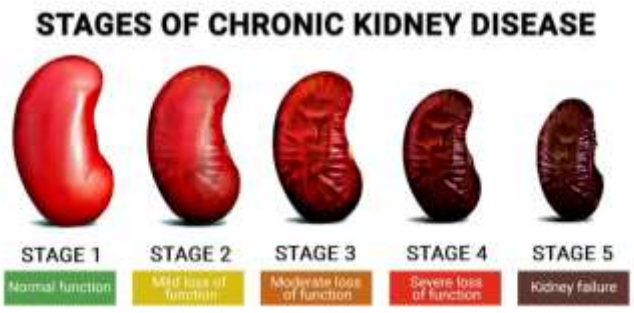
Age Group	2022	2023	Increase	Percentage Increase
21–30 years	107	148	41	38.32%
31–40 years	174	238	64	36.78%
Total	**281**	**386**	**105**	**37.37%**

Source: DOH–Philippine Renal Disease Registry (PRDR), verified age-disaggregated dataset for 2022–2023; reporting or extraction reference provided as July 29, 2024.

Note: The percentage increase among adults aged 21 up to 40 years old was calculated as (386 − 281) / 281 × 100 = 37.37%. Percentages in the final column are based on the total of 3,806 registered new dialysis patients.

3.4 Interpretation of CKD Prevalence Estimates

Figure 1: Stages of Chronic Kidney Disease (CKD)



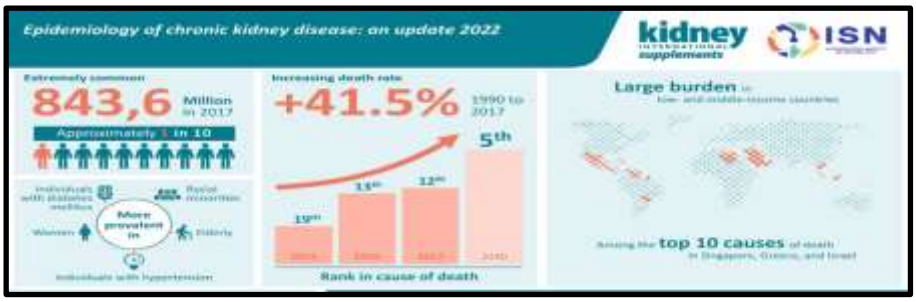
Source: Clinical Renal Associates, 2021

The illustration highlights the five (5) stages of Chronic Kidney Disease (CKD), from preserved kidney function with evidence of kidney damage in Stage 1 to kidney failure in Stage 5; thus, its label "normal function" should not imply the absence of disease. Also, the figure reinforces the importance of identifying CKD before

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substantial kidney function is lost. Integrating routine screening using estimated glomerular filtration rate and urine albumin-to-creatinine ratio into primary care, particularly for individuals with diabetes or hypertension, would support early detection, timely management, and appropriate referral, with the aim of slowing progression and reducing the burden of advanced kidney disease in Central Visayas. Furthermore, lifestyle modification changes and early CKD treatment is effective in the slow progression towards kidney failure.

Figure 2: Epidemiology of Chronic Kidney Disease: An Update 2022

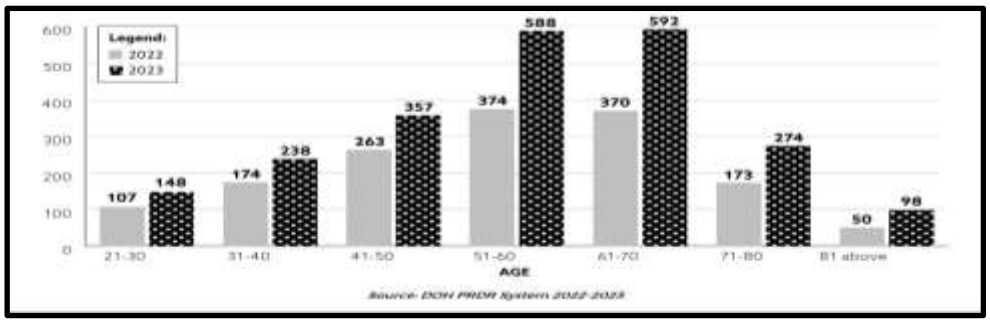


Source: Kovesdy, 2022

The figure states that in 2022, Kovesdy cites the substantial global burden of CKD, affecting an estimated 843.6 million people in 2017, alongside a 41.5% increase in the global all-age CKD mortality rate between 1990 and 2017. It identifies greater vulnerability among older adults and individuals with diabetes or hypertension, with particularly serious implications for low- and middle-income countries. These findings support the integration of routine, risk-based CKD screening into primary care in Central Visayas, prioritizing high-risk populations and linking detection to timely treatment and referral. The 35.94% figure cited in the 2023 Lancet Regional Health – Western Pacific commentary is traceable to the systematic review and meta-analysis by Suriyong et al. (2022). In that review, the Philippine estimate for CKD stages 3–5 was based on one included study with 3,364 participants and was reported as 35.94% (95% CI: 34.32% – 37.59%). It is therefore a country-specific estimate derived from a single study included in the review, not a PRDR figure and not a regional share of registered cases in Central Visayas. The review's pooled estimate across 14 Asian low- and middle-income countries was 11.2% (95% CI: 9.3% – 13.2%), based on 110 studies and 4,760,147 participants. Differences in population selection, CKD stage definition, study design, and geographic scope mean that these estimates should not be directly compared with counts of dialysis patients in the PRDR.

CKD occurs frequently and has devastating consequences thus if remains undetected towards advanced stages, with many patients diagnosed only after symptoms appear, reducing the chances of prevention. Efforts should focus on early detection through routine screening which is not only crucial to preventing progression to end-stage renal disease (ESRD) and related complications, decrease CKD incidence but also to avoid economic burden to patients and their families.

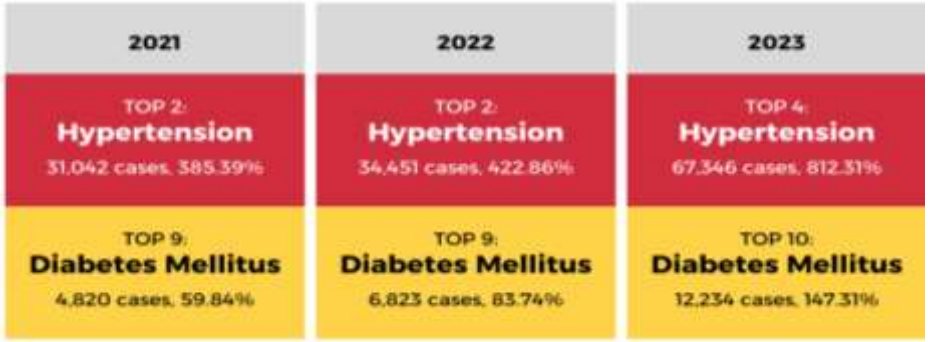
Figure 3. Number of New Dialysis Patients (CKD Cases among 21 years old and above (By Age Group), Central Visayas, 2022-2023; Total- 3,806 from year 2022-2023



While the majority of cases are concentrated among individuals aged 51 to 70 years old, there is a notable and concerning rise in dialysis cases among younger adults aged 21 to 40 years old (see Figure 3). As of July 2024,

the incidence in this younger demographic has increased by over 50% compared to the previous year, signaling a worrisome trend that is expected to persist.

Figure 4: Top 10 Leading Causes of Morbidity, 2021-2023 (Rate, per 100,000 Population in Central Visayas



Source: DOH-CVCHD-Field Health Services Information System (FHSIS), 2024

Increasing reported cases of hypertension in Central Visayas from 31,042 in 2021 to 67,346 in 2023, alongside an increase in diabetes mellitus cases from 4,820 to 12,234 (see Figure 4). These trends reinforce the rationale for the proposed CKD screening policy because hypertension and diabetes are major causes of CKD like sustained high blood pressure damages renal blood vessels, while prolonged elevated blood glucose injures the kidneys' filtering structures, progressively impairing kidney function. Thus, this policy brief therefore supports prioritizing individuals with these conditions for routine kidney screening, timely follow-up, and effective blood pressure and glucose management.

RECOMMENDATIONS

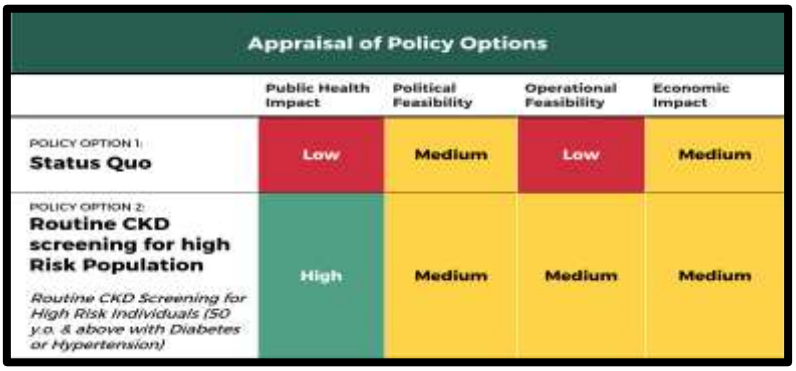
The policy brief highlights the critical role of routine screening in managing CKD among high-risk individuals. The proposed policy not only aims to improve health outcomes but also seeks to alleviate the economic burden on both patients and healthcare systems. Moreover, the implementation challenges include establishing a referral network and ensuring Local Government Units (LGUs) to adhere to new screening protocols.

Key Policy Recommendations:

1. **Status Quo:** Current screening practices are reactive, relying on patients to seek help only after complications arise; and

2. **Routine CKD Screening:** Implementing routine screening for high-risk populations could potentially avert up to 5,986 cases of ESRD annually at an Incremental Cost-Effectiveness Ratio (ICER) of Php 4,693.00 per case averted.

Figure 5: Appraisal of Policy Options



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The global and local rise in CKD is driven by increasing rates of diabetes, hypertension, and other factors. CKD often remains undetected until advanced stages, with many patients diagnosed only after symptoms appear, reducing the chances of prevention. Early detection through routine screening is not only crucial in preventing progression to ESRD and its related complications but to avoid economic burden as well.

Policy Option 1: Status Quo:

CKD Screening of patients is dependent on those who subject themselves to testing or when they have complications already has advised by the attending physicians.

Policy Option 2: Routine CKD screening for high-risk population

This option includes routine CKD risk screening for high-risk individuals aged 50 years old and above that are diagnosed with Diabetes and Hypertension, implementing routine screening and prompt referral to the appropriate specialist whenever necessary. For those individuals aged 50 years old and above, **diagnosed** with diabetes and hypertension are more at risk of developing CKD if these NCDs remain unmanaged. This population should be the priority in routine screening and prompt referral.

Feasibility: Medium which means establishment of new processes is necessary to institutionalize routine CKD screening. While policy development is manageable, its implementation largely depends on the LGUs due to devolution of health services in the Philippines.

Pre - Implementation Phase

Under this, activities such as policy development on routine CKD Screening in the Primary Care Facility (PCF) will be developed. A workshop on the amendment of PhilPEN protocol to include CKD risk assessment will be finalized plus the development of CKD Assessment Algorithm. Also, establishment of CKD Referral Network among health care specialists plus establishment of CKD Referral Protocol from PCF to Apex Hospital.

Implementation Phase

After the pre-implementation phase, CKD Capability Building activities will commence and a regionwide roll-out of the new policy orientation for healthcare workers in Central Visayas will begin to improve LGU Screening Capacity on CKD Management. Recommendation to purchase a Urine Albumin Creatinine Ratio (UACR) Machine that will be allocated to PCFs with trained health personnel and create sustainable partnership with the Department of Interior and Local Government (DILG); Philippine Society of Nephrologists (PSN) and Cebu Provincial Health Office will be initiated towards the implementation of the policy.

Furthermore, inclusion of CKD screening in the Seal of Good Local Governance (SGLG); conduct *barangayan* medical mission to include actual CKD risk screening among high-risk individuals and once identified, appropriate management and referral to nephrologist as necessary. Development of CKD Information, Education and Communication (IEC) advocacy materials and for its wide dissemination of the new policy to the general population.

Post - Implementation Phase (Monitoring and Sustainability)

Includes active follow up of patients (up or down referral) plus monitoring of high-risk individuals regularly (dependent on their CKD status); and prompt management of patients to prevent CKD stage 5 progression through medication, lifestyle modification, surgery, etc.

3.5 Economic Implications

The economic burden for those patients with CKD incurs costs that are 85% higher than those without the disease. The annual cost of hemodialysis can reach Php 624,000.00 per patient, with PhilHealth covering only a portion of these expenses. The financial implications underscore the urgent need for early detection strategies.

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Figure 6: CKD Outcome Results Table

Outcome Results Table

Routine CKD Screening is the most cost-effective strategy

Outputs	POLICY OPTION 1: Status Quo	POLICY OPTION 2: CKD Screening/ Intervention
Number of ESRD cases	11,100	5,114
Number of ESRD Cases averted	-	5,986
Estimated cost to the Government	Php 28,091,400.00	Php 572.00
Cost per ESRD case averted	-	Php 4,693.00

Note: PhilHealth package is at Php 640,000 per patient per year

Based on the decision tree analysis and probability calculations, introduction of routine CKD screening among high-risk adults aged 50 years and above with hypertension and diabetes mellitus in Central Visayas is projected to reduce End-Stage Renal Disease (ESRD) cases from 11,100 under the status quo to 5,114 with intervention, averting an estimated 5,986 cases. These findings support addressing the lack of routine screening, which limits early CKD detection in this population. The estimated annual cost per ESRD case averted is ₱4,693.00 compared with no health intervention which suggests potential economic benefits when considered against the PhilHealth coverage amount cited in the analysis of ₱640,000.00 per patient annually.

CONCLUSION

CKD is a growing health challenge in Central Visayas, primarily affecting individuals with diabetes and hypertension. Early detection and management are critical to mitigating the progression of CKD to ESRD, which has severe health and economic implications. Routine CKD screening for high-risk populations, particularly those aged 50 and above, is a cost-effective strategy that could prevent thousands of ESRD cases annually while reducing healthcare expenses. Collaborative efforts between healthcare institutions, local government units (LGUs), and other stakeholders are essential to integrate CKD prevention into local governance and primary care frameworks.

To effectively address the growing burden of CKD, routine screening protocols must be established and institutionalized for individuals aged 50 and above who have diabetes or hypertension. Integrating CKD risk assessments into primary care services should become a standard practice in health facilities to promote early detection and prevent the progression to ESRD. These efforts will ensure that high-risk individuals are identified early and will receive timely interventions to mitigate the disease's health and economic impacts.

Policy integration and governance are critical to ensuring the success of CKD prevention initiatives. Collaborating with the Department of the Interior and Local Government (DILG) to include CKD screening in the Seal of Good Local Governance (SGLG) indicators will allow LGUs to prioritize and implement these programs. Similarly, strengthening LGUs through integrated governance frameworks, resource allocation, and PhilHealth support for CKD screening packages will reduce financial burdens and improve access to preventive care. Establishment of a referral system and specialist care network will ensure timely and appropriate interventions, supported by partnerships between primary care facilities and hospitals. A whole-of-government approach, combined with advocacy and awareness campaigns, will enhance public compliance and promote seamless integration of CKD management into broader healthcare initiatives, ultimately improving health outcomes and reducing ESRD cases.

By implementation of these recommendations, the region can achieve significant health and economic benefits, preventing nearly 5,986 ESRD cases annually in Central Visayas with an Incremental Cost Effectiveness Ratio (ICER) of ₱4,693.00.00 per averted case. These efforts will not only enhance the quality of life for high-risk individuals but also strengthen the healthcare system’s capacity to address CKD effectively.

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