# Addressing Health Challenges in Paraguay

## Strategies for Improving the Incidence of Non-communicable Diseases

Policy Brief


**Executive Summary**

Non-communicable diseases stand as the primary contributors to mortality in Paraguay, with conditions like ischemic heart disease, strokes, diabetes, and chronic kidney disease witnessing an uptick over the last decade. Major risk factors include high-body mass index, high fasting plasma glucose levels, high blood pressure, tobacco use, and dietary risks. These factors collectively play a significant role in shaping health outcomes and represent key areas for intervention and preventive strategies. In this brief, evidence-based recommendations have been formulated to update the National Action Plan for the Prevention and Control of Chronic Noncommunicable Diseases, focusing on two main areas. First, enhancing efforts in NCD prevention through interventions targeting multiple risk factors, population-level interventions, promoting physical activity, and preventing obesity in children and adolescents. Second, strengthening the health system's response to NCDs by enhancing capacity for smoking cessation interventions, simplifying blood pressure-lowering medication for better adherence, implementing dietary interventions for high-risk populations, and improving access and coverage in rural communities. Challenges within Paraguay's health system, including fragmentation and insufficient geographical coverage, underscore the urgency for improvements to tackle the population's dual burden of disease.

# Paraguay's Health System

With a population of 6.7 million where 17.6 percent are considered to be living in multidimensional poverty (INE, 2023), Paraguay's health system is characterized by high fragmentation and insufficient capacity to address the population's double burden of disease. While non-communicable diseases (NCDs) are on the rise due to longer life expectancies and less healthy lifestyles, unresolved matters persist regarding communicable, maternal, neonatal, and nutritional diseases (OECD, 2019).

By establishing primary care delivery units and abolishing user fees, Paraguay has significantly enhanced healthcare accessibility. The proportion of the population with access to skilled healthcare surged from just over fifty percent in 2003 to over three quarters in 2016. However, progress in health insurance coverage has been minimal, lingering at a mere 26 percent. Consequently, substantial out-of-pocket expenses burden many Paraguayans, raising concerns about potential impoverishment due to healthcare costs (OECD, 2018). The out-of-pocket expenditure in 2021 totaled 35.94 percent (WHO, 2023d), the highest in South America that year.

The lack of clear functional divisions and equitable geographic reach results in coverage problems, mainly in rural areas (Gómez and Escobar, 2021). This fragmentation, combined with minimal public expenditure, results in disparities in access and quality of care (Capurro and Harper, 2022). In 2021, health expenditure accounted for 8.03 percent of GDP (WHO, 2023c), marking the lowest figure among Mercosur counterparts that year.

**Health System Metrics *(WHO)***

- 10.1 hospital beds per 10.000 population (2020).
- 32.42 medical doctors per 10.000 population (2021).
- 8.03% current health expenditure as percentage of GDP (2021).
- 35,94% out-of-pocket expenditure (2021).

**Remaining Issues**

- High fragmentation.
- Low equitable geographic reach.
- Low health insurance coverage.

# Burden of Disease in Paraguay

Between 2009 and 2019, the leading causes of death and disability remained consistent, with the exception of neonatal disorders showing notable improvement, decreasing by 40 percent. However, ischemic heart disease, strokes, diabetes, and chronic kidney disease witnessed an increase over the course of the decade (IHME, 2024b). At present, non-communicable diseases are the main drivers of death in the country. Many deaths occur prematurely, with NCD premature deaths making up 47.3 percent of all NCD-related deaths (WHO, 2021).

Preventing NCDs through lifestyle changes can be affordable, but treating them can be costly. In developing countries, limited resources often go towards remedial healthcare rather than prevention, leading to economic strain. With limited access to quality healthcare, expanding preventive measures and enhancing the healthcare system's response to NCDs is crucial for better health outcomes.

*The Global Burden of Disease Project identifies the following as leading causes of death in Paraguay:*

1. Ischemic heart disease
2. Stroke
3. Diabetes
4. Chronic Kidney Disease

Ischemic heart disease stands as the leading cause of death in the country, with a mortality rate of 47 per 100.000 population, affecting men more (55.5>38.5) compared to women (MSPBS, 2021). Following closely are strokes, diabetes, and chronic kidney disease. The mortality rate of hypertensive diseases in Paraguay reached 23.4 per 100.000 population in 2020, with an equal impact on men (23.3) and women (23.5). Meanwhile, the mortality rate of diabetes was 40.3 per 100.000 population in the same year, with women (42.9>37.7) being more affected than men (MSPBS, 2021).

*Leading risk factors contributing to the majority of deaths and DALYs:*

- High-body mass index
- High fasting plasma glucose levels
- High blood pressure
- Tobacco use
- Dietary risks

*DALY (disability-adjusted life year): each DALY corresponds to one lost year of healthy life. It quantifies the total years lost due to specific causes and risk factors at various geographic levels, from local to global (IHME, 2024a).*

Children and adolescents in Paraguay also exhibit certain risk factors from a very early age. The main nutritional problem of children between 6 and 60 months in Paraguay is not malnutrition, but being overweight. One in eight children under five is overweight (12.4%), which is much higher than the regional average of 7.5 percent. The main obstacles to adequate nutrition are poverty, the price of healthy products versus ultra-processed foods, and the introduction of sugar-sweetened beverages at an early age (UNICEF, 2021).

Strokes, diabetes, high blood pressure (hypertension), and high cholesterol are interconnected (NHS, 2022). These factors collectively play a significant role in shaping health outcomes and represent key areas for intervention and preventive strategies.

# Methodological Overview

This policy brief addresses the primary causes of death and associated risk factors in Paraguay, as outlined in the Global Burden of Disease Project (GBD). The policy recommendations outlined in this brief are grounded in empirical evidence primarily drawn from systematic reviews. Priority was given to articles analyzing Randomized Control Trials (RCTs), although those incorporating observational studies were also taken into account. Single studies were included if they offered relevant insights from Paraguay or the Latin American region, or provided background information on specific diseases. For the formulation of recommendations, 14 articles were reviewed, encompassing a total of 485 studies. The databases consulted included Cochrane, PubMed, and Google Scholar.

***Limitations:***

- Multiple studies caution against the risk of bias and note both clinical and statistical heterogeneity. Furthermore, most studies can only draw limited conclusions due to insufficient evidence.
- Most studies include evidence from high-income, developed countries which limits the generalizability of the findings to the context, population, and setting of Paraguay as a middle-income, developing country. More evidence from LMIEs is needed. In the meantime, transculturalization strategies may be warranted (Nieto-Martínez et al., 2017).

# Key Findings

## Ischemic Heart Disease

Cardiovascular diseases (CVDs) are the leading cause of death in Latin America, primarily driven by ischemic heart disease (Peix and Páez, 2019). Key risk factors include obesity (specifically abdominal), dyslipidemia (abnormal levels of lipids (fats) in the bloodstream), smoking, physical inactivity, and diabetes mellitus (Lanas et al., 2013). Hospital readmissions pose a significant burden on healthcare systems and society as a whole. They are often attributable to poor adherence to heart failure guidelines, particularly in the Latin American region (Ciapponi et al., 2016).

**Women in Latin America** face a heightened risk of premature death from CVDs. However, there's a widespread misconception regarding the significance of CVDs in women, resulting in less attention compared to e.g., breast cancer campaigns (Peix and Páez, 2019).

## Strokes

The epidemiological transition in Latin America, characterized by an increasing population of older urban dwellers, has resulted in a rise in cardiovascular risk factors. Consequently, there has been an uptick in morbidity and mortality rates associated with both stroke and myocardial infarction.

The absense of accurate case registries and medical records, particularly in rural regions, poses local challenges. Strokes result from diverse risk factors and disease processes, with hypertension being the most significant modifiable risk factor, followed by diabetes mellitus, cardiac factors, smoking, alcohol consumption, obesity and sedentary behavior, inflammation, and psychosocial factors (Avezum et al., 2015; Murphy and Werring, 2020).

## Diabetes

In Latin America, diabetes, primarily Type 2, has rapidly become a leading cause of death and disability. Challenges include a large population with risk factors, half of whom remain undiagnosed, resulting in high costs (Bello-Chavolla and Aguilar-Salinas, 2016). The 2015 Paraguay AsuRiesgo study reported a higher prevalence of DM in the general population over 18 years of age (13.3%) (Céspedes et al., 2019). In 2022, only 10,6 percent of individuals with diabetes were undergoing treatment (MSPBS, 2023).

The AsuRiesgo study was obtained from a cohort selected from a single center, the Hospital Central de Instituto de Previsión Social in Asunción, where the **indigenous population** does not usually attend (Céspedes et al., 2019). This example highlights the need for more representative studies and surveys.

## Chronic Kidney Disease

Diabetes and hypertension are now the leading causes of end-stage renal failure worldwide (Atkins, 2005). In Paraguay, full coverage for dialysis and transplantation is exclusive to citizens under the national health insurance for employees. Others seeking hemodialysis must rely on public hospitals, where coverage is provided by the National Institute of Nephrology or other medical foundations. Many lack access to these programs or receive only partial financial assistance. Moreover, the scarcity of nephrologists outside the capital city further hinders expert assistance for a significant portion of the population (Da Cruz et al., 2005).

Non-communicable diseases can often be prevented at a low cost through lifestyle changes such as adopting a healthy diet and exercising. However, treating these diseases can be costly. The challenge arises from households in developing countries allocating minimal resources to preventive healthcare, instead prioritizing spending on remedial healthcare (Dupas, 2011). This economic burden is particularly significant given the lack of free or affordable access to quality healthcare services. Further initiatives aimed at expanding preventive care and improving the health system's response to NCDs are imperative to effectively bolster health outcomes.

# Policy Recommendations

The burden of non-communicable diseases in Paraguay shares similar risk factors, suggesting the need for holistic solutions that can address them simultaneously. The following recommendations are aimed at updating the **National Action Plan for the Prevention and Control of Chronic Noncommunicable Diseases.**

## Prevention of NCDs

### *Implement Multiple Risk Factor Interventions*

Evidence suggests that multiple risk factor interventions can reduce blood pressure levels, body mass index, and waist circumference in populations at high risk of hypertension and diabetes in low- and middle-income countries settings (Uthman et al., 2015). Also, universal school-based interventions targeting multiple risk behaviors are effective in preventing tobacco, alcohol, and illicit drug use in young people (MacArthur et al., 2018).

Recommendations for the Ministry of Health, along with the *National Cardiovascular Prevention Program,* the *National Diabetes Control Program, the National Smoking Control Program,* and *the Ministry of Women:*

**Key Takeaways:**

- Multiple risk factor interventions can prove effective in reducing NCDs' risk factors such as blood pressure in LMIE settings.
- School-based interventions addressing multiple risk behaviors can reduce alcohol, tobacco, and drug use.
- Population-level interventions can be effective for salt intake reduction.
- Altering food availability and placement can influence behavior to avoid overconsumption.

- Develop comprehensive interventions targeting multiple risk factors associated with hypertension and diabetes, including overweight/obesity, high blood pressure, smoking, elevated cholesterol levels, and low physical activity levels.
- Prioritize high risk populations such as those with known hypertension and type 2 diabetes for targeted interventions.
- Cooperate with the Ministry of Women to raise awareness about the heightened risks women face from CVDs.
- Implement school-based interventions targeting multiple risk factors for early prevention.

### *Develop Population-Level Governmental Interventions for Better Nutrition*

In terms of population-level governmental interventions, reducing dietary sodium has the potential to yield widespread decreases in salt intake. This is an important measure for decreasing the risk of heart disease and strokes as excessive salt consumption can elevate blood pressure levels (McLaren et al., 2016). Evidence also suggests that altering food availability and placement can influence behavior, justifying policy actions to promote such changes in food environments (Hollands et al., 2017).

Recommendations to update the *National Cardiovascular Prevention Program:*

- Implement policies aimed at reducing dietary sodium intake at the population level, with a focus on structural changes such as reformulating food products.

- Raise awareness about the health risks of excessive salt consumption and promote healthy dietary habits.
- Implement policies to alter high-in-salt food availability and placement in various settings such as schools and workplaces.
- Promote the adoption of tax on foods high in salt (see more: WHO, 2022b).

***Promote Physical Activity***

Interventions aimed at boosting physical activity levels can result in moderate short and medium-term increases in physical activity, particularly among middle-aged individuals (Foster et al., 2005).

Recommendations for updating the *Physical Activity Promotion Policy* in the National Plan to include the following measures:

- Provide accessible opportunities for physical activity, such as community-based exercise programs and infrastructure improvements.
- Collaborate with stakeholders across sectors, including urban planning, to create environments conducive to active living.
- Encourage employers to implement workplace wellness programs that promote physical activity and sedentary behavior reduction.
- Conduct an updated national adult risk factor survey covering physical inactivity for better-informed recommendations.

***Interventions for Obesity Prevention in Children and Adolescents***

Combining diet and physical activity interventions effectively reduces obesity risk in children aged 0 to 5 years. While evidence for dietary interventions alone is weaker, they may offer some benefits. However, interventions focusing solely on physical activity are ineffective for children aged 0 to 5 years. Conversely, they prove effective in reducing obesity risk in older children and adolescents (Brown et al., 2019).

**Key Takeaways:**

- Expanding the Physical Activity Promotion Policy to incorporate additional interventions can be effective in avoiding sedentary behavior.
- Interventions at an early age are essential to prevent obesity in children and adolescents; an important risk factor for the development of NCDs.

Recommendations to upscale efforts of the *Childhood Obesity Prevention Campaign*:

- Prioritize combined diet and physical activity interventions as the primary approach for reducing obesity risk in children aged 0 to 5 years.
- Develop and implement evidence-based programs that integrate dietary education and promotion of physical activity tailored to the developmental needs of young children.
- Provide resources and support for families and caregivers to facilitate healthy eating habits and active lifestyles in young children.
- Tailor interventions for older children and adolescents to include targeted physical activity programs in schools.
- Promote price subsidies for healthy foods (see more: WHO, 2022a).

## Health System Response to NCDs

***Improve Coverage and Implement Physician Interventions for Smoking Cessation***

Brief advice by physicians can modestly increase smoking cessation rates by 1 to 3 percent beyond the 2 to 3 percent unaided quit rate (Stead et al., 2013). More intensive interventions, such as combining pharmacotherapies and counseling, can significantly boost cessation rates, especially among high-risk populations like psychiatric and substance abuse individuals (Ranney et al., 2006).

Recommendations to improve the *National Smoking Control Program* should:

- Provide training and resources to healthcare professionals to effectively deliver brief advice interventions as a routine part of patient care.
- Allocate resources for more intensive smoking cessation interventions, such as combining pharmacotherapies and counseling, for high-risk populations.
- Expand coverage for pharmacotherapies and counseling services through public health programs and insurance policies.

### *Implement Simplified Medication Regimens for Patients with High Blood Pressure*

Reducing the frequency of daily doses shows effectiveness in improving adherence to blood pressure-lowering medication and should be considered as an initial strategy (Schroeder et al., 2004).

Recommendations:

- Advocate for healthcare providers to consider reducing the number of daily doses of blood pressure-lowering medications as a primary strategy to improve adherence and educate patients about the importance of medication adherence and the benefits of simplified dosing regimens in managing blood pressure.
- Conduct regular evaluations to assess patient satisfaction, medication adherence rates, and clinical outcomes associated with simplified dosing strategies.
- Conduct an updated national adult risk factor survey covering raised blood pressure/hypertension for better-informed recommendations (see more: WHO, 2022c).

### *Promote Dietary Interventions for High-Risk Patients*

Dietary interventions can enhance quality of life, eGFR, and serum albumin levels while reducing blood pressure, and serum cholesterol, and improving weight loss (Palmer et al., 2017; Semlitsch et al., 2021).

**Key Takeaways:**

- Brief advice in routine checks about tobacco use can increase quitting rates. Pharmacotherapy and counseling can be beneficial for high-risk populations.
- Reducing and simplifying daily doses of blood pressure-lowering medications can prove effective in improving adherence.
- Dietary interventions can provide clinical benefits to high-risk patients, especially CKD patients.

Additionally, reducing salt intake in CKD patients lowers blood pressure and albuminuria.

Sustaining these reductions over the long term could potentially result in significant clinical benefits by slowing down CKD progression and reducing the occurrence of cardiovascular events (McMahon et al., 2021).

Recommendations:

- Encourage healthcare providers to offer dietary counseling and support to CKD patients to optimize their nutritional intake.
- Foster collaboration between nephrologists, dietitians, and other healthcare professionals to implement comprehensive dietary interventions for CKD patients.
- Develop strategies to ensure the long-term sustainability of dietary interventions, including ongoing monitoring and support mechanisms.

### *Improve Access and Coverage in Rural Communities*

Decentralization and a task-shifting model can prove effective for NCD management. This involves shifting the care of stable NCD patients to nurses in primary healthcare settings (Some et al., 2016). Also, interventions led by nurses for hypertension were discovered to enhance healthcare accessibility and prove cost-effective (Spies et al., 2018).

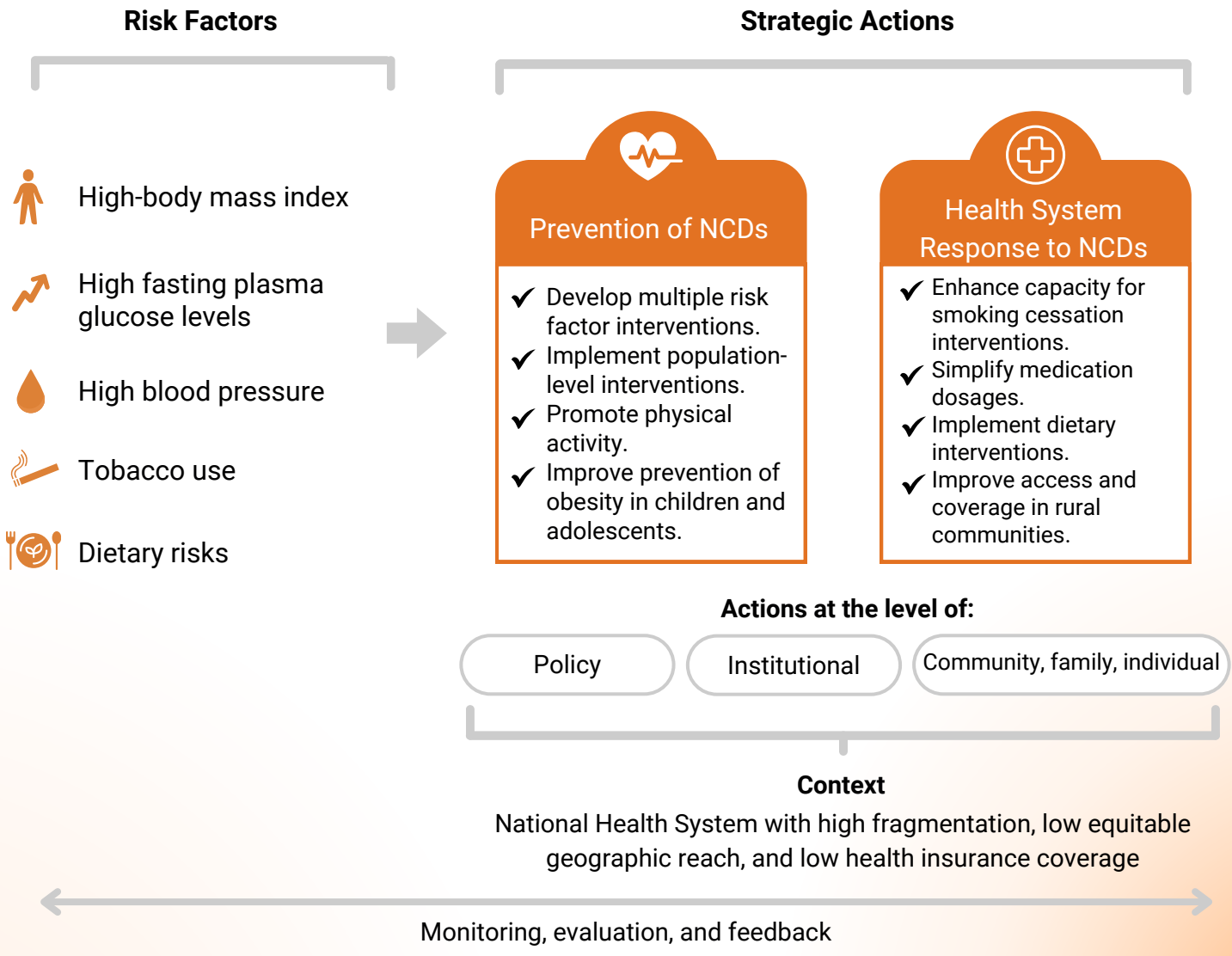
Recommendations:

- Shift the care of stable NCD patients to nurses working in primary healthcare settings in rural areas.
- Provide training and support for nurses to effectively lead interventions targeting hypertension control.
- Establish community-based clinics or mobile healthcare units staffed by trained nurses to reach underserved populations and provide essential healthcare services.

**Key Takeaway:**

- Task shifting and decentralization can be effective strategies for managing stable NCD patients in communities with limited healthcare personnel.

**Figure 1.** Summary of Policy Recommendations for the National Action Plan for the Prevention and Control of Chronic Noncommunicable Diseases.




Source: Own illustration.

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