ASSESSING THE CARE CASCADE FOR DIABETES AND HYPERTENSION IN SAINT LUCIA

Mixed Methods Study Utilizing Qualitative Data from Health Professionals and Service Users and Quantitative Data from the Saint Lucia STEPS 2019–20 Survey

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The study methodology draws extensively on the existing World Bank publication, *Improving Health Services and Redesigning Health Systems: Using Care Cascade Analytics to Identify Challenges and Solutions, Volume 1. Population-level Cascade Analytics*[1] and would not have been possible without the work of these previous authors. In particular, we would like to thank Dr. Nicole Fraser-Hurt for her helpful inputs and guidance on the study methodology.

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[1] Fraser-Hurt, Nicole, Shubber, Zara, and Katherine Ward. 2022. *Improving Health Services and Redesigning Health Systems : Using Care Cascade Analytics to Identify Challenges and Solutions, Volume 1. Population-level Cascade Analytics.* Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/36993

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LIST OF ABBREVIATIONS

BG	blood glucose
BMI	body mass index
BP	blood pressure
CARPHA	Caribbean Public Health Agency
CBO	community-based organization
FBO	faith-based organization
FGD	focus groups discussion
GDP	gross domestic product
HLC	healthy lifestyle counseling
KII	key informant interview
MOHWEA	Ministry of Health, Wellness and Elderly Affairs of Saint Lucia
NEML	national essential medicines list
NCD	noncommunicable disease
NIC	National Insurance Corporation
NGO	nongovernmental organization
OR	Odds Ratio
POC	point-of-care
SDH	social determinants of health
SLUHIS	Saint Lucia Health Information System
UHC	universal health coverage
WHO	World Health Organization

Executive Summary

For more than a decade, the National Epidemiology Unit of the Ministry of Health, Wellness and Elderly Affairs of Saint Lucia (MOHWEA) has reported that noncommunicable diseases (NCDs) are the leading cause of illness and death. According to the World Health Organization (WHO) 2022 NCDs Progress Monitor, NCDs are the cause of 82 percent of deaths and there is an 18 percent probability of premature mortality from NCDs in Saint Lucia. Given these epidemiological challenges faced in Saint Lucia, the World Bank, in collaboration with the MOHWEA, has conducted a study to analyze the care cascades for type 2 diabetes and hypertension in Saint Lucia. This report aims to inform improvements to country-level responses to NCD management in Saint Lucia.

The methodology of the study is based on the care cascade analytical approach, as outlined by Fraser-Hurt[2] and colleagues, which aims to systematically assess service delivery bottlenecks and barriers across the care continuum. The care cascade is a series of connected service delivery steps that cover a client's needs through four main points of care: screening; diagnosis; treatment initiation; and treatment maintenance. The study utilized a mixed methods approach with two main components:

1. Secondary research involving quantitative analysis of 2019–20 STEPS data to develop quantitative care cascades for diabetes and hypertension.
2. Primary, qualitative research involving focus group discussions (FGDs) with health professionals and patients, as well as key informant interviews to explore specific issues and obtain further insights.

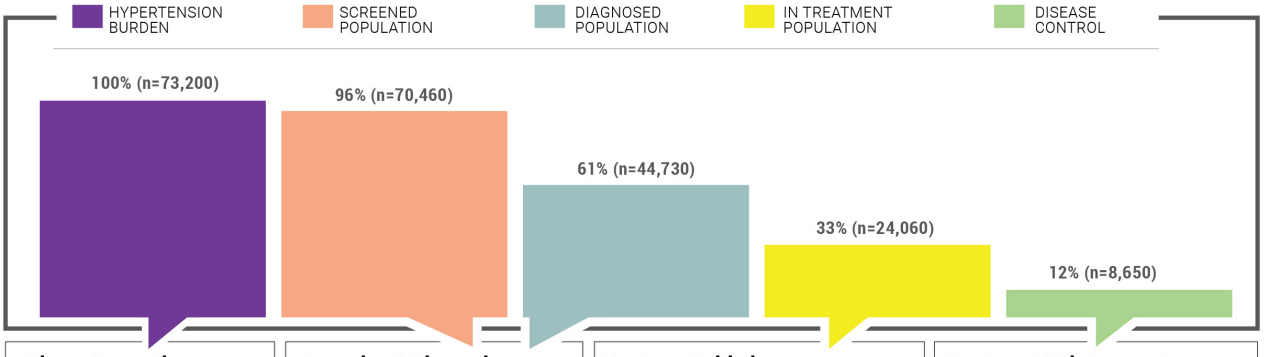
Prevalence at each step of the hypertension and diabetes care cascades in Saint Lucia was assessed descriptively, and then logistic regression methods were utilized to understand key associations. Key quantitative findings indicated the following in Saint Lucia:

- About 41 percent of females and 39 percent of males aged 18–69 are hypertensive, and 18 percent of females and 14 percent of males aged 18–69 are diabetic.
- The largest drop in percentage points along the care cascade for hypertension and diabetes was between screening and diagnosis for most individuals. However, in the hypertension cascade, women and obese individuals experienced the largest drop between diagnosis and treatment.
- For both the diabetes and hypertension care cascades, only 12 percent of adults (18–69 years) with hypertension or diabetes experienced control.
- Despite a higher initial burden, among individuals who have hypertension, being female was associated with significantly higher odds of testing, treatment, and control, compared to males.

Key qualitative study findings identified individual, programmatic, and system level strengths and weaknesses at each stage of the diabetes and hypertension care cascades. Figures 1 and 2 summarize key integrated findings related to the hypertension and diabetes care cascades. The definitions of each stage shown in the bar graphs in Figures 1 and 2 are presented in Table 3 in Section 3. It should be noted that the screened population represents those who self-reported ever having their blood pressure or blood sugar measured by a health professional and does not necessarily represent those routinely or recently screened.

[2] Fraser-Hurt, Nicole, Shubber, Zara, and Katherine Ward. *2022. Improving Health Services and Redesigning Health Systems : Using Care Cascade Analytics to Identify Challenges and Solutions, Volume 1. Population-level Cascade Analytics.* Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/36993

Figure 1. Summary of National Hypertension Care Cascade and Key Qualitative Findings



Primary Prevention

Strengths
- Many programmes, projects and facility-based initiatives currently implemented

Challenges
- Lack of intersectoral and community collaboration
- Lack of patient capacity to self-monitor
- Lack of community capacity to implement sustained prevention strategies

Screening & Diagnosis

Strengths
- Provider awareness and use of HEARTS guidelines for screening and diagnosis
- Previous training for health professionals on guidelines

Challenges
- Lack of an integrated approach to address patients' needs beyond the health sector
- Lack of supplies and functional equipment at higher-level facilities
- Inadequate access to affordable laboratory services

Treatment Initiation

Strengths
- Access to some services and medications at no cost
- General patient satisfaction with provider support

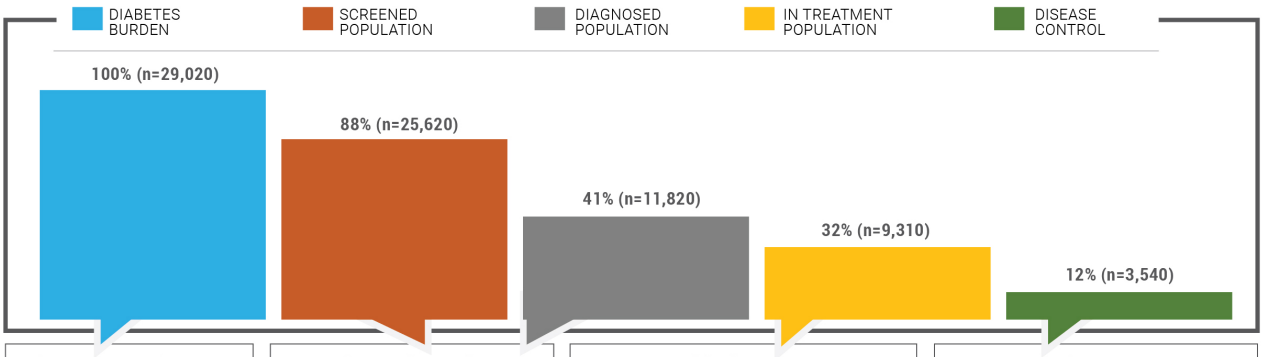
Challenges
- Gaps in provider compliance with clinical guidelines.
- Lack of patient readiness, responsibility and empowerment
- Need for written care "guides" for patients
- Patients' preference for traditional medicines not addressed in care plans
- Inadequate access to medication in public pharmacies

Treatment Maintenance & Monitoring

Strengths
- Access to some services and medications at no cost
- Access to patient records in patient notebooks

Challenges
- Medication shortages
- Lack of access to BP monitors for self-management
- Insufficient patient empowerment to self-manage
- Lack of a defined strategy for patient adherence
- Differential prescribing patterns
- High level of alcohol usage among patients
- Patient frustration & complacency with long-term condition

Figure 2. Summary of National Diabetes Care Cascade and Key Qualitative Findings



Primary Prevention

Strengths
- Many programmes, projects and facility-based initiatives currently implemented

Challenges
- Lack of intersectoral and community collaboration
- Lack of patient capacity to self-monitor
- Lack of community capacity to implement sustained prevention strategies

Screening & Diagnosis

Strengths
- Use of clinical guidelines for screening and diagnosis

Challenges
- Variable capacity for blood glucose testing at health centers
- Various clinical guidelines in use
- Inadequate access to affordable laboratory services
- Lack of gender-differentiated strategies
- Insufficient public knowledge of the size of the problem and early interventions

Treatment Initiation

Strengths
- Access to free clinics and medications
- General patient satisfaction with provider support

Challenges
- Limited functionality of SLUHIS to capture & quickly access relevant information
- Inadequate/inconsistent access to safe and appropriate drugs in public pharmacies
- Insufficient attention to patients' belief systems, preference for traditional medicines, and socio-economic situation in care plans
- Lack of public-private collaboration to reduce conflicting messages and improve prescribing practices

Treatment Maintenance & Monitoring

Strengths
- Proactive and supportive role of the providers
- Adequate information on the management of diabetes, especially guidance on meal planning

Challenges
- Lack of psychosocial and socio-economic support to facilitate patient adherence
- Medication shortages and rationing
- Insufficient attention to the gender dimensions of treatment and care
- Patient frustrations & complacency with a long-term condition

The results of this study are important to the continued improvement of NCD management in Saint Lucia. The following outline key recommendations based on the quantitative and qualitative study findings, as well as a review of literature on international standards, best practices, and evidence-based programs.

1.0 Improve quality of services.

1.1 Create an enabling environment (including the setting of relevant quality standards, training plans for healthcare professionals, and aligned regulatory and financial systems) for the delivery of person- or patient-centered care in primary care.

1.2 Formally adopt standardized national guidelines for treatment of NCDs, ensure health professionals are trained on the standardized guidelines, and implement routine mechanisms to assess adherence.

2.0 Ensure consistent availability of safe and affordable medications and supplies for NCD care.

2.1 Strengthen supply chain management to reduce stockouts of medicines and POC diagnostic tests and other laboratory supplies and improve quality control of medicines and supplies.

2.2 Review and update the national essential medicines list (NEML) at least every two years.

3.0 Strengthen the availability and timely access to NCD-related services.

3.1 Increase availability and access to affordable diagnostic testing, including point-of-care (POC) testing at the lower-level facilities.

3.2 Strengthen equipment maintenance and management protocols and procedures to improve equipment functionality and accuracy of results.

3.3 Increase the number of skilled and specialist staff to provide adequate service coverage based on current and projected population health needs.

3.4 Consider patient preferences in the scheduling of NCD services and the method of service delivery (remote appointments, home visits, or clinic visits).

4.0 Upgrade Saint Lucia Health Information System (SLUHIS) functionalities and expand integrations to increase the availability of reliable information for clinical management of NCDs and evidence-informed policy development.

4.1 Conduct a rapid assessment and address gaps in SLUHIS that impede access to timely and accurate data for NCD patients.

4.2 Where possible, ensure the integration/interoperability of SLUHIS with information systems used in laboratories, pharmacies, and private practices.

4.3 Establish and train healthcare professionals on the use of a structured system within SLUHIS for referral and recall mechanisms between positive screens, diagnoses, and treatment initiation to reduce pretreatment loss.

4.4 Establish a minimum dataset of NCD-related indicators that is routinely collected, analyzed, and disseminated at the national level to monitor and evaluate progress.

5.0 Increase coordinated multistakeholder engagement to improve collaboration in NCD prevention and care.

5.1 Create and operationalize a national multisectoral commission, agency, or mechanism for NCDs.

5.2 Ensure national NCD prevention and control plans incorporate existing community structures and leverage existing community resources.

I.0 Background

Saint Lucia is classified as an upper middle-income country[3] and forms part of the economic union of the Organisation of Eastern Caribbean States. Life expectancy at birth was 76.5 years[4] and annual population growth rate was 0.2 percent in 2021. In 2016, the Gini Index for inequality was 51.2 and approximately one-quarter of Saint Lucia's population was classified as poor (that is, they lived below $6.85[5] a day in 2017 purchasing power parity). From 2016 to 2019, health expenditures as a percent of the gross domestic product (GDP) of Saint Lucia have steadily decreased from 4.91 percent to 4.32.[6] Over the same period, out-of-pocket expenditures per capita declined from $260.70 to $232.27.[7] Health services in the public sector are financed through general tax revenues, contributions from the National Insurance Corporation (NIC) (for services to currently employed NIC members), out-of-pocket payments, and private health insurance.[8] Appendix 6 provides a table of selected health indicators in Saint Lucia and three other OECS countries in comparison to the region.

HEALTH SERVICES OVERVIEW

The Ministry of Health, Wellness, and Elderly Affairs (MOHWEA) provides leadership and coordinates the efforts of public and private sector agencies, and civil society organizations working on population health, including the planning, implementing, and monitoring of national NCD programs. The multisectoral 2017-2025 National Chronic Disease Policy of Saint Lucia provides "a framework for the planning, organizing, managing and delivering public health goods and services aimed at reducing the burden of NCDs." [9]

At the primary healthcare level, most services are available at no cost, and the public sector is estimated to provide a third of primary care services. NCD care is delivered across 34 community-based facilities. These facilities include 31 satellite wellness centers, two district hospitals, and one polyclinic located across eight health regions. The Saint Lucia Health Information System (SLUHIS) has been rolled out in almost all of the wellness centers, as well as the Medical Supplies Unit/Central Procurement and MOHWEA. In addition to collecting information on patient demographics, SLUHIS can generate and print information, such as blood pressure, reason for visit, clinical diagnosis, and electronic prescriptions. The information system is also linked to patient appointments and referrals.[10] Each wellness center provides care through a facility-level health team, supported by a regional health team. Table 1 presents the constitution of the facility-level team and the regional health team.

[3] World Bank. 2023. "Saint Lucia." World Bank Data.
[4] Health in the Americas+ PAHO. 2022. "Saint Lucia Country Profile."
[5] All dollar amounts are in U.S. dollars, unless noted.
[6] World Bank. 2022. "Current Health Expenditure (% of GDP) - Saint Lucia. World Bank Data."
[7] World Bank. 2022. "Out-of-pocket Expenditure per Capita (current US$) - Saint Lucia." World Bank Data.
[8] Ministry of Health. "Draft National Health Sector Policy for Saint Lucia."
[9] Ministry of Health and Wellness of Saint Lucia. Living Our Best Life: A Call to Action to Avoid Premature Death 2017-2025 National Chronic Disease Policy Saint Lucia.
[10] The World Bank. PID/ISDS Saint Lucia Health System Strengthening Project (P166783).

Table 1. Constitution of the Facility-level and Regional-level Health Teams

HEALTH FACILITY TEAM	REGIONAL HEALTH TEAM	
District Medical Officer	District Medical Officer	Dentist
Staff Nurse	Public Health Nursing Supervisor	Nutrition Officer
Nursing Assistant	Family Nurse Practitioner	Social Worker
Nursing Aide	Health Educator	Health Aide and Health Attendant
Pharmacy Technician	Environmental Health Officer Pharmacist	Clinical Specialists (Nephrologist, Internist, and Podiatrist)

The wellness centers are categorized into four levels ranging from Level 1 (which offers basic visiting services) to Level 4 (which offers polyclinic type services). The wellness centers are distributed across geographic regions. Table 2 presents the wellness centers by region and level. The categories also define the capacity of each level and the designated roles that support the implementation of the Saint Lucia care cascade.

Table 2. Wellness Centers by Region and Level

LEVEL REGION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
1. Gross Islet		Monchy, Grand Rivière		Gros Islet Polyclinic
2. Babonneau	La Guerre	Fond Assau	Babonneau	
3. Dennery		Richfond		Dennery Hospital
4. Micoud	Ti Rocher-Micoud	Desruisseaux, Mon Repos	Micoud	
5. Vieux Fort	Grace	Belle Vue, Laborie, Saltibus		Vieux-Fort
6. Soufrière	Etangs Delcer	Mongouge, Fond St. Jacques Canaries	La Fargue	Soufrière Hospital
7. Anse La Raye		Vanard, La Croix Maingot Jacmel	Anse-la-Raye	
8. Castries		Bexon, Ciceron, La Clery Ti Rocher Entrepôt		Castries (presently functioning as a level 3)
Total	**5**	**20**	**4**	**5**

BURDEN OF NCDS IN SAINT LUCIA

For over a decade, the National Epidemiology Unit of the MOHWEA has reported that NCDs are the leading cause of illness and death. According to the WHO 2022 NCDs Progress Monitor, NCDs are the cause of 82 percent of deaths in Saint Lucia and there is an 18 percent probability of premature mortality from NCDs. In the WHO Saint Lucia Diabetes Country Profile (2016), the total prevalence of diabetes in Saint Lucia was estimated to be 14.6 percent. NCD risk factors, such as obesity and physical inactivity, were estimated to be at a prevalence of 27 percent and 41.5 percent, respectively. Additionally, according to the WHO, approximately 28 percent of adults experienced hypertension in 2015. A hypertension care cascade for Saint Lucia based on 2012 WHO STEPwise approach to noncommunicable disease risk factor surveillance (STEPS) Survey Data revealed that approximately 28,900 persons in Saint Lucia had hypertension and approximately 76 percent of persons with hypertension did not have disease control. This report presents updated care cascades for diabetes and hypertension based on STEPS 2019–20 data.

The STEPS approach is a standardized surveillance tool for monitoring key NCD risk factors in countries. The STEPS survey covers key behavioral risk factors (such as smoking, alcohol use, physical inactivity, and unhealthy diet), as well as key biological risk factors (such as obesity, hypertension, and hyperglycemia). The standard STEPS instrument includes three different levels:

1. Questionnaires for households on socio-demographic information, aspects of individuals' medical history related to the main NCDs, and risk behaviors.
2. Physical measurements to assess overweight, obesity, and increased blood pressure.
3. Biochemical measurement involving blood and urine sampling to measure raised blood glucose, cholesterol, high-density lipids, and sodium and creatinine levels.

Beyond using the standard instrument, countries may choose optional modules to include in their site-specific instrument to capture additional information related to NCDs. In Saint Lucia, the first national STEPs survey was conducted from March 2012 to August 2012. The MOHWEA, in collaboration with the Central Statistical Office (CSO) of Saint Lucia, conducted a follow-up STEPS survey from 2019 to 2020. This report includes an analysis of the relevant 2019–20 STEPS data for the diabetes and hypertension care cascades, as well as qualitative data that explores breakpoints in the cascades.

2.0 Study Design

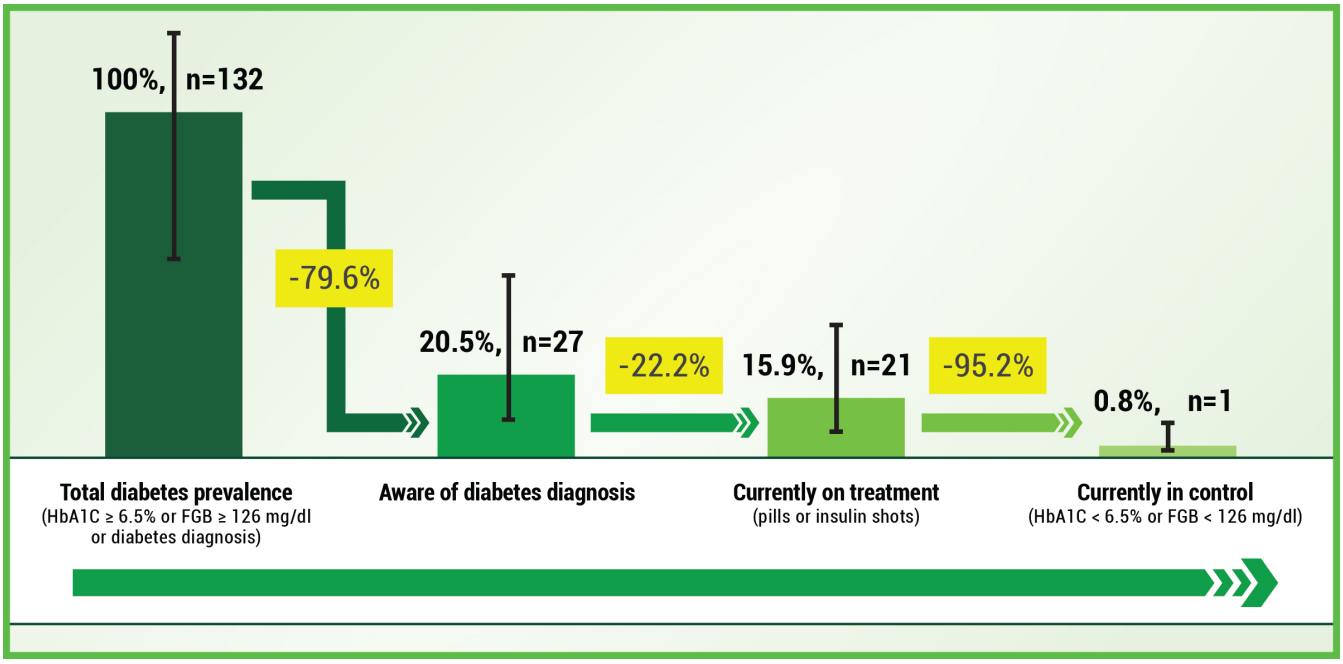
The study design was based on the care cascade analytical approach, as outlined by Fraser-Hurt and colleagues.[11] Cascade analytics are defined as a series of connected service delivery steps that cover a client's needs through screening, diagnosis, treatment initiation, and treatment maintenance toward the desired treatment outcome. The analytical model is designed to systematically assess service delivery bottlenecks and barriers across the care continuum.

The study utilized a mixed methods approach with the following components:

1. Secondary research involving quantitative analysis of 2019–20 STEPS data.
2. Primary, qualitative research involving focus group discussions (FGDs) with health professionals and patients, as well as key informant interviews to explore specific issues and obtain further insights.

Quantitative data from the STEPS survey were used to build care cascade frameworks for type 2 diabetes mellitus (T2DM) and hypertension in Saint Lucia. Figure 3 presents an example of a care cascade framework for diabetes. Qualitative data collected from both patients and health professionals were used to describe service delivery at each stage in the care cascade, propose explanations for individuals "lost" across each stage of care, and inform potential solutions to minimize the losses across the care continuum.

Figure 3. Example of a Care Cascade Framework for Diabetes. (Adapted from "Cascades of diabetes and hypertension care in Samoa: Identifying gaps in the diagnosis, treatment, and control continuum – a cross-sectional study.")[12]



[11] Fraser-Hurt, Nicole, Shubber, Zara, and Katherine Ward. *2022. Improving Health Services and Redesigning Health Systems : Using Care Cascade Analytics to Identify Challenges and Solutions, Volume 1. Population-level Cascade Analytics.* Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/36993

[12] LaMonica, L, McGarvey, S., Rivara, A., Sweetman, C., Naseri, T., Reupena, M, Kadiamada, H., Kocher, E., Rojas-Carroll, A., DeLany, J. and N. Hawley. 2022. "Cascades of diabetes and hypertension care in Samoa: Identifying gaps in the diagnosis, treatment, and control continuum – a cross-sectional study." *The Lancet Regional Health* - Western Pacific, Volume 18, 100313, ISSN 2666-6065, https://doi.org/10.1016/j.lanwpc.2021.100313.

3.0 Quantitative Study Component

3.1 Methodology

SAMPLE

Data from the Pan American STEPS Instrument for Noncommunicable Disease Risk Factor Surveillance in 2019 were utilized to construct care cascades for diabetes and hypertension. A Master Sampling Frame (MSF) that was designed in 1992 and updated by the 2010 Census was used for sampling selection.[13] A total of 2,964 individuals between the ages of 18 and 69 years old were sampled, of which 1,166 were classified as hypertensive and 330 were classified as diabetic. A two-stage stratification method was utilized, which stratified by the 10 districts and occupational groups (with the primary sampling unit[14] as the enumeration district).

DEFINITION OF OUTCOMES

The following definition of outcomes were used to generate a cascade of care for each stage of the hypertension and diabetes cascades.

Table 3. Definition of Care Cascade Stages for Hypertension and Diabetes Care Cascade Analyses

STAGE	DEFINITION FOR HYPERTENSION CARE CASCADES	DEFINITION FOR DIABETES CARE CASCADES
Burden	• Individuals who had a systolic blood pressure (BP) greater than or equal to 140 mmHg or a diastolic blood pressure greater than or equal to 90 mmHg, which is consistent with the 2021 WHO Hypertension Guideline for the Pharmacological Treatment of Hypertension in Adults (Campbell et al. 2022); or • Individuals who were on medication for raised blood pressure at the time of the survey.	• Individuals who had a raised blood glucose (BG) 126 mg/dl or higher, which is consistent with Caribbean Public Health Agency (CARPHA) Guidelines for The Management of Diabetes in Primary Care (CARPHA, 2019); or • Individuals who were on medication for diabetes at the time of the survey.
Screened	• Individuals who were hypertensive based on BP measurement and answered "yes" to the question, "Have you ever had your blood pressure measured by a doctor or other health worker?"	• Individuals who were diabetic based on BG measurement and answered "yes" to the question, "Have you ever had your blood sugar measured by a doctor or other health worker?"
Diagnosed	• Individuals who were hypertensive and an swered "yes" to the question, "Have you ever been told by a doctor or other health worker that you have raised blood pressure or hypertension?"	• Individuals who were diabetic and answered "yes" to the question, "Have you ever been told by a doctor or other health worker that you have raised blood sugar or diabetes?"

[13] St. Catherine, E. 2002. "Methodological Design of the Saint Lucia Sample Frame to Assist with the Conduct of Surveys of Living Conditions and other Multipurpose Surveys." Saint Lucia Central Statistical Office Working Paper.
[14] According to Lepkowski (2008). the primary sampling unit is used in the first stage of sampling as part of a multistage sampling procedure and is useful for identifying individual elements.

Table 3. Definition of Care Cascade Stages for Hypertension and Diabetes Care Cascade Analyses (Cont'd)

STAGE	DEFINITION FOR HYPERTENSION CARE CASCADES	DEFINITION FOR DIABETES CARE CASCADES
In Treatment	• Individuals that had been diagnosed with hypertension and answered "yes" to the question, "In the past two weeks, have you been treated for raised blood pressure with drugs (medication) prescribed by a doctor or other health worker?	• Individuals that had been diagnosed with diabetes and answered "yes" to the question, "In the past two weeks, have you taken any drugs for diabetes prescribed by a doctor or other health worker?"
Control	• Among individuals who were receiving treatment, hypertensive control was calculated by taking the proportion of individuals who had both a systolic blood pressure less than 140 mmHg and a diastolic blood pressure less than 90 mmHg.[15]	• Among individuals who were receiving treatment, diabetic control was calculated by taking the proportion of individuals who had a blood glucose of less than 130* mg/dl. [16]

* Of note, the cut-off for diabetes control is based on the CARPHA guidelines for the management of diabetes that were recently adopted by Saint Lucia. In the guidelines, the target pre-prandial blood glucose for persons with diabetes is 80-130mg/dl, so the largest value of this range was used to determine control.

STATISTICAL ANALYSES

All statistical analyses were performed in Stata v17 (Stata-Corp, College Station, Texas, United States). All cascades and statistical analyses used sample weights calculated by the Pan American qHealth Organization (PAHO).

For each care cascade, the overall burden of hypertension or diabetes was calculated by multiplying the proportion of individuals with hypertension or diabetes in the sample by the World Bank Population Estimate of 18–69 years old population in Saint Lucia for 2019 (N=182,795). In Table 1 and 2, corresponding to the burden is the percentage of individuals within the variable group of interest that experiences each component of the cascade.

Figures 1 to 4 provide the hypertension care cascade by gender (male or female), age range (18–54, 55–69), body mass index (BMI; normal, overweight, obese), and educational attainment (primary school or less, lower or upper secondary school, and post-secondary school). Figures 5 to 8 provide the diabetes care cascade by gender, age, BMI, and educational attainment.

An individual logistic regression analysis was conducted to determine which variables had a significant impact on hypertension and diabetes testing, treatment, and control. The association between gender, age, educational attainment, annual household income quartile (poorest quartile [less than $251 per year], lower middle [$252 to $481 per year], upper middle [$482 to $1,088 per year], richest [$1,089 or more per year]), BMI, and tobacco usage (currently smokes or does not currently smoke) and the outcomes of interest were calculated.

[15] Campbell, N. R. C., Paccot Burnens, M., Whelton, P. K., Angell, S. Y., Jaffe, M. G., Cohn, J., Espinosa Brito, A., Irazola, V., Brettler, J. W., Roccella, E. J., Maldonado Figueredo, J. I., Rosende, A., and P. Ordunez. 2022. "2021 World Health Organization guideline on pharmacological treatment of hypertension: Policy implications for the region of the Americas." Lancet regional health. Americas, 9 (May).
[16] Caribbean Public Health Agency. 2019. Evidence-based treatment protocols for diabetes. Organisation of Eastern Caribbean States, editor. Guidelines for the Management of Diabetes in Primary Care in the Caribbean; Vol. 1. Port of Spain: CARPHA.

3.2 Findings

The study findings from the quantitative care cascade analysis will be presented by condition/disease (that is, hypertension findings followed by diabetes findings). Findings for each condition/disease will include a descriptive table outlining the care cascade stages stratified by key variables, care cascades graphs, and finally, logistic regression results. All numbers shown in this section are scaled to the national population level.

Among the study population of 18–69 years old, 40.18 percent (n=1,142) were classified as hypertensive and 16.09 percent (n=325) were classified as diabetic. Applying survey weights, it is estimated that the burden of hypertension is 73,204 individuals, and the burden of diabetes is 29,015 individuals.

HYPERTENSION CARE CASCADES

Table 4 provides an estimate for the number of individuals in Saint Lucia experiencing each level of the hypertension care cascade, and the corresponding percent of individuals within each variable group. For example, among males in Saint Lucia, an estimated 39 percent have hypertension, 36 percent have been screened for hypertension, 19 percent are diagnosed, 8 percent are in treatment, and 3 percent experience hypertensive control. The burden of hypertension is highest among females, those aged 18–54 years, those with a primary school education or less, and obese individuals.

Table 4. Hypertension Care Cascade in Saint Lucia by Key Variables

	BURDEN n (%)	SCREENED n (%)	DIAGNOSED n (%)	IN TREATMENT n (%)	CONTROL n (%)
GENDER					
Male	34,975 (100%)	32,439 (93%)	17,317 (50%)	7,518 (21%)	2,451 (7%)
Female	38,229 (100%)	38,024 (99%)	27,413 (72%)	16,539 (43%)	6,201 (16%)
AGE					
18-54	26,920 (100%)	25,652 (95%)	15,651 (58%)	7,120 (26%)	2,726 (10%)
55-69	10,430 (100%)	10,231 (98%)	7,047 (68%)	4,472 (43%)	1,559 (15%)
EDUCATIONAL ATTAINMENT					
Primary School or Less	40,135 (100%)	38,786 (97%)	25,669 (64%)	14,993 (37%)	4,379 (11%)
Lower or Upper Secondary School	23,560 (100%)	22,682 (96%)	14,309 (61%)	7,570 (32%)	3,192 (14%)
Post-secondary	10,452 (100%)	10,181 (97%)	6,560 (63%)	3,064 (29%)	1,588 (15%)
BMI					
Normal	16,302 (100%)	15,435 (95%)	7,732 (47%)	3,862 (24%)	1,437 (9%)
Overweight	23,329 (100%)	22,606 (97%)	14,505 (62%)	8,044 (34%)	3,179 (14%)
Obese	34,368 (100%)	33,474 (97%)	24,149 (70%)	13,609 (40%)	4,621 (13%)

Figure 4 provides the hypertension care cascade among all individuals who have hypertension. The largest drop is between screening and diagnosis (35 percentage points), followed by treatment initiated (28 percentage points), and disease control (21 percentage points). Although the largest percentage point drop-off occurs between screening and diagnosis, it is worth noting that the subsequent drop-offs from diagnosis to treatment and from treatment to control, are also quite substantial. For example, nearly half of the individuals are lost between diagnosis and treatment, and nearly two thirds of individuals are lost between treatment and control.

Figure 4. Hypertension Care Cascade for the Population of Saint Lucia

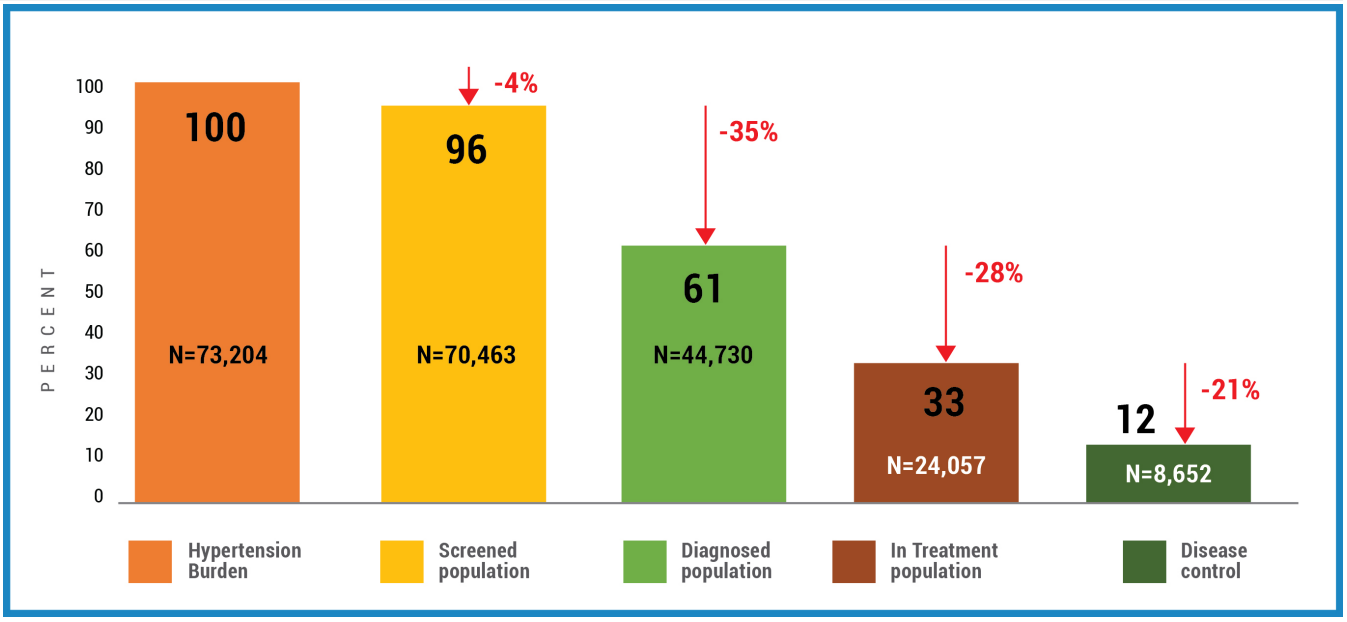


Figure 5 provides the hypertension care cascade by gender, among all individuals who have hypertension. The largest drop for males is between screening and diagnosis, while the largest drop for females is between diagnosis and treatment initiated. Among those with hypertension, a larger proportion of females are screened, diagnosed, treated, and report disease control compared to males.

Figure 5. Hypertension Care Cascade by Gender

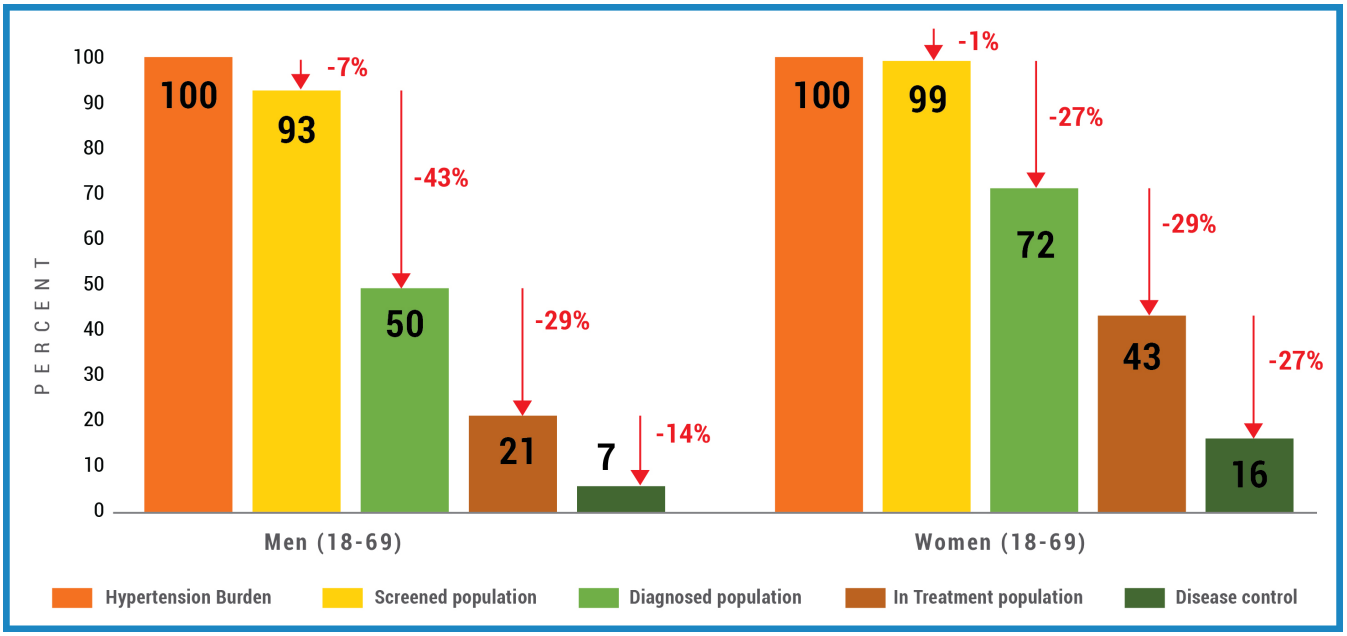


Figure 6 provides the hypertension care cascade by age group, among all individuals who have hypertension. The largest drop for both age groups is between screening and diagnosis. Among those with hypertension, a larger proportion of individuals 55–69 is screened, diagnosed, treated, and report disease control compared to individuals 18–54 years old.

Figure 6. Hypertension Care Cascade by Age Group

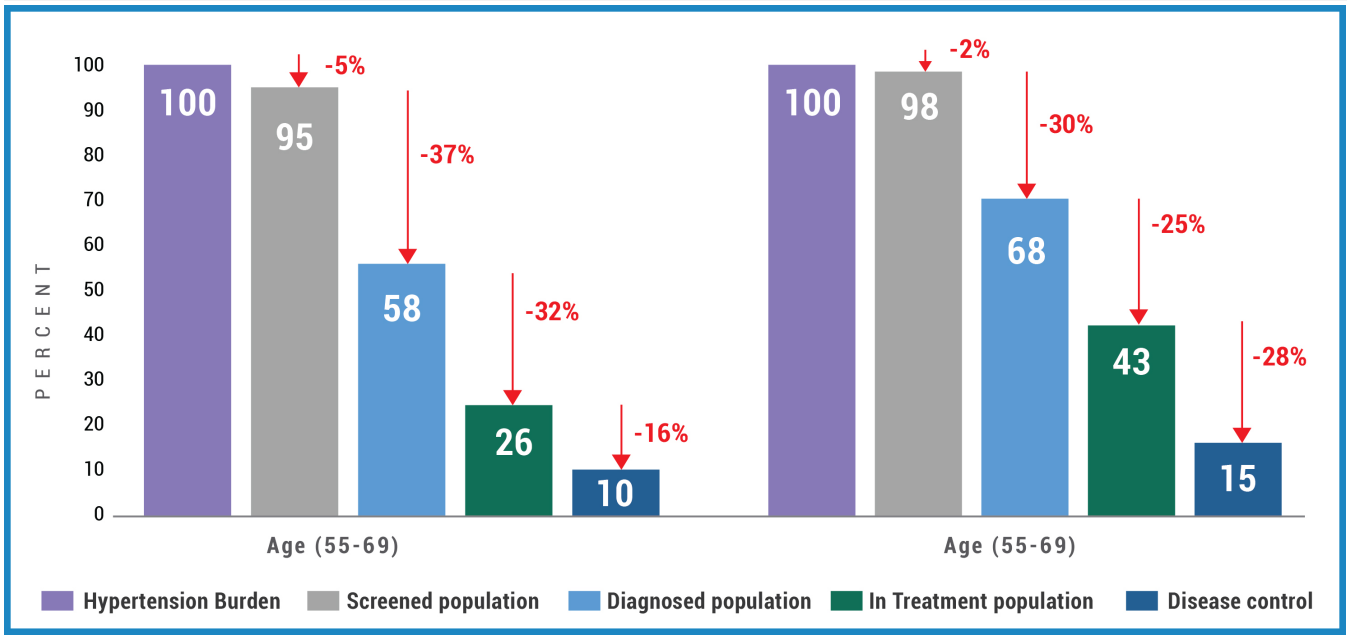


Figure 7 provides the hypertension care cascade by BMI (normal, overweight, or obese), among all individuals who have hypertension. The largest drop for normal and overweight individuals is between screening and diagnosis, while the largest drop for obese individuals is between diagnosis and treatment. Among those with hypertension, a larger proportion of obese individuals are screened, diagnosed, and treated compared to normal and overweight individuals. However, a larger proportion of overweight individuals report disease control compared to obese and normal individuals who are also hypertensive.

Figure 7. Hypertension Care Cascade by BMI

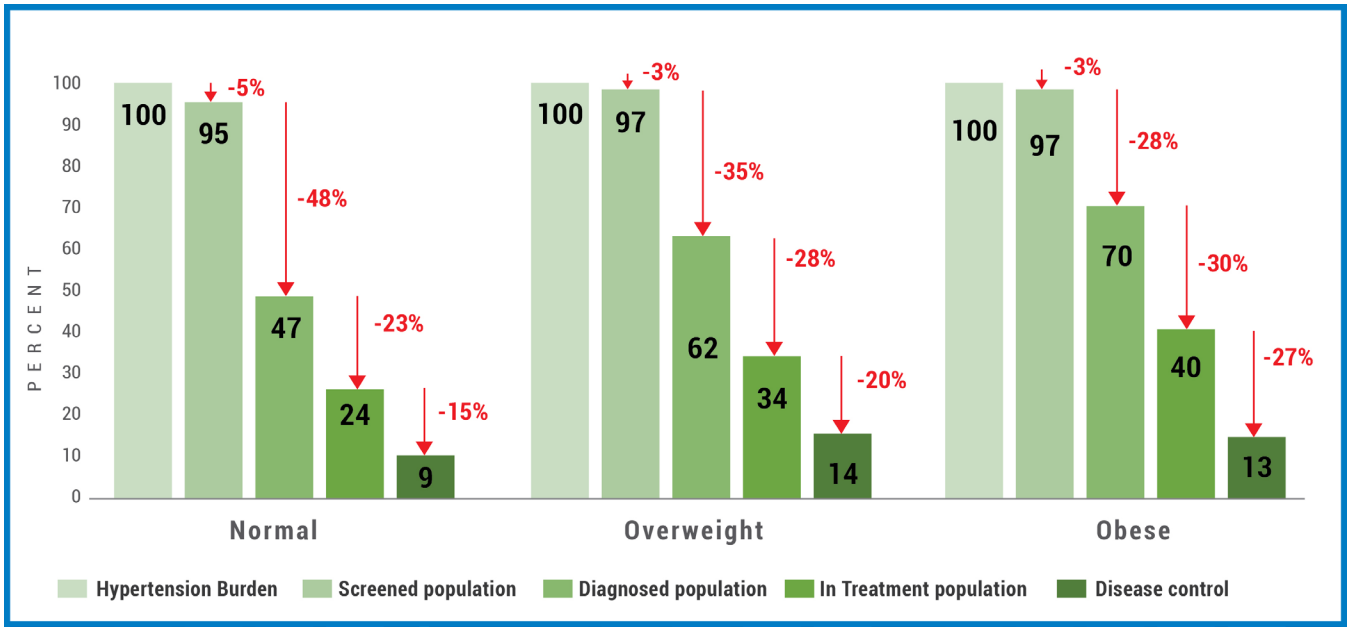
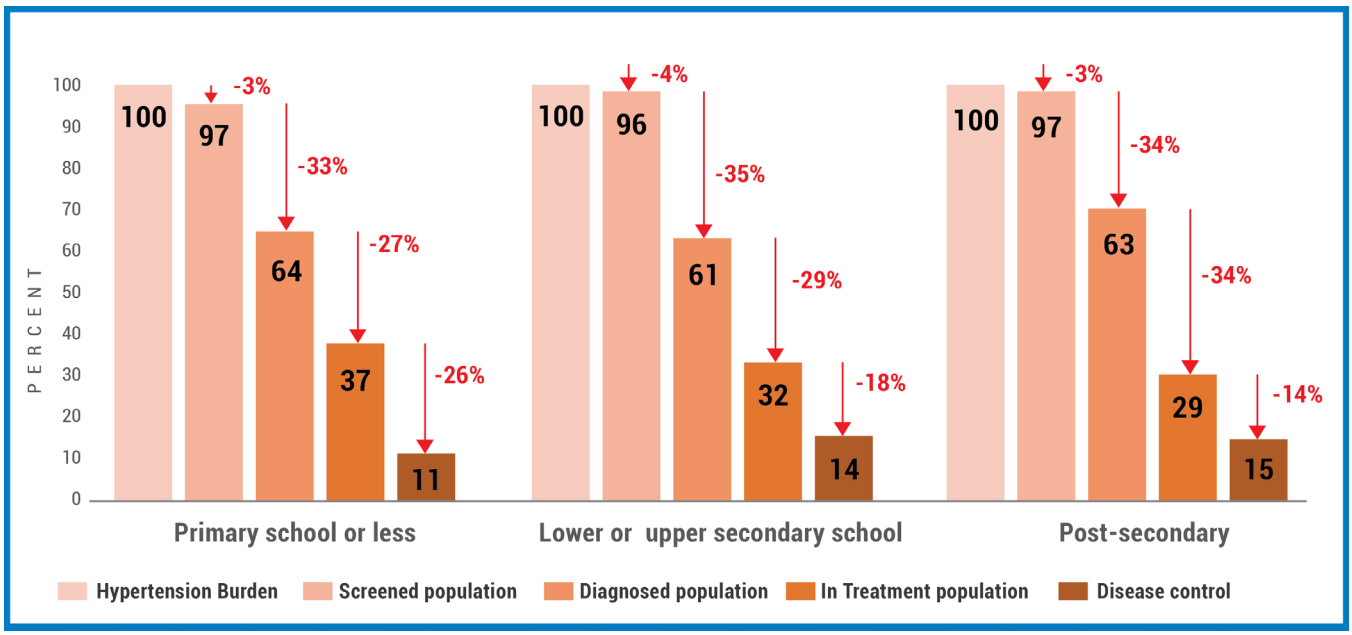


Figure 8 provides the hypertension care cascade by highest level of education achieved (primary school or less, lower or upper secondary school, or post-secondary school), among all individuals who have hypertension. The largest drop for all three groups is between screening and diagnosis; however, those people with a post-secondary education have an equally big drop from diagnosis to treatment. Among those with hypertension, a larger proportion of individuals with a primary school education or less are diagnosed and treated, but a smaller proportion have their hypertension under control.

Figure 8. Hypertension Care Cascade by Educational Status



As shown in Table 5, regression results for hypertension indicate a significantly higher odds of testing, treatment, and control comparing females to males (Odds Ratio [OR] = 14.48, 2.93, and 2.61, respectively). Individuals 55 years and older have a significantly higher odds of testing, treatment, and control compared to those under 54 (OR= 2.53, 2.28, and 1.74, respectively). Nonsmokers have a significantly higher odds of testing, treatment, and control compared to smokers (OR=5.71, 2.16, and 2.27, respectively). Individuals that are overweight have significantly higher odds of treatment compared to those with a normal BMI (OR=1.73), and individuals who are obese have significantly higher odds of treatment and control compared to those with a normal BMI (OR=2.19 and 1.91, respectively). No statistically significant association was seen between differences in income level or education on testing, treatment, or control.

Table 5. Logistic Regression Results for Odds of Hypertension

	ODDS RATIO (95% CI)		
	TESTING	**TREATMENT**	**CONTROL**
GENDER			
Male	Reference Category (Ref)	Ref	Ref
Female	14.48 (5.00, 41.93)	2.93 (2.24, 3.84)	2.61 (1.69, 4.03)
AGE			
18-54	Ref	Ref	Ref
55-69	2.53 (1.24, 5.16)	2.28 (1.74, 2.98)	1.74 (1.18, 2.57)
EDUCATIONAL ATTAINMENT			
Primary School or Less	Ref	Ref	Ref
Lower or Upper Secondary School	0.90 (0.45, 1.81)	0.77 (0.58, 1.03)	1.13 (0.74, 1.73)
Post-secondary	1.31 (0.43, 3.97)	0.73 (0.49, 1.09)	1.48 (0.86, 2.54)
ANNUAL HOUSEHOLD INCOME QUARTILE			
Poorest Quartile	Ref	Ref	Ref
Lower-middle Quartile	0.60 (0.21, 1.66)	1.33 (0.85, 2.08)	1.44 (0.78, 2.63)
Upper-middle Quartile	0.66 (0.23, 1.85)	0.74 (0.45, 1.22)	0.91 (0.44, 1.90)
Richest Quartile	1.75 (0.42, 7.32)	0.81 (0.48, 1.36)	1.42 (0.72, 2.81)
BMI			
Normal	Ref	Ref	Ref
Overweight	1.76 (0.77, 4.00)	1.73 (1.16, 2.60)	1.90 (0.98, 3.67)
Obese	2.10 (0.96, 4.59)	2.19 (1.48, 3.25)	1.91 (1.01, 3.62)
TOBACCO USAGE			
Currently Smokes	Ref	Ref	Ref
Does Not Currently Smoke	5.71 (2.84, 11.47)	2.16 (1.25, 3.72)	2.27 (0.90, 5.74)

DIABETES CARE CASCADES

Table 6 provides an estimate for the number of individuals experiencing each level of the diabetes care cascade and the corresponding percentage of individuals within each variable group. For example, among males in Saint Lucia, an estimated 14 percent have diabetes, 10 percent have been screened for diabetes, 5 percent are diagnosed, 3 percent are in treatment, and 2 percent experience diabetic control. The burden of diabetes is highest among females, those aged 18–54 years, those with a primary school education or less, and obese individuals.

Table 6. Diabetes Care Cascade by Key Variables

	BURDEN n (%)	SCREENED n (%)	DIAGNOSED n (%)	IN TREATMENT n (%)	CONTROL n (%)
GENDER					
Male	12,547 (100%)	10,746 (86%)	4,238 (34%)	2,915 (23%)	1,286 (10%)
Female	16,468 (100%)	14,869 (90%)	7,586 (46%)	6,393 (39%)	2,253 (14%)
AGE					
18-54	10,663 (100%)	9,099 (85%)	2,730 (26%)	1,930 (19%)	575 (5%)
55-69	4,130 (100%)	3,791 (92%)	2,340 (57%)	1,937 (47%)	787 (19%)
EDUCATIONAL ATTAINMENT					
Primary School or Less	16,428 (100%)	14,624 (89%)	8,623 (52%)	7,285 (44%)	2,598 (16%)
Lower or Upper Secondary School	9,926 (100%)	8,528 (86%)	2,973 (30%)	1,864 (19%)	804 (8%)
Post-secondary	3,180 (100%)	2,994 (94%)	713 (22%)	640 (20%)	277 (9%)
BMI					
Normal	8,688 (100%)	7,144 (82%)	3,458 (40%)	2,512 (29%)	808 (9%)
Overweight	8,426 (100%)	7,888 (94%)	3,336 (40%)	2,762 (33%)	1247 (15%)
Obese	12,609 (100%)	11,270 (89%)	5,582 (44%)	4,565 (36%)	1587 (13%)

Figure 9 provides the diabetes care cascade among all individuals who have diabetes. The largest drop is between screening and diagnosis (47 percentage points), followed by disease control (20 percentage points), and screening (12 percentage points). Although the largest percentage point drop-off occurs between screening and diagnosis, the subsequent drop-offs from diagnosis to treatment and specifically from treatment to control are also quite substantial. For example, more than 20 percent of the individuals are lost between diagnosis and treatment, and nearly two thirds of individuals are lost between treatment and control.

Figure 9. Diabetes Care Cascade

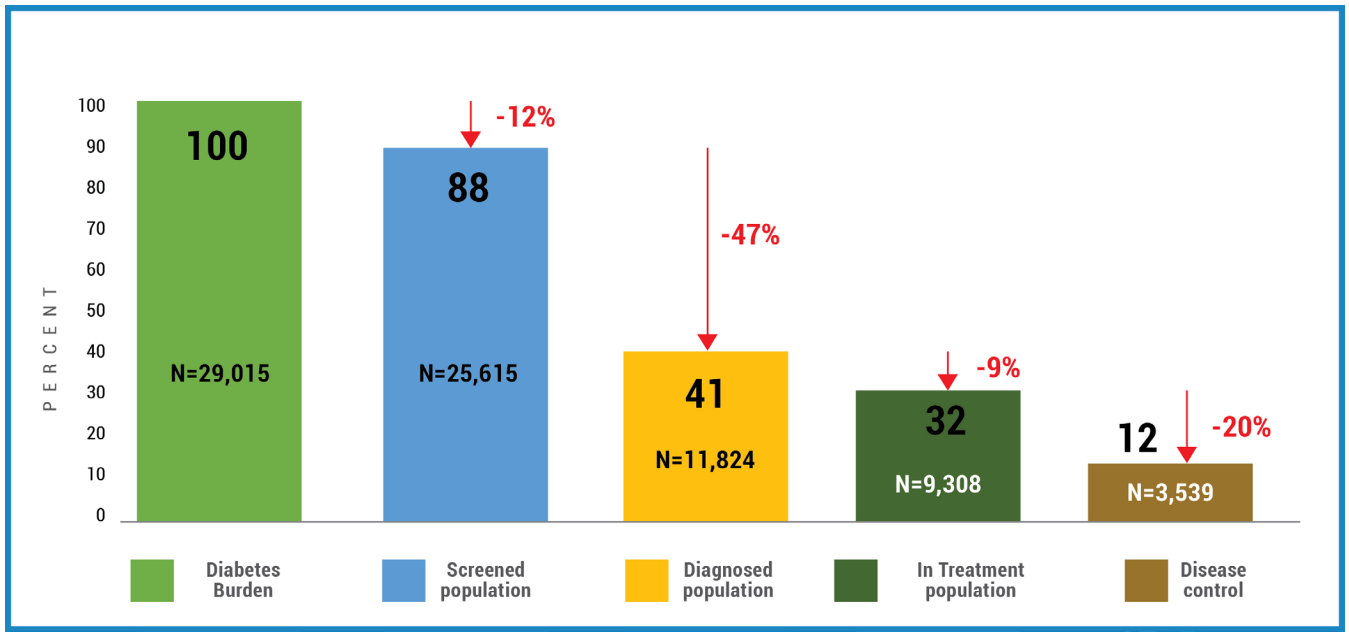


Figure 10 provides the diabetes care cascade by gender, among all individuals who have diabetes. The largest drop for both genders is between screening and diagnosis. Among those with diabetes, a larger proportion of females are screened, diagnosed, treated, and report disease control compared to males.

Figure 10. Diabetes Care Cascade by Gender

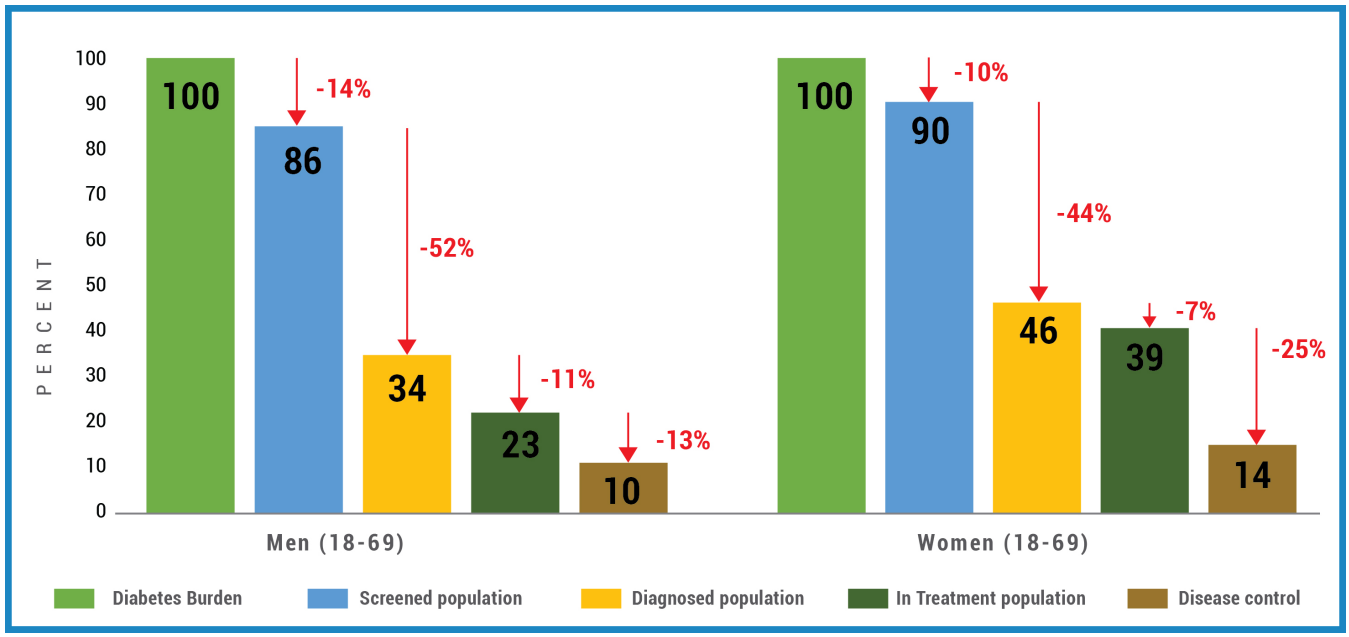


Figure 11 provides the diabetes care cascade by age group, among all individuals who have diabetes. The largest drop for both age groups is between screening and diagnosis. Among those with diabetes, a larger proportion of individuals 55–69 years old are screened, diagnosed, treated, and report disease control compared to individuals 18–54 years old.

Figure 11. Diabetes Care Cascade by Age Group

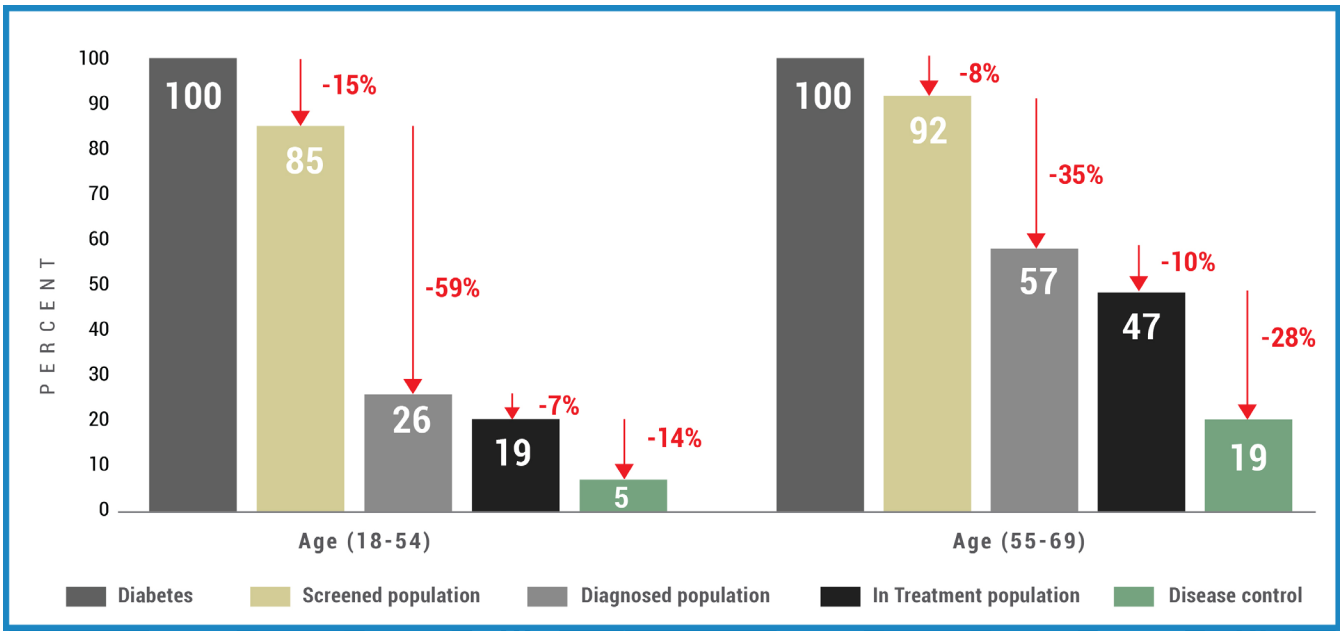


Figure 12 provides the diabetes care cascade by BMI (normal, overweight, or obese), among all individuals who have diabetes. The largest drop for all individuals is between screening and diagnosis. Among those with diabetes, the largest proportion of overweight individuals are screened and have diabetic control, while the largest proportion of obese individuals are diagnosed and treated.

Figure 12. Diabetes Care Cascade by BMI

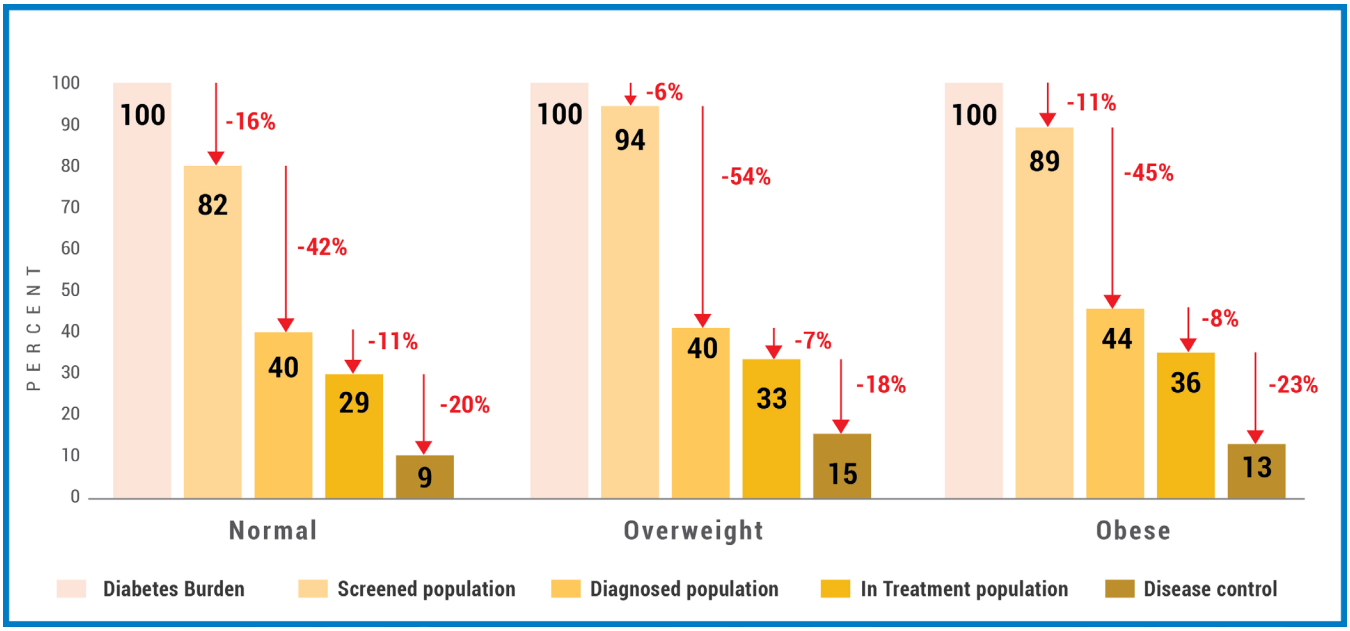


Figure 13 provides the diabetes care cascade by highest level of education (primary school or less, lower or upper secondary school, or post-secondary school), among all individuals who have diabetes. The largest drop for all three groups is between screening and diagnosis. Among those with diabetes, the largest proportion of individuals with a post-secondary education are screened, and the largest proportion of individuals with a primary school education or less are diagnosed, treated, and have their disease under control.

Figure 13. Diabetes Care Cascade by Educational Status

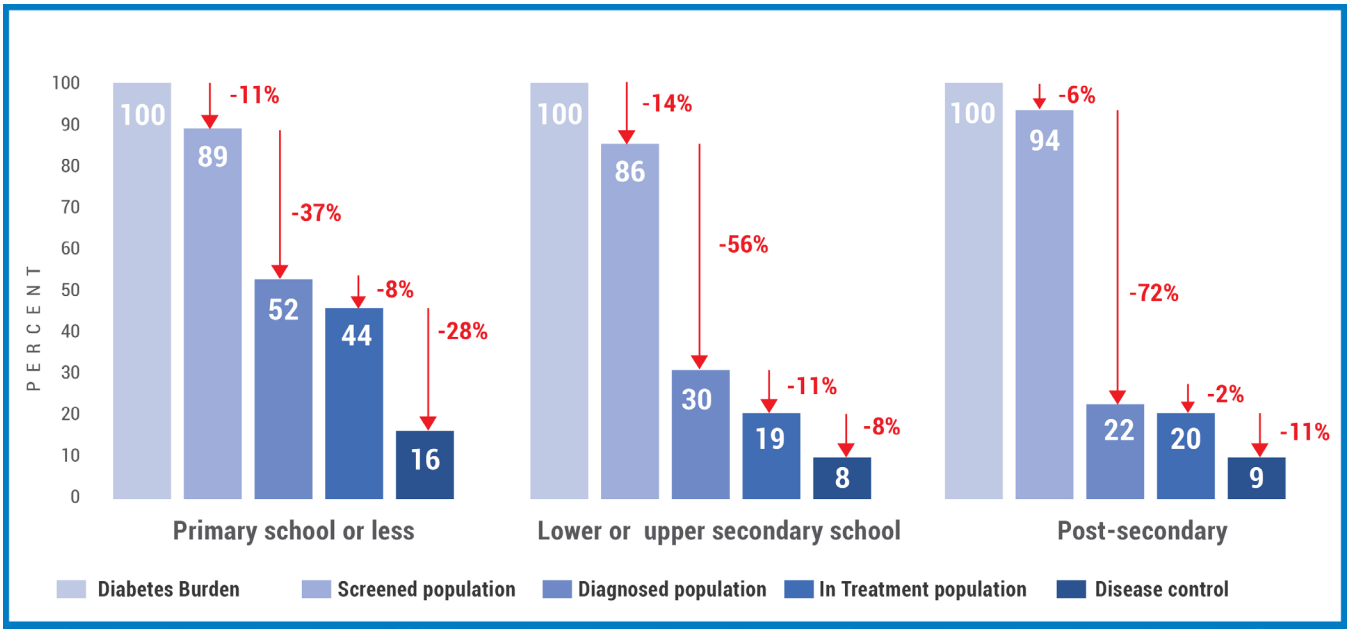


Table 7 includes regression results for diabetes. No statistically significant associations were seen between any key predictors and treatment, or control of diabetes. A small statistically significant association was seen between smoking and odds of testing, as not smoking was associated with 4.7 times the odds of testing compared to those who do smoke. The lack of associations seen were likely due to being underpowered because of the small sample of individuals who had diabetes (n=1,166).

Table 7. Logistic Regression Results for Odds of Diabetes

	ODDS RATIO (95% CI)		
	TESTING	**TREATMENT**	**CONTROL**
GENDER			
Male	Reference Category (Ref)	Ref	Ref
Female	1.56 (0.63, 3.88)	2.43 (0.90, 6.56)	0.74 (0.10, 5.58)
AGE			
18-54	Ref	Ref	Ref
55-69	1.92 (0.96, 3.86)	1.82 (0.62, 5.34)	1.26 (0.17, 9.19)
EDUCATIONAL ATTAINMENT			
Primary School or Less	Ref	Ref	Ref
Lower or Upper Secondary School	0.75 (0.39, 1.46)	0.31 (0.11, 0.83)	N/A
Post-secondary	1.98 (0.40, 9.80)	1.62 (0.17, 15.07)	N/A
ANNUAL HOUSEHOLD INCOME QUARTILE			
Poorest Quartile	Ref	Ref	Ref
Lower-middle Quartile	2.56 (0.76, 8.66)	0.20 (0.03, 1.29)	1.44 (0.78, 2.63)
Upper-middle Quartile	0.62 (0.16, 2.37)	0.39 (0.05, 3.17)	N/A
Richest Quartile	6.24 (0.70, 55.42)	0.21 (0.03, 1.51)	N/A
BMI			
Normal	Ref	Ref	Ref
Overweight	3.17 (0.97, 10.32)	1.81 (0.53, 6.18)	0.49 (0.04, 5.70)
Obese	1.82 (0.63, 5.23)	1.69 (0.53, 5.41)	0.34 (0.03, 3.96)
TOBACCO USAGE			
Currently Smokes	Ref	Ref	Ref
Does Not Currently Smoke	4.71 (1.75, 12.71)	1.85 (0.11, 30.76)	0.38 (0.04, 3.99)

4.0 Qualitative Study Component

4.1 Methodology

A diagnostic and exploratory approach was used for the qualitative study component. Primary research was conducted, involving focus group discussions (FGDs) with health administrators and managers, health providers, and patients to gather information to better understand the care cascade stages for diabetes and hypertension. Additionally, one key informant interview (KII) was conducted to explore specific issues and obtain further insights from policy makers and healthcare providers

ELIGIBILITY CRITERIA

The eligibility criteria tailored to guide selection of each group of study participants are listed.

POLICY & PROGRAM MANAGERS	HEALTH PROVIDERS	PATIENTS
• Health administrators and program managers involved in policy development and/or program management at the national level. • Working in their field for at least three years.	• Service providers supporting service delivery along the cascade of care, including doctors (general practitioners and specialists—internist, podiatrist, and nephrologist), nurses (family nurse practitioners, public health nursing supervisors, and registered nurses), nutrition officers, pharmacist, and laboratory managers. • Working in their field in a community health setting for at least three years.	• Between ages 18–69. • Have a diabetes or hypertension diagnosis previously made by a health professional (includes pregnant women). • Previous or current use of public health services for treatment.

SAMPLING

The study was conducted at multiple sites. Health facilities were selected based on stratification of facilities into four geographic quadrants (that is, northern, eastern, western, and southern), as shown in Appendix 1. In keeping with the wellness center classification system of 4 levels, one health center from each level was selected from each quadrant. A multidisciplinary healthcare team was constituted from each quadrant using purposive sampling, to participate in separate focus group discussions, one on diabetes and one on hypertension. The patients were selected from the diabetes and hypertension registers using selection criteria and convenient sampling.

The participant sample size for the study was 84. The main sampling strategy was purposive and convenient stratified sampling, using work rosters and diabetes and hypertension registers for each quadrant. The sample size for the focus group protocol was eight to 10 people. Table 8 presents the list of participants that were targeted for the study.

Table 8. List of Participants in the Study Sample

CATEGORY	NO. OF FOCUS GROUPS	COMPOSITION OF EACH FOCUS GROUP	TOTAL NO. OF PARTICIPANTS
Focus Group: Health Administrators	1	• NCD Coordinator • Chief Health Planner • Chief Medical Officer • Principal Nursing Officer • Community Principal Nursing Officer • Chief Pharmacist • Chief Nutritionist • National Epidemiologist • Senior Welfare Officer • Director Bureau of Health Education	10
Focus Group: Health Facility Teams	8 (2 FGDS [1 for diabetes and 1 for hypertension] for each of the 4 quadrant geographic areas)	• District Medical Officer • Staff Nurse • Community Nursing Assistant • Pharmacist • Nutritionist	40
Focus Group: Patients with Diabetes	2	• Patients with diabetes	16
Focus Group: Patients with Hypertension	2	• Patients with hypertension	16
Focus Group Discussions: Laboratory Manager	2	• Laboratory managers of 2 hospitals: Owen-King European Union Hospital Owen (OKEU) and St. Jude Hospital	2

DATA COLLECTION AND ANALYSIS

Data were collected from FGDs across study population groups (as highlighted in Table 8) and one KII. For FGDs and the KII, interview guides with questions derived from Fraser-Hurt et.al.[17] were utilized. Data were collected using virtual meeting platforms for the providers and in-person FGDs for the patients. For the consenting process, consent forms were designed and shared with all parties. The forms were reviewed by the Counterpart Team of the MOHWEA and the Ethics Review Committee. Consent forms for the providers were circulated prior to the FGDs. Providers granted approval either by signing the consent form or giving verbal approval before the FGDs. In the case of the clients, the nurse discussed the consent form with each client, prior to the client giving approval to participate in the study. The Principal Investigator confirmed patient consent by requesting that each patient sign the consent form participant list, prior to the commencement of the FGDs. Participant consent forms noted that their identity and the information provided will be protected and their responses will not be linked to them in any way. Due to the small size of the communities, participants knew each other so the importance of keeping the information shared in the group confidential was emphasized. Audio recordings were immediately transferred to a secure electronic database with restricted access and deleted from the capture device.

[17] Fraser-Hurt, Nicole, Shubber, Zara, and Katherine Ward. 2022. *Improving Health Services and Redesigning Health Systems : Using Care Cascade Analytics to Identify Challenges and Solutions, Volume 1. Population-level Cascade Analytics.* Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/36993

Qualitative data from audio files were recorded during the FGDs and the interviews were transcribed verbatim. Transcripts were password protected and stored on a secure electronic database. Participants' names were not included in transcripts, analysis, or reporting. Codes for the analysis were developed based on an initial reading of the transcripts, the main interview questions, and emergent themes. A thematic analysis was then conducted in which individual codes relevant to understanding the qualitative findings developed.

ETHICAL APPROVAL

Ethical approval for the qualitative research was obtained from the Saint Lucia Medical and Dental Council – Research Ethics Committee. The Committee granted approval along with monitoring requirements for the duration of the study. In keeping with the monitoring requirements, the Principal Investigator is required to submit a half-term report and a final report, at the completion of the research.

4.2 Findings

This section first presents a summary of the participants in the qualitative study component and the level of participation, followed by an overall description of the care cascade for diabetes and hypertension in Saint Lucia. Finally, findings related to each stage of care cascade for diabetes and hypertension (that is, screening and diagnosis, treatment initiation, treatment maintenance and monitoring, and primary prevention) are outlined. Under each stage, key issues for both diabetes and hypertension are discussed, followed by a summary of recommendations identified by participants for addressing these issues. Disease-specific differences in qualitative responses for the various stages of care are presented in Appendix 5.

STUDY PARTICIPANTS

A total of 107 people participated in the care cascade study. Table 9 presents the composition of the study group. Among the 50 patient participants, there were 34 females and 16 males, ranging from 21 to 76 years old (with 86 percent of patient participants being 45 years or older).

A total of 19 FGDs were conducted. Eight FGDs were conducted with patients experiencing diabetes and/or hypertension. Eleven FGDs were conducted with health providers involved in diabetes and hypertension management and care from the public and private health sector.

Table 9. Composition of the Group of Study Participants

PARTICIPANT	TOTAL NUMBERS
Administrators*	6
Providers	50
Patients	50
Laboratory Managers	1
Total Number	107

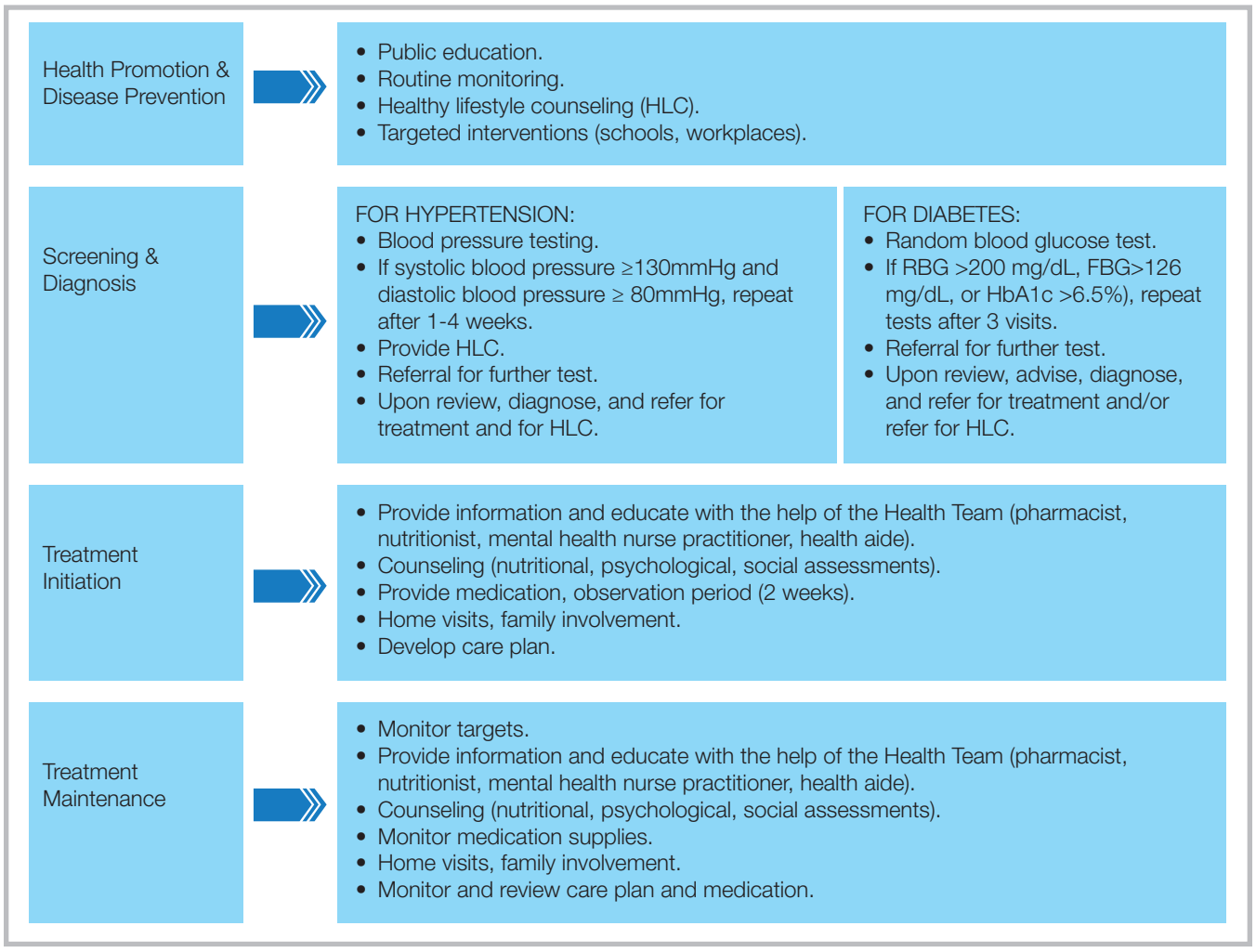
*Key findings from Administrators are summarized in Appendix 4.

The total participant withdrawal was 36 percent for the health providers (19 of 52) and 34 percent for patients (11 of 32). More patients living with hypertension withdrew compared to the ones living with diabetes. About 34 percent of the patients did not attend the FGDs. The main reasons for patient withdrawal were weather conditions and transportation fees. Thirty-six percent of the health providers were unable to attend the FGDs. The main reasons included heavy workloads, staff shortages, and competing demands. The initial sample was augmented by patients who met the study criteria and were willing and available to participate.

OVERALL DESCRIPTION OF THE SAINT LUCIA CARE CASCADE FOR DIABETES AND HYPERTENSION

The providers and patients described the care cascade for hypertension and diabetes delivered at the community-based health facilities. Figure 14 presents the provider perspective of the current diabetes and hypertension care continuums for community-based services

Figure 14. Provider Perspective of the Diabetes and Hypertension Cascade



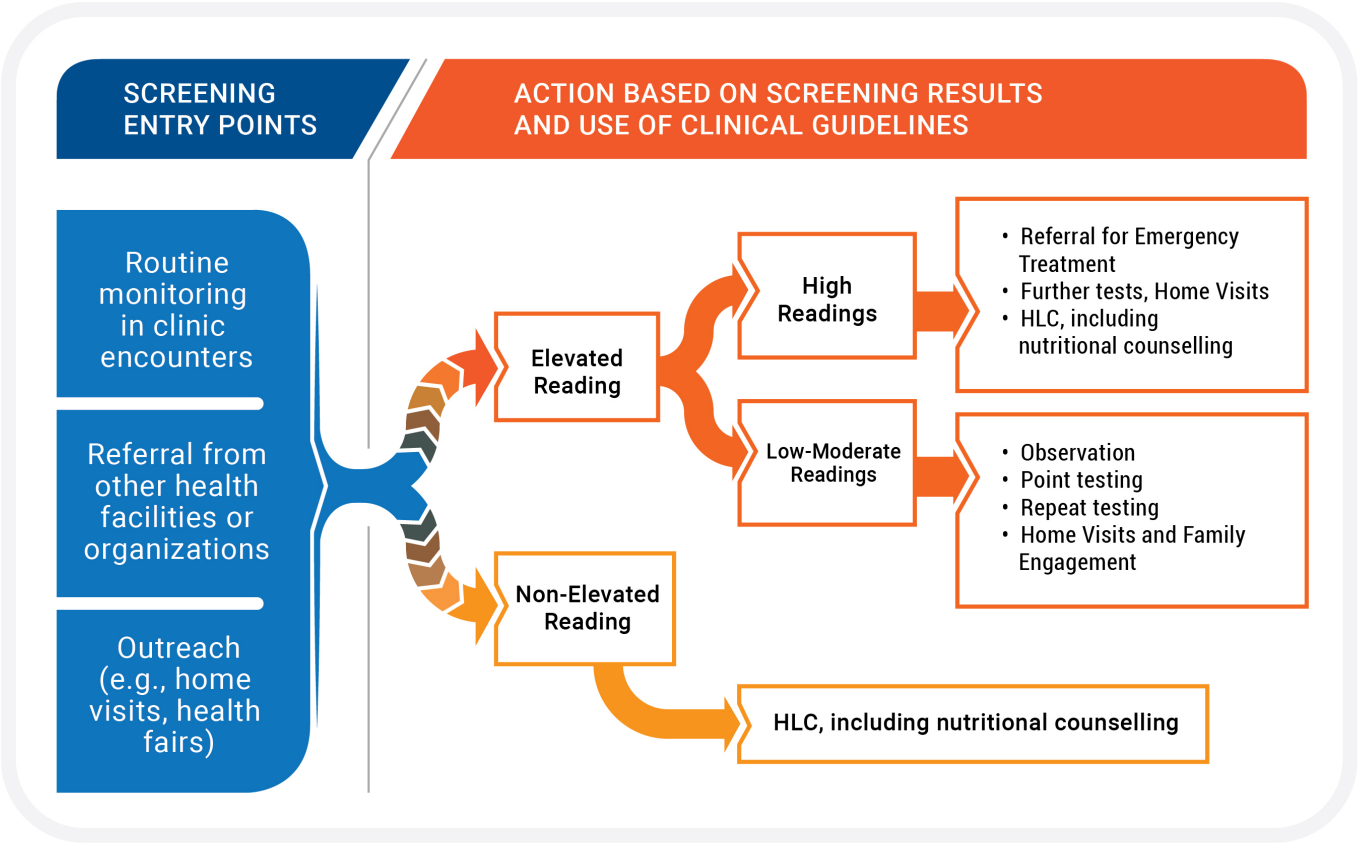
The patients' description of the care cascade confirmed the steps and services described by the providers in the prevention and screening stage of the continuum. However, the patients indicated that sometimes during the screening stage, medication was given and that very often the providers did not consider their level of readiness or incorporate their views in the treatment plan. In the case of both cascades, patients reported the following: feeling unprepared, perceptions of early introduction to medication, and expensive testing processes. Patients also highlighted the lack of access to laboratory testing and the lack of availability of the "good medicine" at the public health pharmacies. More patients indicated that the services and information provided were adequate than those that did not.

SCREENING AND DIAGNOSIS

Identification and Diagnosis of New Cases

Figure 15 presents the diabetes and hypertension screening and diagnosis pathway based on information from the group of administrators and providers. The process for identifying new cases of diabetes and hypertension in clients through screening and follow-up testing did not vary much between the two conditions.

Figure 15. Diabetes and Hypertension Screening and Diagnosis Pathway



*Note HLC=healthy lifestyle counseling.

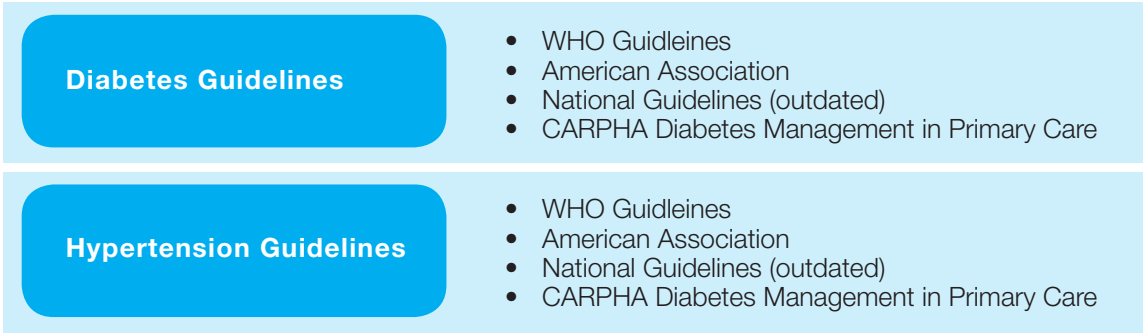
System Capacity: Lack of Supplies and Functional Equipment

Most providers observed that for screening and diagnosis, all the facilities experienced similar challenges related to a lack of supplies and functional equipment, especially for point-of-care testing. However, some providers noted that capacity for blood glucose testing in particular varied at the community-based facilities (in the areas of pharmacy services, laboratory testing, and resources available to providers, such as equipment, supplies, and other tools).

Provider Capacity: Variation in Guidelines Used for Diabetes and Hypertension Care

There were some differences between guideline use for diabetes versus hypertension management. Figure 16 lists the guidelines in use for screening and diagnosing hypertension and diabetes according to healthcare providers. The providers indicated greater clarity and consistency in the use of the WHO HEARTS guidelines to screen and diagnose hypertension compared to the use of guidelines for diabetes. While the providers used diabetes guidelines and knew a range of information that was available to treat and respond to clients, there was a lack of a standardized approach. The providers confirmed that there were trainings on the use of guidelines for both conditions and that provider compliance was assessed at a few wellness centers. However, training is provided on a needs basis and is not linked to continuous medical education or competency requirements. The NCD coordinator is responsible for the coordination of the national NCD program, including in-house training and provider compliance monitoring.

Figure 16. List of Diabetes and Hypertension Guidelines in Use at Wellness Centers as Identified by Providers



IMPROVEMENT TO DIABETES AND HYPERTENSION SCREENING SERVICES

Providers and patients provided several ways to improve diabetes and hypertension screening, which are shown in Table 10.

Table 10. Participants' Proposed Improvements to Diabetes and Hypertension Screening

MAIN ISSUES	PARTICIPANTS' PROPOSED IMPROVEMENTS
Lack of supplies and functional equipment	Increase access and availability of affordable diagnostic testing.
	Increase access to targeted screening services.
	Reduce data loss.
Lack of provider capacity	Standardize guidelines for screening and diagnosis.
	Increase patient privacy.
	Implement more aggressive follow-up approaches.
	Address the impact of culture and belief systems.
	Improve patient-provider communication and increase patient involvement.
	Increase patient access to information, especially on the knowledge of prevalence of NCDs.

TREATMENT INITIATION

Patients and providers portrayed similar concerns but slightly different perspectives for diabetes and hypertension treatment initiation.

System and Provider Capacities

In general, participants believed that although there were clearly defined procedures and protocols, the health system lacked the capacity to adequately initiate clients into pharmacological and nonpharmacological treatment. Further, both providers and patients believed that one of the key issues in treatment initiation was providers' emphasis on pharmacological therapy compared to nonpharmacological treatment and strategies. One reason discussed for the emphasis on pharmacological treatment was a lack of provider compliance with guidelines and protocols. Several patients highlighted that health staff act inconsistently during the treatment initiation process. Other capacity-related areas in need of urgent attention were the limited functionality of the primary healthcare information system (SLUHIS) to capture information, the lack of public-private collaboration to reduce conflicting messages to clients and improve the prescribing processes, and inadequate patient support to complete a referral initiated by their facility.

Pharmaceuticals: Costs, Availability, Side Effects

Several issues related to drug costs, availability, and side effects were noted in discussions on treatment initiation. Some general and specialist doctors highlighted the importance of ensuring that the community pharmacies have access to effective drugs. These providers raised concerns with what they described as the continued use of drugs that cause more harm to patients than other drugs. They felt that the infrequent revision of the drug formulary and the procurement of drugs with more harmful side effects required urgent attention. The patients also reinforced that some medications have side effects that disrupt their daily activities. Accessing prescribed drugs at public pharmacies was also a common issue, with one patient indicating that at some pharmacies: "the good medicine finished fast." When this situation happens, patients either access the drugs from private-sector pharmacies (which is more expensive), get a prescription for other drugs in the public sector pharmacies, or do not access medication and remain untreated.

Tailored Treatment Plans that Account for Patient Preferences and Expectations

Participants highlighted the lack of an individualized treatment approach, in particular a lack of attention to the patients' belief systems, socioeconomic situations, and psychosocial consideration (for such issues as fear, denial, lack of self-esteem, and anxiety) during treatment initiation. Patients shared that there was too much focus on medication and less discussion on traditional (bush) medicine. However, some providers cited that their focus on pharmaceutical treatment was partly driven by patients' expectations and readiness. One doctor noted, "Your ability to treat them (patients) is tied to their expectations. They expect the drugs to do all sorts of things and solve all problems and they reject advice, so sometimes I give them what they ask for as a first step and then we move forward from there." The providers also highlighted the lack of gender differentiated treatment strategies as a major concern, which, in their view, caused pretreatment loss, particularly among males. Self-reports from the patients and the providers confirmed that more women accessed care and were more likely to present for an appointment than their male counterparts. The male participants cited work commitments and the belief that the issue was not urgent as reasons for their delayed and infrequent access to health services at the wellness centers.

Patient Satisfaction and Empowerment

Besides a few exceptions, the majority of patients expressed satisfaction with the following: support provided by the medical staff (particularly the nurses and the nutritionist); access to free clinics and some free medications; education and support for lifestyle changes; self-monitoring; and medication monitoring. The main gaps were linked to the cost of some medications, patient and provider communication, and the attitudes and competencies of some health staff. Some patients noted that there was a lack of personal responsibility to control hypertension. These patients indicated the need for an empowerment approach. In particular, the need for a written guide to support patient compliance was noted as patients were unable to remember all the information shared with them during a consultation.

Improvements to Treatment Initiation

Table 11 presents the solutions identified by participants to improve hypertension and diabetes treatment initiation.

Table 11. Participants' Proposed Solutions for Diabetes and Hypertension Treatment Initiation

MAIN ISSUES	PARTICIPANTS' PROPOSED SOLUTIONS
Lack of supplies and provider capacities	Ensure a structured approach to treatment initiation that includes access to the full range of services and appropriate strategies for patient centered care.
	Upgrade the SIUHIS functionality to increase access to patient information in a timely manner.
	Increase provider evaluation.
	Standardize treatment protocols.
Pharmaceutical supply and cost issues	Increase access to affordable, safe drugs at wellness centers.
	Address drug shortages and limited access to pharmacists.
Lack of tailored treatment plans	Improve patient–provider communication and relationship (build trust).
	Active involvement of patients—Use individualized plans to ease patients into the treatment plan.
	Address the influence of alternative medicine in the treatment plan.
	Engage the family and community, especially regarding psychosocial support strategies.
	Provide targeted education on healthy behavior modification and treatment adherence.
	Develop and implement gender-specific programs and service delivery strategies.
Insufficient patient empowerment	Increase public education—use community influencers.
	Consider support for healthy food baskets, strategies for kitchen gardens, and other social and economic support systems.

TREATMENT MAINTENANCE AND MONITORING

An examination of the long-term care of patients with diabetes and hypertension from patient and provider perspectives revealed several similar weaknesses and strengths.

Patient Responsibility and Complacency

Providers focused on the frustration that the patients experienced with managing a chronic condition, while the patients highlighted their lack of responsibility and determination as factors affecting treatment maintenance. In addition, the patients identified the impact of their lifestyle and behaviors, particularly their use of alcohol and traditional medicine, as issues affecting treatment maintenance. A general overreliance of patients on providers and the need for greater patient autonomy was also discussed.

System Capacities

While participants noted deficiencies with patient capacities, participants were also careful to pinpoint the limitations of the system to provide the capacity and opportunity for patients to be more responsible. System issues such as medication shortages, lack of equipment (including BP monitors for patients), lack of services in one location, and the high costs of testing were highlighted. Inadequacies with psychosocial, socio-economic, and community support were also discussed as system shortfalls related to treatment maintenance. In contrast, the free access to some drugs, plans for the role out of the universal health coverage strategy, clinic schedules, and access to patient records in the patient notebooks were viewed as strengths.

Provider Capacities

Shortfalls with provider care were also noted, in particular the lack of gender-differentiated care, differential prescribing patterns, and the lack of a defined strategy to support long-term patient adherence. On the other hand, the participants identified the following as strengths in this component of the care cascade: the proactive and supportive role of the provider; adequate information on managing diabetes; and guidance on meal planning.

Promotion of Treatment Adherence

Although the providers and the patients agreed that a lot was being done to promote treatment adherence, both groups provided suggestions for scaling up the support for adherence and providing opportunities to strengthen family and personal adherence. In addition, opportunities to strengthen the environment that is required to support adherence at the community, facility, and system level were highlighted. Table 12 presents the main recommendations for diabetes and hypertension adherence strategies grouped into four categories

Table 12. Main Recommendations from Patients and Providers for Improving Diabetes and Hypertension Adherence

MAIN COMPONENTS	ADHERENCE STRATEGIES FOR DIABETES AND HYPERTENSION	
Personal and Family	• Educate and train patients and family on the use of self-monitoring techniques, such as, establish routines, use of pill boxes.	• Increase family involvement (understanding of patient needs). • Increase access to BP monitors. • Introduce a spiritual focus.
Community	• Improve collaboration between health and the other community groups and institutions. • Conduct public education campaigns.	• Increase community capacity for self-monitoring. • Provide guidance and support to initiate community groups and activities.
Lack of tailored treatment plans	• Reinstate wellness center exercise activities. • Increase medication monitoring for negative reactions. • Implement patient self-management initiative in all wellness centers. • Develop care plans that include nutrition and mental wellness.	• Increase use of reminders for follow-ups. • Improve documentation of patient progress (legibility of provider notes). • Remove fees charged to patients who request access to their health records. • Facilitate walk-ins seeking support. • Promote health talks at the wellness centers. • Increase outreach and home visits.
Systems	• Improve service integration within and between levels of care. • Increase access to laboratory services. • Develop adequate policies and legislation for patient-centered care. • Reduce medical inertia among providers.	• Assign dedicated teams to work with diabetes and hypertension patients in the community. • Implement universal health coverage. • Increase access to safe and affordable drugs. • Review drug formulary for diabetes and hypertension.

Monitoring Patients with Repeated Failed Blood Pressure and Blood Glucose Targets

Participants were asked to describe how health facilities can support patients who fail blood glucose and blood pressure targets repeatedly. Providers focused on a need for a more targeted and result-oriented approach that enables the provider to understand the individualized needs of the patient. Providers discussed the use of the team-based approach that involved goal setting with the patient, included the family and community, and tailored interventions based on literacy levels and root causes. Patients focused on the need for greater patient empowerment, including greater motivation (such as through peer groups), more in-depth counseling on nutrition and medicine, and using self-monitoring machines/tools.

Improvements to Long-term Care

Table 13 presents the main gaps and solutions for diabetes and hypertension long-term care suggested by participants.

Table 13. Participants' Proposed Solutions to Improve Diabetes and Hypertension Long-term Care

MAIN GAP AREA	SOLUTIONS FOR TREATMENT MAINTENANCE AND MONITORING
System capacity	• Make lab tests and point of care testing available and accessible. For example, subsidize the cost of testing through a government program (similar to the arrangement for antenatal clients). • Develop an integrated diabetes program and diabetes centers in selected communities (such as Micoud Centre of Excellence). • Increase access to psychosocial support and socioeconomic support (such as food baskets). • Increase availability and access to appropriate and affordable drugs. • Ensure protective policies for treatment and care regimens that support patient centered approaches. • Develop specific guidelines for the care of long-term patients. • Strengthen referral points along the continuum. Identify the factors that influence provider acceptance and completion of referrals. • Identify the factors that deter patients and influence adherence. For example, conduct research on the influence of traditional medicine and the extent to which it influences adherence.
Patient capacity (management of burnout and frustration in long–term patients)	• Use gender differentiated strategies, such as men's clinics. • Implement concrete monitoring strategies (such as a notebook) that involve and empower the clients. • Set up appointment systems and reminders. • Strengthen the chronic self-management program (individualized care plans). • Communicate achievements and reinforce treatment results with patients and family. • Educate on changes in medication packaging and dosing. • Increase access to self-monitoring equipment, such as BP monitors. • Use patient testimonials.
Provider capacity	• Complete the roll out and training on the HEARTS guidelines. • Strengthen the team approach to achieve a holistic approach to patient care. • Address burden of service provision on the provider. • Increase number of skilled and specialist staff. • Use fixed dose combinations.
Community capacity for healthy living	• Organize community support activities (such as peer support). • Use targeted approaches for community education. • Integrate NCD education and monitoring into existing community groups and organizations. • Reestablish community groups with new names that instill hope and empowerment. • Strengthen partnership with community-based organizations.

PRIMARY PREVENTION—DIABETES AND HYPERTENSION

The participants were asked to identify strategies that the health services, community, and individual/family could use to prevent people from having high blood pressure or high blood glucose in the first place. The providers and patients both confirmed that there were many programs, projects, and facility-based initiatives presently being implemented, but these initiatives need to be strengthened. Figure 17 presents the main suggestions provided for each category.

Figure 17. Participant Proposed Strategies for Primary Prevention of Diabetes and Hypertension

HEALTH SERVICE STRATEGIES	COMMUNITY STRATEGIES	INDIVIDUAL/FAMILY STRATEGIES
• Strengthen public policy and advocacy for healthy practices • Strengthen health promotion and prevention capacity • Increase community collaborative projects • Strengthen individual and community capacity to self-monitor • Increase research on blood glucose control	• Provide support to communities to increase collaborative projects. • Engage community influencers and gate keepers to mobilize communities for action. • Create mechanisms for shared community resources and spaces. • Nurture creativity at the community level to support diabetes control, such as form groups to support physical exercise in the community, develop community growth, and share initiatives.	• Support voluntarism • Help educate community residents on healthy lifestyle. • Accept personal responsibility to monitor health, such as control diets, and increase water consumption. • Instill a spiritual focus in the management of diabetes

5.0 Discussion

This study aimed to generate quantitative and qualitative data to inform improvements to country-level responses to diabetes and hypertension management and care. This section will discuss the gaps, barriers, and breakpoints for each component of the care cascade, followed by the findings related to cross-cutting and systemic issues.

PRIMARY PREVENTION

The quantitative analysis of the STEPS 2019–20 data estimated that 40.18 percent (n=73,204) of the population had hypertension, while 16.09 percent (n=29,015) of the population had diabetes. One of the key strategies to reducing the burden of these NCDs is prevention of the associated risk factors, including unhealthy diets, physical inactivity, tobacco use, and harmful use of alcohol.[18] Through the qualitative study component, both patient and provider groups identified two main challenges in the primary prevention of diabetes and hypertension: the lack of intersectoral and community collaboration; and the lack of patient and community capacity. The convergence of the provider and the patient perspectives presents opportunities to implement initiatives in an environment that appears ready for change.

Notably, quantitative findings suggest that groups of individuals who are deemed to be "lower risk" and typically may engage with the healthcare system less (such as younger individuals of a normal BMI) should also be targeted for primary prevention, in addition to high-risk groups who more often have higher rates of contact with the healthcare system (such as individuals who are obese or over 60 years old). Quantitative analyses revealed that although 64 percent of 55–69 year-olds were considered hypertensive and only 30 percent of 18–54 year-olds were, the actual number of hypertensive individuals was higher in the younger age group compared to the older one (26,920 versus 10,430, respectively). This is due to the larger population size of 18–54 year-olds in Saint Lucia compared to 55–69 year-olds.

SCREENING AND DIAGNOSIS

The largest drop in percentage points along the care cascade for hypertension and diabetes for both genders, ages, and all education groups were between screening and diagnosis, suggesting a universal need for improving the diagnosis process. It should be noted that this large drop is likely partly due to the STEPS survey data used to classify those who are "screened" based on if individuals were ever screened for hypertension or diabetes. If the STEPS survey instead captured those who were recently or routinely screened, the percentage of population screened will likely have been lower and the drop between screening and diagnosis would also be smaller. However, qualitative findings did identify several breakpoints (related to gaps in system and provider capacities) between the screening and diagnosis stages. System inadequacies included insufficient access to affordable diagnostic testing and screening services, and inadequate supplies and equipment for point testing. In addition, although national guidelines for hypertension and diabetes care have been recently adopted, providers identified a variety of the guidelines used (as shown in Figure 17), which suggests that all providers are not yet aware or trained on these standardized guidelines. Further, with reference to Figure 14, the cut-offs identified by some providers for hypertension diagnosis (SBP≥130mmHg and DBP≥80mmHg) are not aligned to the WHO HEARTS guidelines, which use cut-offs of SBP≥140mmHg and DBP≥90mmHg.

[18] WHO. 2022. "NCD Factsheet." https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

Notably, issues related to screening and diagnosis for diabetes seem to be pertinent across educational statuses, while the gap between screening and diagnosis for hypertension was about the same across educational status. While the burden of diabetes was highest among individuals with a primary school education or less, the gap between screening and diagnosis was largest among those with a post-secondary education with a drop of 72 percentage points. The gap in hypertension screening and diagnosis is more pertinent for men, individuals aged 18–54 years, and those with a normal BMI. Results from the regression analyses indicate that females are estimated to have 14.5 times the odds of being screened compared to men. The observed gender difference in preventive care utilization is consistent with research findings in other countries.[19] The study's qualitative findings also support the need for gender-differentiated strategies for screening and diagnosis. In addition to females, older individuals, those that are obese or overweight, and those that do not currently smoke also show significantly higher odds of testing for hypertension compared to other groups.

TREATMENT INITIATION

Although about the same percent of the population with diabetes or hypertension was receiving treatment (32 percent compared to 33 percent, respectively), hypertension cases experienced a notably larger drop in percentage points in cases transitioning along the care cascade from diagnosis to treatment (28 percentage points) compared to diabetes (9 percentage points) For hypertension, results from the regression analyses indicate that the odds of treatment are significantly higher for females, older people (aged 55–69), those that are overweight or obese, and those who do not currently smoke. For diabetes, results from the regression analyses indicate that the odds of treatment are higher for the same groups, but the differences are not statistically significant.

Qualitative findings identified several breakpoints between diagnosis and treatment initiation including the following: challenges with accessing patient information through SLUHIS, ineffective referral systems, lack of access to a multidisciplinary intersectoral team, inadequate access to nonpharmacological services and safe and appropriate drugs, treatment plans that were not patient-centered, and inadequate patient responsibility and empowerment. In addition, the lack of attention to the socioeconomic determinants and the lack of inclusion of patient belief systems were also identified as barriers to treatment initiation. The providers' and patients' perspectives on determinants beyond the structural limitations of the health sector support the broad definition of health and the integrated models of health service delivery. In support of the need for tailored treatment plans, the drop between diagnosis and treatment was higher among individuals aged 18–54 years compared to those aged 55–69 years (32 percentage point compared to 25 percentage point drop, respectively), suggesting a need for age-differentiated interventions to encourage treatment initiation.

TREATMENT MAINTENANCE AND MONITORING

The study found that for diabetes and hypertension there were lower drops in percentage points for patients moving along the care continuum from diagnosis to treatment and control, revealing more patients being retained in care at this point in the care cascade. However, the small proportion of patients achieving control is concerning, with only 12 percent of 18–69 year-olds with hypertension or diabetes experiencing control. Further analysis points to the influence of age, gender, and level of education. More women for both conditions showed larger proportions reporting disease control compared to men. In terms of hypertension, regression analyses also indicated that women, individuals aged 55–69, individuals with a secondary education or higher, overweight and obese individuals, and individuals who do not currently smoke have significantly higher odds of experiencing control compared to other groups. For diabetes, no results were statistically significant because of the small sample size.

[19] Vaidya, V., Partha, G., and M. Karmakar.2012. "*Gender differences in utilization of preventive care services in the United States." Journal of women's health,* 21(2), 140-145.

Providers identified patient frustrations experienced as a result of living with a long-term condition as a barrier to treatment maintenance. This may be reflected in the major gap between control of diabetes comparing individuals 18–54 years old to those aged 55–69 years old. Only 5 percent of individuals aged 18–54 years old experienced hypertensive control, while 19 percent of individuals 55–69 years old did. Participants further identified the following issues: lack of psychosocial and socioeconomic support; the length of treatment intervals between clinic schedules; lack of communications; and exposure to stigma and discrimination.

Treatment and monitoring of diabetes and hypertension is very costly to the patient and the health system. Patient compliance at this stage of the continuum is strongly influenced by the screening and treatment initiation stage. The patients indicated that the process used to diagnose and initiate them into care influences their level of commitment to the treatment regimen and overall adherence to nonpharmacological treatments. Investing money in the early stages of the care cascade for diabetes and hypertension can help reduce drug dependency and support the attainment of acceptable targets.

CROSS-CUTTING ISSUES

The cross-cutting issues are related to a patient-centered approach and the need for more individualized care modalities.

1. Access to equitable and appropriate care
Patients and providers confirmed the lack of mechanisms and strategies to ensure equitable access to care and address the specific needs of clients. The cost of health services represented a major deterrent to accessing care. The patients also identified the lack of acknowledgement of cultural belief systems during the patient-provider interactions as a barrier to appropriate care.

2. Gender and age specific interventions
The findings highlight the importance of gender and age-specific intervention along the diabetes and hypertension care continuum. Both quantitative and qualitative findings underscored that female patients accessed screening more often than their male counterparts. Although the sample for the qualitative study component represented more older clients, the number of younger persons presenting with symptoms of diabetes and hypertension in more advanced stages of the diseases was noted.

3. Patient Capacity and Degree of Involvement
Patient capacity to engage and be more involved in their care was highlighted often by participants. Patients identified the need to improve individual, family, and community capacity, while the providers reinforced a lack of patient responsibility and supported the need for more strategies that support patient empowerment.

SYSTEMIC ISSUES

Under each stage of the care cascade framework, system-related gaps were identified.

1. Health Management and Organization
One of the main findings was the lack of an integrated delivery model to support the delivery of holistic and comprehensive services. Patients described a care pathway that required them to traverse across the public and private health delivery system in search of basic and specialist services. In their view, this was the result of the lack of resources at the wellness centers. Patients shared their experiences with drug shortages, low staffing levels, and absence of diagnostic services at the wellness centers where they receive care. Limited capacity at the level one to four community-based facilities resulted in patients seeking basic care at multiple

public and private facilities and having to repeat visits to the wellness centers throughout the week to access services scheduled on different days. Such barriers likely play a role in the relatively low proportion of persons with diabetes or hypertension (12 percent) who achieve disease control.

2. Health Service Delivery and Supply Chain

The findings revealed inconsistencies in the service complement at the wellness centers. Providing holistic and comprehensive services posed a challenge because of resource constraints. Limited services were available to patients daily. Health service fragmentation and rationalization has given rise to shared services at different locations in different regions. This type of resource scheduling reduces patient access to care and patients identified it as a reason for seeking noncritical and specialized care at other health centers. Some providers indicated that this situation has given rise to high patient volumes at some sites, while other sites remain underutilized. The drug supply chain also represented a major systemic issue. The lack of a safe and appropriate drug supply and frequent stockouts created patient and provider frustration. Deficiencies in diagnostic services, functional equipment, and adequate spaces to deliver patient consultations within private and confidential settings were also highlighted as major gaps.

3. Human Resources

Insufficient skilled staff to manage diabetes and hypertension patients was an issue mentioned often. The patients reported being referred to sites outside their community and sometimes their region. This practice was costly and inconvenient for many patients. The providers reported a high volume of patients and the inability to endure adequate consultation to all patients. This deficiency in adequate staffing affects the composition of the health team. Although many wellness centers reported a team approach, they also lamented the lack of a complete team. Limited opportunities for training and refresher courses also represented systemic gaps.

4. Standardized Treatment Guidelines and Quality Management

Findings revealed that all providers are not aware, trained on, and/or adhering to the recently adopted national standardized guidelines for diabetes and hypertension care (that is, the CARPHA Diabetes Management Guidelines and WHO HEARTS Guidelines, respectively). Providers identified the use of a variety of other guidelines for diabetes and hypertension treatment. The absence of a system for quality monitoring, evaluation, and reporting remains an issue.

5. Health Information

The strengths and weaknesses of SLUHIS were highlighted. The system provides support with patient registration, data collection, and reporting; however, the system is slow and in need of improvements. The findings revealed the following: weaknesses in access to information for patient monitoring; the lack of integration of SLUHIS with laboratory monitoring; data loss in the field because of lack of online access; and the delayed response and downtime. The providers recommended an upgrade of the SLUHIS functionality to increase analysis of drug usage, prescribing policies, and provider compliance and accountability.

6. Social Determinants of Health

The social determinants of health (SDH) were linked directly to the lack of access to a national social protection strategy, including universal health coverage mechanisms. The multisectoral focus group of program administrators revealed a lack of joint planning and evaluation among sectors. The FGDs revealed a heavy emphasis on the impact of the SDH on patient compliance and the lack of provider consideration of the SDH in the design of diabetes and hypertension care plans and interventions. The FGDs also revealed that the lack of transportation, limited access to mental health and social services, limited access to universal healthcare, and low literacy levels influence patient compliance.

LIMITATIONS

The following outlines several limitations of the study design:

- Data for the STEPS 2019-20 survey were collected during the COVID-19 pandemic, with Saint Lucia recording its first COVID-19 case in March 2020. During the pandemic, there were disruptions to regular health services and changes in patient and provider behaviors. Thus, the quantitative data used in the study, in particular the question linked to treatment (that is, in the past two weeks, did the participant take any drugs for diabetes/high blood pressure prescribed by a doctor/health worker) may be lower than typical because of the pandemic-related disruptions and behavior changes. Further, the qualitative data were collected from October to November 2022 and participant responses may also reflect recent pandemic-related disruptions and behavior changes (though this was not specifically addressed in FGDs).

- Data from the 2010 Census were used for sampling selection in the 2019 STEPS survey, and the makeup of the population may have changed since then, leading to a potentially biased sampling frame.

- Screening and diagnosis questions related to if the individual had ever been screened or diagnosed for hypertension/diabetes, and they do not capture if persons were routinely or recently screened.

- Treatment questions related to if an individual had received treatment with drugs in the past two weeks. Therefore, individuals who had initiated treatment and stopped (because of condition improvement or nonadherence), as well as individuals who received nonpharmacological treatment (such as lifestyle advice regarding exercise and nutrition) were not captured under “treated” in the quantitative care cascade frameworks.

- Diabetes and hypertension control should ideally be measured via a medical record screen using multiple data points over time, but control was determined using STEPS data collected at one time point.

- The use of FGDs limited the level of confidentiality that could be achieved during a discussion. Stakeholders may have either reduced their participation or only communicated information that they felt comfortable sharing. Further, levels of seniority and management within the medical and nursing profession may have reduced participation among the subordinate officers or younger professionals.

- Using the cascade framework restricted issues to the points along the cascade and may have impeded a fuller discussion and understanding of the systemic, patient, and provider related issues.

- The majority of the FGD participants were over 45 years, which may have skewed the data to issues related to older populations.

- The use of virtual communication platforms may alter group dynamics, leading to less interactive exchange.

Of note, quantitative and qualitative analyses specifically examining those with both hypertension and diabetes were not conducted and represent an area for further research.

6.0 Recommendations

The following recommendations were developed for improving diabetes and hypertension care along the care cascade in Saint Lucia, based on an analysis of study findings, as well as a literature review of international standards, best practices, and evidence-based programs in both grey and peer-reviewed literature. The recommendations presented are summarized in Table 14 and categorized according to level of effort and impact in relation to low (L), medium (M), and high levels (H). The level of effort and impact are assigned based on the authors' best estimates; further research and stakeholder engagement on each recommendation are needed to more accurately identify the associated level of effort and impact.

1. Improve quality of services.

1.1 Create an enabling environment (including the setting of relevant quality standards, training plans for healthcare professionals, and aligned regulatory and financial systems) for the delivery of person- or patient-centered care in primary care. Plans should promote the design and implementation of individualized patient plans that engage the patient and family, incorporate psychosocial support strategies, address patient preferences (for example, alternative medicines), leverage peer support groups, and include patient empowerment approaches tailored specifically to age and gender differences and literacy level. One systematic review noted that patient-centered care had positive influences on patient satisfaction and self-management.[20] Ongoing performance-based financing reforms present an opportunity to ensure person-centered care is prioritized.

1.2 Formally adopt standardized national guidelines for treatment of NCDs, ensure health professionals are trained on the standardized guidelines, and implement routine mechanisms to assess adherence. While progress has been made with the recent adoption of standardized guidelines for hypertension and diabetes (that is, the WHO HEARTS guidelines and CARPHA diabetes guidelines), standardized guidelines need to be adopted at the national level for other NCDs, including different types of cancers and chronic respiratory diseases. Standardized treatment guidelines should be reviewed on a regular basis to ensure continued alignment with evidence-based practices. Also, the adoption of such guidelines must be accompanied by long-term training plans, as well as plans to assess adherence to the guidelines as lack of adherence can result in clinical inertia and overall low rates of control.

2. Ensure consistent availability of safe and affordable medications and supplies for NCD care.

2.1 Strengthen supply chain management to reduce stockouts of medicines, POC diagnostic tests, and other laboratory supplies and improve quality control of medicines and supplies. The implementation of POC diagnostic testing (Recommendation 2.1) relies heavily on adequate supply chain management. An audit into the supply chain management of medicines, POC diagnostic tests, and other laboratory supplies for NCD care may identify gaps or barriers to efficient supply chain management. Of note, surveillance is being strengthened as part of the OECS Regional Health Project on improving lab capacities and through the Health System Strengthening Project by implementing the performance-based financing scheme to improve diabetes and hypertension management.

[20] Rathert C, Wyrwich MD, and SA Boren. 2013. "Patient-Centered Care and Outcomes: A Systematic Review of the Literature. *Medical Care Research and Review.*" 70(4):351-379. doi:10.1177/1077558712465774

2.2 Review and update the national essential medicines list (NEML) routinely. The WHO recommends that governments formally check whether their NEMLs need to be updated at least every two years following the publishing of the WHO Model List of Essential Medicine.[21] The selection of NCD medicines for the NEML should be linked to data on medicines utilization, thereby allowing the routine updating of the NEML to function as a mechanism to improve appropriate and rational prescribing. The selection of NCD medicines should aim to lower costs for patients and improve accessibility and availability, where possible.

3. Strengthen the availability and timely access to NCD-related services.

3.1 Increase availability and access to affordable diagnostic testing, including point-of-care (POC) testing at the lower-level facilities. POC testing can allow for more immediate clinical management discussions and decisions between healthcare professionals and patients. One review examining studies over one and a half decades found that the introduction of POC HbA1c testing was associated not only with improved diabetes management and glycemic control, but also increased patient satisfaction and motivation.[22]

3.2 Strengthen equipment maintenance and management protocols and procedures to improve equipment functionality and accuracy of results. This could include developing assessment checklists that identify the performance status of medical equipment in the health centers. A medical equipment maintenance program should consist of procedures for scheduled maintenance and corrective maintenance activities. Timely corrective maintenance or replacement (if needed) of nonfunctional equipment should be prioritized to ensure timely diagnoses and continuity of care.

3.3 Increase the number of skilled and specialist staff to provide adequate service coverage based on current and projected population health needs. While the use of a national needs-based health workforce planning method is being increasingly adopted, a standardized approach has not yet emerged.[23] The WHO Global Strategy on Human Resources for Health: Workforce 2030 advises that planning consider workforce needs as a whole (rather than treating each profession separately), while taking into account reliable and updated health workforce information, population needs, labor market analyses, and scanning of scenarios. The establishment of a national health workforce registry is essential for strengthening health workforce planning; the country should ensure such a registry aligns with the WHO Minimum Data Set for Health Workforce Registry, as applicable to its context. Further, as a small island, Saint Lucia should consider creative strategies for addressing workforce challenges, such as the introduction of telemedicine and long-term partnerships with other countries to pool health workforce education, accreditation, and regulation needs.

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[21] WHO 2020. "Selection of essential medicines at country level: using the WHO Model List of Essential Medicines to update a national essential medicines list." Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IGO.

[22] Schnell O, Crocker JB, and J. Weng. 2017. "Impact of HbA1c Testing at Point of Care on Diabetes Management." *J Diabetes Sci Technol.* 11(3):611-617. doi: 10.1177/1932296816678263. Epub 2016 Nov 27. PMID: 27898388; PMCID: PMC5505423.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5505423/

[23] Asamani, J. A., Christmals, C. D., and G.M. Reitsma. 2021. "The needs-based health workforce planning method: a systematic scoping review of analytical applications." *Health Policy and Planning*, 36(8), 1325-1343.

3.4 Consider patient preferences in the scheduling of NCD services and the method of service delivery (remote appointments, home visits, or clinic visits). Patients could be encouraged to book appointments in advance to avoid excessive wait times. The promotion of self-monitoring and remote appointments via a secure and confidential platform can increase accessibility of services for some patients.

4. Upgrade SLUHIS functionalities and expand integrations to increase the availability of reliable information for clinical management of NCDs and evidence-informed policy development.

4.1 Assess and address gaps in SLUHIS that impede access to timely and accurate data for NCD patients. A rapid evaluation of challenges with the use of SLUHIS in health centers and hospitals (such as data loss in the field because of lack of online access and the delayed response times) can be conducted to inform and prioritize targeted facility-level improvements to SLUHIS.

4.2 Where possible, ensure the integration/interoperability of SLUHIS with information systems used in laboratories, pharmacies, and private practices. This will facilitate more integrated care and create more seamless patient experiences, especially for individuals with multimorbidity and chronic conditions, who often must traverse the public and private health systems to access testing, medications, and medical services. Such integrations could also allow healthcare professionals to better monitor patients (through immediate access to laboratory results and information on prescription filling and the need for prescription renewals) and tailor care.

4.3 Establish and train healthcare professionals on the use of a structured system within SLUHIS for referral and recall mechanisms between positive screens, diagnoses, and treatment initiation to reduce pretreatment loss. Existing registries could be adapted to track which patients are overdue for visits, and a routine mechanism should be activated for contacting them to remind them to return. Development and implementation of such a system for NCD patients should be accompanied by a standard written policy/procedure with assigned roles and responsibilities.

4.4 Establish a minimum dataset of NCD-related indicators that is routinely collected, analyzed, and disseminated at the national level to monitor and evaluate progress. The recently published Noncommunicable Disease Facility-Based Monitoring Guidance provides a list of 22 core indicators (see Appendix 2) and 59 optional indicators that the government can select for monitoring their NCD management performance. Specific baseline values and targets will need to be developed for each indicator at each reporting level, as well as established methodologies, roles, and responsibilities for data collection. Routine analysis and dissemination of such data within the MOWEA and back to facilities will facilitate evidence-informed decision-making.

5. Increase coordinated multistakeholder engagement to improve collaboration in NCD prevention and care.

5.1 Create and operationalize a national multisectoral commission, agency or mechanism for NCDs. Effective NCD prevention and control requires action and engagement from a wide range of stakeholders, including stakeholders from the public sector, private sector, and civil society. The recently developed WHO Toolkit for Developing a Multisectoral Action Plan for NCDs recommends such a national multisectoral mechanism "for planning, guiding, monitoring and evaluating the enactment of national policy with the effective involvement of sectors outside health." The toolkit also suggests that a scientific/expert committee, steering committee, and working groups/task forces be considered as distinct components of the multisectoral mechanism.

5.2 Ensure national NCD prevention and control plans incorporate existing community structures and leverage existing community resources. This aligns with the 2017–25 National Chronic Disease Policy of Saint Lucia, which highlights integrated programs as a priority area (especially in schools, workplaces, and faith-based settings). As such, plans should include mechanisms for using shared community resources and spaces. Leveraging capacities and resources at the community-level can increase individual empowerment and motivation. For example, collaborating with workplaces to promote screening through mobile clinics or visits from community health workers may reach populations who are typically missed in other screening efforts.

Table 14. Summary of Recommendations

RECOMMENDATION	EFFORT (L, M, H)	IMPACT (L, M, H)	POTENTIAL TIMELINE (MONTHS)
1.1 Create an enabling environment (including the setting of relevant quality standards, training plans for healthcare professionals, and aligned regulatory and financial systems) for the delivery of person- or patient-centered care in primary care.	H	H	12+
1.2 Formally adopt standardized national guidelines for treatment of NCDs, ensure health professionals are trained on the standardized guidelines, and implement routine mechanisms to assess adherence.	M	H	6+
2.1 Strengthen supply chain management to reduce stockouts of medicines and POC diagnostic tests and other laboratory supplies and to improve quality control of medicines and supplies.	H	H	12
2.2 Review and update the national essential medicines list (NEML) at least every two years.	L	M	N/A
3.1 Increase availability and access to affordable diagnostic testing, including point-of-care (POC) testing at the lower-level facilities.	M	H	6-12
3.2 Strengthen equipment maintenance and management protocols and procedures to improve equipment functionality and accuracy of results.	L	M	6
3.3 Increase the number of skilled and specialist staff to provide adequate service coverage based on current and projected population health needs.	H	H	24+
3.4 Consider patient preferences in the scheduling of NCD services and the method of service delivery (remote appointments, home visits, or clinic visits).	M	H	12

Table 14. Summary of Recommendations (Cont'd)

RECOMMENDATION	EFFORT (L, M, H)	IMPACT (L, M, H)	POTENTIAL TIMELINE (MONTHS)
4.1 Conduct a rapid assessment and address gaps in SLUHIS that impede access to timely and accurate data for NCD patients.	L	H	3-6
4.2 Where possible, ensure the integration/interoperability of SLUHIS with information systems used in laboratories, pharmacies, and private practices.	H	H	12-18
4.3 Establish and train healthcare professionals on the use of a structured system within SLUHIS for referral and recall mechanisms between positive screens, diagnoses, and treatment initiation to reduce pretreatment loss.	M	H	8-12
4.4 Establish a minimum dataset of NCD-related indicators that is routinely collected, analyzed, and disseminated at the national level to monitor and evaluate progress	M	H	6-12
5.1 Create and operationalize a national multisectoral commission, agency, or mechanism for NCDs	L	M	3-6
5.2 Ensure national NCD prevention and control plans incorporate existing community structures and leverage existing community resources.	M	H	6

Note: L=low; M=medium; H=high

Appendix 1: Distribution of Health Facilities by Quadrant

LEVEL	Quadrant 1 – Northern Region	Quadrant 2 – Eastern Region	Quadrant 3 – Western Region	Quadrant 4 – Southern Region
Level 1	La Guerre	Ti Roche Micoud	Etangs Delce	Grace
Level 2	Monchy Grand Riviere Fond Assau	Richfond Desruisseaux Mon Repos	Mongouge, Fond St. Jacques Canaries	Belle Vue, Laborie, Saltibus
	Bexon, Ciceron, La Clery Ti Rocher Entrepôt		Vanard, La Croix Maingot Jacmel	
Level 3	Babonneau Castries Health Centre	Micoud	La Farge, Anse-La-Raye	
Level 4	Gros Islet Polyclinic	Dennery Hospital	Soufriere Hospital	
	Castries Urban Health Centers (presently Level 3)			

Appendix 2: Core Indicators by Disease

The following are core indicators grouped by disease (extracted from The WHO Noncommunicable Disease Facility-based Monitoring Guidance: Framework, Indicators and Application):

Hypertension and cardiovascular diseases

1. Availability of hypertension core medicines.
2. Availability of CVD core medicines.
3. Availability of a functional blood pressure measuring device.
4. Blood pressure control among people with hypertension.

Diabetes

1. Availability of diabetes core medicines.
2. Availability of plasma glucose testing.
3. Availability of HbA1c testing.
4. Glycaemic control among people with diabetes.

Chronic respiratory diseases

1. Availability of asthma core medicines.
2. Availability of chronic obstructive pulmonary disease core medicines.
3. Asthma control.
4. Chronic obstructive pulmonary disease control.

Cancers—Breast cancer

1. Clinical breast evaluation for early diagnosis of breast cancer among women aged 30–49 years with signs and/or symptoms associated with breast cancer.
2. Timeliness of referral for breast cancer diagnosis among women aged 30–49 years with associated signs and /or symptoms of breast cancer who had suspicious findings from clinical breast evaluation.

Cancers—Cervical cancer

1. Availability of human papillomavirus testing.
2. Cervical cancer screening with high-performance test among women aged 30–49 years.
3. Cervical cancer screening among women aged 30–49 years.
4. Cervical cancer screening test positivity among women aged 30–49 years.

Cancers—Childhood cancer

1. Clinical evaluation for early diagnosis of childhood cancer among children with signs and/or symptoms associated with childhood cancer.
2. Timeliness of referral for childhood cancer diagnosis among children with associated signs and/or symptoms of childhood cancer who had suspicious findings from clinical evaluation.

Cancers—General cancer

1. Clinical evaluation for early diagnosis of cancer among people with signs and/or symptoms associated with cancer.
2. Timeliness of referral for cancer diagnosis among people with associated signs and/or symptoms of cancer who had suspicious findings from clinical evaluation.

Appendix 3: Key Qualitative Findings from Administration and Management

The health administrators and program managers were asked to indicate their main roles in the management and care cascade of diabetics and hypertension. They identified four main roles, which are in Figure 18.

Figure 18. Main Roles of Health Administrators and Program Managers in Diabetes and Hypertension Management and Care

ADMINISTRATION AND MANAGEMENT	PROGRAM MANAGEMENT	PROVISION OF CARE	COLLABORATION
• Human resource management • Supplies management • Monitoring standards • Monitoring health trends	• Monitoring and reporting • Capacity assessment • Education and training • Monitoring health trends	• Education and health promotion • Screening and diagnosis • Treatment • Monitoring	• Intersectoral collaboration • Integrated planning • Building capacity and linkages for shared responsibility in the public and private health system

The program managers were asked to identify the main issues related to the administration and management of diabetes and hypertension care. The main issues were grouped under three themes: (i) weak program management; (ii) lack of a holistic approach to care; and (iii) lack of collaboration to provide support to patients to meet blood pressure and diabetes targets. The themes provide insights into breaks along the continuum of care, and further analysis of the themes revealed specific gaps. The main gaps along the continuum included the lack of access to the full range of services and the inadequate emphasis on capacity building for patient self-management. The participants from the social sectors reinforced the importance of a more collaborative approach.

Appendix 4: Analysis Showing Disease-Specific Differences in Qualitative Responses for the Various Stages of Care

Figure A4.1 presents the main issues related to diabetes treatment initiation, while Figure A5.2 presents the main issues related to hypertension treatment initiation, from the patient and provider perspectives.

Figure A4.1 Main Issues in Diabetes Treatment Initiation

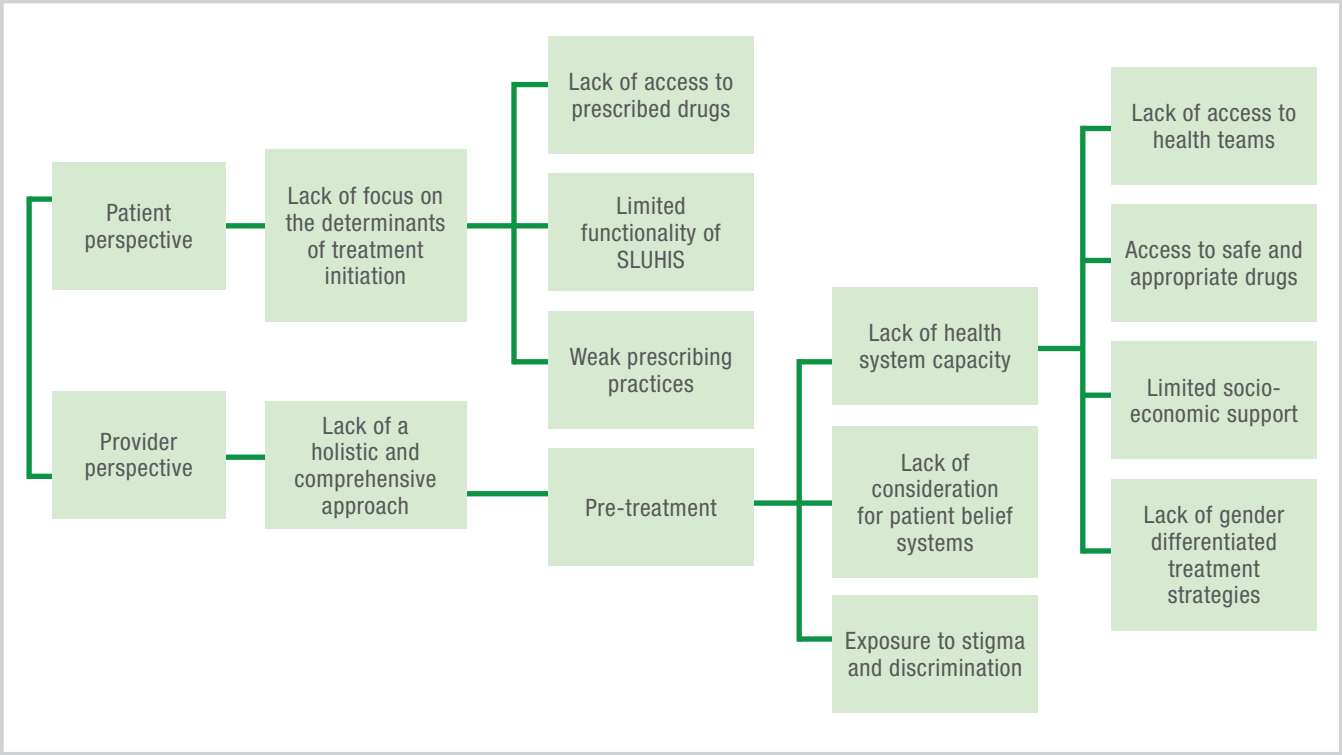

Figure A4.2 Main Issues in Hypertension Treatment Initiation

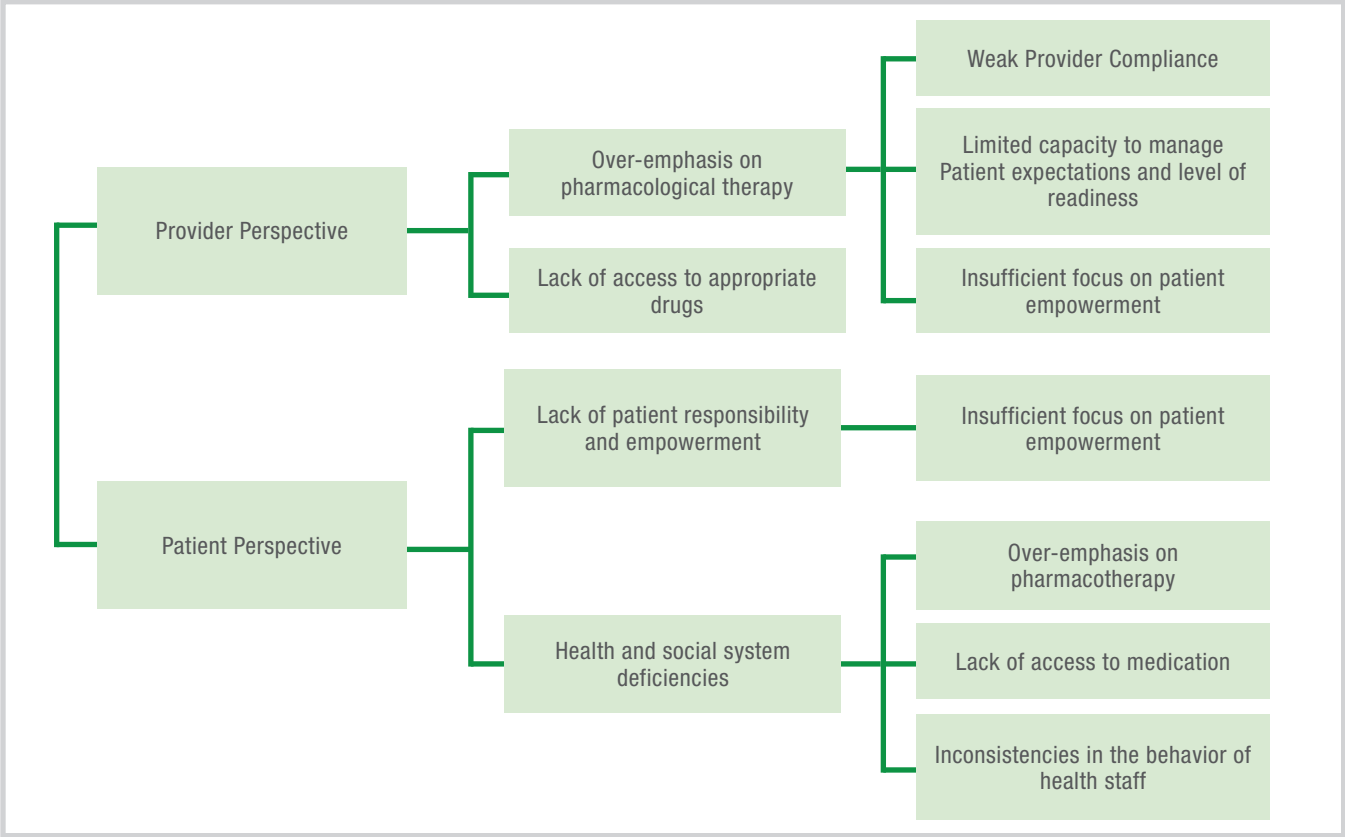

Figure A4.3 presents the main themes and subthemes related to diabetes treatment maintenance and monitoring, while Figure A4.4 presents the main themes and subthemes related to hypertension treatment maintenance and monitoring.

Figure A4.3 Main Themes and Subthemes Regarding Issues Related to Diabetes Treatment Maintenance and Monitoring

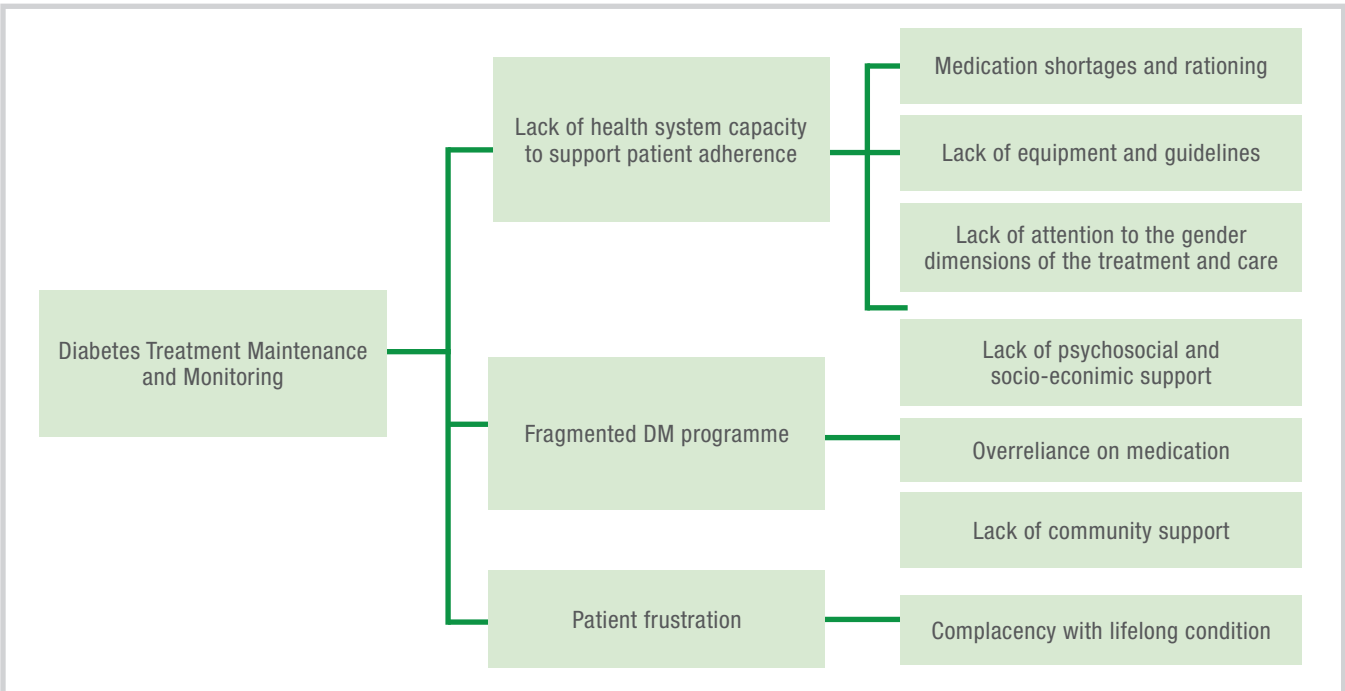

Figure A4.4 Main Themes and Subthemes Regarding Issues Related to Hypertension Treatment Maintenance and Monitoring

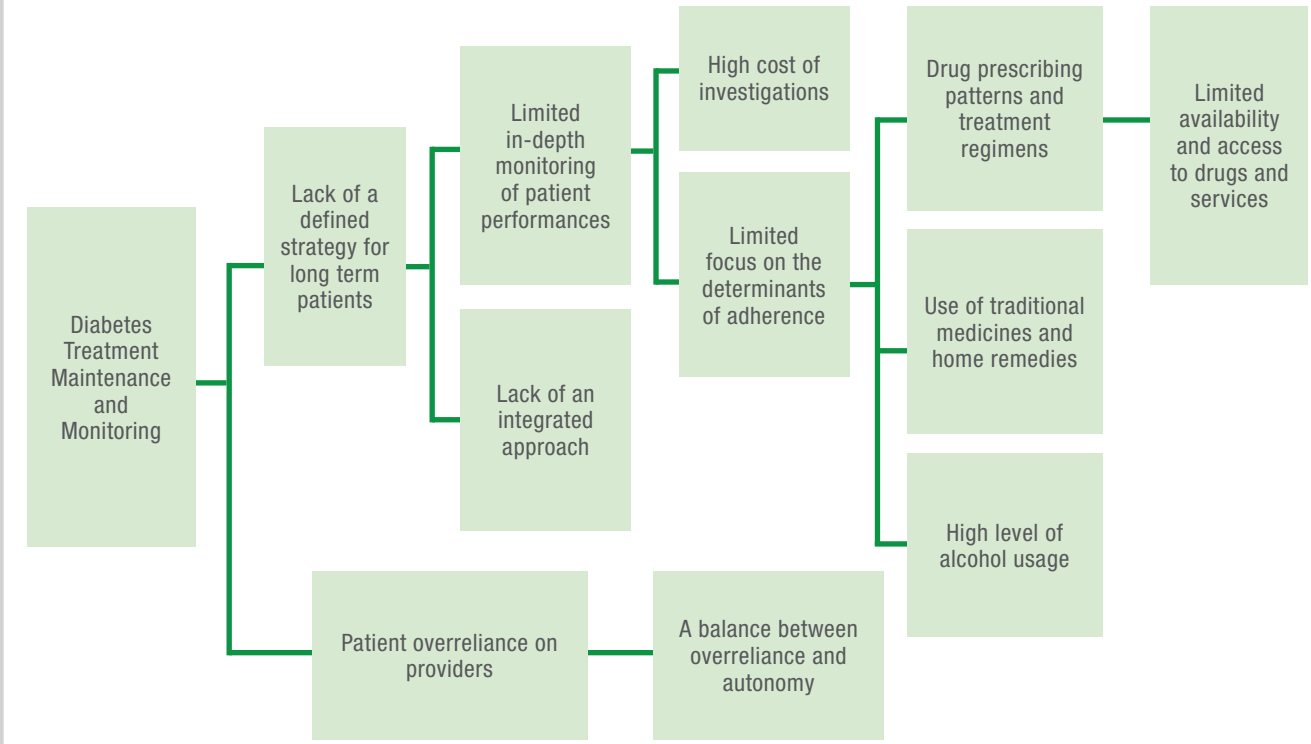

Table A4.1. Participants' Proposed Solutions to Improve Diabetes Long-term Care

MAIN GAPS	SOLUTIONS FOR DIABETES TREATMENT MAINTENANCE AND MONITORING
System capacity for ongoing monitoring support	• Develop an integrated diabetes program and diabetes centers in selected communities (such as Micoud Centre of Excellence). • Increase access to psychosocial support and socioeconomic support (such as food baskets). • Increase access to affordable drugs and diagnostic testing. • Ensure protective policies for treatment and care regimens that support patient centered approaches. • Develop specific guidelines for the care of long-term patients. • Strengthen referral points along the continuum. • Identify the factors which deter patients and influence adherence. • Identify the factors which influence provider acceptance and completion of referrals. • Address burden of service provision on the provider. • Increase number of skilled and specialist staff.
Management of burnout and frustration in long-term patients (communication and motivation)	• Implement concrete monitoring strategies (such as a notebook) that involve and empower the clients. • Set up appointment systems and reminders. • Strengthen the chronic self-management program (individualized care plans). • Communicate achievement and reinforce treatment results with patients and family.
Strengthen community capacity for healthy living	• Organize community support activities (such as peer support). • Use targeted approaches for community education. • Integrate diabetes education and monitoring into existing community groups and organizations. • Reestablish community groups with new names that instill hope and empowerment. • Restart wellness center exercise class.

Table A4.2. Participants' Proposed Solutions to Improve Long-term Hypertension Care

MAIN GAPS	SOLUTIONS FOR HYPERTENSION TREATMENT MAINTENANCE AND MONITORING
Provider monitoring support (resource health service delivery)	• Make lab tests and points of care testing available and accessible. • Subsidize the cost of testing through a government program, similar to the arrangement for antenatal clients. • Complete the implementation of the HEARTS guidelines. • Conduct research on the influence of culture (traditional medicine) and the extent to which it influences adherence. • Strengthen the team approach to achieve a holistic approach to patient care. • Increase availability and access to appropriate drugs.
Patient adherence and empowerment	• Educate on changes in medication packaging and dosing. • Use fixed dose combinations. • Increase access to BP monitors. • Gender differentiated strategies (such as men's clinics). • Re-establish the community social groups. • Celebrate achievements as a way of motivating the clients. • Increase opportunities for education and dialogue. • Include patient experience of what works in treatment plans. • Increase community outreach strategies. • Use patient testimonials. • Increase opportunities for education and dialogue.
Collaboration and partnerships	• Strengthen partnership with community-based organizations.

Appendix 5: Selected Health System and Health Indicators in Four OECS Countries

		DOMINICA	GRENADA	ST. LUCIA	ST. VINCENT & THE GRENADINES	REGIONAL* AVERAGE
GENERAL	Population (2021)[1]	72,413	124,610	178,652	104,332	–
	Income level	Upper Middle	Upper middle	Upper middle	Upper middle	–
	Public expenditure on health as % of GDP (2019) [1] *PAHO/WHO recommended benchmark: 6%*	3.5	2.1	4.9	3.2	3.9
	Out-of-pocket expenditure as % of total health expenditure (2019) [1]	33.9	54.4	23.9	29.1	32.2
	Life expectancy at birth (2021) [1]	78	2.5	76	72.8	72.2
NCD-RELATED	Prevalence of overweight and obesity among adults (2016) [2]	60.3	51.4	48.1	55.0	62.5
	Prevalence of physical inactivity in adults (2016) [2]	21.6	57.4	79.5	46.1	39.3
	Prevalence of raised fasting blood glucose (2014) [2] **	11.1	11.1	14.5	10.6	8.3
	% with diabetes achieving control	n/a	n/a	12 (2019-20) 4 [4]	n/a	33.1 [5]
	Prevalence of raised blood pressure (2015) [2] **	22.5	24.3	27.1	23.3	17.6
	% with hypertension achieving control	n/a	n/a	12 (2019-20) 4 [4]	15 (2015) [6]	23.6 [7]
	Percentage of deaths from NCDs (2019) [3]	n/a	83	82	79	81.9 [1]
	Total number of NCD deaths (2019) [3]	n/a	840	1,200	740	–
	Probability of premature mortality from NCDs (%, 2019) [3]	n/a	23	18	21	–
	STEPS survey/comprehensive health examination survey every 5 years [3]	✗	✗		✓	–
	National integrated NCD policy/strategy/action plan [3]	✗	✗		✓	–
	Evidence-based national guidelines/protocols/standards for the management of major NCDs [3]	✓	✓		✓	–
	Drug therapy (including glycemic control)/counselling to prevent heart attacks and strokes [3]	✗	✗		✓	–

Note: ✗ = not achieved; ✓ = partially achieved; ✓ = fully achieved; * = data based on countries in the region of the Americas as classified by PAHO/WHO unless cited otherwise; ** = more recent data available for some countries but for comparison, data from the same source is shown.

[1] PAHO/WHO Health in the Americas+ 2021. https://hia.paho.org/en
[2] Pan American Health Organization. NCDs at a Glance: NCD Mortality and Risk Factor Prevalence in the Americas. Washington, DC: PAHO; 2019.
[3] WHO Noncommunicable Diseases Progress Monitor Reports 2022. https://apps.who.int/iris/bitstream/handle/10665/353048/9789240047761-eng.pdf?sequence=1&isAllowed=y
[4] Based on population level estimates using data from STEP 2019-20 report. Findings from: Final Report: Assessing the Care Cascade for Diabetes and Hypertension in Saint Lucia. Mixed Methods Study Utilizing Qualitative Data from Health Professionals and Service Users and Quantitative Data from the Saint Lucia Steps 2019–20 Survey. World Bank. 2023.
[5] Based on pooled data from selected countries in Latin America and the Caribbean in a 2018 study: Manne-Goehler, Jennifer, et al. "Health Systems Performance for Diabetes in 25 Low-and Middle-Income Countries (LMICs), 2005–2016." Diabetes 67. Supplement_1 (2018).
[6] Based on study sample in most recent STEPS report for St .Vincent and the Grenadines
[7] Based on pooled data from selected countries in Latin America and the Caribbean in a 2019 study: Geldsetzer, Pascal, et al. "The state of hypertension care in 44 low-income and middle-income countries: a cross-sectional study of nationally representative individual-level data from 1· 1 million adults." 2019. The Lancet 394.10199: 652-662. Appendix Table S6. The hypertension care cascade by region when weighting each country proportional to its population size.