

## REVIEW

# Diabetes Care in the Philippines



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### Abstract

**BACKGROUND** Diabetes is increasing at an alarming rate in Asian countries including the Philippines. Both the prevalence and incidence of type 2 diabetes (T2D) continue to increase with a commensurate upward trend in the prevalence of prediabetes.

**OBJECTIVES** The aim of this study was to review the prevalence of diabetes in the Philippines and to describe extensively the characteristics of diabetes care in the Philippines from availability of diagnostics tests to the procurement of medications.

**METHODS** A literature search was performed using the search words *diabetes care* and *Philippines*. Articles that were retrieved were reviewed for relevance and then synthesized to highlight key features.

**FINDINGS** The prevalence of diabetes in the Philippines is increasing. Rapid urbanization with increasing dependence on electronic gadgets and sedentary lifestyle contribute significantly to this epidemic. Diabetes care in the Philippines is disadvantaged and challenged with respect to resources, government support, and economics. The national insurance system does not cover comprehensive diabetes care in a preventive model and private insurance companies only offer limited diabetes coverage. Thus, most patients rely on “out-of-pocket” expenses, namely, laboratory procedures and daily medications. Consequently, poor pharmacotherapy adherence impairs prevention of complications. Moreover, behavioral modifications are difficult due to cultural preferences for a traditional diet of refined sugar, including white rice and bread.

**CONCLUSIONS** Translating clinical data into practice in the Philippines will require fundamental and transformative changes that increase diabetes awareness, emphasize lifestyle change while respecting cultural preferences, and promote public policy especially regarding the health insurance system to improve overall diabetes care and outcomes.

**KEY WORDS** diabetes, diabetes care, Philippines, Southeast Asia, type 2 diabetes

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## INTRODUCTION

Diabetes is a chronic disease and is increasing in both prevalence and incidence worldwide. Diabetes exerts a major impact in third-world countries, particularly in the Philippines. It is said that Asia will see the greatest increase in the number of people

with diabetes by 2025.<sup>1</sup> This increase in the burden of chronic diseases in Asia will significantly affect nations' respective health care systems, both acutely and chronically.<sup>2</sup>

The Philippines is located in Southeast Asia situated in the Western Pacific Ocean. It is made up of 7101 islands and has approximately 115,831

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square miles of total land area, and with a coastline of 22,549 miles, it is considered the fifth longest coastline in the world.<sup>3</sup> Three prominent bodies of water surround the archipelago namely, the Pacific Ocean on the east, the South China Sea on the west and north, and the Celebes Sea on the south. The topography of the larger islands is characterized by rolling hills and high mountains, whereas the smaller islands are mountainous in the interior, surrounded by flat low lands, which constitute the coastal rims.<sup>3</sup> Each island is accessed via sea transportation using larger vessels or smaller boats, the latter referred to by the natives as *bancas*. There are about 14 regions, 73 provinces, and 60 cities across the archipelago.<sup>3</sup> Therefore, individuals from smaller cities must traverse by land and sea to receive medical care in tertiary hospitals located in major cities.

The Philippines is unique in that Filipinos in different regions of the country speak different dialects but all Filipinos can speak one national language called *Tagalog*. The Philippines has an estimated population of approximately 101 million as of 2015 and is categorized by the World Bank as a lower-to middle-income country and by the United Nations as a country with a developing economy.<sup>4</sup>

The gross domestic product of the Philippines real growth rate averaged 7.3% in a report in 2007, the highest in 31 years.<sup>5</sup> In 2014, the economy of the Philippines grew from 6.1% in 2014 to 6.5 % in 2015 fueled by sustained increases in private consumption, higher fixed investment, and recovery in exports.<sup>4</sup> The challenge for the government is how to make these economic gains felt among the poorer sectors of society. The recent 2014 poverty incidence stands around 25.8%.<sup>4</sup> This latest figure is lower than the 2006 recorded official poverty statistic of 26.9%.<sup>5</sup> Thus, with economic growth and decreasing poverty, the Philippine government is realigning the national budget to improve social services. More specifically, this will allow an effective population management program focusing on education and health care.

Noncommunicable diseases (NCD; noninfectious or nontransmissible diseases)—including diabetes—in the Philippines account for 6 of the top 10 causes of mortality and are considered a major public health concern.<sup>5</sup> Diseases of the heart and vascular system continue to be the leading causes of death, comprising 31% of all deaths. Other NCDs include malignant neoplasms, chronic obstructive pulmonary disease, and chronic kidney disease.<sup>5</sup> What is alarming is that as deaths due to

preventable diseases have been on a decline, lifestyle-related diseases due to “Westernization” of the culture have begun to dominate as the leading causes of death, particularly due to cardiovascular diseases, malignant neoplasms, diabetes, and chronic lower respiratory diseases.<sup>5</sup>

At present, there are no published nationwide prevalence or incidence studies on type 1 diabetes (T1D). However, 1 survey was done in a municipality of Bulacan in Central Luzon Region that showed a very low prevalence of T1D with only 7 cases diagnosed among children aged 0 to 14 years during a 10-year period from 1989 to 1998.<sup>6</sup> A recent survey on pediatric type 2 diabetes (T2D) in the Philippines also found a low prevalence at 0.91%.<sup>7</sup> As a result of the low prevalence of T1D, continuous glucose monitoring (CGM) devices and continuous subcutaneous insulin infusion (insulin pumps) are not widely used. Standard home glucose monitoring devices are readily available and affordable as well as various insulin preparations that are generic and biosimilar via subcutaneous injections. There is little research on stem cell therapy or islet cell transplantation for T1D in the Philippines.

Gestational diabetes (GDM) is prevalent in the Philippines. Published data from the Asian Federation of Endocrine Societies Study Group on Diabetes in Pregnancy (ASGODIP) showed that the Philippines has a GDM prevalence of 14% in 1203 pregnancies surveyed.<sup>8</sup> Because of this high prevalence rate, the United for Diabetes Clinical Practice Guideline (CPG) recommends universal GDM screening for the Filipino population.<sup>6</sup> The ASGODIP data found that about 40.4% of high-risk women were positive for GDM when screening was performed beyond the 26th week of pregnancy.<sup>9</sup> In a cohort of Filipino women with GDM delivering babies with macrosomia in the Cardinal Santos Medical Center, >75% were diagnosed between gestational weeks 26 and 38.<sup>10</sup> In another cohort population from the Veterans Memorial Medical Center, 50% of GDM cases were diagnosed between gestational weeks 31 and 40.<sup>11</sup> The Filipino CPG recommends adopting the criteria by the International Association of Diabetes & Pregnancy Study Groups for interpretation of the 75-g oral glucose tolerance test as GDM screening.<sup>6</sup>

T2D is the most common type of diabetes in the Philippines. In 2009, a cohort study derived from the a larger population-based investigation in 1998 was revisited and demonstrated a 9-year incidence rate of T2D in the Philippines to be around

16.3%.<sup>12</sup> In the latest survey published by the Food and Nutrition Research Institute in the Philippines (the Eighth National Nutrition Survey of 2013), the prevalence of high fasting blood glucose based on the World Health Organization criteria of >125 mg/dL for individuals >20 years old was 5.4%, an increase of 0.6%, compared with the same study in 2008.<sup>13</sup> The highest prevalence rate was found among the richest in the wealth index, those living in urban areas, and those in the 60- to 69-year age group in both sexes.<sup>13,14</sup> These studies show an alarming growth rate of T2D in the Philippines commensurate with an upward trend in worldwide prevalence.<sup>13</sup> In the 2014 prevalence estimates published by the International Diabetes Federation, it is estimated that there are 3.2 million cases of T2D in the Philippines with a 5.9% prevalence rate in adults between the ages of 20 and 79 years.<sup>15</sup> Around 1.7 million people with T2D remain undiagnosed. The estimated cost per person with T2D in 2013 in the Philippines is \$205, which is comparable with neighboring countries such as Thailand (\$285) and Indonesia (\$174.7).<sup>15</sup>

## THE HEALTH CARE SYSTEM IN THE PHILIPPINES

The Philippines has a very low physician-to-household ratio. As of 2002, it was estimated that there were only 12 physicians per 10,000 households, although there were more nurses available, at 61 per 10,000 Filipino households.<sup>16</sup> The Philippines government health care insurance company PhilHealth provides benefits for diabetes-related admissions.<sup>17,18</sup> This is a government corporation that aims to ensure universal health insurance for all Filipinos. In 2014, based on the PhilHealth Circular No. 17s 2014, new implementing guidelines were released for outpatient coverage for medications for hypertension, diabetes, and dyslipidemia.<sup>9</sup> The stated rationale for this coverage is “considering the increasing burden of NCDs vis-à-vis the cost of maintenance drugs for these diseases, PhilHealth Primary Care Benefit 2 Package (PCB2) will pay for outpatient medicines for PhilHealth qualified members or dependents with hypertension, diabetes and dyslipidemia long before their conditions become catastrophic.”<sup>19</sup> Indigent and sponsored members or their dependents are eligible for the package but only one recipient per family with a 10-year cardiovascular risk of >30% can avail of the PCB2 at one time.<sup>19</sup> Limited medications were included in the coverage for diabetes, namely

only the sulfonylurea glibenclamide and the biguanide metformin, provided on a monthly basis. A price cap, as agreed on with PhilHealth, is reimbursed to the package provider.<sup>19</sup> These guidelines are obviously superior to no provisions for diabetes medical outpatient care. However, the guidelines are still not sufficiently comprehensive, as reimbursements for medications and overall health coverage remain limited for each family household.

PhilHealth also provides hospitalization benefits but only in accredited institutions with a ceiling price for each diagnosis and procedure.<sup>17,18</sup> The majority of outpatient services continue to be “out-of-pocket” expenses unless patients have their own health insurance under the health medical organization system, generally as part of employees’ benefits while working in private institutions. In effect, the national insurance system is limited and does not cover comprehensive diabetes care in a preventive care model, and moreover, that private insurance companies only offer limited diabetes coverage placing the overall care model at a distinct disadvantage.

Diabetes clinics in several government hospitals offer free consultations and affordable medicines for the underprivileged. Additionally, most city governments also have city health centers, which are called *barangay* health units. These units offer basic primary health care deliveries.<sup>20</sup> A *barangay* is the smallest administrative unit of the government in the Philippines and is similar to a village. It is at *barangay* health stations (BHS) where health care professionals (HCPs) are expected to deliver basic diabetes self-management and perform basic measures, such as blood pressure and body mass index calculations. In the City (or Provincial) Health Offices, diabetes clubs are established.<sup>20</sup> Private-paying individuals receive their outpatient diabetes consultations in tertiary hospital settings where they have a choice of specialists trained in endocrinology, diabetes, and metabolism certified by the Philippine Society of Endocrinology Diabetes and Metabolism. At present, there are only 7 training institutions accredited by the Philippine Society of Endocrinology, Diabetes and Metabolism (PSEDM) that provide about 30 certified endocrinologists every year with the balance of diabetologists trained under the auspices of the Institute for Diabetes Foundation.<sup>21</sup>

## AVAILABILITY OF MEDICATIONS

The Philippines government has implemented reforms to make diabetes medications readily

available and affordable to all Filipinos. The Philippines Generics Act of 1998 under Republic Act No. 6675 was passed mainly to improve the supply of medicines for HCPs, specifically allowing importation, manufacturing, and encouragement of generics instead of branded medicines.<sup>22,23</sup> Likewise, the Philippines Department of Health established the National Drug Policy Pharmaceutical Management Unit, or Pharma 50, to reduce prices of medicines by 50% through parallel drug importation.<sup>24</sup> Local government units also have the *Botika ng Barangay* (Pharmacy of the Village) program that caters to marginalized underserved communities by providing affordable over-the-counter and selected prescription medications at very low prices.<sup>25</sup> In 2008, the universally accessible Cheaper and Quality Medicines Act No. 9502 was passed, which granted the government the power to regulate medicine prices and ensure quality affordable medicines through the Bureau of Food and Drugs.<sup>25,26</sup>

Most diabetes medications, both oral antidiabetic (OAD) and injectable such as insulin and glucagon-like peptide 1 receptor agonists (GLP1-RA), are available in the Philippines (Table 1). Most of the off-patent diabetes medications are now available as generics. In a 2012 publication, the DiabCare study looking at T2D, assessed the status of diabetes care in the Philippines and found that of the total sample population, approximately 78.5% of the patients were on OAD, whereas 42% were on insulin.<sup>27</sup> Of the OADs, biguanides followed by sulfonylureas were the most frequently prescribed. This practice is understandable considering that these

2 medications are the most cost-effective in the Philippines since generic equivalents are readily available and therefore very affordable to the public sector. It is understandable that metformin is frequently prescribed, but the continued prevalence of sulfonylurea prescription in light of deprioritization in virtually all diabetes CPG (due to high rates of hypoglycemia) highlights the dominant and continued role of economics as a driver of diabetes care. The most commonly prescribed insulin preparation was the premixed insulin accounting for 43%, followed by basal insulin (detemir or glargine) accounting for 26%. Half of the patients who were on insulin were using the newer insulin analog preparations for both basal and bolus injections, while the remaining half were on the usual human NPH and R insulin preparations.<sup>27</sup> Almost half of the patients on insulin were using pen devices; the remaining half were using insulin via a syringe. Based on the questionnaire given, approximately two-thirds of patients were still worried about starting insulin therapy.<sup>27</sup>

## DATA ON METABOLIC CONTROL

The mean hemoglobin A1c (A1C) in the 2008 study was 8.03% which is slightly better than the same survey done in 2003 where the mean A1C was 8.9%.<sup>27,28</sup> Only approximately 15% of the patients in the study achieved the target A1C goal of <7.0% from the American Diabetes Association.<sup>29</sup>

Blood glucose self-monitoring is considered a mainstay in the treatment of diabetes because it has been shown to assist in improving glycemic control.<sup>30</sup> Unfortunately, due to economic pressures and a basic lack of disease awareness, the majority of patients choose to buy T2D medication instead of paying for test strips. However, increased awareness of the disease and increased physician education regarding the benefits of home glucose monitoring may have improved the utilization of glucose monitoring over time. Hence, compared with the earlier 2008 DiabCare survey, there was considerable improvement in the number of patients who reported self-monitoring from 16.1% in 2003 to 46.5% in 2008.<sup>27</sup> This supports the role of diligent diabetes education among Filipino patients with diabetes to optimize glucose control.

Metabolic control measures are an important component of comprehensive, complications-centric diabetes care. Results of one study found that 94% of patients in the Philippines with T2D had dyslipidemia, but only 53% of these patients

**Table 1. Available Diabetes Medications in the Philippines**

Class	Drug
Biguanides	Metformin
Sulfonylureas	Glibenclamide, glipizide, gliclazide, glimipride
$\alpha$ -glucosidase inhibitor	Acarbose
DDP-IV Inhibitors	Sitagliptin, saxagliptin, vildagliptin, linagliptin
GLP1 receptor agonists	Liraglutide, exenatide, lixisenatide
SGLT2 Inhibitors	Dapagliflozin, empagliflozin, canagliflozin [pending]
Insulins	Human Insulin R, Mix 70/30, NPH, glulisine, insulin aspart, detemir, glargine, degludec

DDP-IV, dipeptidyl peptidase-4; GLP1, glucagon-like peptide 1; SGLT2, sodium glucose cotransporter-2.

received treatment with statins.<sup>27</sup> Along these lines, hypertension was found in 68% of patients, but only 64% were treated with antihypertensive medications, where angiotensin receptor blockers were the drugs most commonly used. The study authors concluded that the status of diabetes care in the Philippines appears below the accepted standards and calls for urgent measures to improve the delivery of quality care among patients with T2D.<sup>27</sup>

Among newly diagnosed patients with T2D in the Philippines, 20% already had peripheral neuropathy, 42% had proteinuria, and 2% had diabetic retinopathy upon consultation.<sup>31</sup> This study suggests that diabetes awareness in the Philippines is also far from ideal.

## DIABETES PROGRAMS

Diabetes awareness campaigns have always been at the forefront of activities among diabetes organization in the Philippines, including the PSEDM, The Institute for Diabetes Foundation (IDSF), Diabetes Philippines (DP), American Association of Clinical Endocrinologists Philippines (AACE Philippines), and the Philippine Center for Diabetes Education Foundation (PCDEF). Diabetes Awareness month is celebrated every July with concurrent activities nationwide, including many lay forum events. The Department of Health also reserves every fourth week of July in its yearly calendar for a Diabetes Awareness campaign.<sup>32</sup> Additionally, general practitioners and internal medicine specialists regularly attend diabetes workshops by these organizations to optimize care in underserved regions.

## AVAILABILITY AND AFFORDABILITY OF LABORATORY TESTS

Most of the important laboratory tests including A1C are available in most tertiary hospitals in major cities of the Philippines. However, standardization of this A1C assay according to the DCCT (Diabetes Control and Complications Trial) or NGSP (originally referred to as the National Glycohemoglobin Standardization Program in 1996) certification cannot be accurately established.<sup>6,33</sup> It is for this reason that the unified CPG established by the Unite for Diabetes Philippines (made up of >20 specialties) state that A1C cannot be used in the Philippines to diagnose diabetes because of lack of standardization.<sup>6</sup> The Philippines CPG recommends that only fasting plasma glucose, random plasma glucose, and 2-hour glucose using oral

glucose tolerance testing should be used as tests for diagnosing diabetes.<sup>6</sup> However the CPG recommends A1C measurement for glucose control monitoring.<sup>6</sup> Another problem with A1C is that it is not readily available in public hospitals and health centers, further limiting the ability to monitor glycemic status and achieve optimal diabetes care.

A major concern for the general public is the high cost of laboratory testing for comprehensive evaluation of patients with diabetes. A comprehensive panel including the complete blood count, A1C fasting blood sugar, blood urea nitrogen, creatinine, serum glutamic pyruvic transaminase, lipid profile, urinalysis, and urine albumin/creatinine ratio will cost approximately \$45 in a private hospital laboratory or outpatient diagnostic center. Without outpatient medical insurance, these and other laboratory costs are out-of-pocket expenses. For perspective, this cost is 3 to 4 times more than the average daily earning of a working Filipino. As of 2010, the average daily pay for a domestic worker in the Philippines is only P132.60 or roughly US\$3 per day.<sup>34</sup> In comparative wage studies of different countries, as of 2015, the calculated average monthly wage of a Filipino worker is only \$174.67 to \$242.60.<sup>35</sup> Poverty continues to be a major part of this challenge, affecting both the financial and socioeconomic fronts. The national poverty index of the Philippines as of 2014 continues to be high and hovers around 25.8%, with many of the poorest still incurring out-of-pocket expenses.<sup>36</sup> Therefore, the high cost of laboratory evaluation represents a clear disincentive for outpatient follow-up and another factor contributing to suboptimal care.

## FAMILY SUPPORT

On the bright side, a distinctive feature among Filipinos is the strong family unit. Parents are taken care of by family members up to the time of their death. Having diabetes is not being discriminated by family members but instead receives very strong family support.<sup>37</sup> Elderly parents are always accompanied by family members to outpatient clinic visits. Financial burden from medicines to laboratories are all shouldered and shared by siblings. Single children are expected to continue help the household expenses until they are married. Nursing homes are not in practice in the Philippines and therefore chronic disease supportive measures, such as with diabetes and its complications, are provided by family members until the patient's death.<sup>37</sup>

**Table 2. Key Features of Diabetes Care in the Philippines**

- Prevalence of diabetes in the Philippines is increasing due to rapid urbanization and Westernization of the Filipino culture.
- “Out-of-pocket” system of health care continues to be the main mechanism of patient–doctor relationship and compensation.
- The national insurance system does not allow comprehensive coverage of diabetes management, is only limited to certain household members, and provides limited medication coverage.
- Both generics and branded antihyperglycemic medications are readily available including both human and analog insulins.
- Metformin and sulfonylureas are the most commonly prescribed medications due to availability and cheaper cost.
- Individuals with diabetes receive very strong family support.
- Fundamental and transformative changes are necessary to increase diabetes awareness, emphasize lifestyle change while respecting cultural preferences, and promoting public policies particularly with the health insurance system, to improve overall diabetes care and outcomes.

## CONCLUSION

Diabetes care in the Philippines continues to be a challenge for the primary care physicians of the region as urbanization continues to augur a significant rise in disease prevalence over the next few years. Key features of diabetes care in the Philippines are provided in Table 2. The region is expected to have one of the highest number of newly diagnosed diabetes by 2025.<sup>1</sup> Philippine Practice Guidelines on the Diagnosis and Management of Diabetes Mellitus recommends that Filipinos age >40 years and those at risk for developing

diabetes should be tested annually owing to the significant prevalence and burden of diabetes.<sup>6</sup>

Unless both government and private organizations go hand in hand in combatting the spread of this disease, by implementing programs such as limiting fast food advertising in print form and on television, as well as implementing disease awareness campaigns including early detection and financial support for the afflicted underprivileged, it is expected that diabetes will continue to haunt Filipinos in the next century with increasing economic burden not only for individual families but also the entire nation.

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