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# Improving Type 2 Diabetes Therapy Compliance and Persistence in Brazil

Appendix



# Introduction

This Appendix document provides supporting material for the report entitled Improving Type 2 Diabetes Therapy Compliance and Persistence in Brazil, How to Address Avoidable Economic and Societal Burden.

Research and analysis for this report was undertaken by the IMS Consulting Group with support from Lilly Diabetes.

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# Appendix

## Overview of methods

A number of key areas were addressed to understand how to improve T2D therapy compliance and persistence in Brazil. First of all, the current social, economic and political context surrounding T2D therapy compliance and persistence was analyzed. The different reasons and motivations for being compliant or non-compliant were then explored before understanding the challenges facing PwD. After creating a holistic picture of therapy compliance in T2D, a number of key recommendations to improve the current situation were then developed.

In order to build up this holistic viewpoint and subsequent recommendations, a multifaceted approach was taken. This comprised extensive literature and desk-based research, stakeholder interviews, online quantitative surveys and, the use of the IMS CORE Diabetes Model (CDM)– an economic model validated in peer-reviewed journal articles.

### Assessing the current situation

The epidemiology of T2D, current strategies for treating and preventing T2D as well as the political context surrounding T2D and therapy compliance were investigated through stakeholder interviews and surveys, literature reviews and desk-based research of a variety of sources including scientific, governmental and charity publications. Complications and costs linked to T2D and sub-optimal compliance were then quantified using the CDM, based on data inputs gathered from a variety of sources, including data from the Ministry of Health (DataSUS).

The CDM was populated with a series of Brazil-specific inputs to build an average PwD risk profile for various diabetes-related complications, notably:

- The direct healthcare costs of various diabetes-related complications in Brazil (e.g. MI, stroke, amputation, blindness, renal disease, among others)
- The medical characteristics of the average PwD in Brazil (e.g. HbA1c levels, blood pressure, body mass index, age, duration of diabetes, co-morbidities, among others)

These risk profiles were built for three different age cohorts (35-49, 50-64, 65+ years old), while the 50-64 age profile was applied to newly diagnosed PwD.

However, one variable, HbA1c levels, of each PwD risk profile was left open to change in order to differentiate between compliant and non-compliant PwD in Brazil. The HbA1c of a compliant PwD and a non-compliant PwD was calculated by collecting the following information:

- The proportion of PwD in Brazil who are compliant and non-compliant, respectively
- The average HbA1c levels of all PwD in Brazil
- The relationship between T2D therapy compliance and HbA1c among PwD in Brazil

With all of this information, the model was then run twice on a per-patient basis:

- Once in a scenario for compliant PwD, where HbA1c levels are lower and therefore the risk of complications is lower
- Once in a scenario for non-compliant PwD, where HbA1c levels are higher and therefore the risk of complications is higher

Each scenario results in a per-patient cost, which was multiplied by the number of PwD who are compliant or non-compliant in Brazil, respectively. The total of these two scaled-up scenarios represents the total cost burden of PwD in Brazil.

Finally, in order to determine the avoidable cost due to low T2D therapy compliance, the compliant per-patient scenario was multiplied by the total number of PwD in Brazil (representing a hypothetical scenario where all PwD in Brazil have adequate compliance levels and therefore lower rates of complications and costs) before subtracting it from the actual cost burden of PwD in Brazil. This difference captures the total avoidable cost due to T2D therapy non-compliance in Brazil and therefore the estimated cost saving were all PwD to reach an adequate level of compliance (generally defined in these papers as the PwD picking up 80% or more of their T2D medication as prescribed by the physician or, the PwD reaching a threshold level of adherence as scored in a self-reported adherence survey).

### Characterizing PwD

PwD face a number of challenges, which can act as a barrier to compliance and persistence. The main barriers to T2D therapy compliance were identified through extensive literature searches before being validated in discussions with healthcare professionals and policy makers.

### Creating the Recommendations

By analyzing the current situation, PwD behaviors and challenges facing them at the level of desk research, a number of recommendations to improve compliance and persistence in T2D were developed. These recommendations were then reviewed and optimized during qualitative interviews with healthcare professionals, payers, policy makers and patient association representatives thus ruling out all but the most important, effective and easily implementable solutions.

## Recommendations

### Exhibit A: Recommendations and Associated Interventions to Improve T2D Therapy Compliance and Persistence in Brazil

Recommendation	Intervention description	Possible intervention assessment metrics	Key Partners / Target Audience	Outcomes
<b>IDENTIFY AND PROFILE</b>				
Promote the use of electronic medical records and keep track of compliance and persistence	Improve health centres IT infrastructure and integration with Health Information Systems to allow for PwD tracking	Number of institutions supplying information, number of patients with recorded information	Ministry of Health (MoH), Information Technology (IT) support vendor, Health Information Systems (HIS) vendor, public and private healthcare providers	A structured database of health data, which can be used to identify and track PwD
Use predictive analytics to identify PwD at risk of low compliance and persistence	Utilization of the collected health data to perform “predictive analytics”, a process whereby software algorithms mine compiled data based on set criteria to identify PwD with or at risk of low compliance and persistence	Better prediction of patient activation levels in public institutions, predict high risk patients	Private partners, pharmaceutical companies, MoH, providers of predictive analytics capabilities	Reliable, time- and cost-effective identification of individuals with or at risk of low compliance and persistence; holistic and personalized care; lower and optimized healthcare service use
Use validated psychometric assessment models to evaluate identified PwD activation as related to their diabetes care	Implement psychometric questionnaires, such as the Patient Activation Measure (PAM), to provide insights into a range of health-related attributes (attitudes, motivators, behaviors, or logistical challenges) and measure degree of PwD activation.	Tool uptake in PHCs, diabetes clinics and hospitals (number of questionnaires sent); questionnaire completion rates; changes in PwD activation degrees; fewer emergency admissions, medical visits or prescriptions	Management of Primary Health Centres (PHCs), Diabetes Centre, MoH hospitals, IT support vendor, predictive analytics tool and support, pharmaceutical companies	Holistic and personalized care; better T2D self-management (including compliance and persistence in therapy); lower and optimized healthcare service use

Recommendation	Intervention description	Possible intervention assessment metrics	Key Partners / Target Audience	Outcomes
<b>ACTIVATE</b>				
Provide education on T2D management, including compliance and persistence	Improve PwD disease and medication knowledge through standard education programs targeted to broad PwD profiles	Measure disease and medication knowledge (teach back method or questionnaire); improvements in PwD activation degrees and compliance	Management of PHCs, Diabetes Centre, MoH hospitals, private healthcare providers	Improved health literacy and health knowledge; increased PwD engagement; better T2D self-management (including compliance and persistence in therapy); reduction in T2D-related complications; optimized healthcare service use
Develop follow up programs for PwD tailored to their activation degree	“Prescribe” educational interventions according to PwD level of health knowledge and aptitude to self-manage their condition. Provide a range of formats (e.g. human and technology interventions and mix thereof) based on PwD preferences and degree of activation	Measure disease and medication knowledge (teach back method or questionnaire); improvements in PwD activation degrees and compliance	Management of PHCs, Diabetes Centre, MoH hospitals, HIS vendor services integrated with mobile messaging, mobile service provider (T2D educators to frame messages)	Improved health literacy and health knowledge; increased PwD engagement; better T2D self-management (including compliance and persistence in therapy); reduction in T2D-related complications; optimized healthcare service use
<b>SUSTAIN</b>				
Monitor high PwD activation and repeat or adapt activation strategy for PwD with dropping activation or diabetes control	Once optimally activated, PwD can be monitored to check if activation or control drops, thus allowing HCPs to understand when further or different strategies are needed to increase activation or improve control	Record PwD activation trends, compliance and medical statistics	Payers, HCPs, policy makers	Holistic and personalised care; improved PwD engagement; improved health status; lower and optimized healthcare service use

Recommendation	Intervention description	Possible intervention assessment metrics	Key Partners / Target Audience	Outcomes
Leverage technology and digital offerings to maintain PwD activation	Use of traditional mass media and technology to implement campaigns based on promoting short messages regarding diabetes self-management and the importance of treatment compliance and lifestyle changes	Improvements in PwD activation degrees and compliance	MoH, Management of PHCs, Diabetes Centre, MoH hospitals, HIS vendor services integrated with mobile messaging, mobile service provider, PwD	Better T2D self-management; reduced costs to healthcare system; optimized healthcare service use
Engage NGOs and medical societies as to turn them into process and advocacy keepers	Mobilization of NGOs, medical societies and patient advocacy groups as major campaigners for the importance of improvements in compliance and persistence	Positioning of NGOs, medical societies and patient advocacy groups regarding compliance and persistence, number of compliance and persistence campaigns backed by these organizations	NGOs, medical societies and patient advocacy, major societal stakeholders	Raised awareness towards compliance and persistence in T2D treatment

Source: IMS Consulting Group research and analysis

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