THE DATA AND ANALYTICS CHALLENGE 2024

The Case

Presented by World Diabetes Foundation, Novo Nordisk and Devoteam Data Driven.

Introduction

This year, the World Diabetes Foundation, Novo Nordisk and Devoteam Data Driven are excited to provide you with a case that will broaden your understanding of one of the most defining health issues of the 21st century: the state and prevalence of diabetes in low- and middle-income countries. We will challenge you to do both a global analysis and a deep dive into India, a country where more than a staggering 100 million people are estimated to live with diabetes.

Based on this foundation, we also invite you to look towards the future of improving diabetes care and prevention and provide your recommendations on how and where to tackle this significant global health challenge most efficiently.

The World Diabetes Foundation

The World Diabetes Foundation (WDF) is a non-profit foundation governed by the Danish Foundation Act. It was established by Novo Nordisk in 2002 as an independent trust dedicated to preventing and treating diabetes in low- and middle-income countries. The Foundation supports sustainable partnerships and acts as a catalyst to help others do more. Today, it is a leading global funder of diabetes prevention and care projects in low- and middle-income countries.

WDF supports projects that are demand-driven, locally formulated and owned, and integrated into existing health systems where possible. We pursue sustainable, scalable approaches, helping countries meet global goals for improved care of diabetes and other non-communicable diseases. Since 2002, the World Diabetes Foundation has provided 201.5 million EUR in funding to 605 partnership projects in 120 countries.

https://www.worlddiabetesfoundation.org/who-we-are/

Novo Nordisk

Novo Nordisk is a leading global healthcare company headquartered in Denmark, with the purpose of driving change to defeat serious chronic diseases, building upon a heritage in diabetes. For more than 100 years, Novo Nordisk has been translating the unmet medical needs of people living with a severe chronic disease into innovative medicines and delivery systems. This has been achieved by pioneering scientific breakthroughs, expanding access to medicines and working to prevent and ultimately cure the diseases we treat.

With more than 64,000 people employed in 80 offices around the world and products in 170 countries, Novo Nordisk aims to be a sustainable business that adds value to society. For example, it strives to provide access to affordable diabetes care for vulnerable patients. Part of Novo Nordisk's contribution to promoting access to care is a continued long-term financial commitment to the World Diabetes Foundation.

https://www.novonordisk.com/about/who-we-are.html

Case Background

This year's case is divided into two parts to guide your presentation. The aim is to ensure a systematic exploration of diabetes globally and in India, with actionable insights for the World Diabetes Foundation (WDF) and Novo Nordisk.

The rising burden of diabetes and other non-communicable diseases (NCDs) is one of the most defining health issues of the 21st century. In the last decades, NCDs have become the number one cause of death globally, as cardiovascular diseases, diabetes, and other cardiometabolic diseases account for 74% of all deaths.[1]

The number of people living with diabetes seems ever-increasing, and it is posing notable negative socio-economic impacts at both the societal and the individual levels. The disease burden is unevenly distributed and affects people in vulnerable positions the hardest. This includes population groups that are disproportionately affected by unhealthy lifestyles, climate change, comorbidities, and insufficient access to healthcare. The most immense burden is borne by countries with already strained health systems, as 86% of all premature deaths from NCDs now take place in low- and middle-income countries (LMICs).[1]

While the urgent need to address the rising NCD burden is undeniable, the health system response in LMICs remains insufficient. More than 80% of people with diabetes live in low- and middle-income countries. Across 28 LMICs, the total unmet need for diabetes care is as high as 77%, and fewer than one in ten people with diabetes in LMICs receive guideline-based comprehensive diabetes treatment.[2]

The burden of diabetes and other NCDs is not only unevenly distributed geographically, but it is also gendered, with women being disproportionately affected. Diabetes is the ninth leading direct cause of death for women globally, causing 2.1 million deaths each year, most of them being premature.[3]

When someone living with diabetes or another chronic disease is not cared for properly or left untreated altogether, they are at risk of developing life-threatening complications. Untreated diabetes is thus associated with severe complications and premature deaths. The severe complications include stroke, blindness, kidney disease, depression, cardio-vascular diseases, and amputations.

The dire consequences of untreated – or sub-optimal management of - diabetes are the main reason why WDF and Novo Nordisk are committed to the cause of alleviating human suffering related to diabetes, especially concerning the people living with diabetes in countries where financial and human resources are scarce. The economic burden of providing or getting access to medical care puts people at risk of severe health complications, thus exacerbating the hardships faced by people living with a chronic disease.

This cause is also what led Novo Nordisk to establish the WDF in 2002 as an independent foundation. Both WDF and Novo Nordisk aim to measure the impact of their outcomes on health and diabetes. Bridging the gap between outcomes and impact necessitates diverse, often unavailable data sources.

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[1] World Health Organization: https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases
[2] Research papers: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6396901/, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8865379/
[3] Research paper: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5861464/ .

Your task

Your task is to propose innovative methods for WDF and Novo Nordisk to effectively increase their impact on diabetes prevention, utilising the available data at your disposal.

For example, if Novo Nordisk decided to provide additional funding for WDF, where would you recommend WDF focus its additional funding and activities to address the most pressing unmet needs in low- and middle-income countries?

Part 1: Understanding the current state and burden of diabetes in low- and middle-income countries (according to the Development Assistance Committee (DAC) list of Official Development Assistance (ODA) recipients)[4].

Analyse the current state of diabetes in LMICs and summarise WDF's results in improving diabetes care and prevention over the last 20 years

Your first task is to analyse the present state and prevalence of diabetes in low- and middle-income countries, drawing insights from the provided datasets and publicly available sources from respected entities (e.g. UN and WHO).

Based on the datasets made available, dive into WDF's projects and outcomes spanning the last two decades, while also gaining an understanding of the healthcare landscape in LMICs.

By examining global data, trends, and WDF's ongoing efforts in diabetes prevention, you will establish the foundation for subsequent analyses.

Note: You should allocate approximately 20-30% of your group's effort towards addressing this first question.

Part 2: Deep diving into the case of India

With a growing and ageing population of currently 1.3 billion people and a growing economy, India is facing a rapidly expanding epidemic of NCDs. New figures show that in India alone, more than a staggering 100 million people are estimated to live with diabetes, accounting for approximately 1/5 of the world's total number of diabetes cases.

Every year, roughly 6 million Indians die from heart and lung diseases, stroke, cancer and diabetes. According to the WHO, 1 in 4 Indians risk dying from an NCD before they reach the age of 70.

NCDs account for most of the mortality and disability in India and affect, in particular, adults in the productive age between 30 and 69 years. Most of these conditions are caused by underlying (and often interrelated) risk factors such as smoking, high blood pressure, obesity, and lack of exercise. 15% of Indian females and 12% of males are classified as overweight or obese, and about 30% have high blood pressure (hypertension).

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[4] Find the list here:
https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/daclist.htm

The growing burden of NCDs is seriously undermining the social and economic development in the country where millions of people are lost prematurely to NCDs adding stress on both private households and the healthcare system. According to a study by the World Economic Forum and Harvard School of Public Health, it is estimated that India stands to lose USD 4,58 trillion before 2030 due to NCDs and mental health conditions.

In recent years, India has taken bold action and targeted some of the most significant risk factors contributing to NCDs. These efforts have been developed in parallel with substantial and essential changes in the national health system and policy environment. For example, the country has embarked on a large-scale healthcare reform, with ambitions to establish universal health coverage and to create improved access to NCD care at the primary level.

What should we do going forward?

The core of the case competition is presenting suggestions on how Novo Nordisk and WDF should proceed with their work. Your suggestions can, for instance, focus on 1) a better understanding of how they are changing the state of diabetes, 2) the returning impact on Novo Nordisk's funding through WDF's outcomes, 3) which gaps their current work has, or 4) how they conduct projects and work day-to-day. Your suggestions can take various forms, such as an app, interface, or a series of dashboards - the possibilities are endless.

Feel free to think outside the box and inspire us with your creativity! While the list of suggestions provided is not exhaustive, your proposed solution must be practical and centred around elements of the datasets provided. Let your imagination run wild and showcase inventive approaches to tackle this challenge.

Below, we have listed a few examples to guide your approach and presentations on Sunday:

- Recommendations in specific areas or project types to focus on for new projects
- Develop a tool to help WDF understand data quickly
- Develop a tool to collect new data
- Based on your findings, propose a strategic shift
- Uncover hidden insights within the dataset
- Identify possible data gaps and suggest improvements for better decision-making
- Consider what we could improve in the data to understand the business better

Submission

You are expected to give a 10-minute presentation on your findings, including time for a 2–3-minute Q&A. You can present PowerPoint presentations, Tableau workbooks, or another visual - the format is up to you. On Sunday, you will present from your own laptops. Therefore, please make sure to have everything ready for the panel presentations!

Your presentation should demonstrate how the team has used the provided data to identify your findings. The evaluation will be based on how well you respond to the business case, your presentation technique, technical ability, visual skills, analytical methodology, and the creativity of the solution. The tools used to conduct the analysis will not be part of the evaluation.

Data Catalogue

This data catalogue serves to provide an overview of all available data.

Remember that your team's presentation is expected to be 10 minutes, including 2-3 minutes for Q&A, so you won't be able to cover all the data in your presentation. Allow yourself to explore the various data points, but be decisive and choose an angle that interests you rather than covering everything.

1. WDF Project Data

Source: The World Diabetes Foundation

The project dataset from the World Diabetes Foundation comprises all completed projects, containing geographical, financial, and project-specific data. It consists of two sheets, each offering a different level of granularity.

Sheet 1: Projects
Each row corresponds to an individual project, detailing its various attributes like project descriptions, owners, intervention areas, and objectives. Additionally, each project involves multiple dates and funding stages. Initially, a portion of the budget is allocated to kickstart the project. The remaining funds are released only after the project achieves specific milestones, proving its progress.

Sheet 2: Milestones
Every project may consist of several milestones, each marked by a starting date, a due date, and corresponding expenditures. Each milestone is associated with a Milestone Title and Intervention Areas, which are somewhat predefined. For example, a Milestone Title with ID 41.05 signifies the completion stage of a project.

2. WDF Results Report

Source: The World Diabetes Foundation

The WDF Result Report is an annual publication of WDF results broken down into the most central and impactful numbers. All numbers in these reports are based on reports from *WDF Project Data*.

3. Health Data from the International Diabetes Foundation

Source: IDF Diabetes Atlas

This dataset, sourced from the International Diabetes Federation (IDF), presents estimates of diabetes prevalence worldwide for individuals aged 20 to 79. It includes data on the number of people with diabetes in thousands, categorised by region and country. The dataset spans several years (2000, 2011, 2021, 2030, and 2045), providing a comprehensive view of the evolving diabetes landscape over time.

4. Health Data from The Indian Council of Medical Research–India Diabetes (ICMR-INDIAB) study

Source: The Lancet.

The ICMR-INDIAB study, a nationwide survey, examined a sample of adults aged 20 and above from urban and rural areas across 31 states, union territories, and the National Capital Territory of India.

The dataset includes prevalence estimates for prediabetes, diabetes, hypertension, and generalised obesity across various states in India.

5. IQVIA Data: Value and Volume of Insulin Sales in India

Source: Novo Nordisk India

The IQVIA dataset encompasses data from every state in India, detailing sales by product for diabetes by various companies, including Novo Nordisk. Information for each product is provided for a five-year period spanning from 2020 to 2024 in columns G through K.

MAT stands for Moving Annual Total, which is a method used in business to analyse data over a rolling 12-month period. In the context of sales and volume data for IQVIA and different therapies, interpreting MAT columns involves understanding how much sales or volume has occurred over the past 12 months up to the current point in time.

Sheet 1: Value_Diabetes & Insulin

The sales value is reported in Indian Rupees (Actual).

Sheet 2: Volume_Insulin

The therapeutic volumes are reported in Million Units (MU).

6. India Population (2011)

The dataset presents the 2011 census data of India, offering a breakdown of population statistics categorised by gender and residence (total, rural, and urban) for each state and the nation as a whole. The 2011 census stands as the most recent, given that the anticipated census for 2021 was delayed due to the COVID-19 pandemic. The forthcoming census is scheduled to take place following the 2024 general election.

Data Quality

These are real-world datasets from WDF, Novo Nordisk and publicly available resources. Some data cleansing may be required - but it's level is entirely up to you.

If you have any questions about the dataset, please reach out to one of our helpers on-site. In all cases, we highly recommend investigating it yourself to get an understanding of potential ways to approach the case at-hand.