

Business Case: Multi-Class Prediction of Obesity Risk

Use Cases:

Use Case 1: Risk Assessment by Healthcare Providers

Stakeholders: Doctors, Nurses, Health Clinicians

Functionality: Access the predictive model via a user interface to input patient data and receive an obesity risk classification.

Scenario: A doctor consults a patient exhibiting potential risk factors for obesity. The doctor accesses the model through a tablet, inputs the patient's health metrics (like BMI, dietary habits, exercise frequency), and receives a risk classification. Based on the result (e.g., high risk), the doctor discusses potential lifestyle changes or treatments with the patient.

Benefits: Personalized patient care, early intervention, prevention strategies.

Use Case 2: Policy Making and Resource Allocation by Public Health Officials

Stakeholders: Public Health Officials, Policy Makers

Functionality: Use aggregated data and model predictions to understand obesity trends and allocate resources more effectively.

Scenario: A public health official uses the model to analyze regional health data, identifying areas with high obesity risk prevalence. They use this data to allocate resources for public health campaigns, such as fitness programs or nutritional education, targeted at high-risk communities.

Benefits: Efficient use of resources, informed policy decisions, improved public health outcomes.

Use Case 3: Insurance Premium Adjustment

Stakeholders: Insurance Underwriters, Actuaries

Functionality: Integrate the model's risk predictions to adjust insurance premiums or develop tailored health insurance packages.

Scenario:

An actuary at a health insurance company uses the model to assess risk profiles of applicants. By inputting health data into the model, they receive risk classifications that influence premium calculations, offering lower rates for lower risk categories and designing specific health plans that include preventive care for high-risk categories.

Benefits: Risk adjusted pricing, personalized insurance plans, potentially lower health costs.

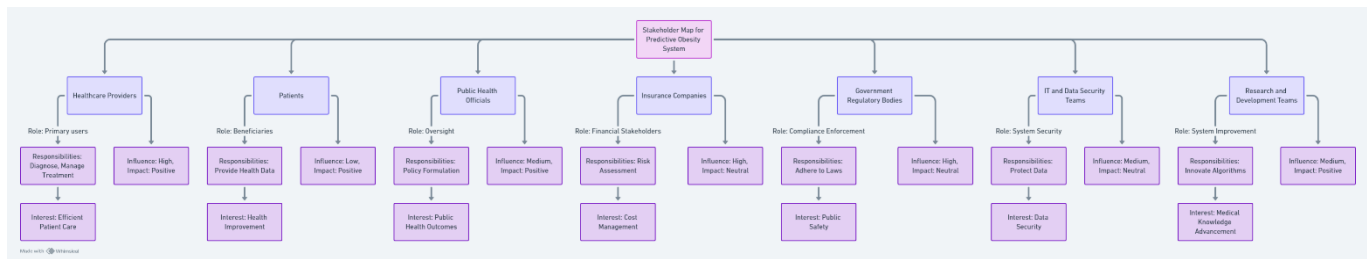
Expected Outcomes:

For Healthcare Providers: Enhanced capability to identify at-risk patients early and customize preventative strategies.

For Public Health Officials: Data driven insights that inform better resource allocation and public health initiatives.

For Insurers: Ability to create finely segmented insurance products based on individual risk, potentially reducing costs associated with high-risk policyholders.

Comprehensive Stakeholder Map:



Business Impact:

The project will enable more effective prevention and management of obesity, which is expected to reduce the incidence of related health issues and associated healthcare costs. It will empower stakeholders across the health sector with data-driven tools for making informed decisions that can lead to healthier populations.

Value Proposition: Predictive Obesity Risk Classification System for Canada

Economic Impact:

1. Cost Savings through Preventive Healthcare

Rationale: Obesity is associated with chronic diseases such as type 2 diabetes, heart disease, and certain cancers, which significantly increase healthcare costs.

Estimates: According to a study published by the Canadian Obesity Network, obesity-related healthcare costs in Canada range between CAD \$4.6 billion and \$7.1 billion annually.

Implementing early intervention through predictive analytics could reduce healthcare costs associated with obesity by up to 10%, potentially saving the healthcare system CAD \$710 million per year.

2. Revenue Opportunities for Healthcare Providers and Insurers

Rationale: Enhanced use of predictive analytics enables healthcare providers to design personalized wellness programs and insurers to create tailored insurance plans.

Estimates: The Canadian market for personalized medicine, including predictive health interventions, was valued at CAD \$1.4 billion in 2019 with an expected annual growth rate of 10%. Assuming a market capture of 5%, this equates to potential annual revenue of CAD \$70 million from these services.

3. Reduced Insurance Claims

Rationale: Effective management and preventive care for high-risk individuals lead to fewer chronic disease claims.

Estimates: A reduction in insurance claims related to obesity and associated conditions by even 5% could represent significant cost savings annually.

Innovation and Strategic Benefits:

- *Data-Driven Health Interventions:* Leverages advanced analytics and machine learning to offer highly personalized health interventions, setting a new standard in preventive care.
- *Compliance and Security:* Fully compliant with the Personal Information Protection and Electronic Documents Act (PIPEDA), ensuring top-tier data security and patient confidentiality.
- *Support for Public Health Strategy:* Offers critical data insights for public health officials, enabling more effective policy-making aimed at reducing national obesity rates.

Conclusion:

Implementing a predictive obesity risk classification system in Canada is not just an innovative approach to healthcare; it is a financially sound investment that promises substantial economic returns through cost savings and revenue generation. The system's capacity for personalization, adherence to privacy laws, and contribution to public health strategy enhance its value, making it an essential tool for advancing healthcare objectives in Canada.

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Appendix: Detailed Stakeholder Map Visualization

