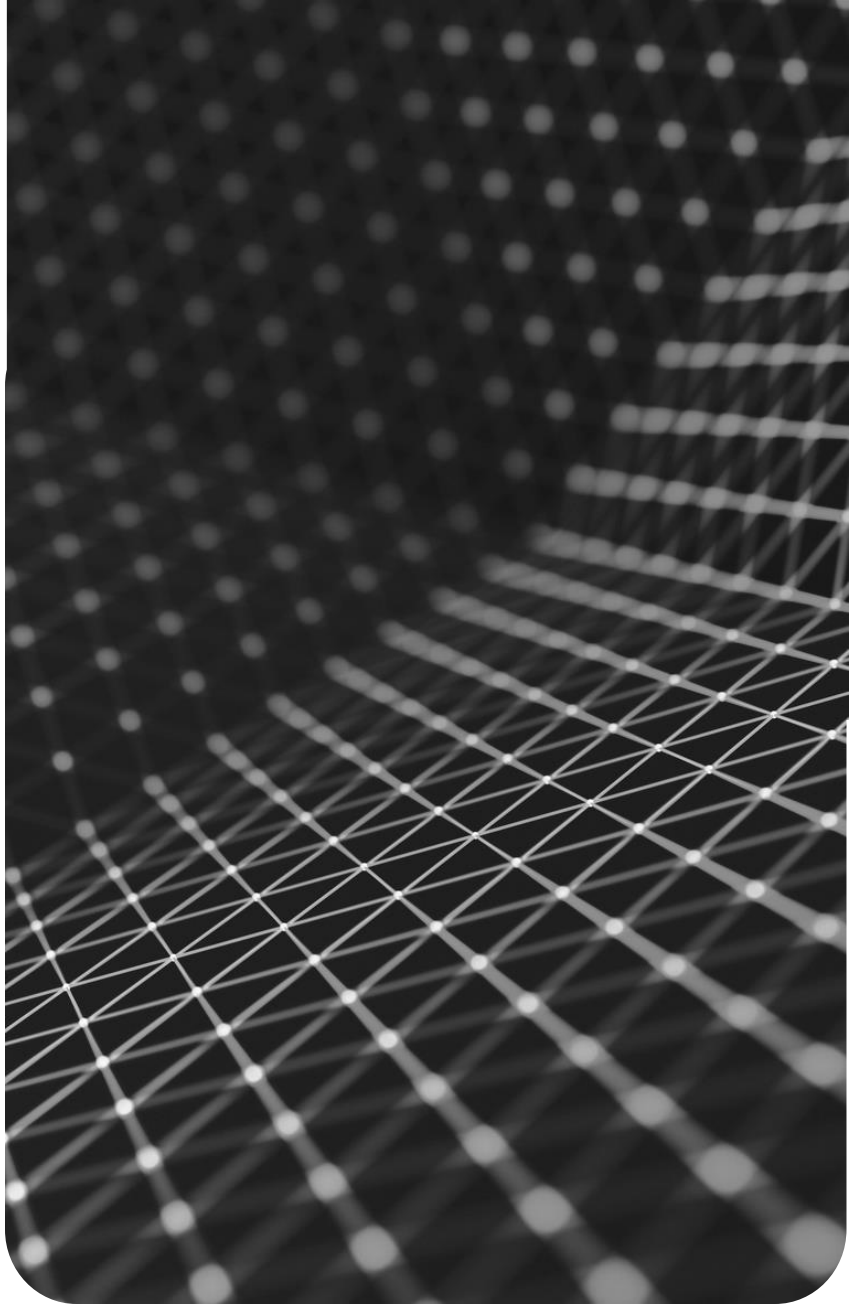
Healthcare Risk & Cost Insight Generation – Loblaw Health Division

- Presented by
- Nishtha Rai Kadariya

Business Problem Statement

How can Loblaw use its existing demographic, clinical, and biometric data to detect early signs of health risk — and activate timely, cost-saving interventions through its pharmacy services, virtual care platform, or health app?

Goal :" Doing so will reduce avoidable healthcare costs and unlock new revenue through proactive care programs."



Available Datasets

Source: Loblaw.ca

Dataset	Description	Key Columns
Patients.csv	Demographic info for each patient	age, gender, ethnicity, zip code
medical_records.csv	Diagnoses, visits, costs across time	diagnosis, visit_type, cost, date
biometrics.csv	Clinical risk markers from health checks	blood_pressure, glucose, BMI, etc

Analytical Approach

5-Step Process

- Data Merging
  - Combined patients.csv, medical_records.csv, and biometrics.csv using patient_id
  - Ensured relational integrity across tables
- Data Cleaning & Preprocessing
  - Handled missing biometric values
  - Removed duplicates, fixed data types, standardized column names
  - Filtered out invalid records (e.g., negative costs or outlier BMI values)
- Exploratory Data Analysis (EDA)
  - Analyzed age, gender, cost distribution, and diagnosis frequency
  - Identified cost-heavy patients and chronic condition clusters
  - Visualized biometric deviations (e.g., high BP, glucose)
- Feature Engineering
  - Created flags: chronic_condition_flag, biometric_risk_flag
  - Generated variables: visit_frequency, avg_cost_per_visit
  - Mapped risk thresholds (e.g., BMI > 30 = Obesity risk)
- Risk Factor Insights
  - Stratified patients into Low, Rising, and High risk groups
  - Connected risk levels to potential interventions (pharmacy, virtual care)

Key Insights :

1.**Cost Concentration**

•*Top 20% of patients contribute to nearly 70% of total medical costs.*
→ Indicates a small high-cost population worth targeting.

•2. **Diagnosis Frequency**

•*Most common diagnoses: Hypertension, Type 2 Diabetes, Asthma*
→ These are chronic, manageable via pharmacy and digital health interventions.

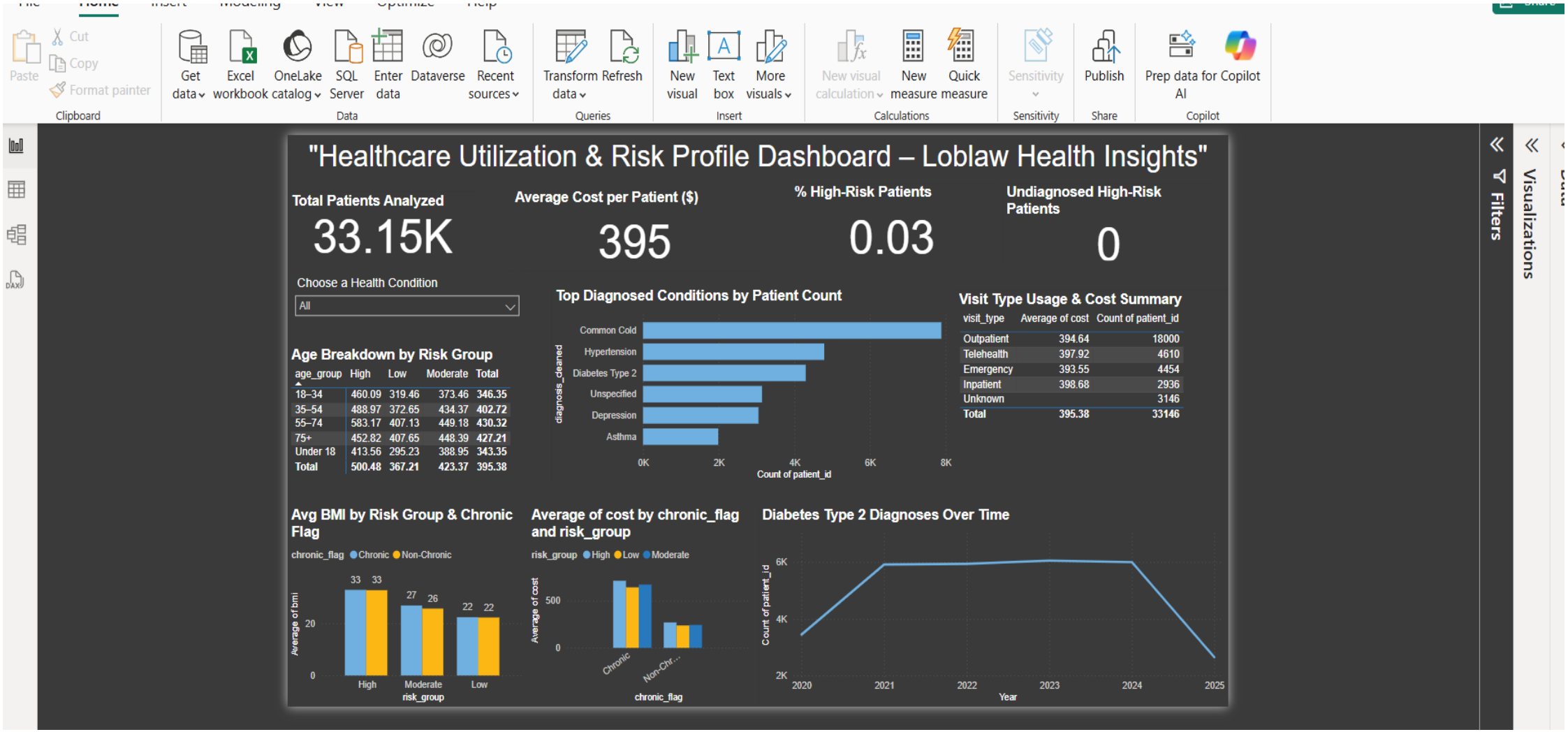
•3. **Biometric Red Flags**

•*30% of patients have BMI > 30 or BP > 140/90 (clinical thresholds)*
→ Indicates unmanaged chronic conditions.

•4. **Age & Risk Correlation**

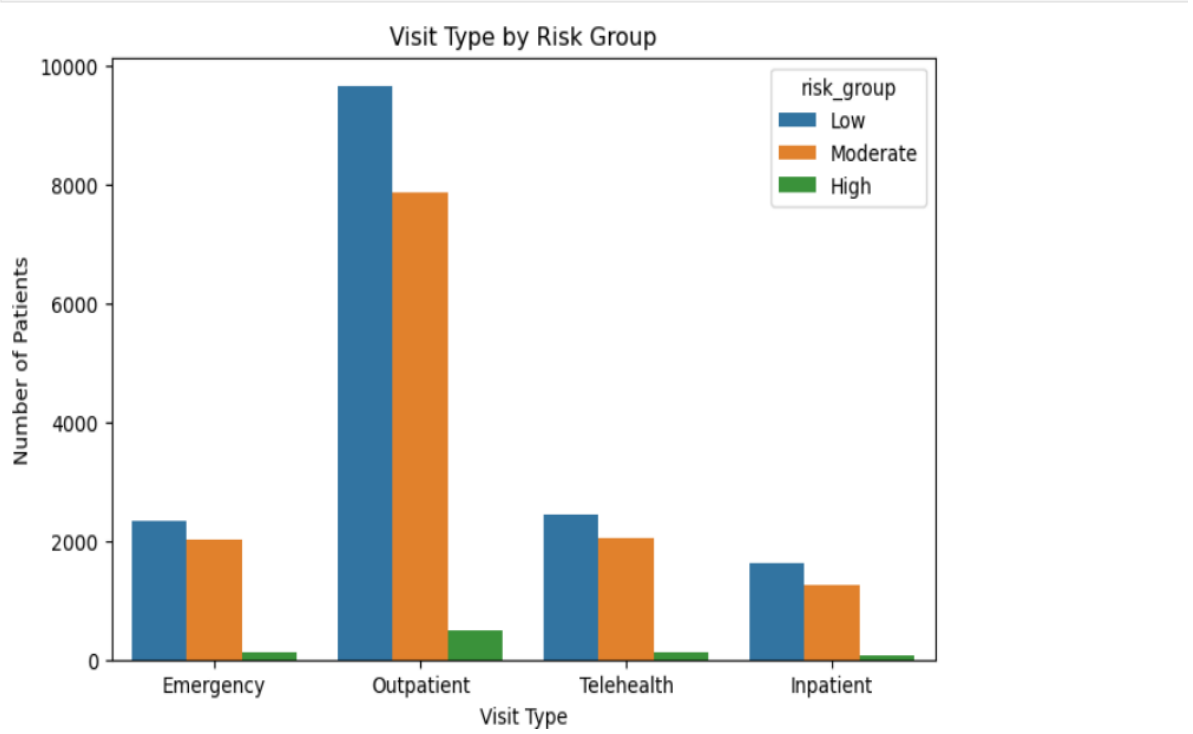
• *Risk and cost increase significantly after age 50*
→ Age groups 50–75 should be prioritized for early intervention.

Visuals Dashboard

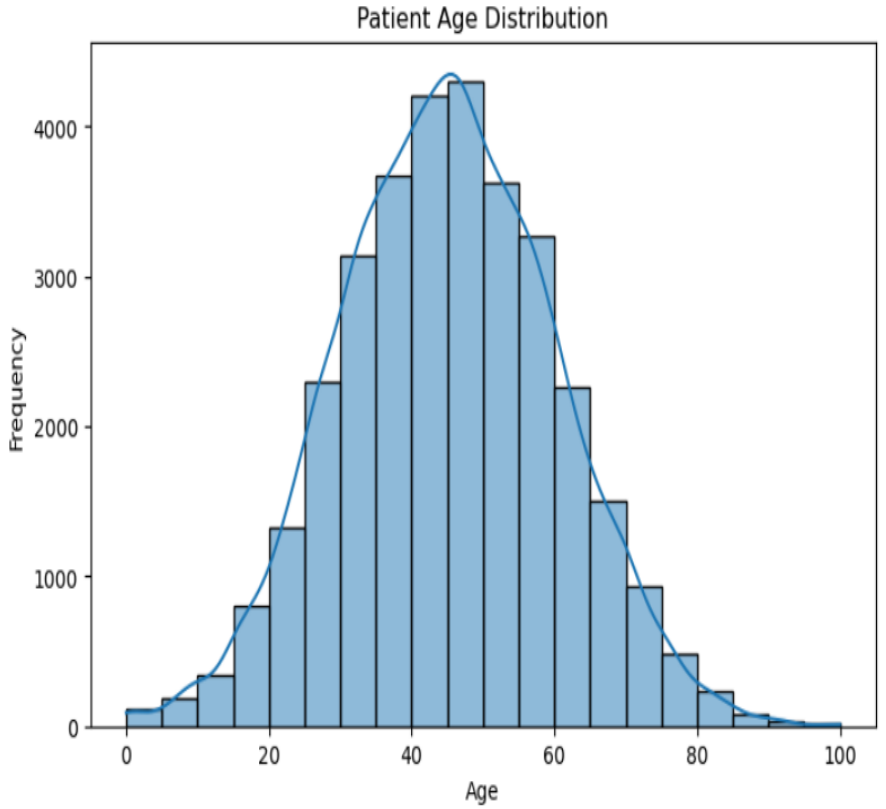


Glimpse of EDA :

Focus targeted outreach on high-risk patients to increase use of lower-cost outpatient/telehealth channels.



Patient Age Distribution :*Focus marketing and intervention efforts on this age group using pharmacy and app-based engagement.*



Action Plan: Risk-Based Intervention Strategy

Risk Group	Patient Characteristics	Business Impact	Loblaw Channel
High-Risk (55–75)	Multiple chronic conditions, high BMI, high average cost	Capture high-value customers, reduce cost leakage	Shoppers Drug Mart, PC Health App
Moderate (45–54)	Some biometric risk, early-stage chronic indicators	Drive app engagement, increase refill adherence	PC Health app, push notifications, email
Low (<45)	Healthy, low-cost, digitally active	Upsell wellness products, build long-term loyalty	PC Optimum, lifestyle campaigns, online offers

"This model enables Loblaw to segment and monetize its patient base across pharmacy, digital, and retail channels — turning data into profitable action."

Strategic Recommendations to Drive Business Impact :

“Loblaw already has the data — that’s not the question. The real opportunity now is to stop just monitoring it and start activating it. Because patient engagement, when you look at it closely, isn’t only about care anymore. It’s a strategic lever. One that, if applied thoughtfully, can open up entirely new value — not just in pharmacy operations, but across digital touchpoints, loyalty, even retail performance. It’s all connected. The key is using what we already know to act sooner, smarter.”

THANK YOU