



The Implications of Regional and National Demographic Projections for future GMS costs in Ireland through to 2026

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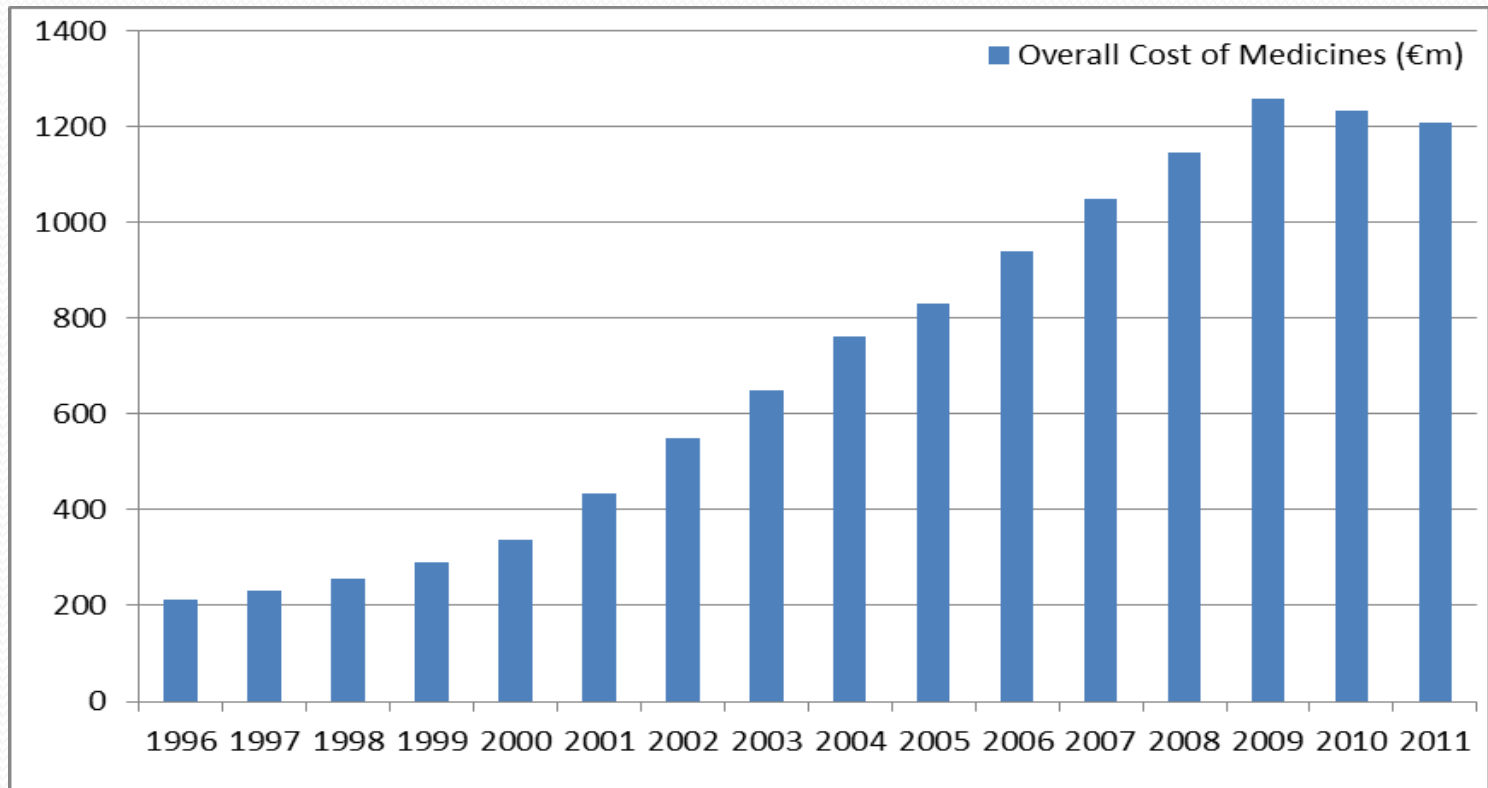
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Cost of Medicines (€m) GMS Scheme 1996 - 2011



Objective of Research

- Aim: To assess the implications of demographic change and policy scenarios for future GMS costs in Ireland from 2007 through to 2026.
- *Total Cost = f (Population, GMS Coverage, Cost Per Claim, Claims Rate)*
 - Population
 - Coverage (GMS Population / Total Population)
 - Average Cost per claim (Total Cost of claimants / No. of Claimants)
 - Claims rate (No. of Claimants / GMS Population)
- An upper and lower bound scenarios were determined around each of the 4 variables.

Data Sources

- **Population Data:** CSO Regional and National Population Projections 2011 – 2026.
- **Coverage Data:** PCRS Statistical Analysis of Claims and Payments, 2007 Annual Report.
- **Average Cost per Claim Data:** HSE-PCRS Sample Database 2007.
- **Claims Rate Data:** PCRS Statistical Analysis of Claims and Payments, 2007 Annual Report & HSE-PCRS Sample Database 2007.

HSE-PCRS Sample Database 2007

- GMS sample for 2007 by month (PCRS)
- Cohorts of 100 data points for each of the following per month. - Age (10 age cohorts)
 - Gender (2)
 - Old health board regions (8)
- **Variables**
 - Ingredient cost
 - Number of items dispensed
 - Dispensing fees
 - VAT
- Total of 192,000 observations

Population Projections - Methodology

- CSO developed 2 scenarios (M2F1, M0F1) with 4 variants.
- The principal CSO scenario is M2F1T and this formed the principal scenario for our population projections.
- CSO Data was provided by year, age, gender and region.
- Reconcile CSO Data to conform to 11 HSE age Cohorts.
- The CSO regions (Border, Mid-East, Dublin) were not reconcilable with 3 of the HSE regions (North-West, North-East, Eastern).
- Adjustment factor was applied based on 2006 Census.

Coverage Projections - Methodology

- 2007 Coverage estimated from PCRS Annual Report & CSO Population Projections.
- Minimum, mean and maximum coverage rates were calculated from historical coverage data (1996 – 2010).
- Coverage 2011 data formed the basis of coverage projections 2016, 2021 & 2026.

AC per Claim & Claims Rate - Methodology

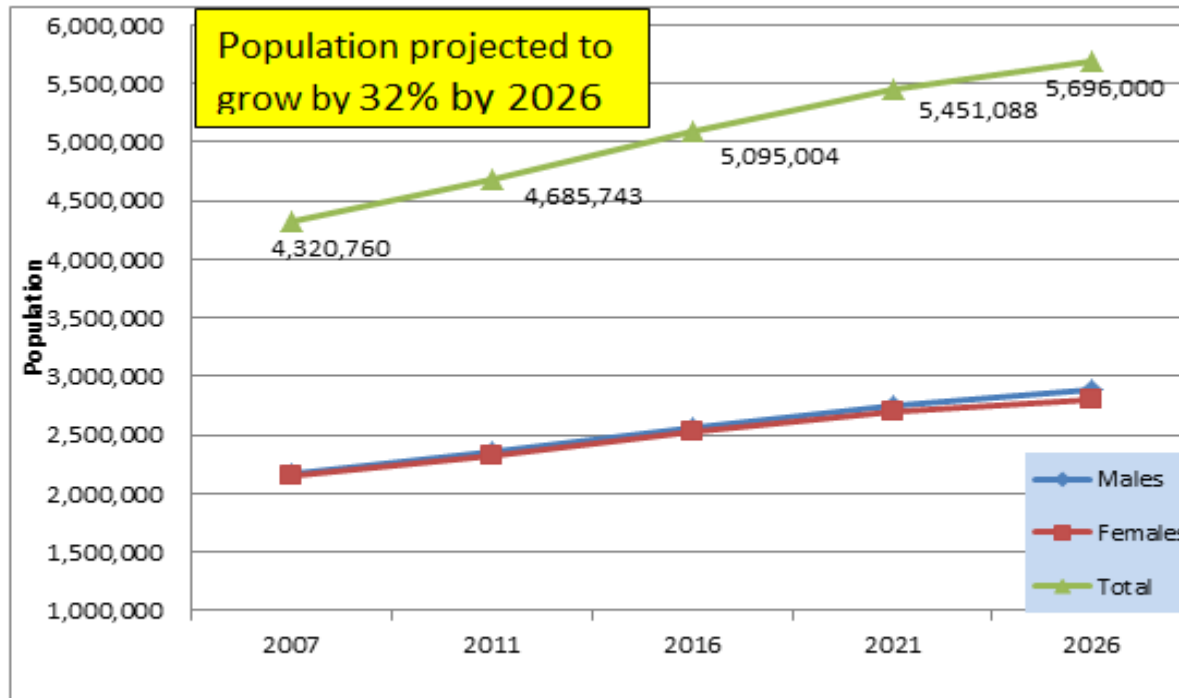
- Claims Rate – proportion of medical card holders who make a claim.
- 95% CI was applied around the mean claims rate to establish lower & upper bound.

- AC per Claim - total cost of claimants divided by the number of claimants.
- 95% CI was applied around the mean ac per claim to establish lower & upper bound.

Monte Carlo Simulation Model

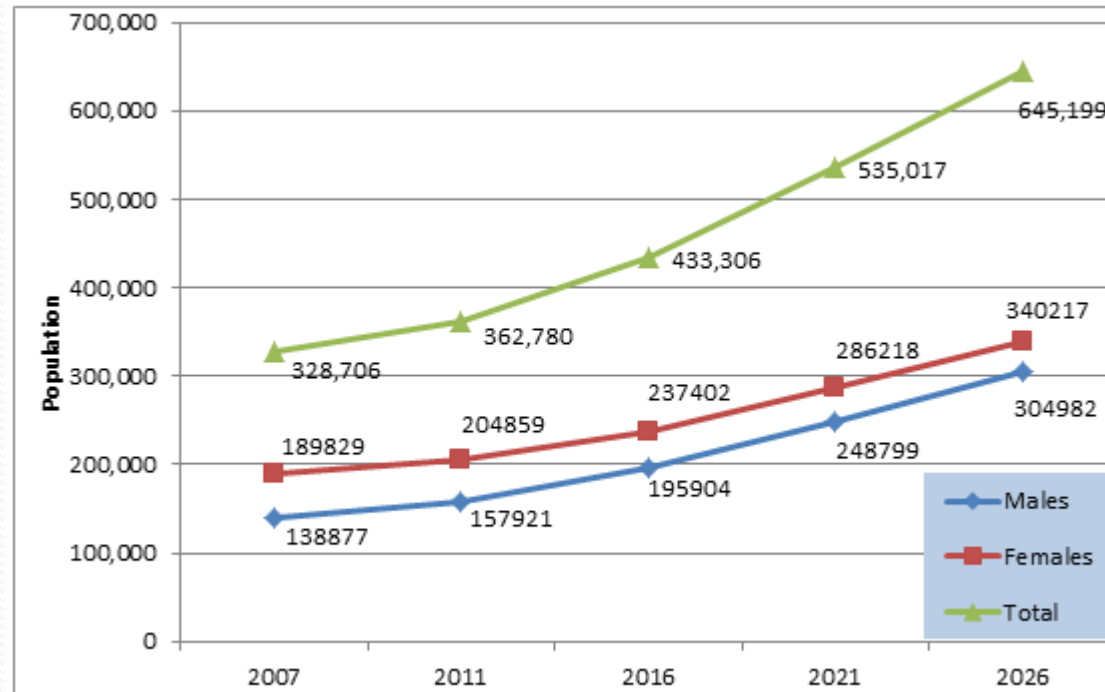
- MCS is used to forecast and estimate under uncertainty.
- The inputs (uncertain variables) into the model and the output (uncertain function).
- A macro was written in Visual Basic Editor in Microsoft Excel to run the simulations. An MCS with 100,000 iterations was used to propagate the uncertainty in the model.
- A Monte Carlo Model is used to simulate the effects of demographic change will have on GMS prescribing costs in 2016, 2021 and 2026 under different scenarios.
- **4 Projected (uncertain) Explanatory Variables:**—Pop Data, Coverage, Average Cost per claim and Claims rate.
- **Uncertain Function (Dependant Variable)** - GMS Cost per annum by region, gender and age cohort.

Results: Population Growth By Gender, 2007-2026

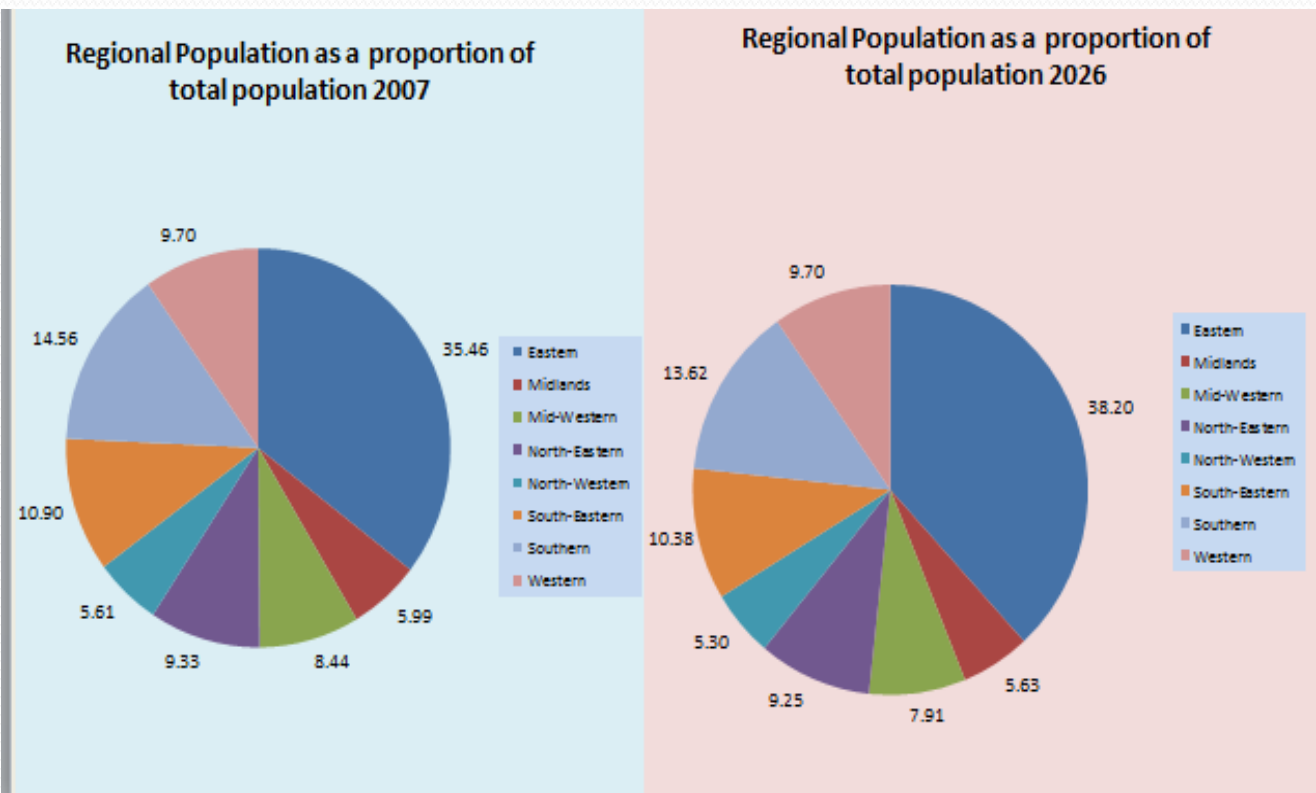


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Population Growth, Ireland, over 70s 2007 – 2026



Regional Population 2007 and Projections 2026



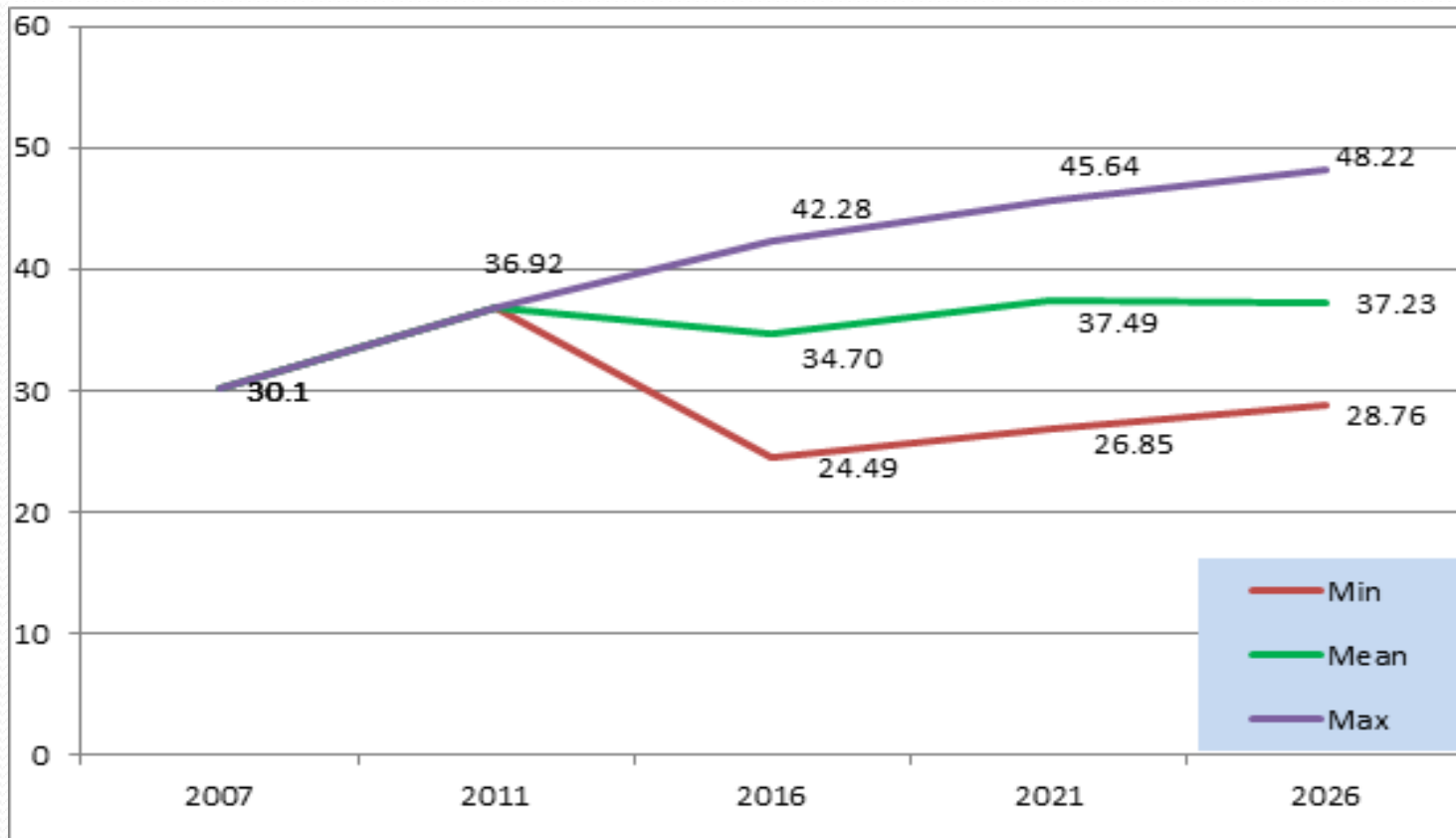
Population Proportion (%) estimated to have GMS card 2007

| Region | 0 - 11 | 12 - 15 | 16 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65 - 69 | > 70 |
|---------------|--------|---------|---------|---------|---------|---------|---------|---------|------|
| Eastern | 0.28 | 0.26 | 0.13 | 0.12 | 0.15 | 0.15 | 0.23 | 0.39 | 1.00 |
| Midlands | 0.30 | 0.30 | 0.20 | 0.17 | 0.20 | 0.21 | 0.33 | 0.50 | 1.00 |
| Mid-Western | 0.31 | 0.30 | 0.21 | 0.19 | 0.21 | 0.22 | 0.33 | 0.51 | 1.00 |
| North-Eastern | 0.27 | 0.27 | 0.19 | 0.15 | 0.17 | 0.20 | 0.31 | 0.49 | 1.00 |
| North-Western | 0.42 | 0.42 | 0.33 | 0.28 | 0.32 | 0.33 | 0.46 | 0.64 | 1.00 |
| South-Eastern | 0.31 | 0.30 | 0.22 | 0.20 | 0.21 | 0.23 | 0.35 | 0.54 | 1.00 |
| Southern | 0.28 | 0.26 | 0.18 | 0.17 | 0.19 | 0.22 | 0.33 | 0.52 | 1.00 |
| Western | 0.32 | 0.33 | 0.22 | 0.18 | 0.23 | 0.26 | 0.39 | 0.58 | 1.00 |

Population Proportion (%) forecasted to have GMS card 2026

| Region | 0 - 11 | 12 - 15 | 16 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65 - 69 | > 70 |
|---------------|--------|---------|---------|---------|---------|---------|---------|---------|------|
| Eastern | 0.36 | 0.37 | 0.22 | 0.17 | 0.23 | 0.23 | 0.28 | 0.43 | 0.85 |
| Midlands | 0.46 | 0.45 | 0.38 | 0.31 | 0.35 | 0.33 | 0.39 | 0.57 | 0.91 |
| Mid-Western | 0.42 | 0.43 | 0.35 | 0.30 | 0.33 | 0.32 | 0.38 | 0.58 | 0.93 |
| North-Eastern | 0.46 | 0.48 | 0.40 | 0.30 | 0.35 | 0.33 | 0.39 | 0.60 | 0.96 |
| North-Western | 0.54 | 0.55 | 0.48 | 0.40 | 0.45 | 0.42 | 0.49 | 0.68 | 0.99 |
| South-Eastern | 0.43 | 0.44 | 0.38 | 0.32 | 0.35 | 0.34 | 0.42 | 0.61 | 0.96 |
| Southern | 0.39 | 0.38 | 0.30 | 0.26 | 0.30 | 0.29 | 0.36 | 0.57 | 0.94 |
| Western | 0.46 | 0.48 | 0.39 | 0.29 | 0.36 | 0.37 | 0.43 | 0.63 | 0.95 |

Projected GMS Coverage Rates (%), 3 Scenarios 2007 – 2026



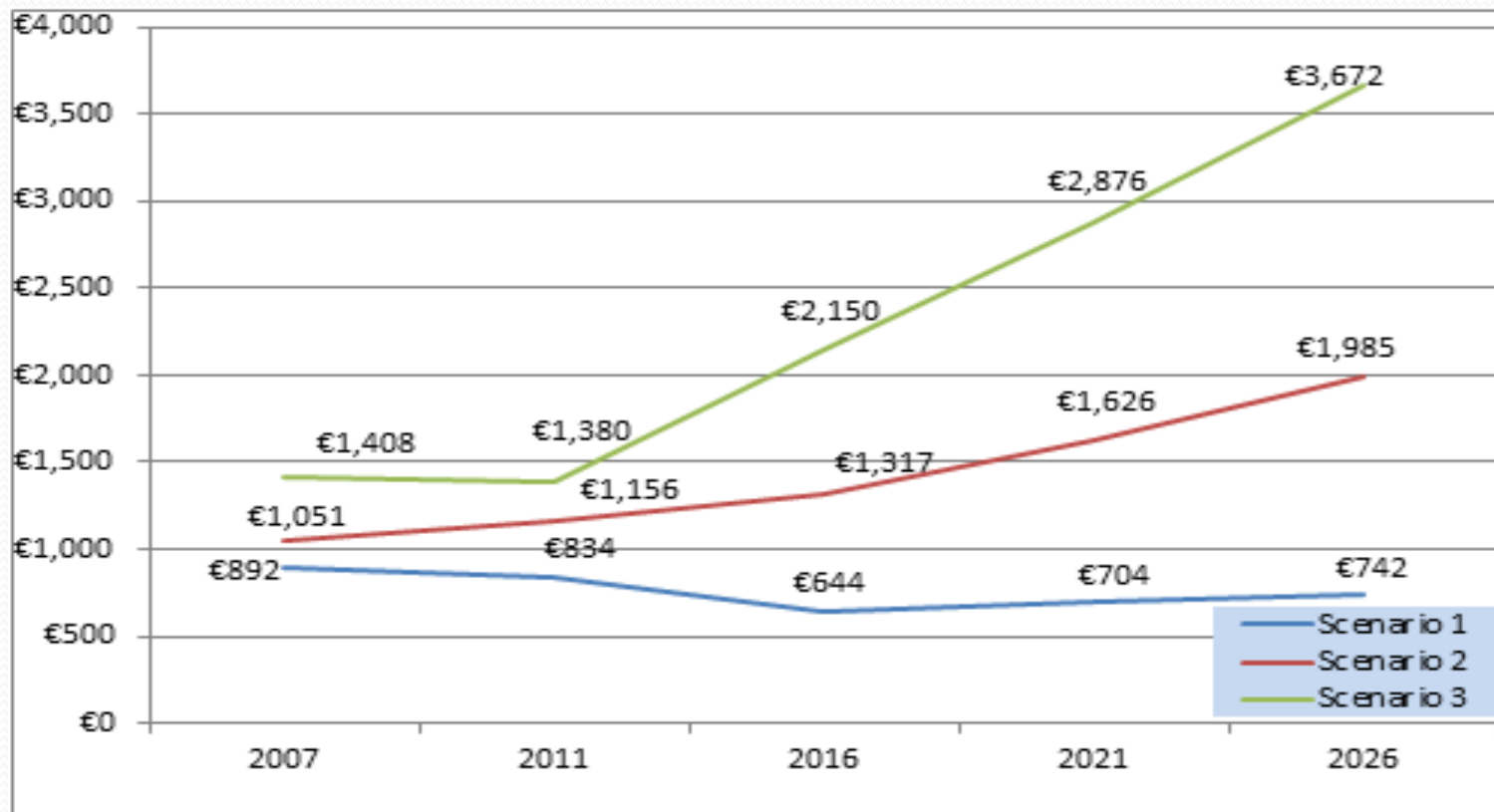
Average Cost per Claim 2007

| Region | 0-11 | 12-15 | 16-24 | 25 - 34 | 35 -44 | 45-54 | 55-64 | 65-69 | 70-74 | < 75 | TOTAL |
|---------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|---------|
| Eastern | €239.11 | €333.63 | €419.38 | €548.83 | €668.95 | €1,030.35 | €1,204.02 | €1,320.80 | €1,172.51 | €1,413.83 | €835.14 |
| Midlands | €269.43 | €317.09 | €502.20 | €694.89 | €813.92 | €1,046.50 | €1,246.56 | €1,325.24 | €1,442.20 | €1,646.28 | €930.43 |
| Mid-Western | €322.07 | €454.97 | €507.09 | €677.16 | €861.48 | €974.01 | €1,191.71 | €1,192.16 | €1,222.34 | €1,373.41 | €877.64 |
| North-Eastern | €288.71 | €412.72 | €435.26 | €654.85 | €741.45 | €945.33 | €1,133.13 | €1,235.24 | €1,264.92 | €1,480.79 | €859.24 |
| North-Western | €241.19 | €288.81 | €352.87 | €497.57 | €644.05 | €779.84 | €962.93 | €1,026.29 | €1,030.62 | €1,307.43 | €713.16 |
| South-Eastern | €259.89 | €393.67 | €486.19 | €635.67 | €800.39 | €1,062.24 | €1,155.08 | €1,214.20 | €1,257.45 | €1,395.73 | €866.05 |
| Southern | €333.91 | €430.93 | €516.62 | €734.11 | €823.11 | €1,085.77 | €1,234.49 | €1,345.43 | €1,302.23 | €1,377.51 | €918.41 |
| Western | €309.95 | €348.88 | €447.37 | €714.43 | €783.49 | €985.45 | €1,096.21 | €1,218.68 | €1,227.90 | €1,421.66 | €855.40 |
| Average Total | €283.03 | €372.59 | €458.37 | €644.69 | €767.10 | €988.69 | €1,153.02 | €1,234.75 | €1,240.02 | €1,427.08 | €856.93 |

Mean Claim Rate 2007

| Region | 0-12 | 12-15 | 16-24 | 25 - 34 | 35 -44 | 45-54 | 55-64 | 65-69 | 70-74 | > 75 |
|---------------|------|-------|-------|---------|--------|-------|-------|-------|-------|------|
| Eastern | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Midlands | 1.00 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Mid-West | 0.93 | 0.88 | 0.91 | 0.92 | 0.92 | 0.95 | 0.96 | 0.97 | 0.97 | 0.98 |
| North-Eastern | 0.88 | 0.82 | 0.88 | 0.88 | 0.89 | 0.91 | 0.94 | 0.95 | 0.95 | 0.95 |
| North-Western | 0.86 | 0.81 | 0.85 | 0.86 | 0.86 | 0.89 | 0.92 | 0.94 | 0.95 | 0.94 |
| South-Eastern | 0.96 | 0.94 | 0.95 | 0.96 | 0.96 | 0.97 | 0.98 | 0.99 | 0.98 | 0.99 |
| Southern | 0.97 | 0.95 | 0.97 | 0.97 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 |
| Western | 0.87 | 0.81 | 0.86 | 0.87 | 0.88 | 0.90 | 0.92 | 0.93 | 0.94 | 0.95 |

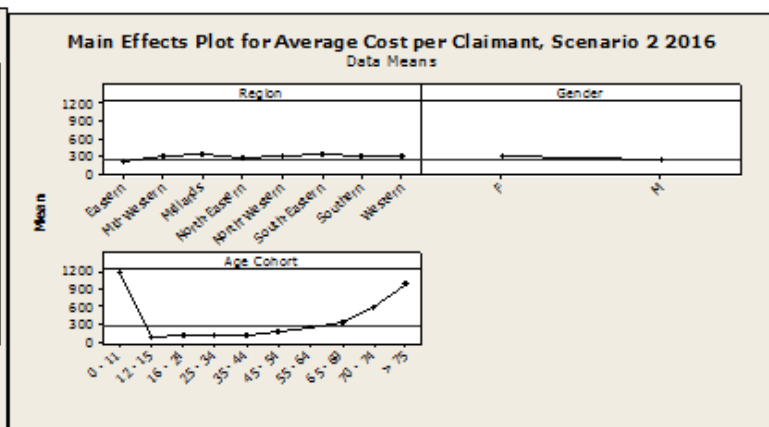
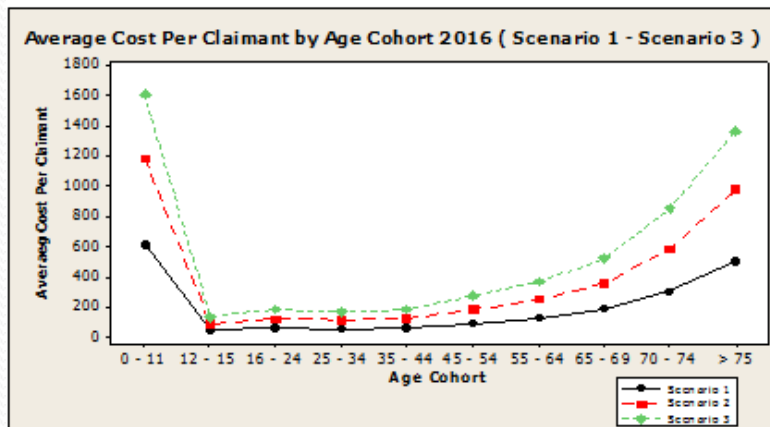
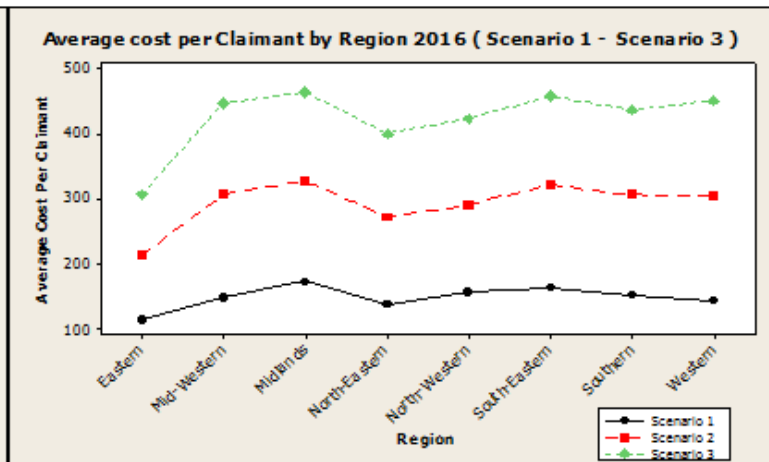
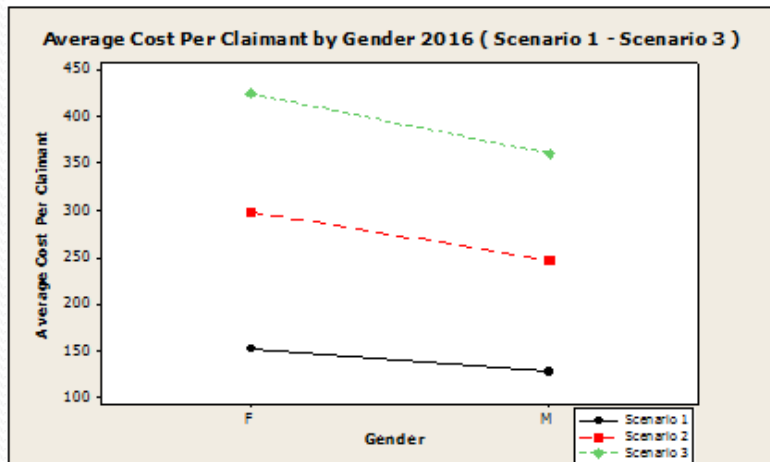
Historical Projections and Projected GMS Cost (€'000m) to 2026



Descriptive Analysis

| Year | # of Simulations | Mean | St. Dev | Min | Q1 | Median | Q3 | Max |
|-------------|-------------------------|-------------|----------------|------------|-----------|---------------|-----------|------------|
| 2016 | 100,000 | 272.31 | 149.32 | 69.63 | 106.19 | 167.59 | 286.14 | 1541.72 |
| 2021 | 100,000 | 312.61 | 314.45 | 78.65 | 121.29 | 190.43 | 330.86 | 1579.73 |
| 2026 | 100,000 | 366.81 | 272.28 | 86.68 | 135.56 | 241.10 | 371.60 | 1602.28 |

Statistical Analysis



Key Findings

- The main factors driving costs in 2016 - 2026 were found to be:
 - 1). age, and in particular those aged 0-11, and those aged 70+
 - 2). being resident in the midlands region
 - 3). being female.

Conclusion: Over the next decade, Ireland's population will experience rapid growth. This growth coupled with an aging population will result in an increase in the coverage rate thus the projected increase in overall prescribing costs.



Thank You