Identifying Policy Characteristics Leading to Benefit Exhaustion

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Sponsor: Genworth Financial

Agenda

- Background
  - Genworth Financial
  - Long Term Care
- Data Analysis
  - What is the Data?
  - Frequency Correlation Method
  - List of Factors We Analyzed
  - Charts
    - Single Factor
    - Dual Factor
    - Predictive vs. Known During Underwriting
- Conclusion
- Questions

Genworth Financial

- Publicly traded global financial security company
  - Wrote its first policy in 1871 as The Life Insurance Company of Virginia
  - Fortune 500 company
  - Recognized in the S&P 500 Index
- Products include:
  - Long term care
  - Mortgage insurance
  - Annuities
  - Life Insurance

Long Term Care

- Can be broadly defined as care provided by another party for the benefit of those who are unable to care for themselves.
- At least 70% of people over 65 will need long term care services at some point in their lives.
- Long term care insurance helps protect family and friends from the burden of caregiving.
- Helps recipients maintain control and choice of where they receive their care.

What is the data?

- Contains 31,488 policies which had a claim between 1994 and 2003. 26,114 of these policies are closed.
  - *A policy is considered closed if Genworth is no longer making claim payments to it.*
- Of those closed policies in our data set:
  - 15,250 of them were due to death
  - 5,954 of them were due to recovery
  - 3,948 of them were due to benefit exhaustion
  - The remaining 962 were split between 12 miscellaneous reasons

What is the data?

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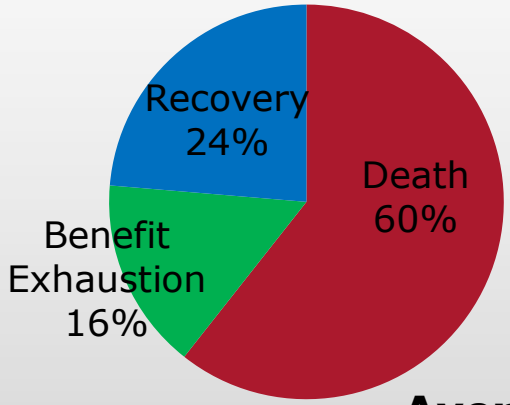
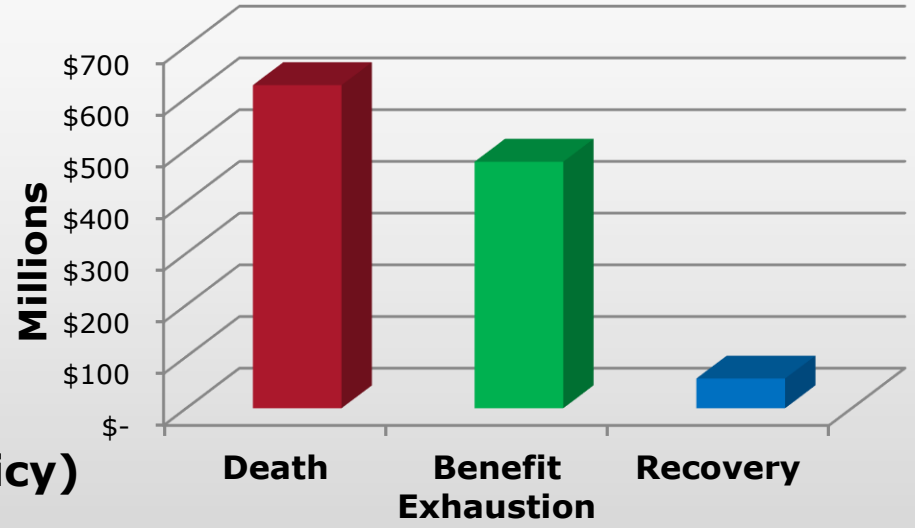
Data Analysis

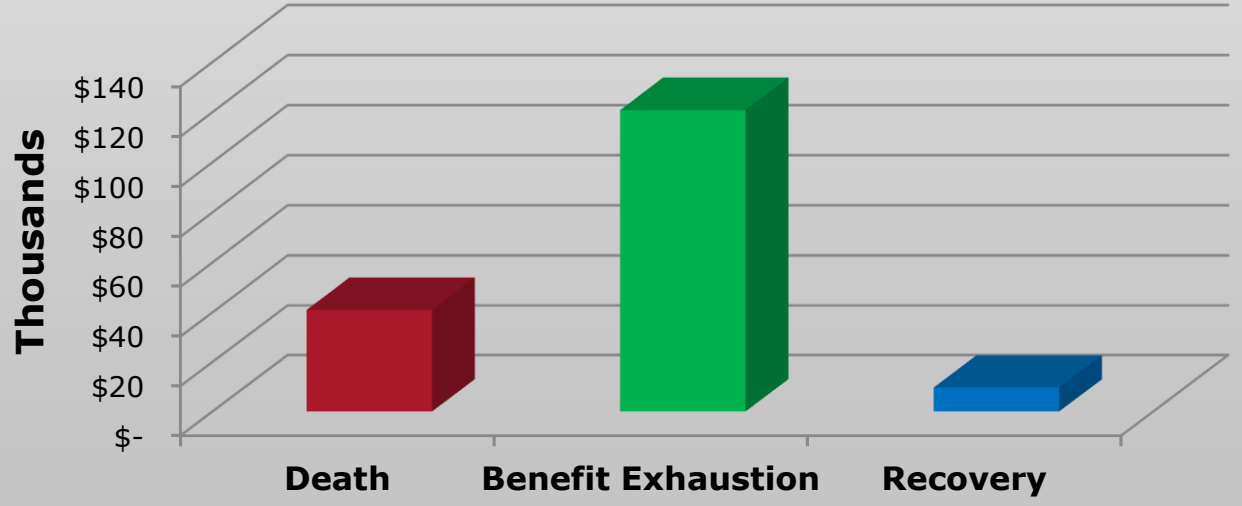
Breakdown of 26,114 Closed Policies



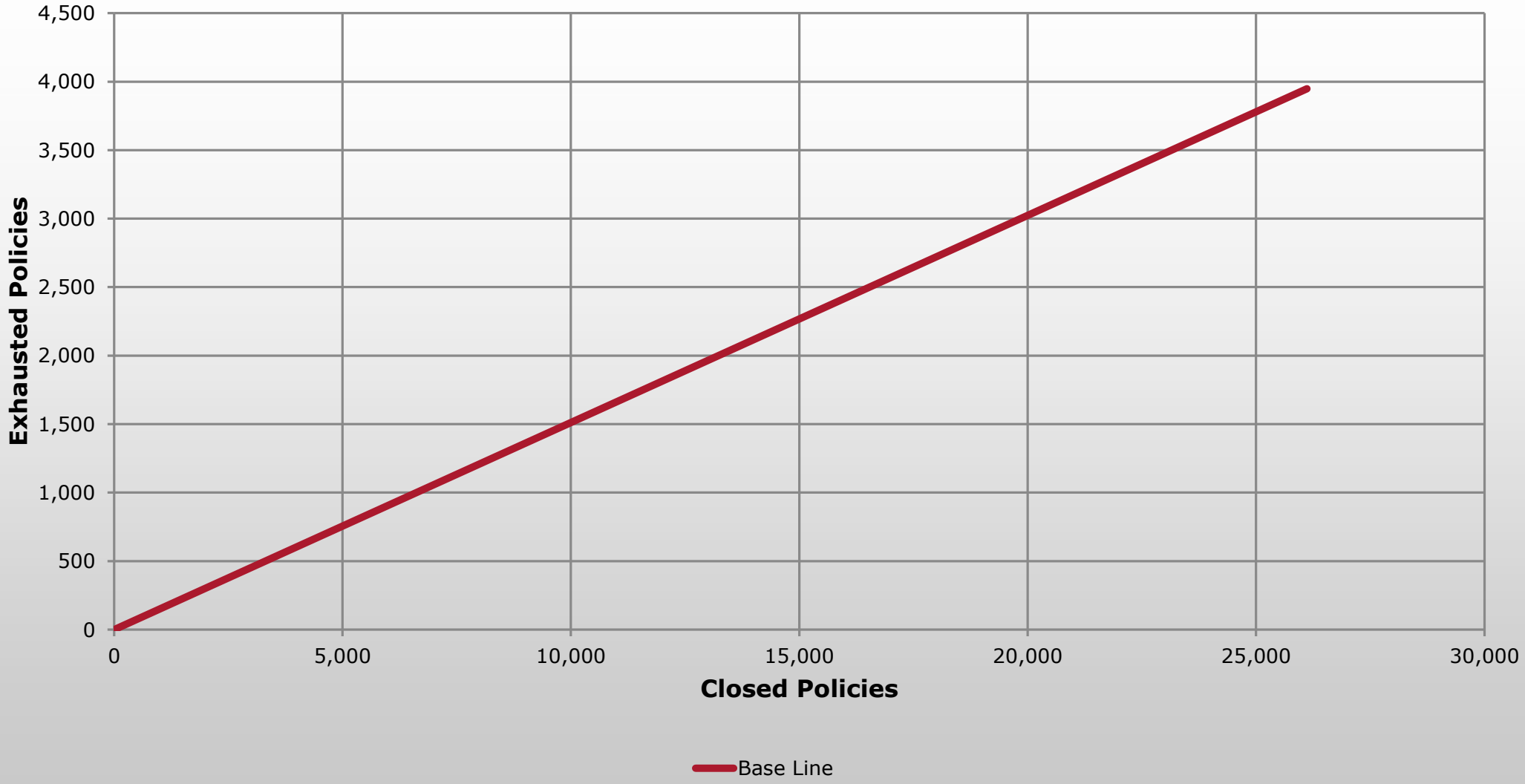
Total Claim Payments



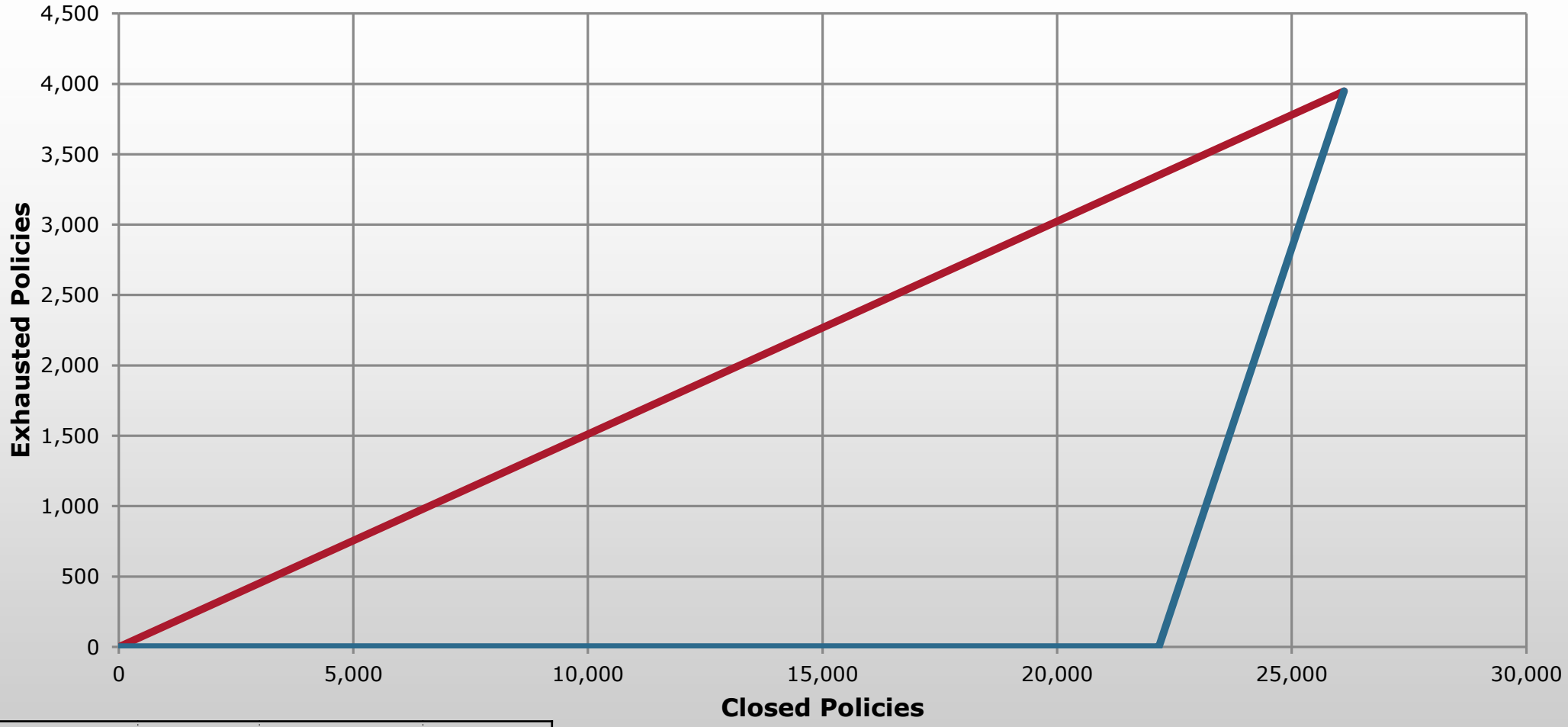
Average Total Claim Payments (Per Policy)



Frequency Correlation Method



Frequency Correlation Method



Close Reason	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Death	-	15,250	0.000000	-	15,250
Recovery	-	5,954	0.000000	-	21,204
Other	-	962	0.000000	-	22,166
Exhaustion	3,948	3,948	1.000000	3,948	26,114

Frequency Correlation Method

Percentage of Maximum Area
100.0%

Close Reason	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Death	-	15,250	0.000000	-	15,250
Recovery	-	5,954	0.000000	-	21,204
Other	-	962	0.000000	-	22,166
Exhaustion	3,948	3,948	1.000000	3,948	26,114

Factors We Analyzed:

- Begin Duration
- Benefit Increase Option
- Benefit Period
- Claim Age
- Claim Age Group
- Claim ID
- Client Set Out of Force Date
- Close Reason
- Company
- Current Diagnosis Code
- Elimination Period
- End Duration
- Gender
- Initial Diagnosis Code
- Issue Age
- Marital Status
- Original Benefit Claim Coverage
- Plan Type
- Policy Status
- Replacement Indicator
- Risk Commenced Year
- U.S. Region
- Total Days on Claim

Total Days on Claim

Total Days on Claim	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
1	753	19,393	0.038828	753	19,393
2	2,540	5,568	0.456178	3,293	24,961
6	3	6	0.500000	3,296	24,967
3	552	992	0.556452	3,848	25,959
4	88	137	0.642336	3,936	26,096
5	12	18	0.666667	3,948	26,114

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Percentage of Maximum Area
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Genworth Financial

Worcester Polytechnic Institute

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5	12	18	0.666667	3,948	26,114

Percentage of Maximum Area
65.9%

Predictive
Unknown during Underwriting

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Factors We Analyzed:

- Begin Duration
- Benefit Increase Option
- Benefit Period
- Claim Age
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Factors We Analyzed:

- Begin Duration
- **Benefit Increase Option**
- **Benefit Period**
- Claim Age
- Claim Age Group
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- Risk Commenced Year
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- Total Days on Claim

Claim ID (3rd Digit)

Claim ID (3rd Digit)	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
8	355	2,611	0.135963	355	2,611
0	369	2,627	0.140464	724	5,238
6	359	2,552	0.140674	1,083	7,790
5	401	2,694	0.148849	1,484	10,484
4	382	2,560	0.149219	1,866	13,044
9	412	2,708	0.152142	2,278	15,752
7	405	2,581	0.156916	2,683	18,333
3	410	2,587	0.158485	3,093	20,920
2	429	2,661	0.161218	3,522	23,581
1	426	2,533	0.168180	3,948	26,114

Percentage of Maximum Area
4.3%

Not Predictive

Known during Underwriting

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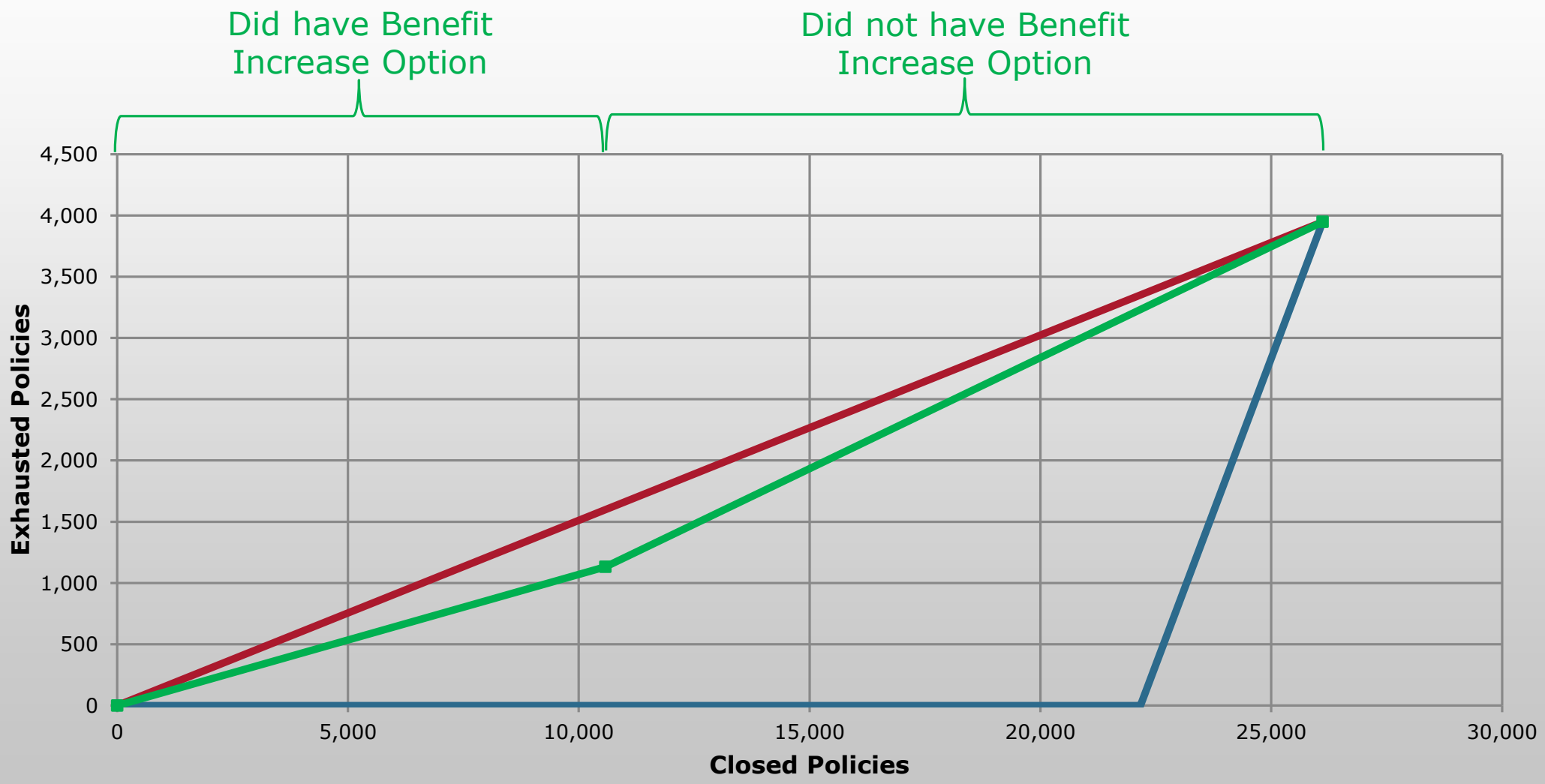
Benefit Increase Option

Benefit Increase Option	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Yes	1,132	10,576	0.107035	1,132	10,576
No	2,816	15,538	0.181233	3,948	26,114



Percentage of Maximum Area
14.8%

Predictive
Known during Underwriting

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Benefit Period

Benefit Period	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
6	144	2,743	0.052497	144	2,749
4	1,065	10,248	0.103923	1,209	12,997
3	1,402	7,982	0.175645	2,611	20,979
2	1,337	5,135	0.260370	3,948	26,114

Percentage of Maximum Area
28.2%

Predictive
Known during Underwriting

Gender

Gender	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Male	960	9,425	0.101857	960	9,425
Female	2,988	16,689	0.179040	3,948	26,114

Percentage of Maximum Area
13.9%

Predictive
Known during Underwriting

Issue Age

Issue Age	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
40-59	19	517	0.036750	19	517
60-64	143	1,997	0.071607	162	2,514
65-69	471	4,914	0.095849	633	7,428
70-74	1,101	7,812	0.140937	1,734	15,240
75-79	1,407	7,213	0.195064	3,141	22,453
80-94	807	3,661	0.220432	3,948	26,114

Percentage of Maximum Area
22.0%

Predictive
Known during Underwriting

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Marital Status

Marital Status	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Married	1,471	11,716	0.125555	1,471	11,716
Single	2,477	14,398	0.172038	3,948	26,114

Percentage of Maximum Area
9.0%

Predictive
Known during Underwriting

Factors We Analyzed:

- Begin Duration
- **Benefit Increase Option**
- **Benefit Period**
- Claim Age
- Claim Age Group
- **Claim ID**
- Client Set Out of Force Date
- Close Reason
- **Company**
- Current Diagnosis Code
- **Elimination Period**
- End Duration
- **Gender**
- Initial Diagnosis Code
- **Issue Age**
- **Marital Status**
- **Original Benefit Claim Coverage**
- **Plan Type**
- Policy Status
- **Replacement Indicator**
- Risk Commenced Year
- **U.S. Region**
- Total Days on Claim

Key Predictive Factors:

- Begin Duration
- **Benefit Increase Option**
- **Benefit Period**
- Claim Age
- Claim Age Group
- **Claim ID**
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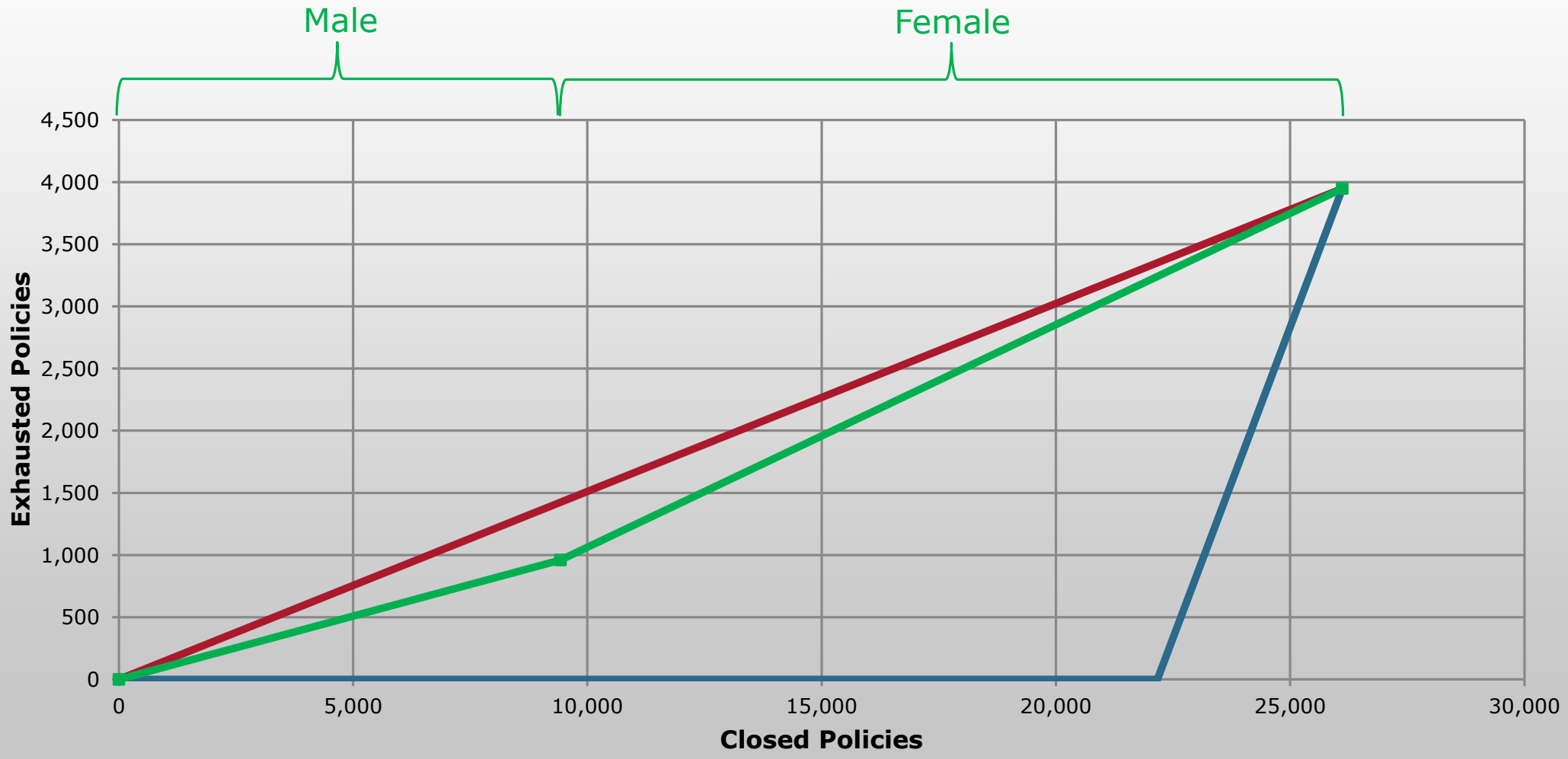

Percentage of Maximum Area
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Predictive
Known during Underwriting

Gender

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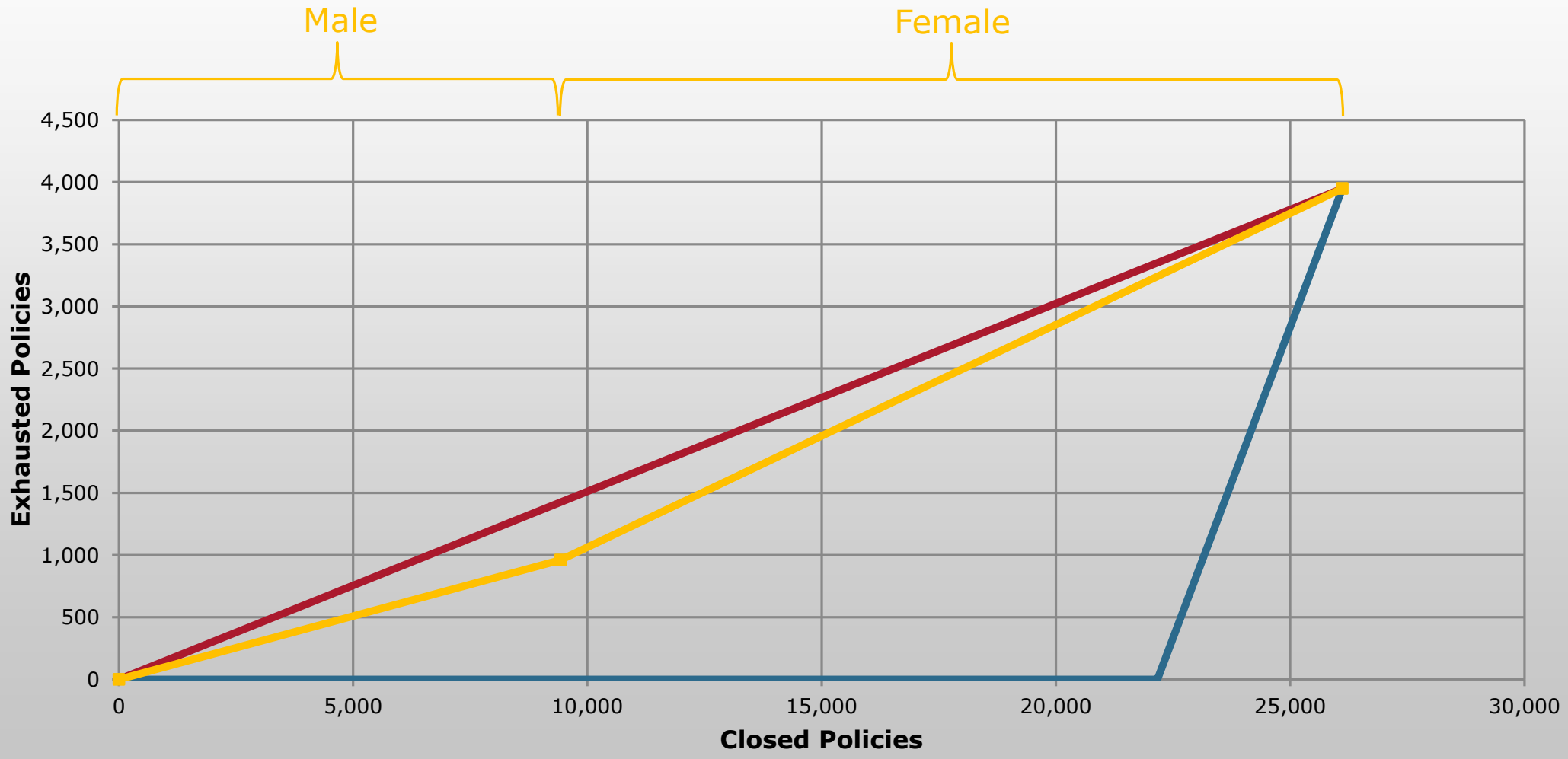
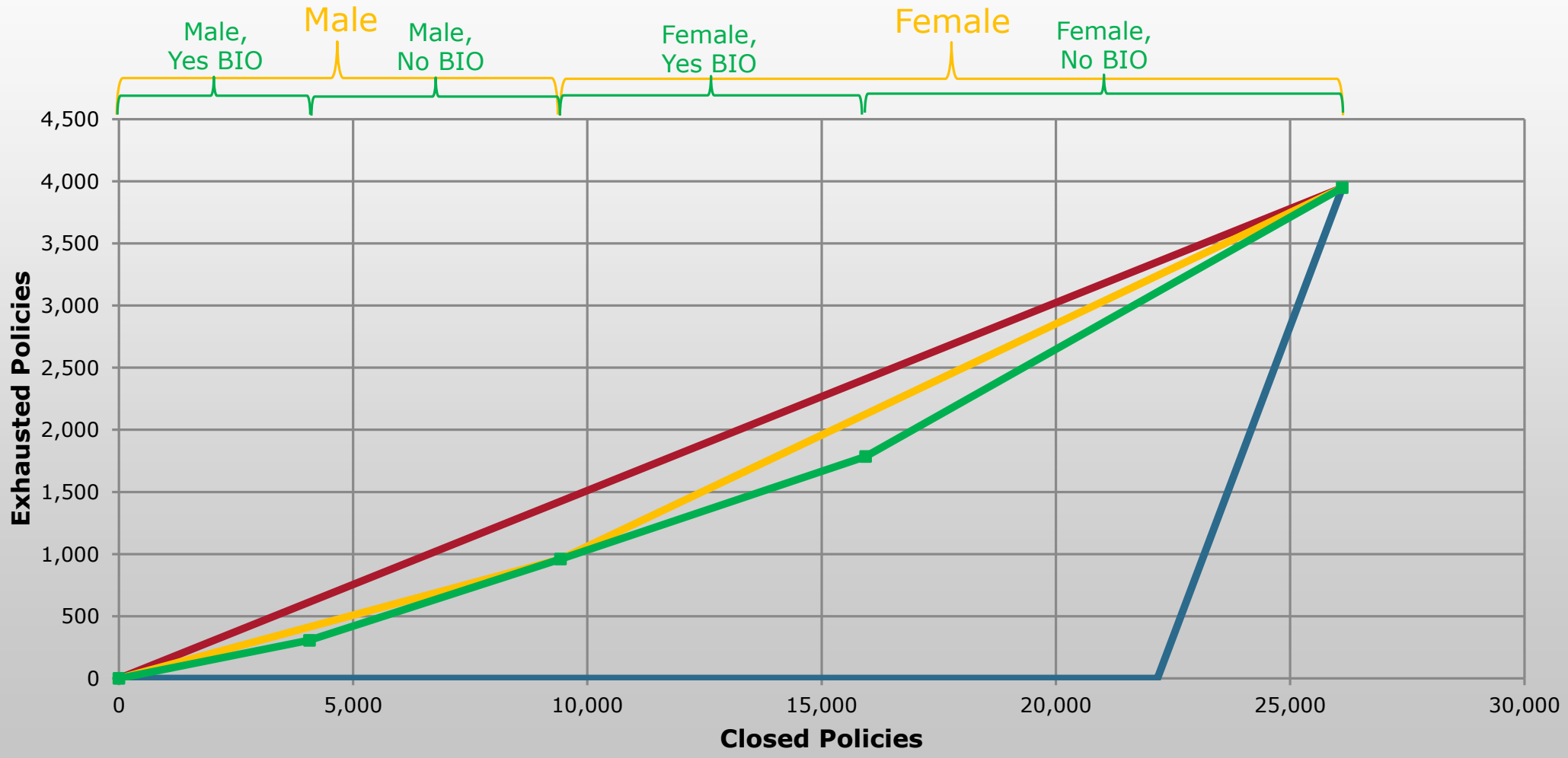


Percentage of Maximum Area
13.9%

Predictive
Known during Underwriting

Gender (13.9%) and Benefit Increase Option (14.8%)

Gender and Benefit Increase Option	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Male, Yes	307	4,066	0.075504	307	4,066
Male, No	653	5,359	0.121851	960	9,425
Female, Yes	825	6,510	0.126728	1,785	15,935
Female, No	2,163	10,179	0.212496	3,948	26,114



Percentage of Maximum Area
21.5%

Predictive
Known during Underwriting

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Base Line | Close Reason | Gender | Benefit Increase Option and Gender

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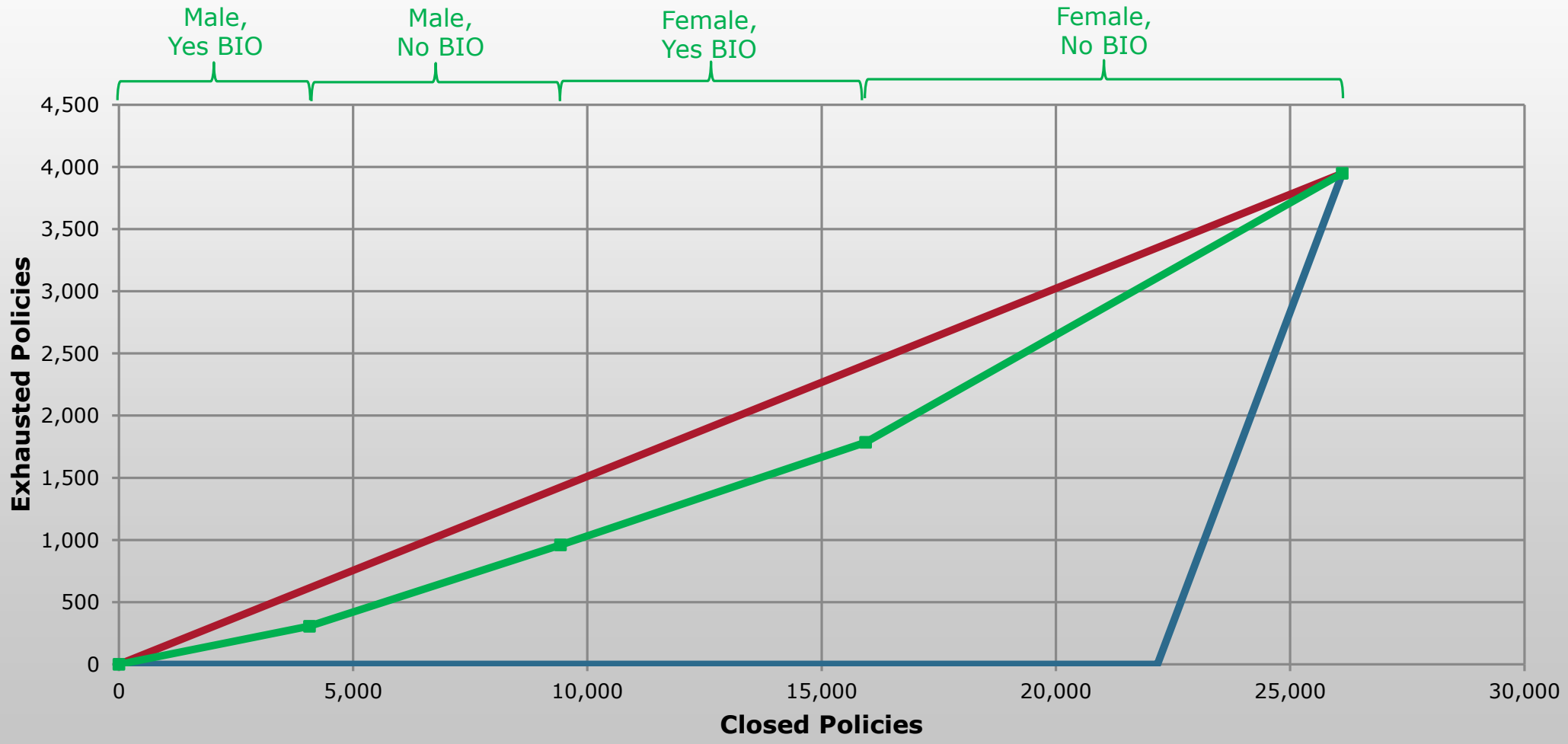
Gender (13.9%) and Benefit Increase Option (14.8%)

Gender and Benefit Increase Option	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Male, Yes	307	4,066	0.075504	307	4,066
Male, No	653	5,359	0.121851	960	9,425
Female, Yes	825	6,510	0.126728	1,785	15,935
Female, No	2,163	10,179	0.212496	3,948	26,114



Percentage of Maximum Area
21.5%

Predictive
Known during Underwriting

Genworth Financial

Base Line Close Reason Benefit Increase Option and Gender

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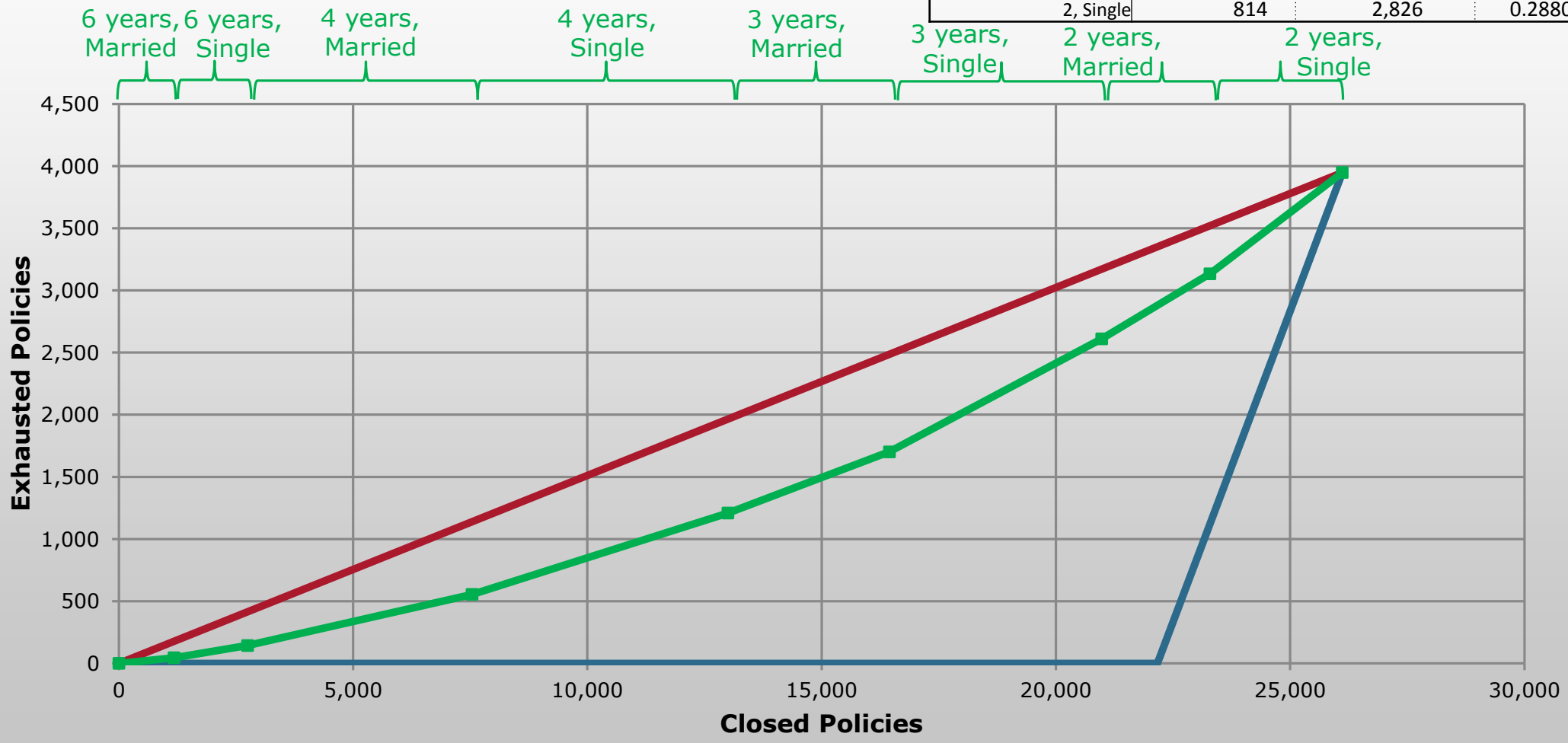
Benefit Period (28.2%) and Marital Status (9.0%)

Benefit Period and Marital Status	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
6, Married	45	1,169	0.038494	45	1,175
6, Single	99	1,574	0.062897	144	2,749
4, Married	410	4,786	0.085667	554	7,535
4, Single	655	5,462	0.119919	1,209	12,997
3, Married	493	3,449	0.142940	1,702	16,446
3, Single	909	4,533	0.200529	2,611	20,979
2, Married	523	2,309	0.226505	3,134	23,288
2, Single	814	2,826	0.288040	3,948	26,114



Percentage of Maximum Area
30.7%

Predictive
Known during Underwriting

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Base Line Close Reason Marital Status and Benefit Period

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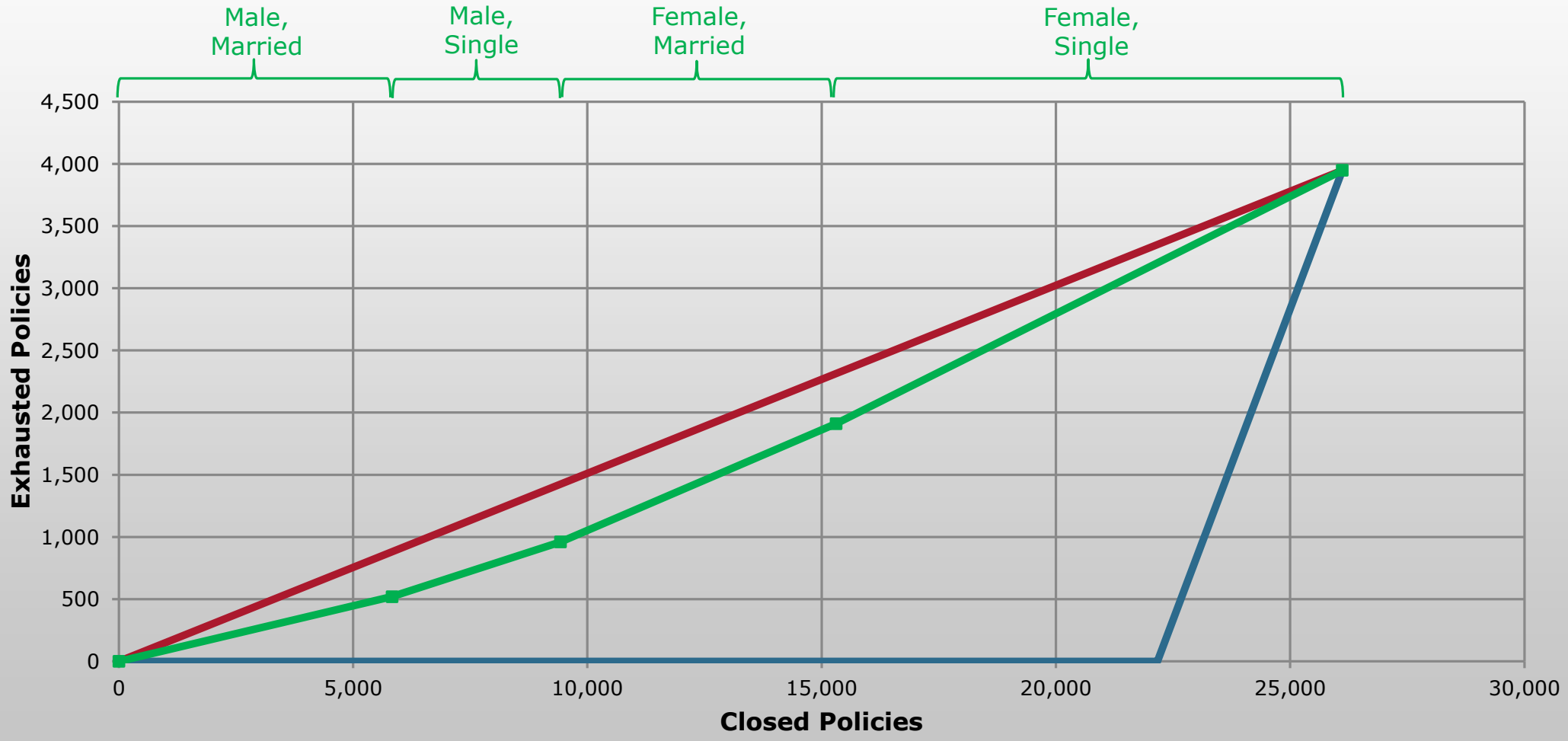
Gender (13.9%) and Marital Status (9.0%)

Gender and Marital Status	Count of Exhausted Policies	Count of Closed Policies	Slope	Total Exhausted Policies	Total Closed Policies
Male, Married	520	5,831	0.089179	520	5,831
Male, Single	440	3,594	0.122426	960	9,425
Female, Married	951	5,885	0.161597	1,911	15,310
Female, Single	2,037	10,804	0.188541	3,948	26,114



Percentage of Maximum Area
16.6%

Predictive
Known during Underwriting

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Factors We Analyzed:

- Begin Duration
- Benefit Increase Option
- Benefit Period
- Claim Age
- Claim Age Group
- Claim ID
- Client Set Out of Force Date
- Close Reason
- Company
- Current Diagnosis Code
- Elimination Period
- End Duration
- Gender
- Initial Diagnosis Code
- Issue Age
- Marital Status
- Original Benefit Claim Coverage
- Plan Type
- Policy Status
- Replacement Indicator
- Risk Commenced Year
- U.S. Region
- Total Days on Claim

Summary of Individual Factors We Analyzed:

Known During Underwriting	
Predictive	• Marital Status (9.0%) • Gender (13.9%) • Benefit Increase Option (14.8%) • Issue Age (22.0%) • Benefit Period (28.2%)
Not Predictive	• Plan Type (0.0%) • Replication Indicator (0.8%) • Company (0.9%) • Elimination Period (2.3%) • Claim ID (4.3%) • Original Benefit Claim Coverage (5.8%) • U.S. Region (6.0%)

Unknown During Underwriting
• Risk Commenced Year (5.2%) • Claim Age Group (6.3%) • Policy Status (11.7%) • Claim Age (12.0%) • Begin Duration (17.7%) • Initial Diagnosis Code (31.1%) • End Duration (22.0%) • Client Set Out of Force Year (23.2%) • Current Diagnosis Code (39.8%) • Total Days on Claim (65.9%) • Close Reason (100.0%)

Summary of Individual Factors We Analyzed:

Known During Underwriting	
Predictive	• Marital Status (9.0%) • Gender (13.9%) • Benefit Increase Option (14.8%) • Issue Age (22.0%) • Benefit Period (28.2%)
Not Predictive	• Plan Type (0.0%) • Replication Indicator (0.8%) • Company (0.9%) • Elimination Period (2.3%) • Claim ID (4.3%) • Original Benefit Claim Coverage (5.8%) • U.S. Region (6.0%)

Unknown During Underwriting
• Risk Commenced Year (5.2%) • Claim Age Group (6.3%) • Policy Status (11.7%) • Claim Age (12.0%) • Begin Duration (17.7%) • Initial Diagnosis Code (31.1%) • End Duration (22.0%) • Client Set Out of Force Year (23.2%) • Current Diagnosis Code (39.8%) • Total Days on Claim (65.9%) • Close Reason (100.0%)

Conclusion

Benefit Increase Option - 14.8%	Gender - 13.9%
Benefit Increase Option & Gender - 21.5%	

Benefit Increase Option - 14.8 %	Benefit Period - 28.2%
Benefit Increase Option & Benefit Period - 31.8%	

Issue Age - 22.0%	Benefit Period - 28.2%
Issue Age & Benefit Period - 34.7%	

Issue Age - 22.0%	Marital Status - 9.0%
Issue Age & Marital Status - 23.6%	

Marital Status - 9.0%	Benefit Period - 28.2%
Marital Status & Benefit Period 30.7%	

Marital Status - 9.0%	Gender - 13.9%
Marital Status & Gender 16.6%	

Benefit Increase Option - 14.8%	Marital Status - 9.0%
Marital Status & Benefit Increase Option - 18.4%	

Benefit Period - 28.2%	Gender - 13.9%
Benefit Period & Gender - 33.4%	

- Not all factors are available to predict benefit exhaustion at time of underwriting.
- Not all factors that are available demonstrate predictive abilities.
- The most predictive factor is benefit period, where policies with smaller benefit periods tend to exhaust more frequently.
  - Followed by issue age, benefit increase option, gender, and marital status, respectively.
- When combining multiple predictive factors the result tends to be more predictive.
- This process should allow Genworth Financial to better predict which of their policies are going to close due to benefit exhaustion.
  - Knowing this information will allow Genworth to better refine their underwriting process

Questions?