ANALYTIC MODEL: ONLINE ACCESS OF EMR

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HANDLING THE DEPENDENT VARIABLE

- Dependent Variable: AccessOnlineRecord
- Number of missing and error values: 1671 rows
- Removed those rows from the dataset
- **Left with 1833 rows**
- Analyzing the dependent variable in 3 ways:

1. Keeping all the 5 levels and applying multinomial logistic regression
2. Collapsing the number of levels to 2 and apply binary logistic regression
3. Collapsing the number of levels to 3 and apply ordinal logistic regression

SCREENING VARIABLES

1. B1 – UseInternet:

- B1 Had 1 row with missing value, so removed
- Rest, removed the number of rows having "No" as their survey answer

2. D4 - EverOfferedAccessRec

- It was already screened after we screened D4

Now, we are left with 1483 rows

CONCEPTUAL ANALYTICAL MODEL

Demographics:

O1: Age Group
O2: Occupation
O6: Education
O14: Gender
O17: Income Ranges

Tech Savvy:

B5: PCA
B7: Tablet Health Wellness Apps
B9: Other Device Track Health
B10: Shared Health Device Info

Health:

G1: General Health
G2: Ability to take care of Health
G3: Chronic Diseases
C3: Regular Checkup

Trust:

D2: Confident Info Safe

LifeStyle:

I1: Times Moderate Exercise

PRE-PROCESSING OF INDEPENDENT VARIABLES

Code	Name	Distribution(Factor levels)	Missing Values/ Error values	Treatment
G1	General health	Good(Values:1,2,3) Bad(Values: 4,5)	Total: 9	kNN Imputation
G2	Own Ability Take Care Health	Confident(Values: 1,2,3) NotConfident (Values: 4,5)	Total: 7	kNN Imputation
G3	MedCon_Add	Integer: range-0:6	N/A	Addition of all yes in G3
D11	Useful Online Med Record	5 levels	Total: >60%	Remove variable
B5	Used internet to electronically send or read some health-related data	6 questions with 2 levels each		PCA not giving accurate results. We use those variables as categories separately

MULTINOMIAL LOGISTIC REGRESSION(RESULTS)

Variable	Category	P-value
ElectronicLookedAssistance	2 - No	0.02
ElectronicTestResults	2 - No	0.014, 0.0003, 0.049 for each levels 1,2 and 3 of the dependent variable respectively
SharedHealthDeviceInfo	2 - No	0.04
GeneralHealth	2 - Bad	0.0269
OwnAbilityTakeCareHealth	Not Confident	0.0094
Med_ConFinalValues	1	0.017
IncomeRanges	50k - 99.9k	0.008

MULTINOMIAL LOGISTIC REGRESSION - CONCLUSION

- If a patient has never looked for health assistance online, the person is less likely to access EMR than never
- If a patient has never sent health test results online, he is less likely to access EMR 1-9 times than never
- If a patient has never shared health information online with a health professional, the person is more likely to access EMR 6-9 times than never
- If a patient considers his health is bad, he is less likely to access EMR 3-5 times than never in the past 12 months
- If a person is not confident about his ability to take care of his health, is more likely to access EMR 3-5 times than never
- People earning in the bracket 50K-99.9K are less likely to access EMR 1-2 times than never

BINOMIAL LOGISTIC REGRESSION - RESULTS

Found 3 variable classes to be significant. They are:

Significant Variable	Category	P-value
Electronic_TestResults	2	0.0015
IncomeRanges	50K – 99.9K	0.01318
IncomeRanges	100K – 199.9K	0.01461

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	1.054394	0.454155	2.322	0.02025	*
Electronic_SelfHealthInfo2	-0.165780	0.187620	-0.884	0.37691	
Electronic_SelfHealthInfoNA	15.692112	323.658038	0.048	0.96133	
Electronic_HealthInfoSE2	-0.138316	0.156452	-0.884	0.37665	
Electronic_HealthInfoSENA	-1.506943	1.269818	-1.187	0.23533	
Electronic_BuyMedicine2	0.009959	0.148617	0.067	0.94657	
Electronic_BuyMedicineNA	0.152132	0.942443	0.161	0.87176	
Electronic_LookedAssistance2	-0.004328	0.175430	-0.025	0.98032	
Electronic_LookedAssistanceNA	0.146328	0.988119	0.148	0.88227	
Electronic_TalkDoctor2	0.068624	0.161505	0.425	0.67091	
Electronic_TalkDoctorNA	-14.664833	323.649389	-0.045	0.96386	
Electronic_TrackedHealthCosts2	-0.057537	0.155912	-0.369	0.71210	
Electronic_TrackedHealthCostsNA	-0.043914	1.482616	-0.030	0.97637	
Electronic_TestResults2	-0.521830	0.164356	-3.175	0.00150	**
Electronic_TestResultsNA	-1.392908	1.177109	-1.183	0.23668	
TabletHealthWellnessApps2	-0.016967	0.148095	-0.115	0.90879	
TabletHealthWellnessAppsNA	0.212306	0.281895	0.753	0.45137	
OtherDevTrackHealth2	0.188173	0.145836	1.290	0.19694	
OtherDevTrackHealthNA	-0.344251	0.974510	-0.353	0.72390	
SharedHealthDeviceInfo2	0.039550	0.175206	0.226	0.82141	
SharedHealthDeviceInfoNA	-0.049438	0.847565	-0.058	0.95349	
FreqGoProvider1	0.034612	0.218853	0.158	0.87434	
FreqGoProvider2	0.077331	0.231567	0.334	0.73842	
FreqGoProvider3	0.247522	0.247961	0.998	0.31817	
FreqGoProviderNA	1.677817	1.310182	1.281	0.20033	
ProviderMaintainEMR20	0.078024	0.191780	0.407	0.68413	
ProviderMaintainEMR2NA	-13.945888	882.743756	-0.016	0.98740	
ConfidentInfoSafe0	-0.149491	0.179487	-0.833	0.40491	
ConfidentInfoSafeNA	14.567648	882.743463	0.017	0.98683	
GeneralHealthBad	-0.418514	0.234235	-1.787	0.07398	.
OwnAbilityTakeCareHealthNot Confident	0.426619	0.393064	1.085	0.27776	
MedCon_FinalValues	-0.113621	0.062573	-1.816	0.06940	.
TimesModerateExerciseLight	-0.050759	0.169508	-0.299	0.76460	
TimesModerateExerciseModerate	0.070144	0.195819	0.358	0.72019	
TimesModerateExerciseHeavy	-0.106676	0.230301	-0.463	0.64322	
TimesModerateExerciseNA	-1.390738	0.538378	-2.583	0.00979	**
Age31 - 50	-0.281802	0.257858	-1.093	0.27446	
Age51 - 65	0.081134	0.263406	0.308	0.75807	
Age65 or more	0.388665	0.331755	1.172	0.24138	
AgeNA	-0.216134	0.643562	-0.336	0.73699	
OccupationStatusUnemployed	0.015079	0.432847	0.035	0.97221	
OccupationStatusHomemaker	0.137103	0.333136	0.412	0.68067	
OccupationStatusStudent	0.044702	0.512131	0.087	0.93044	
OccupationStatusRetired	-0.336551	0.229503	-1.466	0.14253	
OccupationStatusDisabled	-0.127220	0.345066	-0.369	0.71236	
OccupationStatusNA	-0.312489	0.498998	-0.626	0.53116	
EducationPost highschool/college	-0.015497	0.197195	-0.079	0.93736	
EducationCollege Graduate	-0.074354	0.200258	-0.371	0.71042	
EducationPost Graduate	0.201737	0.228092	0.884	0.37645	
EducationNA	0.015075	0.705308	0.021	0.98295	
SelfGenderFemale	0.020120	0.141571	0.142	0.88699	
SelfGenderNA	0.149867	0.306840	0.488	0.62525	

BINOMIAL LOGISTIC REGRESSION - CONCLUSION

From the significant variable obtained, considering the respective coefficients, we can say that:

- People who do not look for any health or medical information using a computer, smartphone or other electronic means are less likely to access the Electronic Medical Records.
- People whose income is in the range of 50K – 99.9k are less likely to access Electronic Medical Records.
- People whose income is in the range of 100K – 199.9K are less likely to access Electronic Medical Records.

ORDINAL LOGISTIC REGRESSION - RESULTS

Variable	Category	P-value
Electronic_TestResults	2 – No	0.00064
SharedHealthDeviceInfo	2 – No	0.04729
MedCon_FinalValues	1	0.03706
MedCon_FinalValues	6	0.00000

ORDINAL LOGISTIC REGRESSION - CONCLUSION

From the significant variables obtained, considering the respective coefficients, we can say that:

- People who have not looked up medical test results using a computer, smartphone or other electronic means are less likely to access the Electronic Medical Records.
- People who did not share health information from either an electronic monitoring device or smartphone with a health professional within the last 12 months are more likely to access Electronic Medical Records.
- People who have 1 out of 6 medical conditions are less likely to access Electronic Medical Records.
- People who have 6 out of 6 medical conditions are less likely to access Electronic Medical Records.