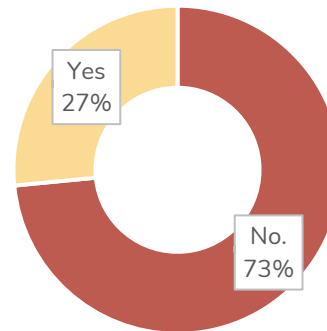# How much Additional Services Decrease Churn Rate ?

Churn rate can be affected by many factors and probably certain services is on the play. There is a dataset about churn rate in fictional telco company. There are many variables such as demographic, payment, tenure, charges and services. This company provide internet services with some additional service such as online backup, online services, device protection, technical support, sterming service for TV and streaming service for movies. However we are interested to analyze these additional service on how much these services affect churn rate.
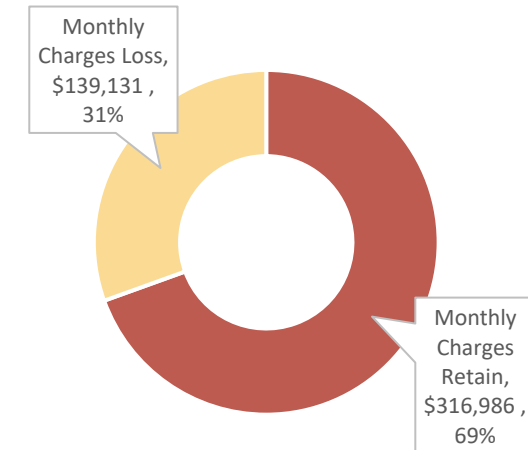
NUMBER OF USER

7043

Churn ?

Yes 27%

No. 73%

Revenue Loss

Monthly Charges Loss, $139,131 , 31%

Monthly Charges Retain, $316,986 , 69%

Telco service provider churn rate :

- 27% churn rate in the last quartal

- According to industry standard this is very high (above 20%)

- Revenue loss estimates is 31% or around U$139,131 based on current monthly charges
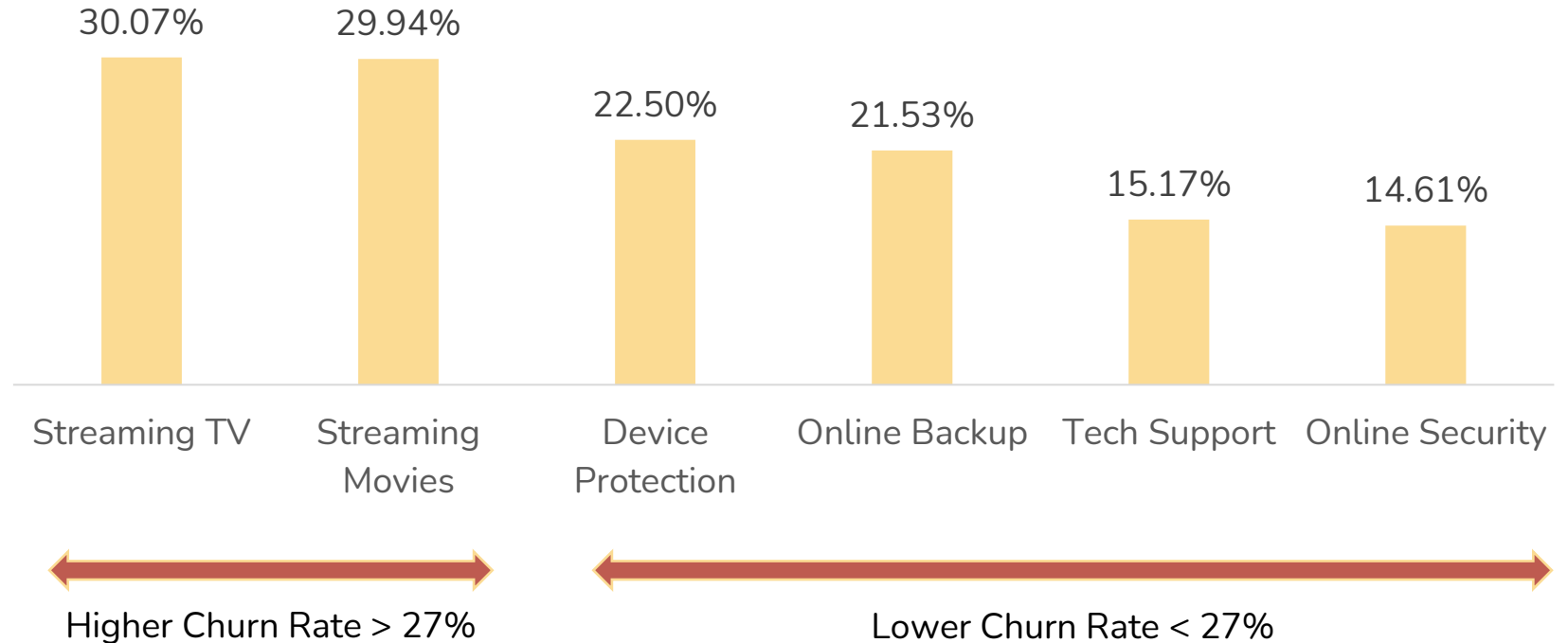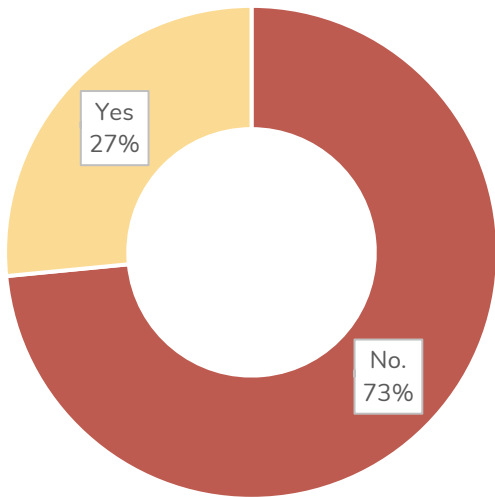
What Services are They Using ?

Phone Service

No, 682, 10%

Phone Service User, 6361, 90%

Internet Service

No, 1526, 22%

DSL, 2421, 34%

Fiber optic, 3096, 44%
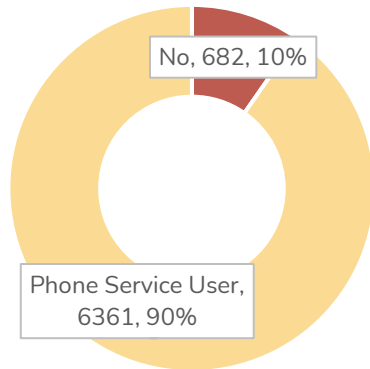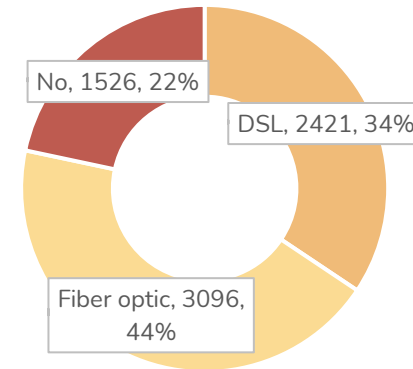
- In general, there are two products Phone Service and Internet Service
- 90% user using phone service
- 78% user using internet service with variance of product (44% Fiber Optic Internet and 34% DSL Internet)
- Let's say, we are more interested in analyzing internet services further

Churn Rate in each Internet Additional Services

Churn Rate In General

Yes
27%

No.
73%

30.07% — Streaming TV

29.94% — Streaming Movies

22.50% — Device Protection

21.53% — Online Backup

15.17% — Tech Support

14.61% — Online Security

Higher Churn Rate > 27%

Lower Churn Rate < 27%

- Some additional services tend to have lower churn rate, streaming services tend to have higher churn rate

- As if some factor have huge impact on decreasing churn. We have to becarefull because, the condition of the data may not be homogenous

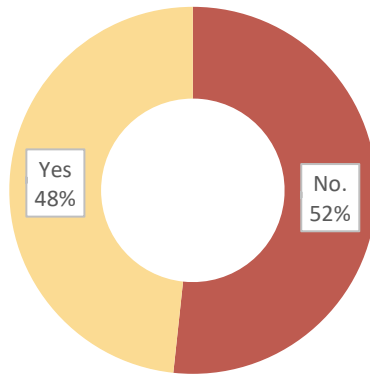- The effect may not be pure because another varible such as demographic and tenure in play

Telco Company User Profile
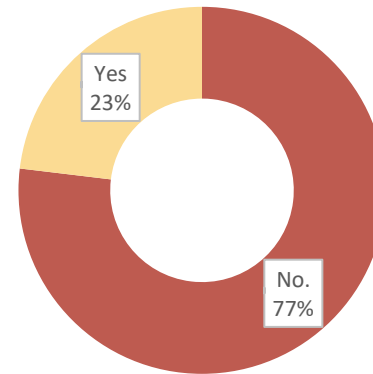
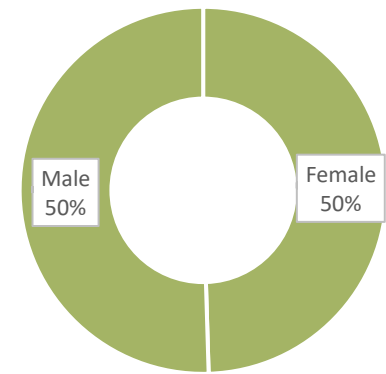Dominated by Junior Citizen and People without Dependents

Senior Citizen ?

Yes 16%

No. 84%

Partner ?

Yes 48%

No. 52%

Dependents ?

Yes 23%

No. 77%

Gender ?

Male 50%
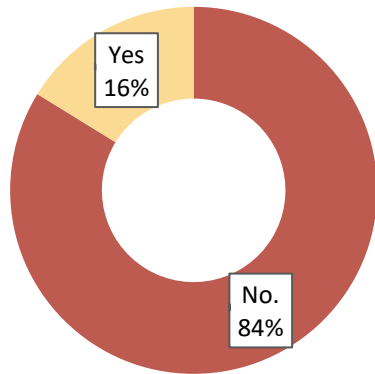
Female 50%
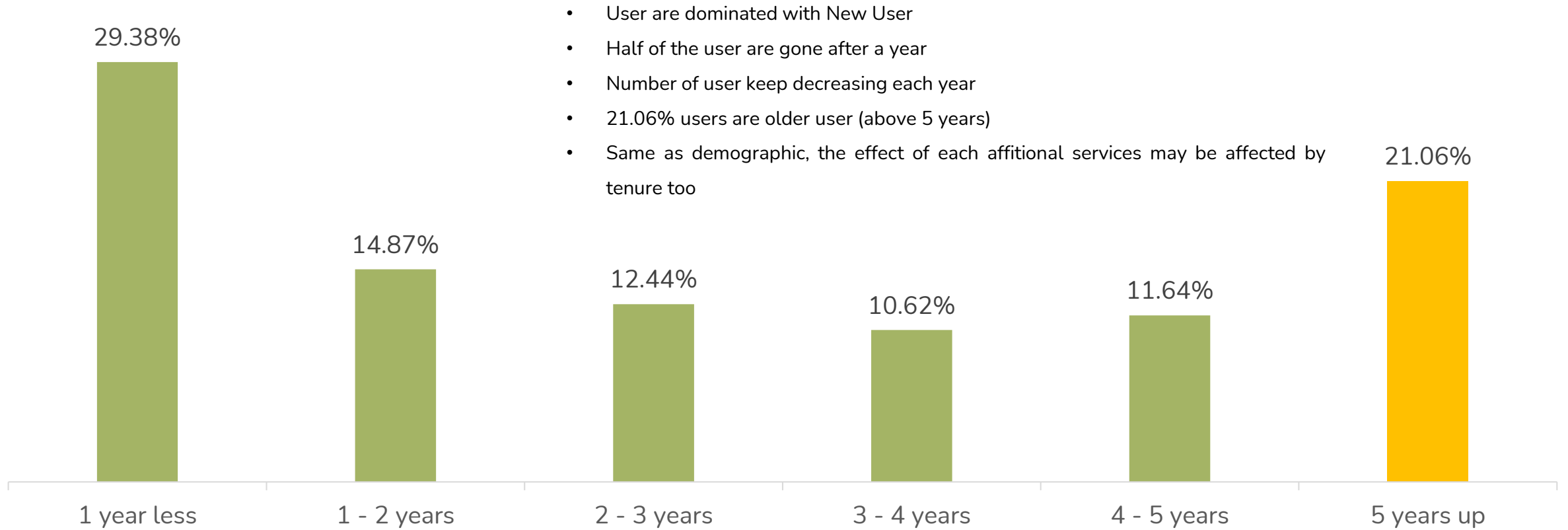
- Most User are Junior Citizen and also Without Dependents

- Half of them are whether with or without partner

- Half of them are whether male or female

- The effect of each affitional services may be affected by these factors

# How Long Have They been Subscribe ?

- User are dominated with New User
- Half of the user are gone after a year
- Number of user keep decreasing each year
- 21.06% users are older user (above 5 years)
- Same as demographic, the effect of each affitional services may be affected by tenure too

29.38%
14.87%
12.44%
10.62%
11.64%
21.06%

1 year less | 1 - 2 years | 2 - 3 years | 3 - 4 years | 4 - 5 years | 5 years up

Causal Inference : Propensity Score Matching

WHAT IS PROPENSITY SCORE MATCHING ???

Propensity score matching attempts to **balance the treatment groups** on confounding factors to **make them comparable**. This allows users to draw conclusions about the **causal impact** of a treatment on the outcome using observational data.

Source : https://builtin.com/data-science/propensity-score-matching
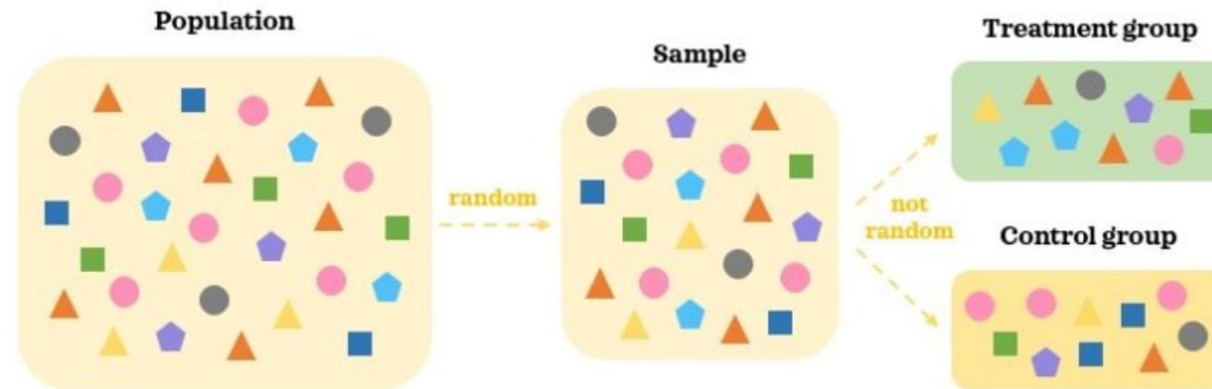
Observational data overview. | Image: Zolzaya Luvsandorj

Online Security Compostion
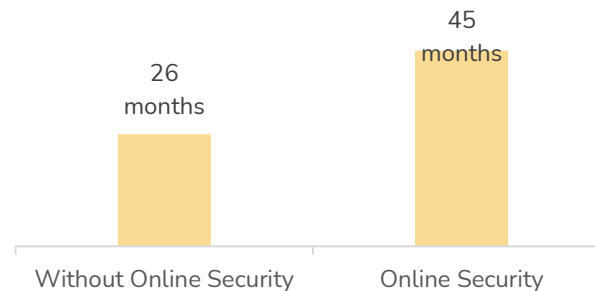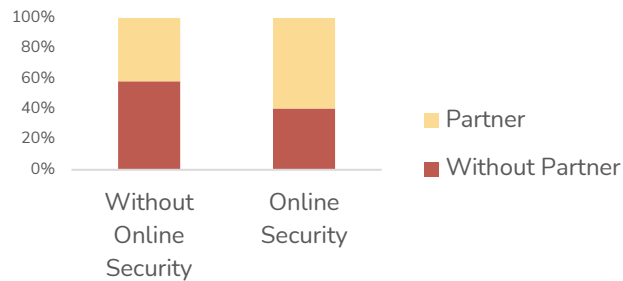
- Data composition is not homogenous
- Online security user and without online scurity user has different profile in : senior citizen, partner, dependent, internet services and tenure

Online Security Effect

Churn Rate	Churn Rate in Online Security
27.00%	14.61%

Churn Rate in Diffent on Data	Estimated of True effect on churn rate
-12.39%	-8.90%

- Churn Different in 27 – 14.61 % = 12.39%

- True Effect based on Propensity Score Matching : - 8.90%

- Online Security usage can decrease churn rate around 8.90%

Online Backup Compostion
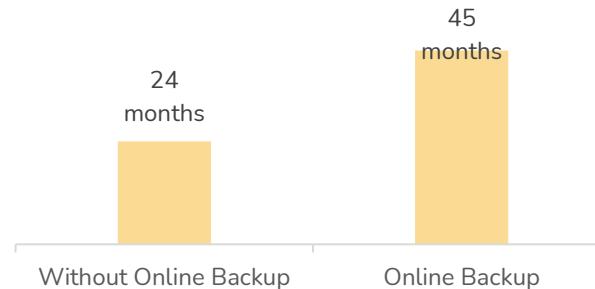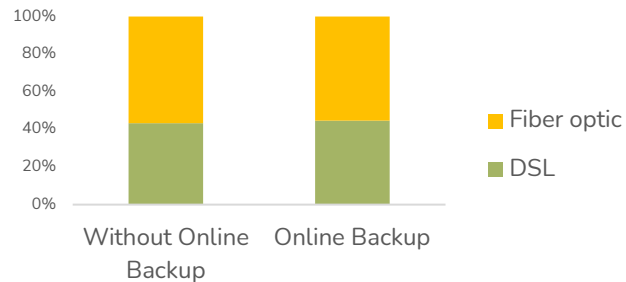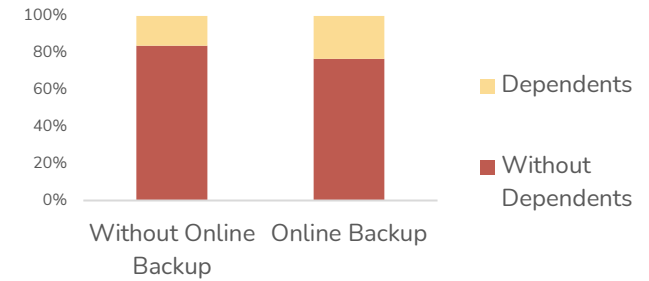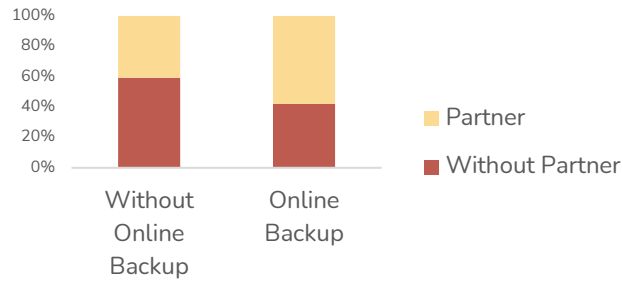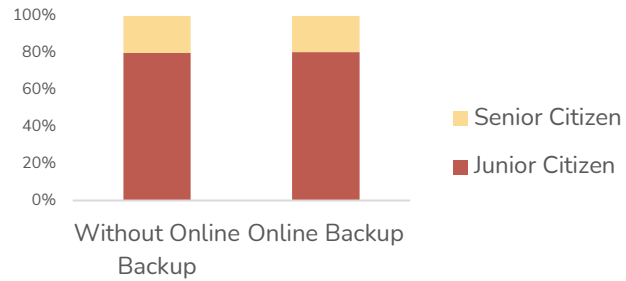
- Data composition is not homogenous

- Online security user and without online scurity user has different profile in : partner, dependent, internet services and tenure

Online Backup Effect

Churn Rate	Churn Rate in Online Backup
27.00%	**21.53%**

Churn Rate in Diffent on Data	Estimated of True effect on churn rate
-5.47%	**Insignificant**

- Churn Different in 27 – 21.53 % = 5.47%

- True Effect based on Propensity Score Matching : insignificant

Device Protection Compostion
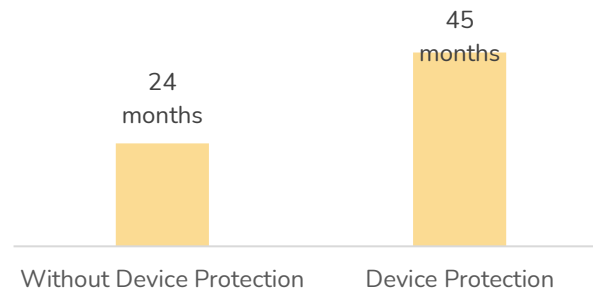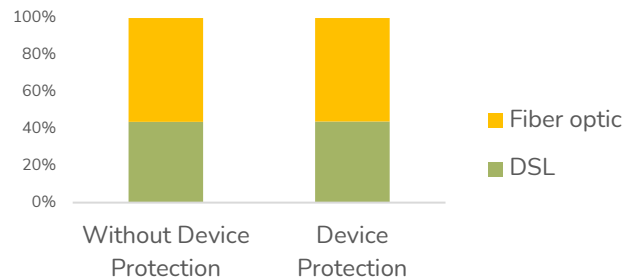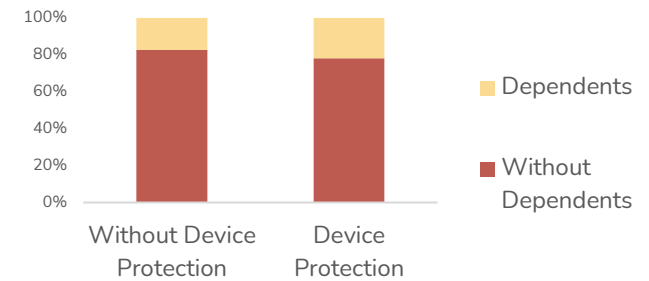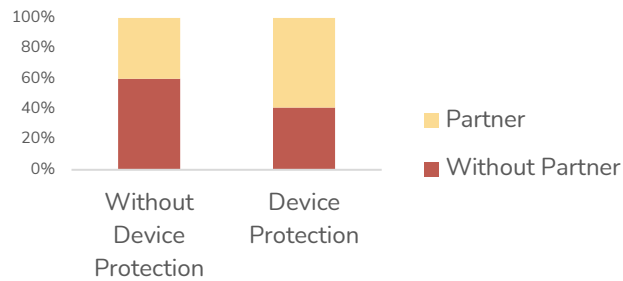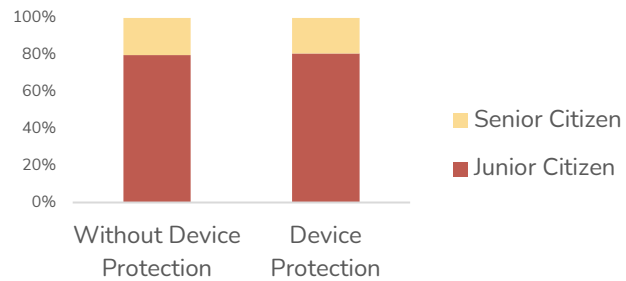
- Data composition is not homogenous

- Online security user and without online scurity user has different profile in : partner, dependent, and tenure

Device Protection Effect

Churn Rate	Churn Rate in Device Protection
27.00%	**22.50%**

Churn Rate in Diffent on Data	Estimated of True effect on churn rate
-4.5%	**Insignificant**

- Churn Different in 27 – 22.50 % = 4.5%

- True Effect based on Propensity Score Matching : insignificant

Tech Support Compostion
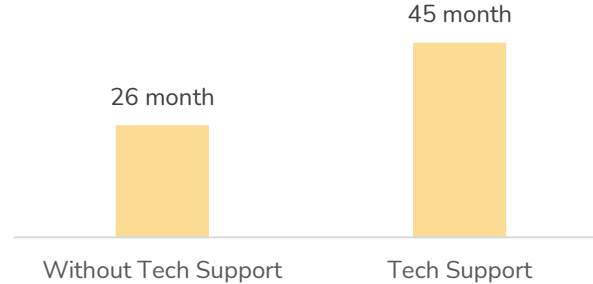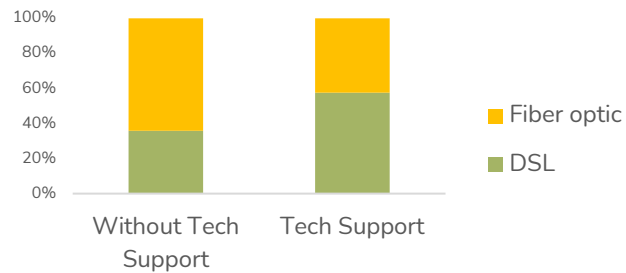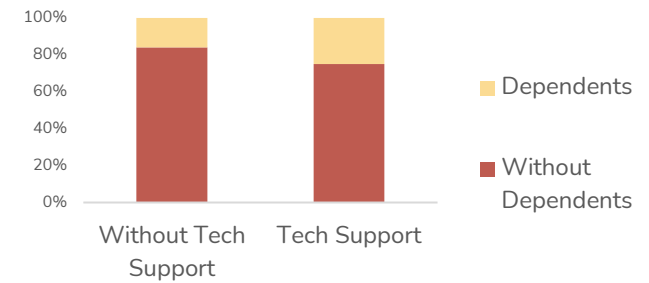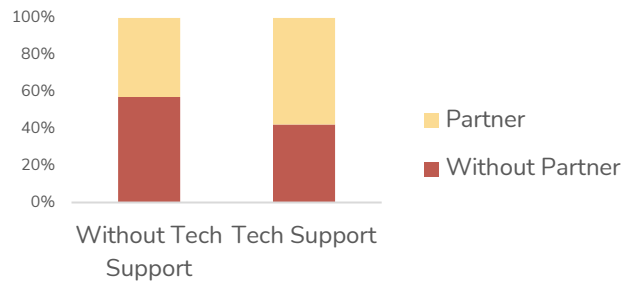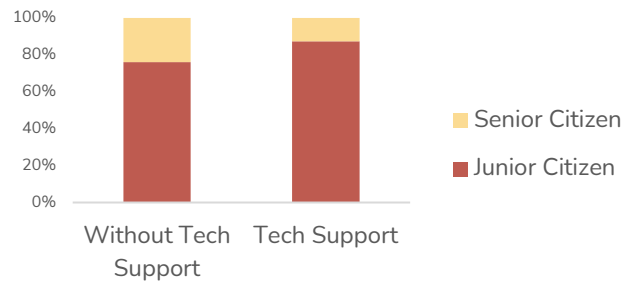
- Data composition is not homogenous
- Online security user and without online scurity user has different profile in : senior citizen, partner, dependent, internet service and tenure

Tech Support Effect

Churn Rate	Churn Rate in Tech Support
27.00%	**15.16%**

Churn Rate in Diffent on Data	Estimated of True effect on churn rate
-11.84%	**-8.90%**

- Churn Different in 27 – 15.16 % = 11.84%

- True Effect based on Propensity Score Matching : - 8.90%

- Tech Support usage can decrease churn rate around 8.90%

Conclusion

Additional Internet Service Effect on Churn

So, How much Additional Services Decrease Churn Rate ?

Answer:

- Online Security usage can decrease churn rate around 8.90%

- Tech Support usage can decrease churn rate around 8.90%

- Online backup and device protection didn't affect churn significantly