



Does Migration Exacerbate Domestic Labor Supply in Healthcare?

Presentation by Yaksh Ujoodha. Check out the Tableau Dashboard [here.](#)



Why study healthcare economy?

- Healthcare economy is massive and expensive.
- Health is a major source of uncertainty and risk.
- Governments are deeply involved in financing healthcare systems.



Why is labor supply in healthcare important?

- Labor accounts for the largest portion of expenditure in many health systems.
- High demand for healthcare due to aging population could lead to a shortage problem.
- Not enough access to healthcare and price of healthcare will become increasingly expensive.

10 million more health workers

are needed by 2030, primarily in low and lower-middle income countries

[Learn more](#)



**Hypothesis: Migration leads to
lower domestic labor supply.**



Data Collection

- Data was collected from OECD Statistics.
- The analysis is done through 24 OECD countries out of 38 OECD member countries.
- The data is originally a time series data. The year 2019 was chosen as it is before COVID-19 pandemic and recent enough.
- Data was easy to access.



Characteristics of OECD countries

- Most OECD countries are high income countries.
- Most OECD countries have high Human Development Index (HDI).
- These could be potential countries attracting lots of immigrants.



Literature Review

Gross, Dominique M. (2014). *Temporary Foreign Workers in Canada: Are They Really Filling Labour Shortages*. Commentary 407. Toronto: C.D. Howe Institute.

Organization for Economic Co-operation and Development. (2010.) *International Migration Of Health Workers*. Policy Brief. France: Paris

Lots of other research materials available on the Internet.



Tableau Dashboard

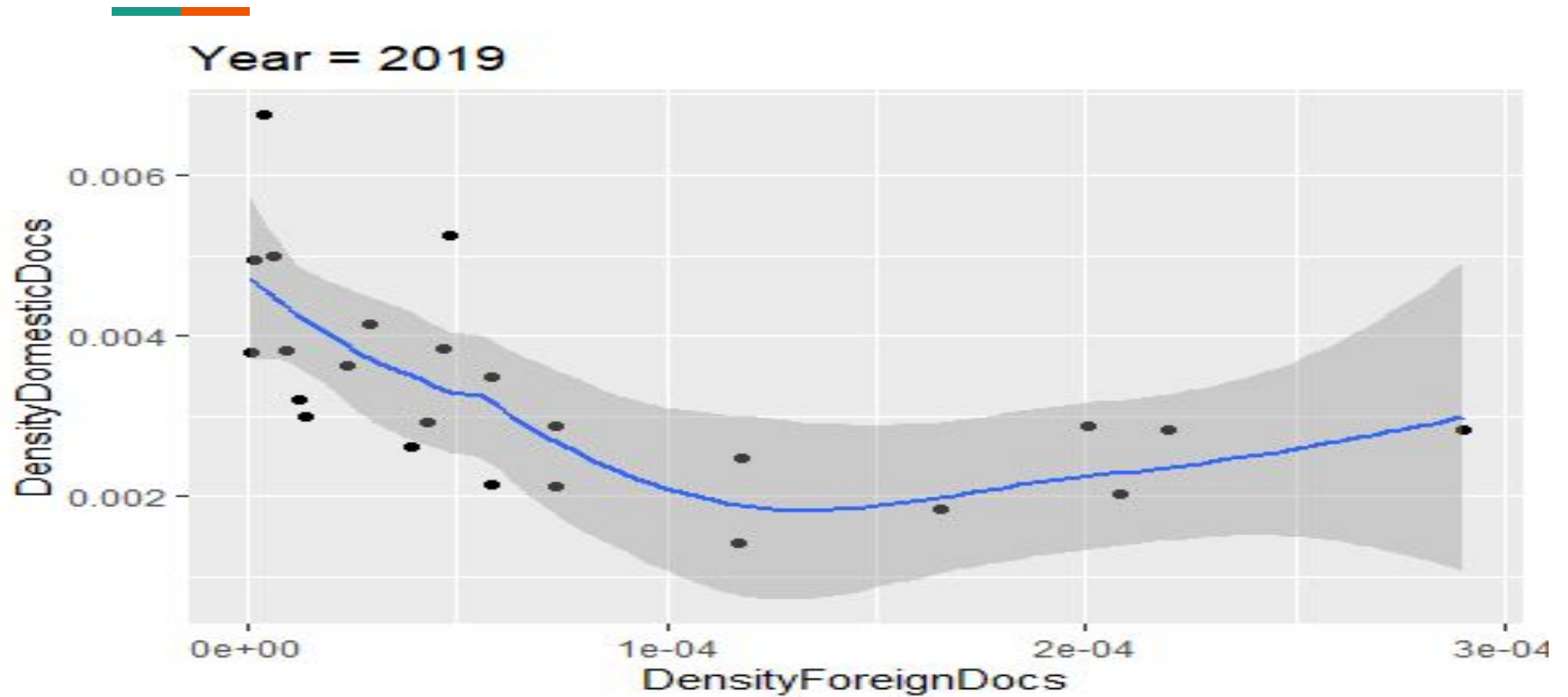
Tableau dashboard can be found [here](#).



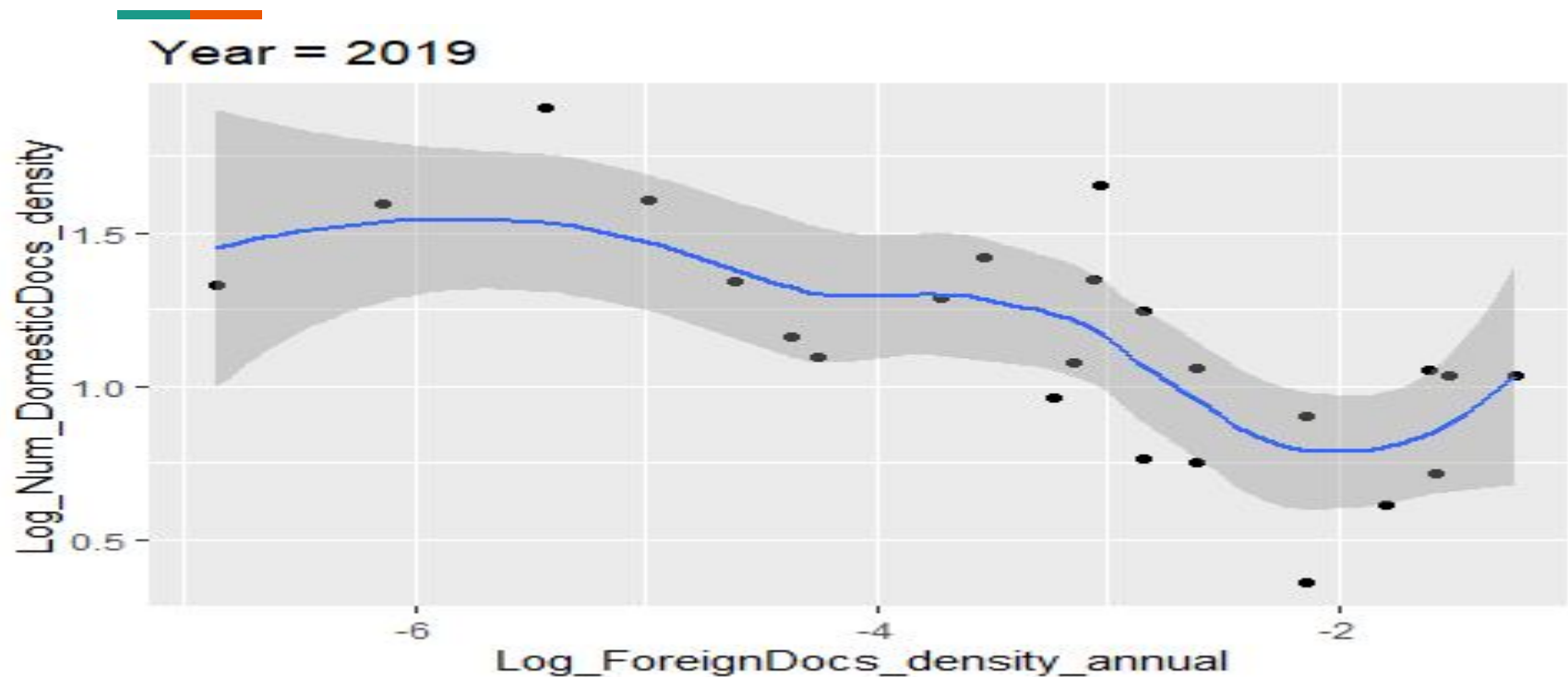
Proposed Regression Model

$\text{Log}(\text{Number of Domestic Doctors Per 1000 people}) = \beta_0 +$
 $\beta_1 \text{Log}(\text{Number of Foreign Doctors Per 1000 people}) +$
 $\beta_2 \text{Log}(\text{GDP Per Capita}) + \beta_3 \text{Log}(\text{Health Spending as share of GDP}) +$
 $\beta_4 \text{Number of Medical Graduates Per 1000 people} +$
 $\beta_5 \text{Binary Gov Or Compulsory Health Insurance Coverage above 95\%} +$
 $+ u$

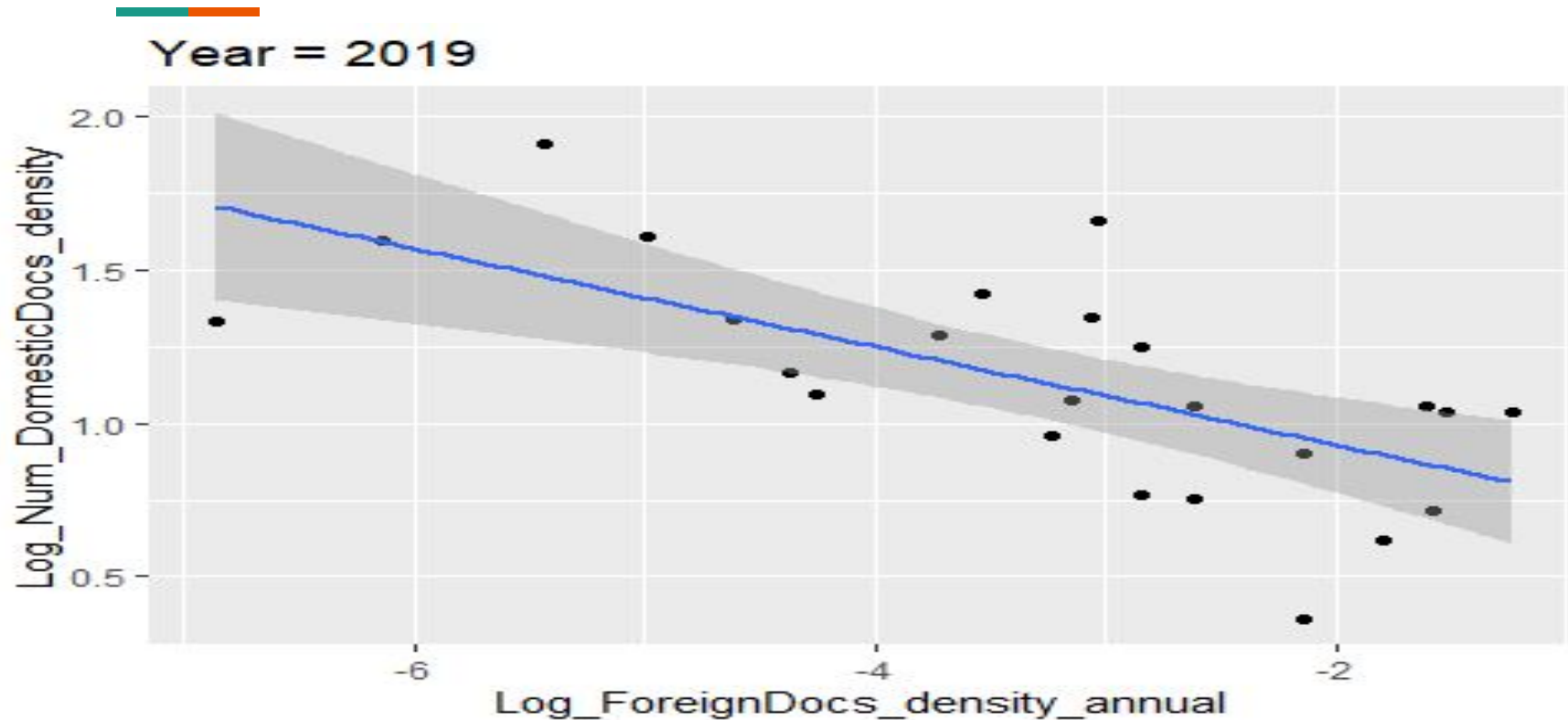
Trends in the data



Trends in the transformed variables



Fitting linear model with no control variables

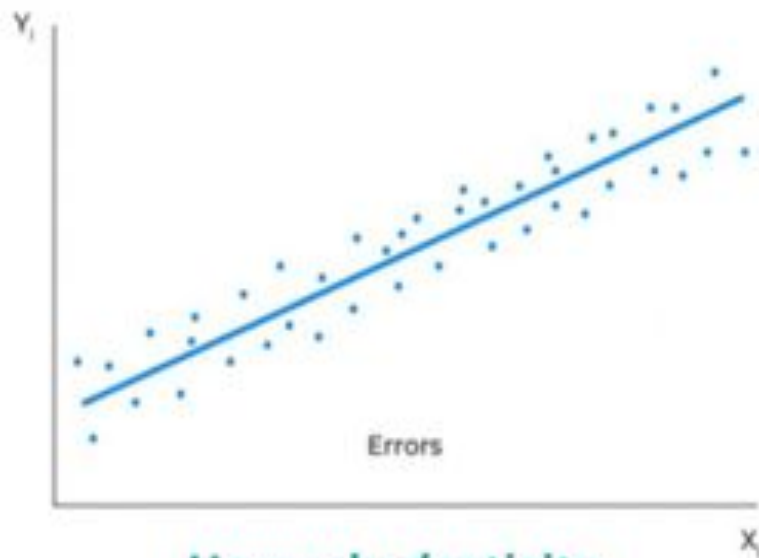




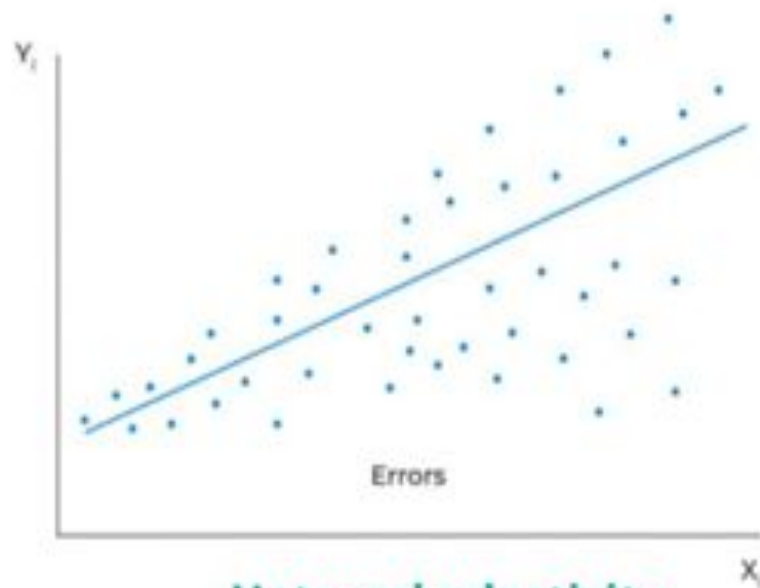
Results of Multiple Linear Regression Model

Coefficients	Estimate	Std. Error	t value	Pr(> t)	Sign level
Intercept	-7.32491	2.47489	-2.960	0.00839 **	0.1%
ForeignDocs	-0.21647	0.04237	-5.108	7.35e-05 ***	0%
GDPperCapita	0.60879	0.24844	2.450	0.02472 *	1%
HealthSpend	0.53387	0.33600	1.589	0.12949	Close to 10%
MedGraduates	2.08480	1.37657	1.514	0.14727	Close to 10%
BinaryHIC	-0.30707	0.16621	-1.847	0.08118 .	5%

Heteroskedasticity



Homoskedasticity



Heteroskedasticity

- Heteroskedasticity is an unequal scatter of the residual in comparison to measured values.





Using Breusch-Pagan Test to test for heteroskedasticity

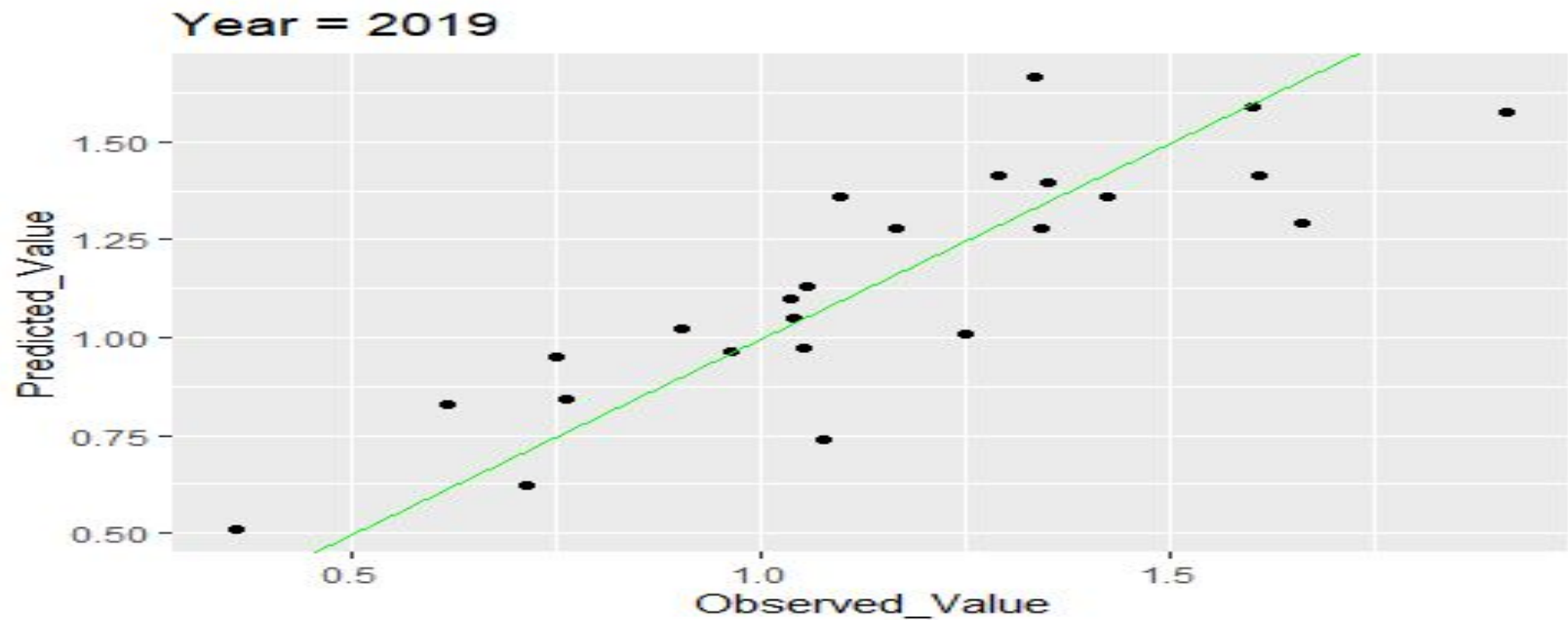
- This is a Chi-square test.
- Null hypothesis is that model is homoskedastic. Variance is constant.
- Running the test in R: Test-statistic = 6.2924, df = 5
- P-value = 0.2788
- DO NOT reject the null hypothesis. Model is Homoskedastic.



Other Statistics

- Adjusted R-Square: 0.6512
- Global F-Statistic: 9.587, P-Value = 0.0001
- This shows that together all explanatory variables are jointly significant. Has an effect on dependent variable.

Accuracy of the Model





Interpretation of Coefficients

A 1% increase in Number of Foreign Doctors Per 1000 people leads to 0.22% decrease in number of domestic doctors per 1000 people.

Keeping all other explanatory variables constant.



Limitations

- More data points would lead to better estimates.
- Omitted Variables in the regression model.
- Zero Conditional Mean Assumption might not hold. Which means that the explanatory variable is correlated with the error term/unobserved factors.
- Model cannot validate causality.



Conclusion

- In the long run, receiving countries should focus on investing in training and education pipeline of healthcare workers at domestic level.
- In the long run, source countries should invest more in providing better working opportunities to retain workers and decrease migration.
- In the short run, countries should collaborate together to design migration policies which benefit receiving and source countries. For example implement policies which promote circular migration.

**Thank you for your attention.
Do you have any questions?**
