DEPARTMENT OF FINANCE

PRESENTS
2019

RESEARCH SYMPOSIUM

5th Floor Finance Admistrative Centre

Point Seraphine

14TH AND 15TH OCTOBER 2019

SYMPOSIUM SCHEDULE

DAY 1

11:30am	PRAYERS
11:40am	WELCOME REMARKS
11:45am	KEYNOTE ADDRESS
12:00am -12:30pm	POSTER PRESENTATIONS
12:30am - 1:30pm	LUNCH
1:30pm - 3:00pm	MONETARY/FINANCIAL SECTOR
3:00pm - 3:15pm	COFFE BREAK
3:15pm - 4:30pm	SUSTAINABLE DEVELOPMENT

Day 2

9:00 -10:00 am	POSTER PRESENTATIONS
10: 00 – 10:30am	BREAK
10:30 – 12:00 am	REAL/FISCAL SECTOR
12:00 – 1:00 pm	LUNCH
1:00 – 2:15pm	EDUCATION
2:15 – 3:30 pm	HEALTH
3:30 – 3:45	COFFE BREAK
3:45 – 4:30	INNOVATION

Theme: "Research, the Platform for Innovation, Competitiveness and Growth"

Guest Speaker Profile

Dr. Sonia Alexander is a graduate of the University of the West Indies; she holds a Ph.D. in Public Health from the UWI, Mona Campus. She is a Master Certified Health Education Specialist (MCHES) and a Master Trainer.

Dr. Alexander's employment history details her work with the Ministries of Health in Jamaica, Trinidad and Tobago and Saint Lucia in various capacities. In 2004 she was granted the Principal's Fellowship at UWI, Mona campus where she worked as a Research Fellow for two years in the Community Health department of the Medical Science faculty. Prior to that, in August 2000 she was awarded the prize for "Best Student Presentation" at the UWI Medical Faculty, annual research day conference with a presentation entitled "Oral health status of 12 year old children in Saint Lucia and its association with knowledge, attitudes and practices". Dr. Alexander was employed with the government of Saint Lucia for approximately 25 years and retired from the post of Director of the National AIDS Program of Saint Lucia in 2010.

After retirement, Dr. Alexander has been engaged by various international, regional and national agencies as a public health consultant. Consultancies include:

1. Long Term Technical Associate for Saint Lucia and the OECS on the Regional Stigma and Discrimination Unit; for two years
2. Long Term Technical Advisor on the Department For International Development, United Kingdom Overseas Territories (6 countries) HIV and AIDS Project; for two years
3. Reviewing and updating the Maternal and Child Health Manual for the Commonwealth of Dominica and production of a pocket guide to the Manual
4. Development of Standard Operating Procedures for HIV Monitoring and Evaluation – Ministry of Health, Saint Lucia
5. Evaluation of CARICOM PANCAP Regional Strategic Framework for HIV and AIDS in the region; 2008-2012
6. Completion of the National Strategic Plan for HIV and AIDS for the Ministry of Health, HIV and AIDS Unit Guyana
7. Writing the Implementation Completion Report for the HIV and AIDS Prevention and Control World Bank Project for Saint Lucia
8. Writing the Implementation Completion Report for the Ministry of Education, Saint Lucia; OECS Skills for Inclusive Growth World Bank project.

Research projects include:
1. HIV Care Givers research Saint Lucia (A UNIFEM Project),
2. Most At Risk Populations (MARPS) Mapping Exercise of service delivery in five Caribbean Countries, a PANCAP and UNFPA project
3. Caribbean Institute for Women in Leadership research project - Women and Politics in Saint Lucia, (UN Women funded)
4. Ministry of Health, Saint Lucia – Research on Measles, Mumps and Rubella, (Pan American Health Organization funded), 2015
5. Ministry of Health, Saint Lucia – research on Sickle Cell Disease, (Pan American Health Organization funded), 2016
6. "People Living with HIV Stigma Index Survey", CARICOM, Pan Caribbean Partnership against HIV and AIDS (PANCAP), research project 2018

Publications:

Dr. Alexander has several publications in peer reviewed journals including: The West Indian Dental Journal, The International Journal of Gynecology and Obstetrics and the Pan American Journal of Public Health.

Presently, she is employed as the Dean of Academics, Monroe College, Saint Lucia Campus, and also functions in the region as a Public Health Consultant.

SESSION 1: MONETARY/FINANCIAL SECTOR
1:30Pm-3:00pm

CHAIRPERSON: Javan Lewis

DISCUSSANTS: Calixte Leon
Dr. Thomas Samuel
Larry Andrew
Ronald James

Determinants of Deposit Growth in Saint Lucia
Kimbert Evans

Impact of Remittance Flows on the OECS Economies
Tommy Descartes

Did VAT Cause a Lowering of Consumer Prices
Bill Monrose

Determinants of the Adoption of Electronic Payments in the ECCU – Panel Data Evidence
Martina Regis

COFFEE BREAK
3:00PM-3:15PM

SESSION 2: SUSTAINABLE DEVELOPMENT

CHAIRPERSON: Jilayne Clery-King
DISCUSSANTS: Janai Leonce
Marcathian Alexander
Jannel Gabriel
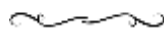
Eco Services Systems Valuations
Jannel Gabriel/Berthia Thomas

Assessing Long Term Planning Requirements for the Water Sector in Saint Lucia
Gemma Edwin/Alice Providence

Fiscal Risks Management: Natural Hazards in the Caribbean – Mainstreaming Disaster Risk Management (DRM)
Ronald James

POSTER PRESENTATION
9:00 – 10:00 AM

SESSION 3: REAL/FISCAL SECTOR
10:30 – 12:00pm

CHAIRPERSON:	Kimbert Evans
DISCUSSANTS:	Barry Innocent
	Tommy Descartes
	Phillip Dalsou
	Janai Leonce

The Significance of Climate Change Related Natural Disasters on Agriculture Production in Saint Lucia
Petriana Daniel

Does Saint Lucia Fuel Prices Mimic International Developments?
Jilayne Clery-King

An Investigation of Public Sector Project Implementation in Saint Lucia
Rosemary Pierre Louis

Taxes and the Demand For Intra-Regional Travel
Javan Lewis

LUNCH
12:00 – 1:00pm

SESSION 4: EDUCATION
1:00 – 2:15 pm

CHAIRPERSON:	Petriana Daniel
DISCUSSANT:	Joseph Janey
	Dr. Clarence Henry

Male Academic Underachievement in Tertiary Education
Dr. Maria Lashley

The Effects of Tactile Learning Strategies on Attitudes of Form 4 CCSLC Mathematics Students of a Secondary School in District 8
Pascalina Stanislas

Multi-dimensional Poverty Indicators
Jason Cotton

SESSION 5: HEALTH
2:15 – 3:30 pm

CHAIRPERSON: Myra Delice

DISCUSSANT: Dr. Gemma Chery

Social determinants of adherence and disease severity among people living with lupus in a small island developing state: a report from Saint Lucia, West Indies
Dr. Amanda King, Dr. Cleopatra Altenor, Ian Hambleton, Catherine Brown, Christina Howitt

People Living with HIV (PLHIV) Stigma Index Survey; the Case of Saint Lucia
Dr. Sonia Alexander and Department of Health

To Have or Not Have Private Health Insurance?
Janai Leonce

COFFEE BREAK
3:30 – 3:45 pm

SESSION 6: INNOVATION

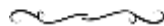**CHAIRPERSON:**   Rosemary Pierre Louis

DISCUSSANTS: Fiona Hinkson

Motivation, Innovation and Efficiency in the Workplace
Kurt Augustin

Innovation in Saint Lucia
Lennel Malzaire

CLOSING REMARKS
4:30 pm

Monetary and Financial Sector
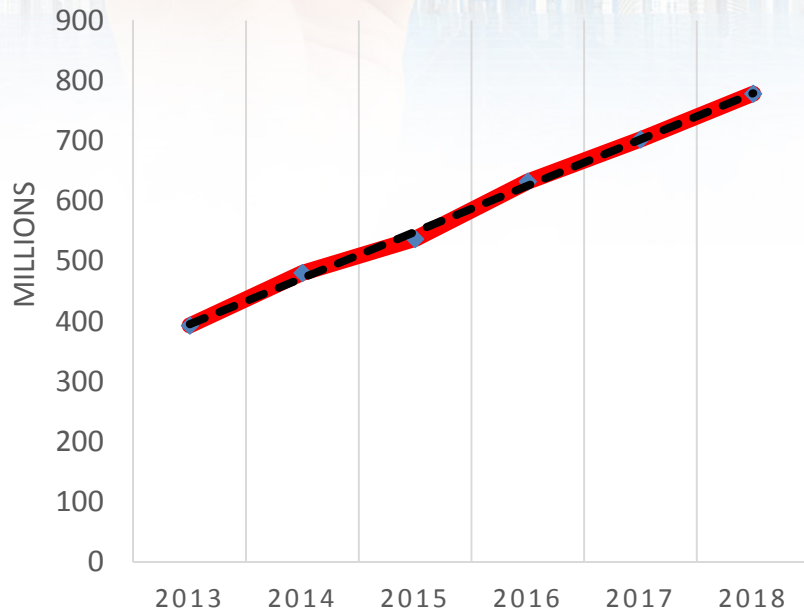
Session 1

Deposits in Saint Lucia

S1   make the line thicker... in addition the research question should not be the title here..this is the background or stylized facts....i would also include GDP growth here as well..to point toi despite the fall inGDP...deposit were increasing...

Sharm, 10/10/2019
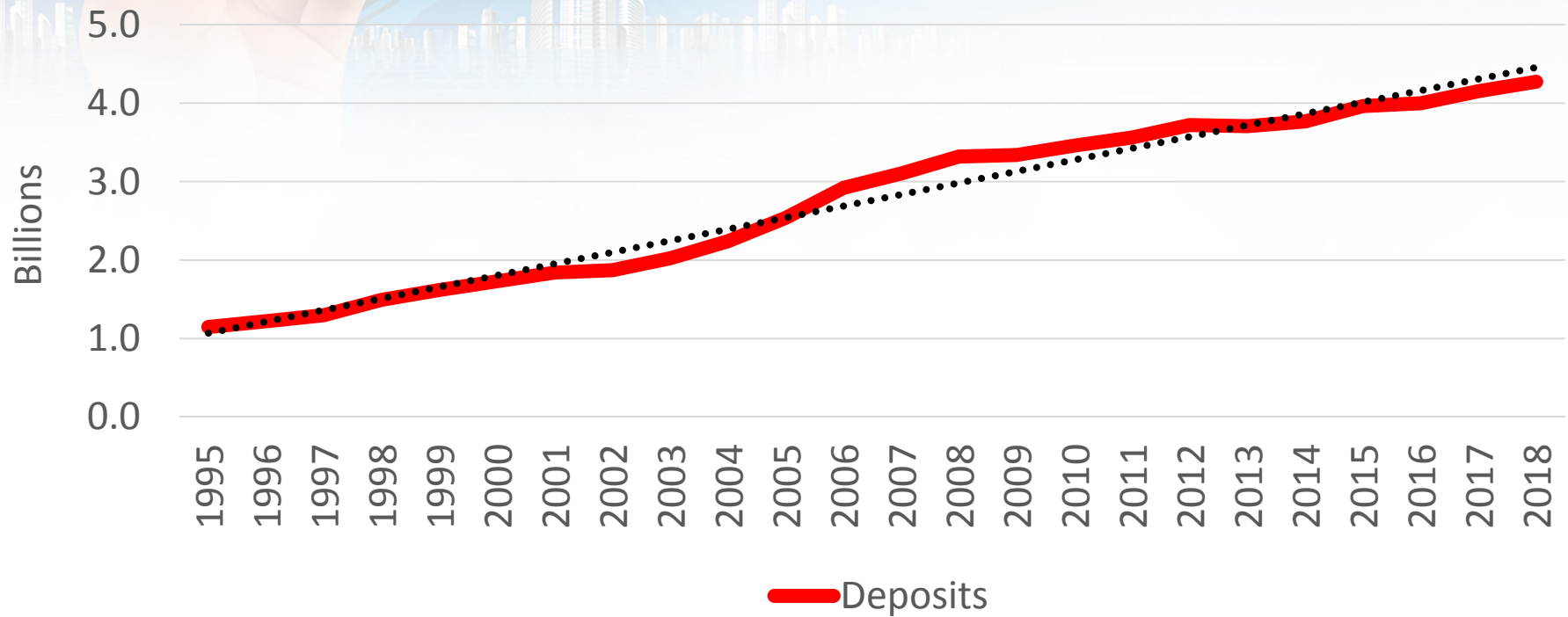
S1 make the line thicker... in addition the research question should not be the title here..this is the background or stylized facts....i would also include GDP growth here as well..to point toi despite the fall inGDP...deposit were increasing...
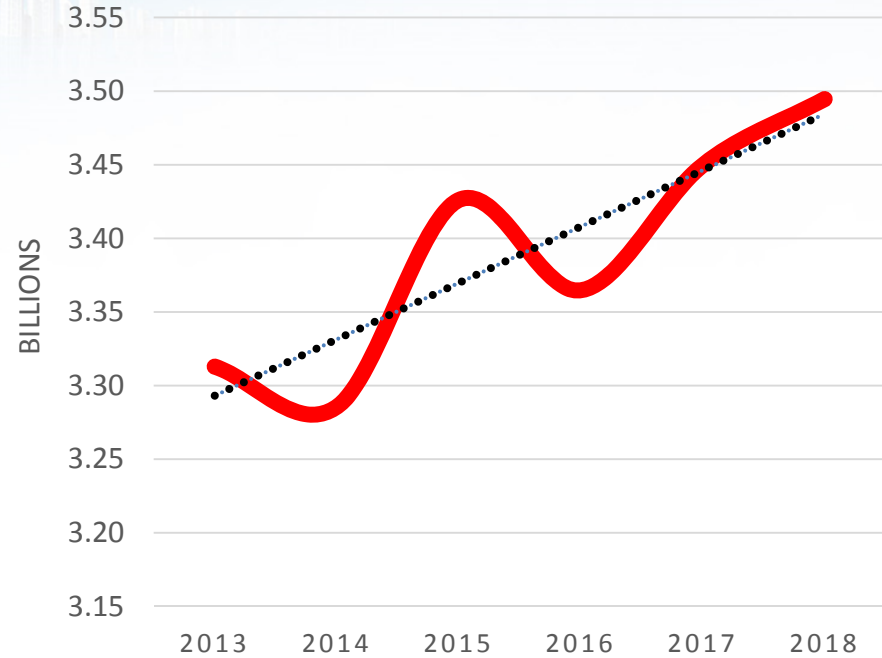
Sharm, 10/10/2019

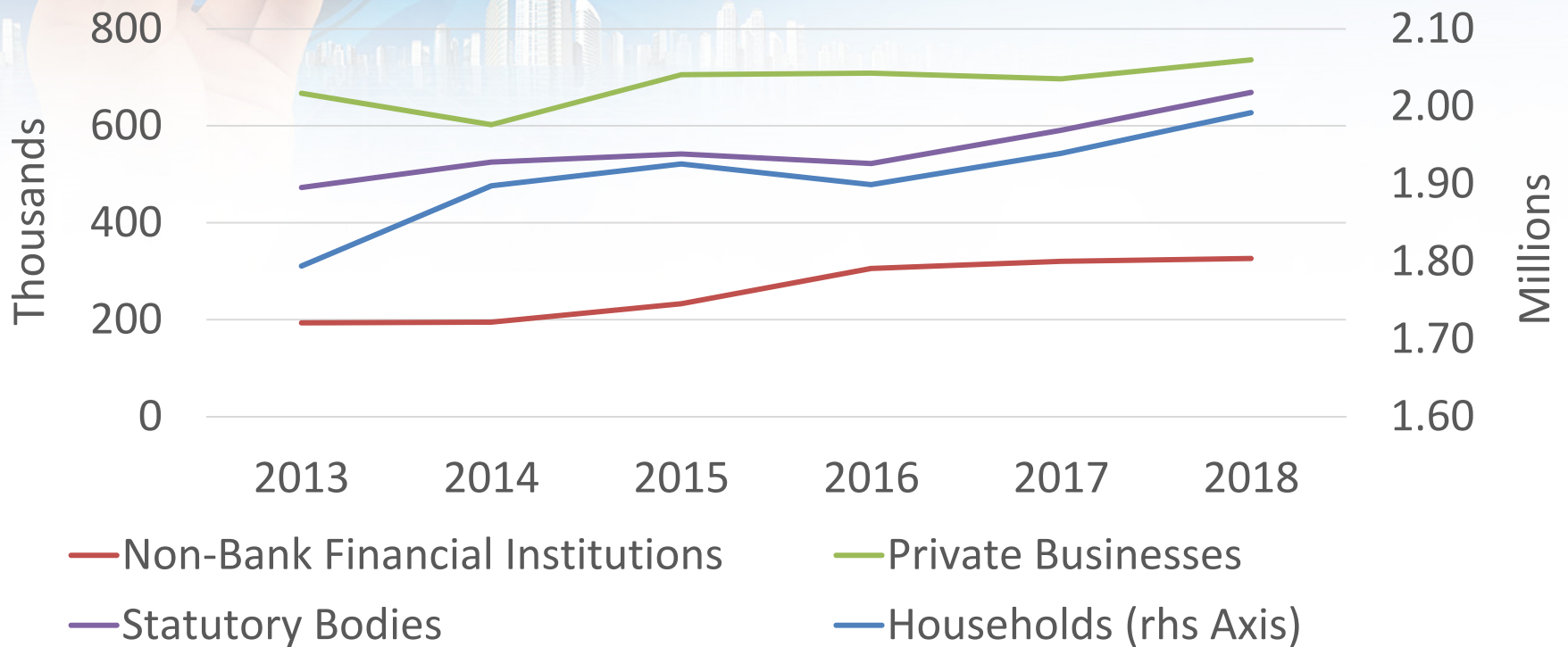Components to deposit growth (Cont'd)

S1   make the line thicker... in addition the research question should not be the title here..this is the background or stylized facts....i would also include GDP growth here as well..to point toi despite the fall inGDP...deposit were increasing...

Sharm, 10/10/2019

- Specific objectives of the study are to:
  - Identify and estimate a model to determine the factors which contribute to commercial banks deposit growth in Saint Lucia;
  - Evaluate the magnitude of each determinant of deposit growth in Saint Lucia; and,
  - Draw relevant policy recommendations.

Current Literature

Soyode and Oyejide (1975)
Positive and significant relationship between branch network and savings growth in Commercial banks in Nigeria.

Srinivasan and Meyer (1986)
Per capita income, bank density and real rate of interest were the main determinants of increasing deposits in India, Pakistan, Nepal and Sri Lanka.

Athukorala and Sen (2001)
Favourable interest rates, rate of economic growth, spread of banking facilities and inflation were positively correlated with increasing deposit rates in India.

Variables influencing GDP according to literature

S3

The State of the Economy

- Real GDP
- Corporate Income Tax
- Remittances

The Stability of the Economy

- Inflation

Monetary Factors

- Interest Rate

S3 theoretically how are each of these variables influence deposit

Sharm, 10/10/2019

- Autoregressive Distributive Lag (ARDL) bounds test approach:

  - Model does not require data series to be the same order of integration;

  - Model is best for small samples.

- Autoregressive Distributive Lag (ARDL) bounds test equation:

  - $DEP = \propto_0 \; + \propto_1 RGDP + \propto_2 INF + \propto_3 IR + \propto_4 REM + \propto_5 CIT + \; \varepsilon_{it}$

Results and Discussion

Short-run
- Real GDP(0.53%);
- Inflation (1.10%).

Long-run
- Real GDP;
- Inflation;
- Corporate Income Tax;
- Remittances;
- Interest Rate.

Answers to Research Question

Research Question

What are the determinants of deposit growth in Saint Lucia?

Answers to Research Question

- In the Short run: Real GDP. As GDP grows deposit rates increase.

- In the Long run: Real GDP, Corporate Income Taxes and remittances. As Real GDP, Corporate Income Taxes and remittances grow deposit rates increase

S2   this is way to early ….i need to understand why you have placed it here

Sharm, 10/10/2019

Policy Recommendations

Continue stimulating GDP.

Encourage investments with remitted funds.

Which will lead to an increase in Corporate Income Taxes.

Recap

Research Question:

What are the determinants of deposit growth in Saint Lucia?

In the Short run: GDP and Inflation.

In the Long run: GDP, Inflation, Corporate Income taxes, Remittances and Interest Rates.

Policy Recommendation: Short run – To influence deposit rates policies should be aimed at growth enhancing measures.

Long run – To influence deposits rates policies should be aimed at attracting remittances or encouraging investments with remitted funds which will lead to an increase in Corporate Income taxes.

THANK YOU!

The Impact of VAT Reduction on Food Prices in Saint Lucia

What was our aim?

1

✓ To determine the extent to which the VAT rate reduction from 15% to 12.5% impact consumer prices of food and beverages in Saint Lucia.

✓ To distinguish which types of goods saw increases and decreases in prices.

Largest-weighted Goods

Variable	Before VAT Reduction					After VAT Reduction				
	n	Mean	Std. Dev.	Min	Max	n	Mean	Std. Dev.	Min	Max
People's Choice Enriched Flour 2kg	25.00	2.87	0.03	2.82	2.93	25.00	3.04	0.05	2.89	3.07
Easy Bake 1kg	25.00	4.21	0.12	4.02	4.64	25.00	3.92	0.16	3.77	4.56
Easy Bake - Whole Wheat 1kg	25.00	4.70	0.37	4.35	5.54	25.00	4.38	0.09	4.21	4.52
Counter Flour 2lbs	25.00	2.00	0.00	1.99	2.00	23.00	2.00	0.01	1.98	2.04
Cornflakes (Kellogg's) 12 oz	25.00	13.64	0.35	13.12	14.30	25.00	19.25	4.68	13.08	23.99
Cornflakes (Sunshine) 12oz	25.00	7.46	0.04	7.37	7.57	22.00	7.17	1.26	1.90	9.41
Cornflakes (IGA) 18 oz	25.00	8.89	0.09	8.73	8.99	25.00	8.79	0.26	7.78	9.12
Cornflakes (Universal) 12oz	25.00	7.08	0.04	7.03	7.16	25.00	6.95	0.20	6.04	7.12
Cornflakes (Universal) 18oz	25.00	10.20	0.14	10.07	10.56	25.00	9.94	0.16	9.27	10.09

Table 1: Statistical data **two (2) years before and after** VAT reduction between largest-weighted food items

Largest-weighted Goods

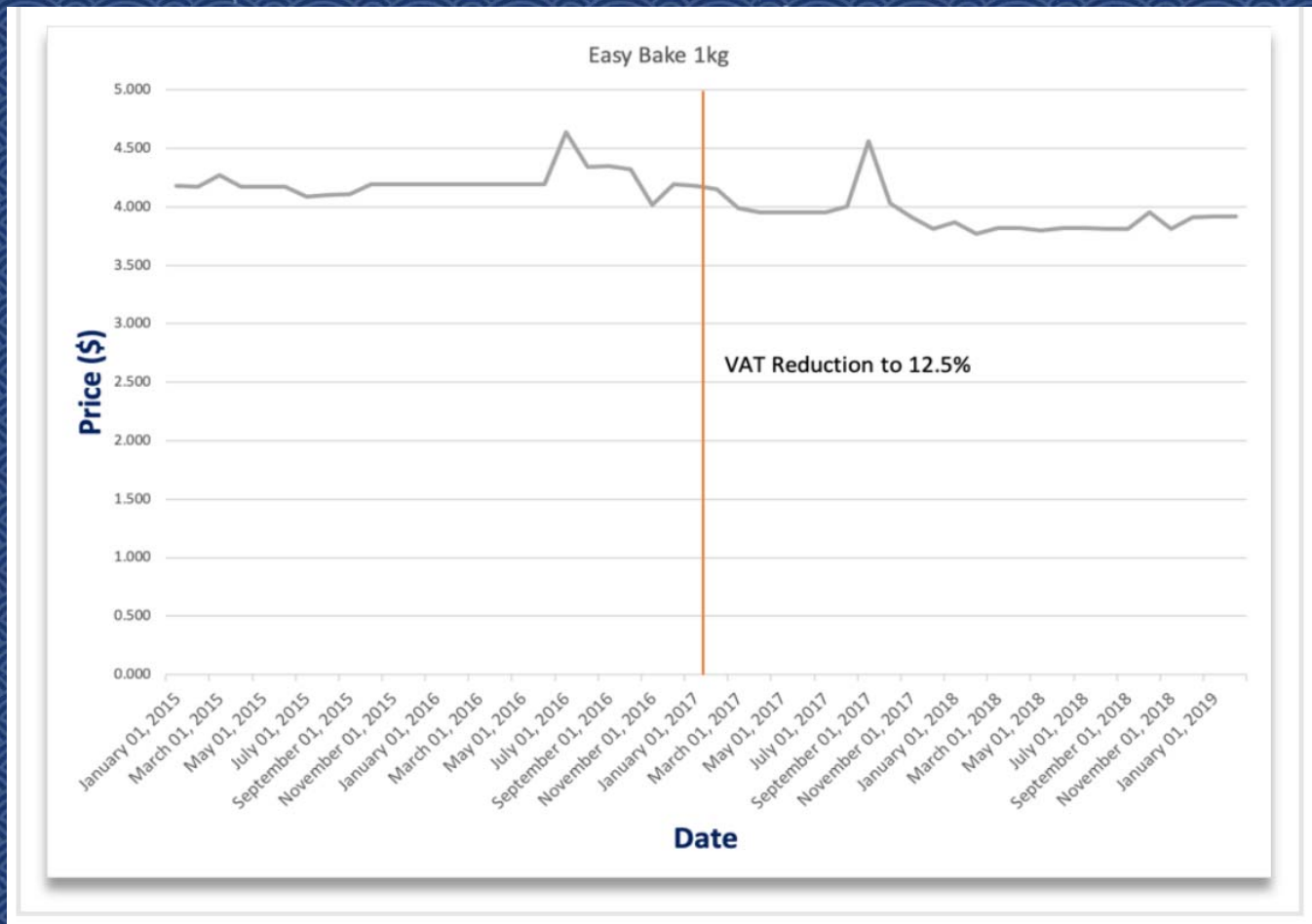| Variable	Before VAT Reduction					After VAT Reduction				
	n	Mean	Std. Dev.	Min	Max	n	Mean	Std. Dev.	Min	Max
People's Choice Enriched Flour - 2kg	6.00	2.90	0.02	2.89	2.93	6.00	2.99	0.08	2.89	3.04
Easy Bake - 1kg	6.00	4.23	0.13	4.02	4.35	6.00	3.99	0.08	3.95	4.15
Easy Bake - Whole Wheat - 1kg	6.00	4.66	0.46	4.35	5.54	6.00	4.28	0.05	4.22	4.32
Counter Flour 2lbs	6.00	2.00	0.01	1.99	2.00	6.00	2.00	0.01	1.98	2.00
Cornflakes (Kellogg's) 12 oz	6.00	13.25	0.14	13.12	13.43	6.00	13.19	0.06	13.08	13.26
Cornflakes (Sunshine) 12oz	6.00	7.50	0.05	7.44	7.57	6.00	7.37	0.01	7.35	7.38
Cornflakes (IGA) 18 oz	6.00	8.90	0.07	8.86	8.99	6.00	8.70	0.05	8.67	8.77
Cornflakes (Universal) 12oz	6.00	7.06	0.03	7.04	7.12	6.00	6.92	0.01	6.91	6.93
Cornflakes (Universal) 18oz	6.00	10.28	0.21	10.12	10.56	6.00	9.94	0.02	9.92	9.97

Table 2: Statistical data **six (6) months before and after** VAT reduction between largest-weighted food items
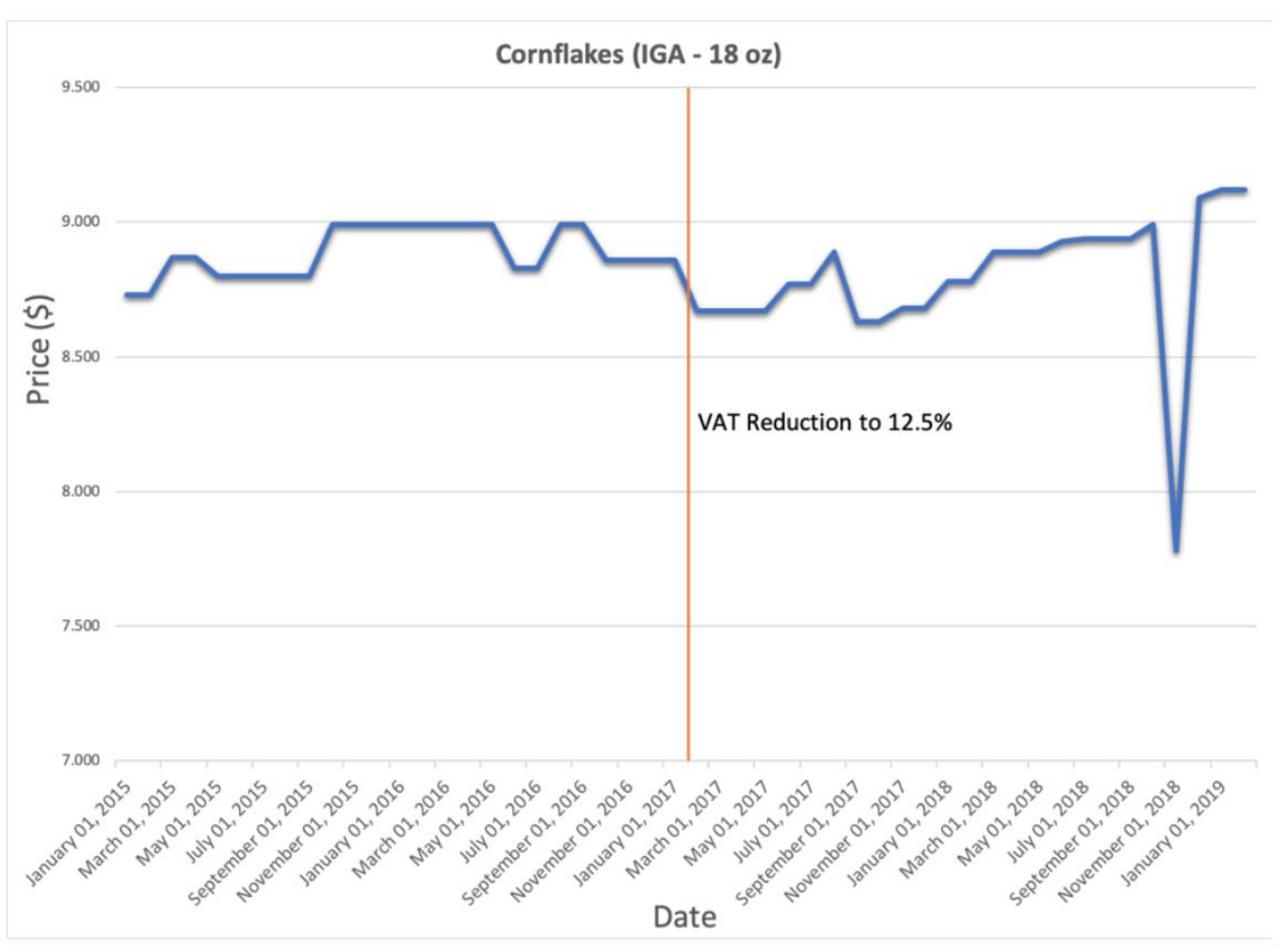
In this presentation, we will be using two (2) time periods:

VAT reduced from 15% to 12.5% from February 1, 2017.
Therefore we will be analyzing the prices six (6) months before and after the aforementioned date.
We will also be viewing the data one (2) year before and after VAT reduction.

Easy Bake 1kg

VAT Reduction to 12.5%

Cornflakes (IGA - 18 oz)

VATable vs Non-VATable Goods

	Variable	Before VAT Reduction					After VAT Reduction				
		n	Mean	Std. Dev.	Min	Max	n	Mean	Std. Dev.	Min	Max
Non-VATable	Macaroni Swiss Pasta 400g	25.00	3.14	0.05	3.02	3.22	25.00	3.25	0.05	3.14	3.31
	Nido Powered Milk 1800g	25.00	20.27	1.22	18.67	21.91	25.00	36.98	16.20	19.26	55.00
	Carib Pearl Long Grain Parboiled 400g	25.00	1.94	0.13	1.84	2.37	25.00	1.89	0.01	1.87	1.90
	Chicken Mixed Parts 1lb	25.00	4.51	0.18	4.25	4.75	25.00	4.46	0.14	4.22	4.69
	Chicken Neck Fresh or Frozen 1lb	25.00	2.75	0.08	2.58	2.86	25.00	2.56	0.16	2.32	2.77
VATable	Morning Coffee 150g	25.00	3.51	0.09	3.36	3.68	25.00	3.55	0.03	3.47	3.64
	Frozen Pork 1lb	25.00	8.82	0.25	8.29	9.19	25.00	8.34	0.39	7.69	8.90
	Lamb Neck 1lb	25.00	9.44	0.50	8.73	10.17	25.00	9.52	0.50	8.73	9.90
	Farmers Choice 200g	25.00	10.96	0.06	10.69	11.05	25.00	11.37	0.19	11.03	11.60
	The Chef Streaky Bacon 200g	25.00	8.74	0.17	8.32	8.97	25.00	8.63	0.10	8.45	8.75

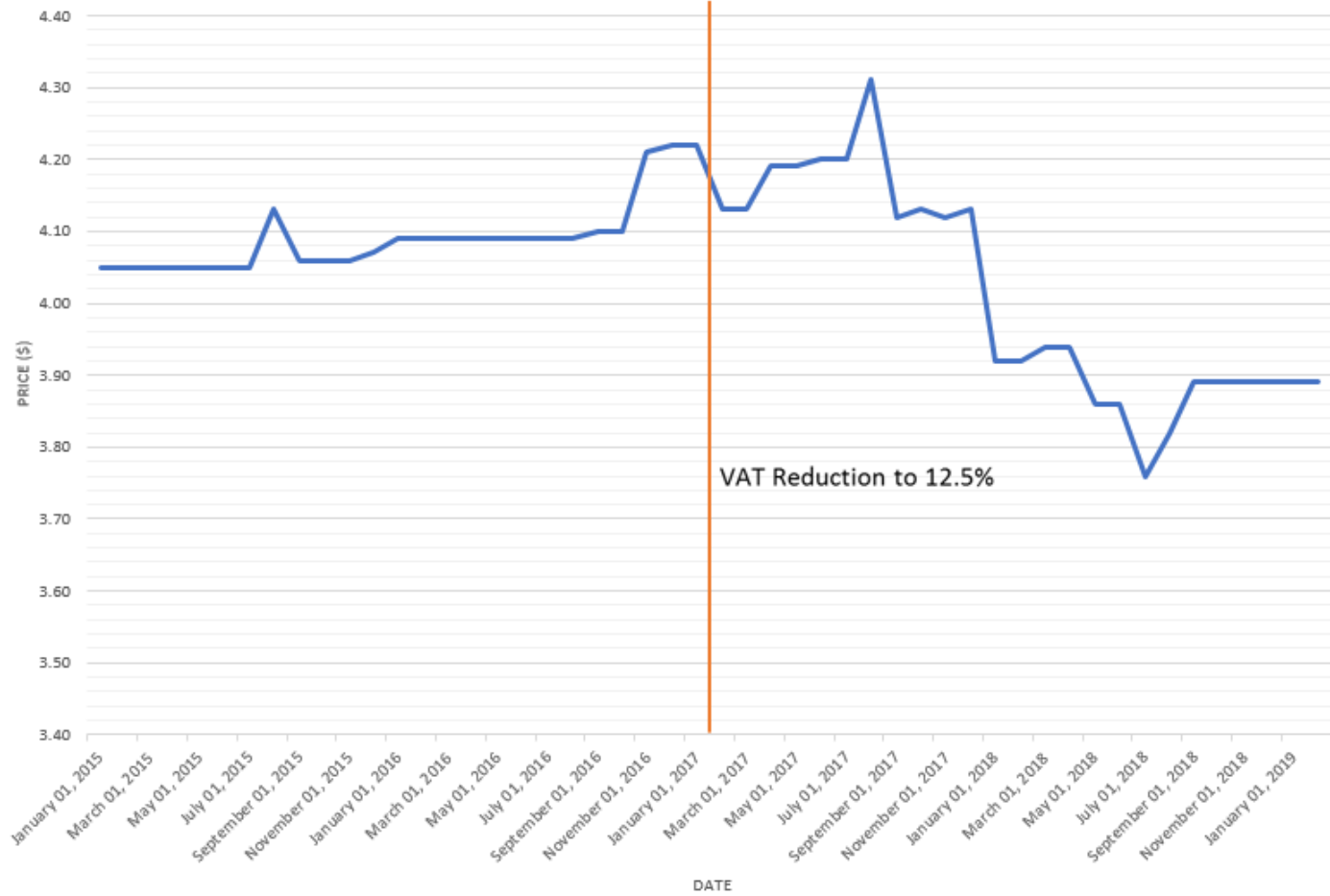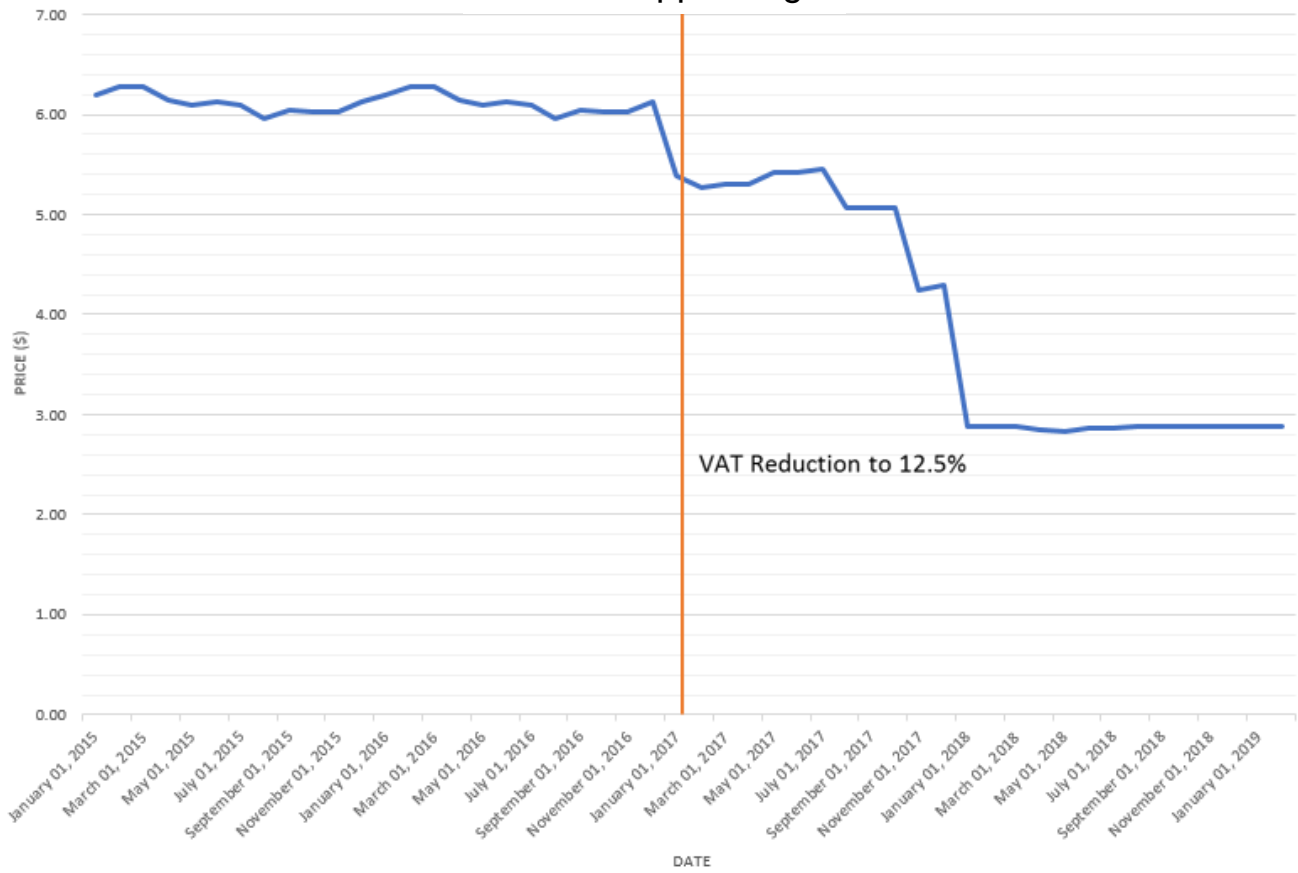Table 2: Statistical data before and after VAT reduction between VATable and Non-VATable food items
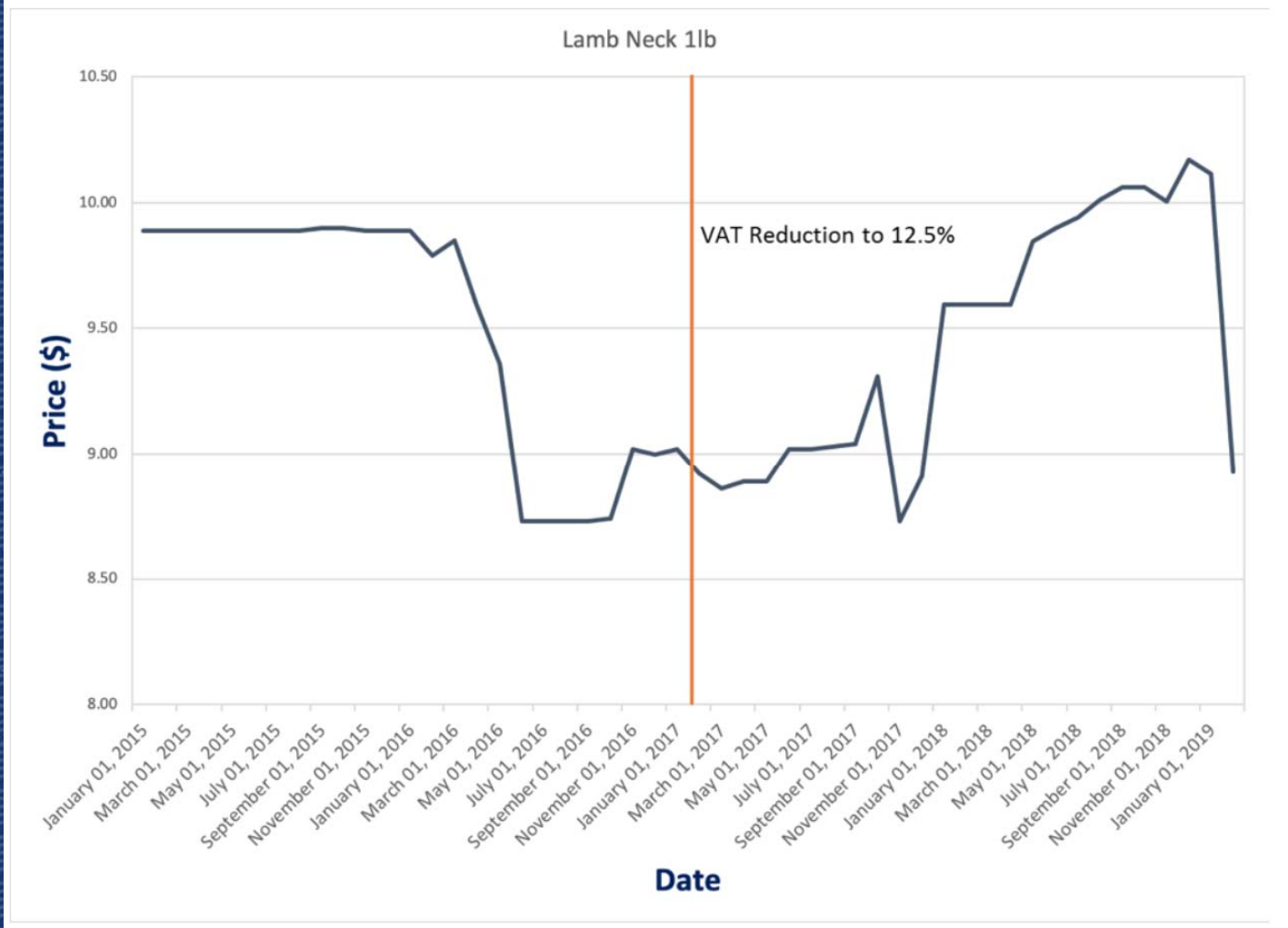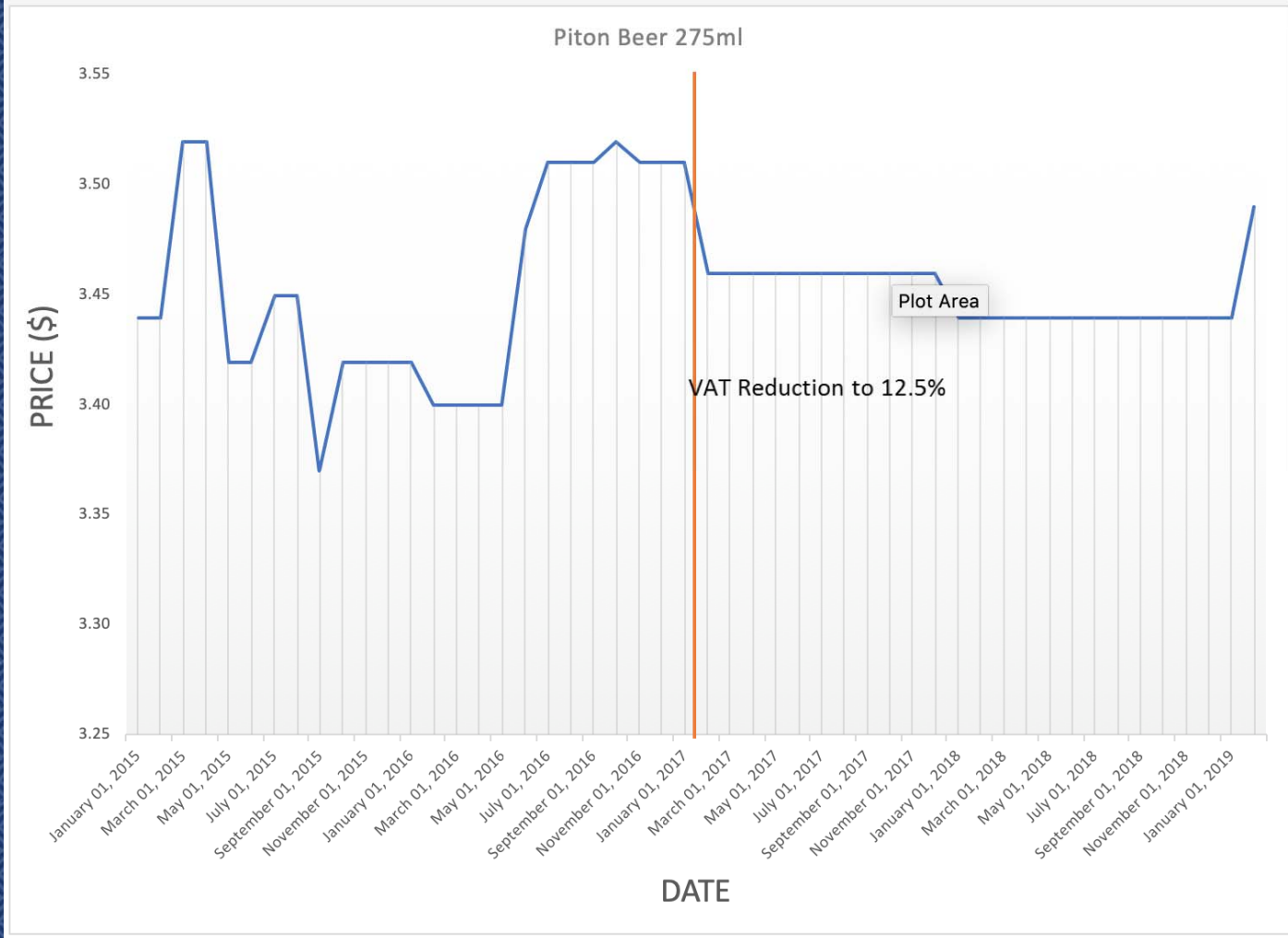
Nido Powdered Milk 900g

Chicken Neck 1lb

The Chef Streaky Bacon 200g
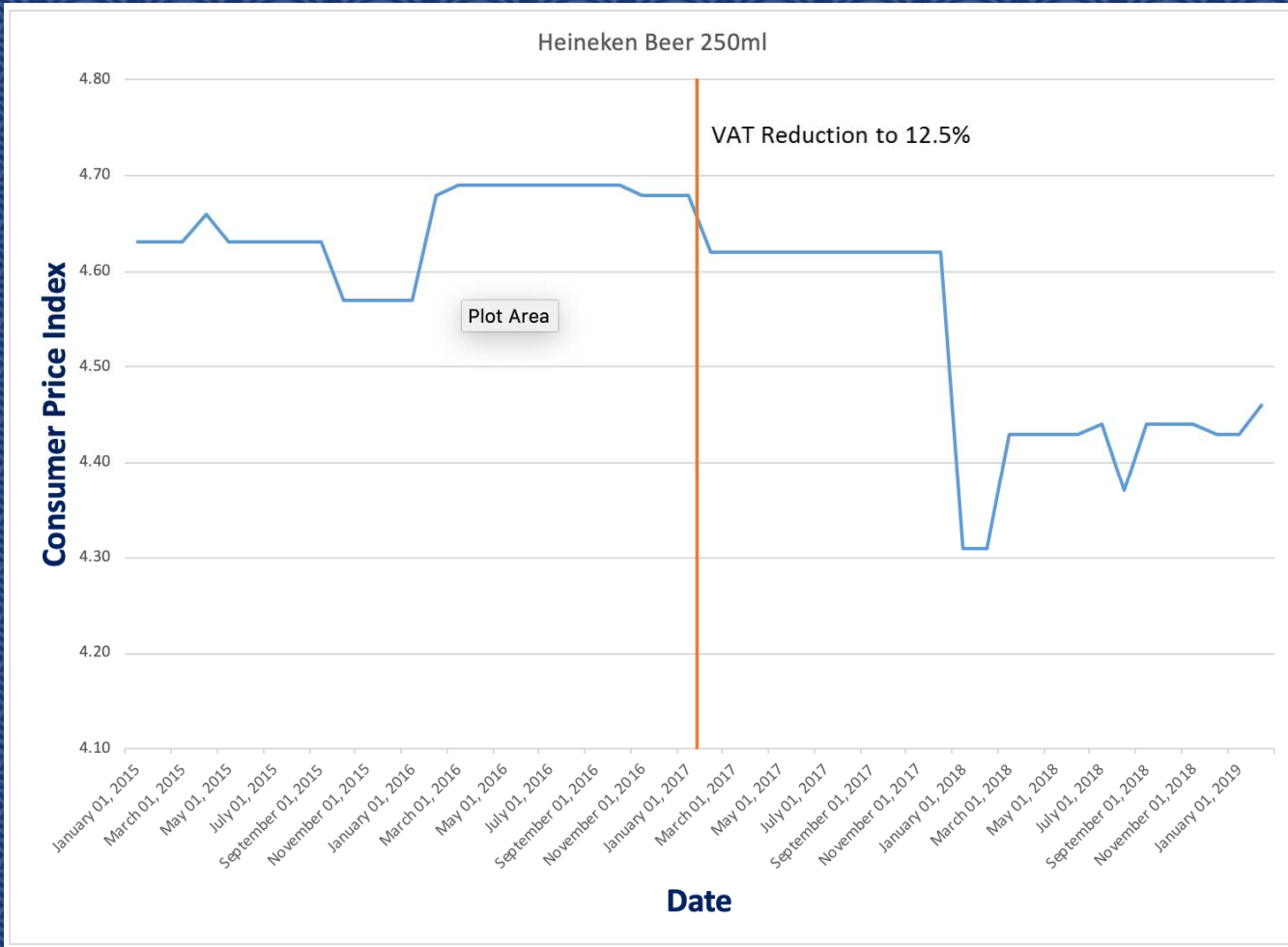
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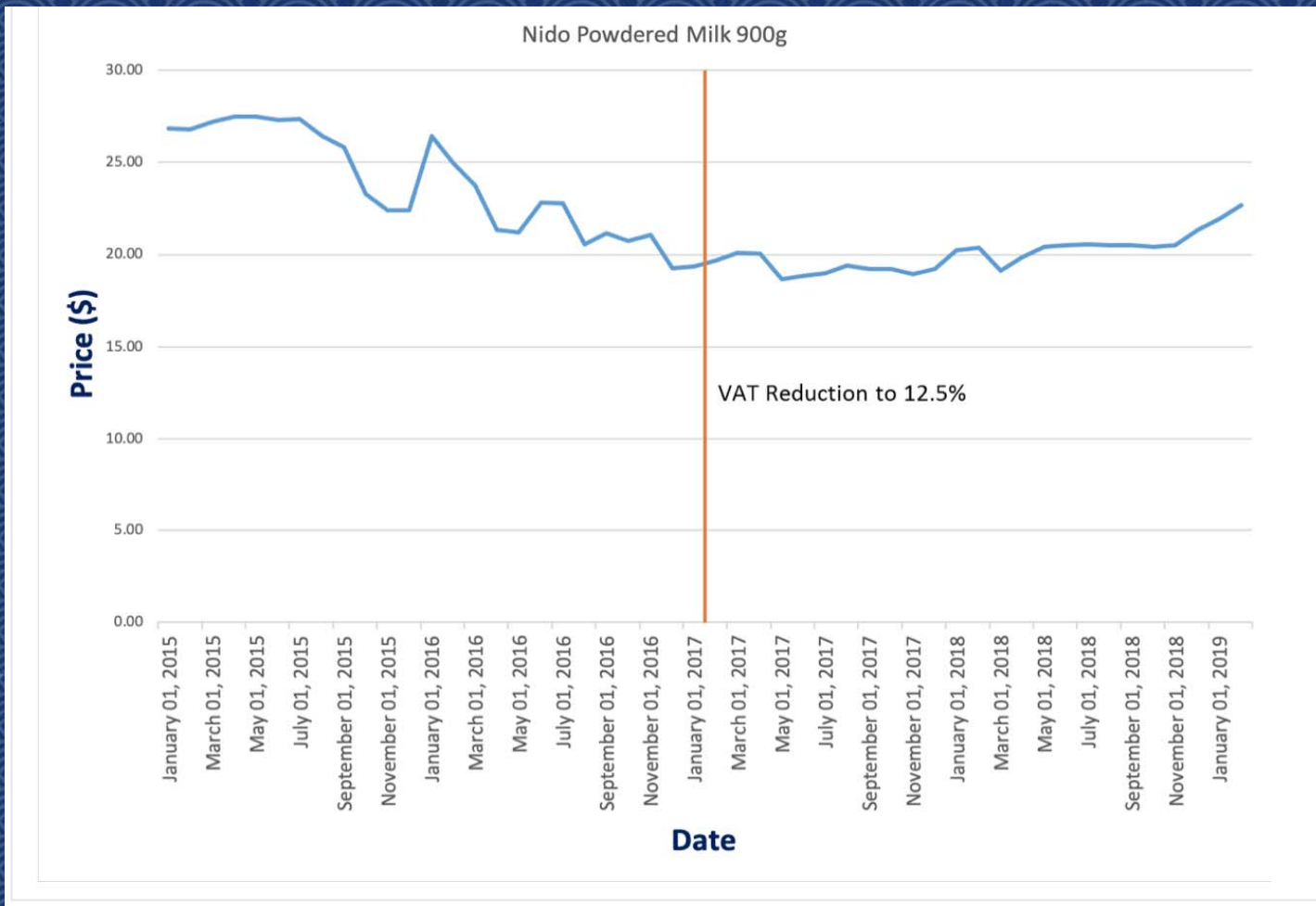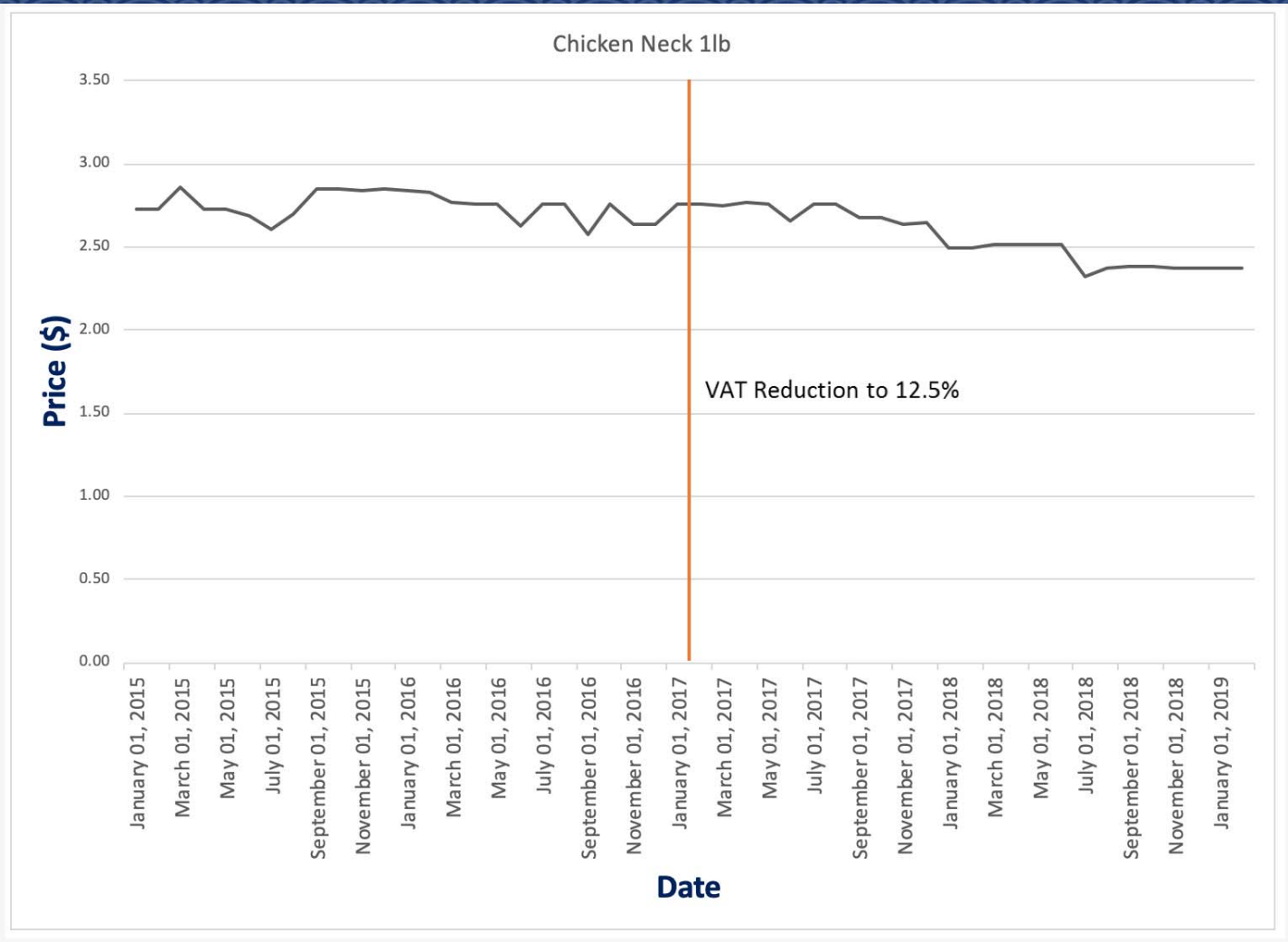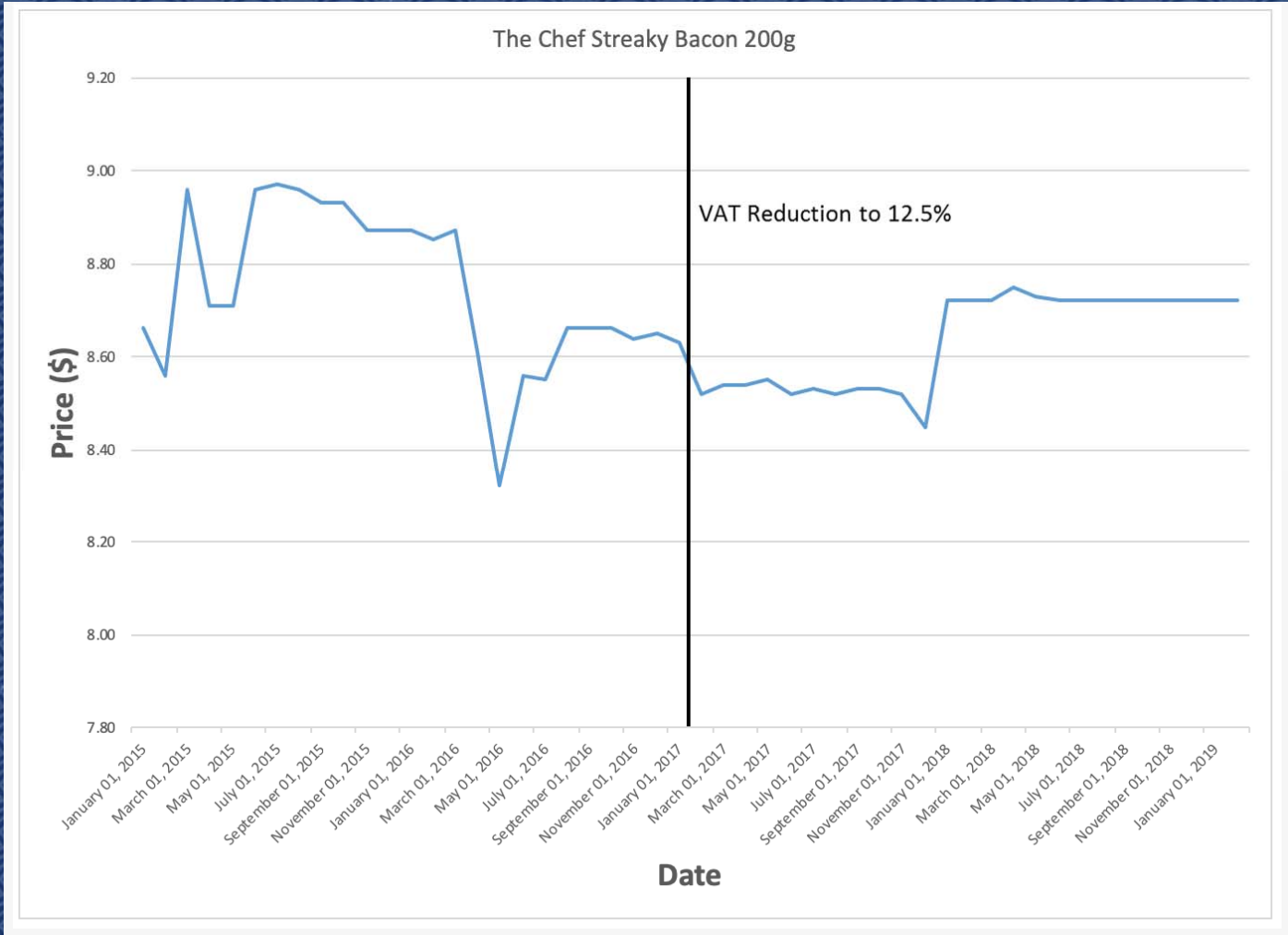
Barons Ketchup 397g

Barons Pepper 85g

Lamb Neck 1lb

Piton Beer 275ml

Stating Our Hypothesis

Our Methodolgy
Two-Sample Independent T-Test

❖ Compares the means between two groups or samples

❖ Determines whether the mean difference is statistically significant

Two-Sample Independent T-test

Null hypothesis:
$$H_0: u_d = 0$$
In other words, the statistical mean difference between the two samples is equal to zero and is insignificant.

Conditions:

We reject our null hypothesis if our p-value falls below our level of significance α.

Why the scenarios?

In order to truly determine whether VAT reduction truly had an effect on food prices over the period,
It was necessary to test the data from different angles.

Scenario 1 – Largest Weighted

Easy Bake Whole wheat 1kg

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

◎ α = 0.05
◎ P-Value = 0.1013
◎ We fail to reject the null hypothesis.

◎ We deduce that the statitistical mean difference is zero and insignificant.

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019)

◎ α = 0.05
◎ P-Value = 0.0003
◎ We reject the null hypothesis.

◎ We deduce that there is a significant difference between the two population means.

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Scenario 1 – Largest Weighted

Sunshine Cornflakes 12oz

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

◎ α = 0.05
◎ P-Value = 0.0006
◎ We reject the null hypothesis.

◎ We deduce that there is a significant difference between the two population means.

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019

◎ α = 0.05
◎ P-Value = 0.2883
◎ We fail to reject the null hypothesis.

◎ We deduce that the statitistical mean difference is zero and insignificant.

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Scenario 1 Summary

Easy Bake Flour

- The Prices 6 months before and after February 1st 2017 were not significantly different.
- By contrast, the Prices 2 years before and after VAT reduction were statistically different. Thus, the differences in prices were influenced by other factors but **not** VAT reduction.

Sunshine Cornflakes

- The prices 6 months before and after VAT reduction were statistically different.
- The difference between the prices 2 years before and after VAT reduction were insignificant. Therefore, the reduction in VAT did influence a reduction in the price of sunshine cornflakes **temporarily,** however this reduction wasn't sustained throughout the years.

Scenario 2 – Non-VATable

Swiss Pasta Macaroni 400g

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

- ◎ α = 0.05
- ◎ P-Value = 0.4230
- ◎ We fail to reject the null hypothesis.

- ◎ We deduce that the statitistical mean difference is zero and insignificant.

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019)

- ◎ α = 0.05
- ◎ P-Value = 0.0000
- ◎ We reject the null hypothesis.

- ◎ We deduce that there is a significant difference between the two population means.

Chicken Mixed Parts 1lb

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

◎ α = 0.05
◎ P-Value = 0.8053
◎ We fail to reject the null hypothesis.

◎ We deduce that the statitistical mean difference is zero and insignificant.

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019)

◎ α = 0.05
◎ P-Value = 0.2650
◎ We fail to reject the null hypothesis.

◎ We deduce that the statitistical mean difference is zero and insignificant.

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Scenario 2 – Non-VATable

**White Sugar
2lb**

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

◎ α = 0.05
◎ P-Value = 0.1372
◎ We fail to reject the null hypothesis.

◎ We deduce that the statitistical mean difference is zero and insignificant.

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019)

◎ α = 0.05
◎ P-Value = 0.0001
◎ We reject the null hypothesis.

◎ We deduce that there is a significant difference between the two population means.

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Scenario 2 – Non-VATable

Brown Sugar 2lb

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

- ◎ α = 0.05
- ◎ P-Value = 0.1925
- ◎ We fail to reject the null hypothesis.

- ◎ We deduce that the statitistical mean difference is zero and insignificant.

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019)

- ◎ α = 0.05
- ◎ P-Value = 0.0000
- ◎ We reject the null hypothesis.

- ◎ We deduce that there is a significant difference between the two population means.

Scenario 2 – VATable

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019)

Frontera Merlot Grape Wine 750ml

◎ α = 0.05
◎ P-Value = 0.0040
◎ We reject the null hypothesis.

◎ We deduce that there is a significant difference between the two population means.

◎ α = 0.05
◎ P-Value = 0.0003
◎ We reject the null hypothesis.

◎ We deduce that there is a significant difference between the two population means.

Scenario 2 – VATable

Barons Black Pepper 85g

6 months before and after VAT reduction (Aug 1, 2016 – July 1, 2017)	2 years before and after VAT reduction (Jan 1, 2015 – Feb 1, 2019)
◎ $\alpha = 0.05$	◎ $\alpha = 0.05$
◎ P-Value = 0.0028	◎ P-Value = 0.0000
◎ We reject the null hypothesis.	◎ We reject the null hypothesis.
◎ We deduce that there is a significant difference between the two population means.	◎ We deduce that there is a significant difference between the two population means.

30

Scenario 2 – VATable
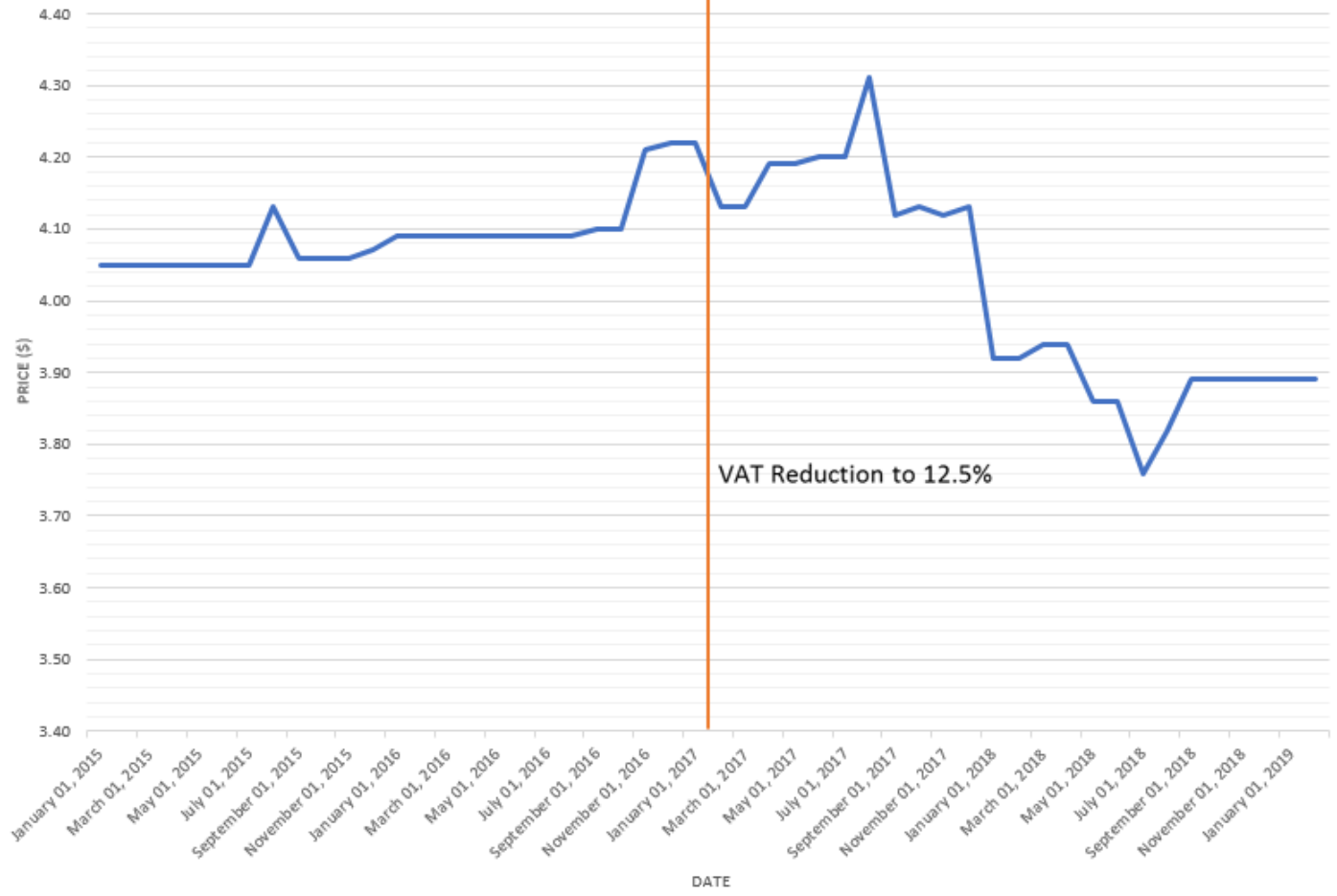
Barons Ketchup 397g

6 months before and after VAT reduction (Aug 1, 2016 – July 1, 2017)

- ◎ $\alpha = 0.05$
- ◎ P-Value = 0.5978
- ◎ We fail to reject the null hypothesis.

- ◎ We deduce that the statitistical mean difference is zero and insignificant.

2 years before and after VAT reduction (Jan 1, 2015 – Feb 1, 2019)

- ◎ $\alpha = 0.05$
- ◎ P-Value = 0.0151
- ◎ We reject the null hypothesis.

- ◎ We deduce that there is a significant difference between the two population means.

Scenario 2 – VATable

6 months before and after VAT reduction
(Aug 1, 2016 – July 1, 2017)

2 years before and after VAT reduction
(Jan 1, 2015 – Feb 1, 2019)

Ferrands Vanilla Icecream 1L

◎ α = 0.05
◎ P-Value = 0.0000
◎ We reject the null hypothesis.

◎ We deduce that there is a significant difference between the two population means.

◎ α = 0.05
◎ P-Value = 0.4258
◎ We fail to reject the null hypothesis.

◎ We deduce that the statitistical mean difference is zero and insignificant.

Scenario 2 Summary

Generally, in the case of our VATable goods, the prices six (6) months before and after were significantly different. It was evident that a reduction in VAT caused a decrease in their prices. However, in some cases, prices two (2) years before and after the VAT reduction were relatively indifferent. This may mean that prices may have decreased only temporarily then increased again at a certain point.

Scenario 3

Actual vs Forcasted Data

In this scenario, we will evaluate whether the trend of actual prices over the given period is similar to the trend followed by forecasted prices of VATable and non-VATable items.

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Scenario 3

Actual vs Forcasted Data

◎ Population 1 (Actual)

This population consist of actual price values from January 2016 until December 2017.

◎ Population 2 (Forcasted)

This population contains actual price values from January 2016 until January 2017, **and then forecasted prices from February to December 2017.**

NOTE: VAT reduction to 12.5% was effective from February 1st 2017.

Scenario 3 – Forcasted Data

Easy Bake 1kg

Non-VATable

- ❖ α = 0.05
- ❖ P-Value = 0.2181
- ❖ We fail to reject the null hypothesis.

We deduce that the statitistical mean difference is zero and insignificant.

Therefore, it is apparent that the reduced **VAT** had **no effect** on the Price of Easy Bake's 1kg package of flour.

Scenario 3 – Forcasted Data

Universal Cornflakes 900g

VATable

❖ α = 0.05
❖ P-Value = 0.0213
❖ We reject the null hypothesis.

We deduce that there is a significant difference between the two population means.

It is evident that the reduced VAT **indeed** had an effect on the Price of Universal's 900g package of powdered milk.

Scenario 3 – Actual vs Forcasted Data

**Piton Beer
275ml**

VATable

❖ α = 0.05
❖ P-Value = 0.0213
❖ We reject the null hypothesis.

We deduce that there is a significant difference between the two population means.
It is evident that the reduced VAT **indeed** had an effect on the Price of Piton Beer (275ml).

Scenario 3 Summary

The mean difference of actual and forecasted prices six (6) months before and after VAT reduction were statistically insignificant in the case of Non-VATable food items. However, the opposite is true in the case of VATable food items, where the mean differences between the actual and forecasted prices were significant.

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Result Summary

	Non-VATable Goods			
		6 months	2 years	6 month price movement
Scenario 1	Easy Bake - 1kg	✔	✔	↓
Largest	Easy Bake - Whole Wheat - 1kg	✘	✔	↓
Weighted	Counter Flour 2lbs	✘	✘	-
Scenario 2 **VATable vs** **Non VATable**	Macaroni [Swiss Pasta - 400g]	✘	✔	-
	(Nido Powered Milk 1800g)	✘	✔	↓
	[Carib Pearl Long Grain Parboiled - 400 grams]	✔	✔	-
	[Chicken Mixed Parts - 1lb]	✘	✘	-
	[Chicken Neck] Fresh or Frozen (1lb)	✘	✔	-
Scenario 3 **Forcasted vs** **Actual Trend**	(Nido Powered Milk 1800g)	✘	✘	↓
	Easy Bake - 1kg	✘	✘	↓
	White sugar 2lbs	✘	✘	↓
	Brown Sugar 2lbs	✘	✘	↓

Key	
✔	The prices before and after the VAT reduction were signifcantly different.
✘	there was no significant difference between the prices before and after the VAT reduction.

Result Summary

		VATable Goods		
		6 months	2 years	6 month price movement
Scenario 1 Largest Weighted	Cornflakes (Kellogg's) 12 oz	✗	✔	-
	Cornflakes (Sunshine) 12oz	✔	✔	↓
	Cornflakes (IGA) 18 oz	✔	✗	↓
	Cornflakes (Universal) 12oz	✔	✔	↓
	Cornflakes (Universal) 18oz	✔	✔	↓
Scenario 2 VATable vs Non VATable	Morning Coffee [150g]	✗	✔	-
	Ferrands-Vanilla (1 Litre)	✔	✔	↓
	Irish Patatoes - 1lb	✔	✔	↓
	Farmers Choice - 200g	✔	✔	↓
	Barons Ketcup 397g	✗	✔	↓
	Barons Black Pepper 85g	✔	✔	↓
	The Chef Streaky Bacon - 200g	✔	✔	↓
Scenario 3 Forcasted vs Actual Trend	Cornflakes (Universal) 18oz	✗	✔	↓
	Piton Beer 275ml	✔	✗	↓
	BlueWaters1.5L	✗	✗	-
	bakedbeans415g	✔	✔	↓
	Ferrands_Vanilla1L	✔	✔	↓

Key		
✔	The prices before and after the VAT reduction were signifcantly different.
✗	there was no significant difference between the prices before and after the VAT reduction.

Conclusion

Eastern Caribbean Central Bank

Determinants of the Adoption of Electronic Payments in the ECCU – Panel Data Evidence

Martina Regis, Eastern Caribbean Central Bank

Research and Policy Unit 2019 Research Symposium, Saint Lucia
14 – 15 October 2019

Eastern Caribbean Central Bank

Outline

1. Introduction and Motivation
2. Trends in E-Payments in the ECCU
3. Data and Method-ology
4. Findings
5. Results and Policy Considerations

Introduction

- This paper is an effort to better understand the factors that affect the adoption of electronic payments in the Eastern Caribbean Currency Union (ECCU).

- It also explores whether electronic payments have been a substitute for cash.

- Given the data challenges of small states, the paper uses a panel data approach in order to capture the evolving nature of electronic payments.

- The paper uses data for seven Member States of the ECCU: Anguilla, Antigua and Barbuda, Dominica, Grenada, St Kitts and Nevis, Saint Lucia and St Vincent and the Grenadines for the period 2005 – 2016.

Eastern Caribbean Central Bank

Benefits of E-Payments

Enhance Traditional Payments
- Offer faster, safer, more secure way to make payments;
- Offer real-time visibility into firms' cash management
- Greater transparency of digital transactions, by creating a virtual record of source and destination of funds; (VISA, 2017) and reduce cash-related crime.

Enhance Trade through Global Logistics
- Facilitate cross-border production and global e-commerce
- e-Bay, Amazon and other online platforms have empowered SMEs and individuals to become micro multinationals (McKinsey, 2018)

Reduce Transaction Costs of Banks
- Reduce the costs of physical banking operations (Chavan, 2018)
- Facilitate cross-border operations
- Reduce information asymmetries and improve deposit-taking and access to credit

Offer Net Benefits to all economic agents
- Save time in banking, transit and retail transactions.
- Help to curb the shadow economy and increase tax revenues
- May yield savings of 1% of GDP per year by shifting from paper-based to e-payments (Humphrey et al., 2003)

Motivation

- High cost of production, transportation, insurance of cash across the eight member countries.

- Cash is usually associated with activities in the shadow economy

- The increased adoption of electronic payments would facilitate the reduction in the demand for cash, which may deliver savings from the production and distribution (*ECCB Strategic Plan 2017 - 2021*)

- Recognizing the transformational potential of e-payments, the ECCB acknowledges that it has a responsibility to influence the adoption speed of payments innovation in the ECCU (*ECCB Strategic Plan 2017 - 2021*).

Anguilla

St Kitts and Nevis

Montserrat

Antigua and Barbuda

Commonwealth of Dominica

Saint Lucia

St Vincent and the Grenadines

Grenada

Electronic Payments

- E-payments can be defined as provision of payment products and services; or financial exchanges through electronic delivery channels or automated processes.

- Electronic methods may include:
  - *Debit and credit cards*
  - *Standing orders*
  - *Direct debits*
  - *Payroll*

A Quick Review of the Literature

Technological Adoption

- [Theory of Diffusion of Innovation](Rogers, 1995)
- Theory of Reasonable Action (TRA), Fishbein and Ajzen (1975)
- Technology Acceptance Models (TAM1) and TAM2 by Venkatesh and Davis (2000) among others
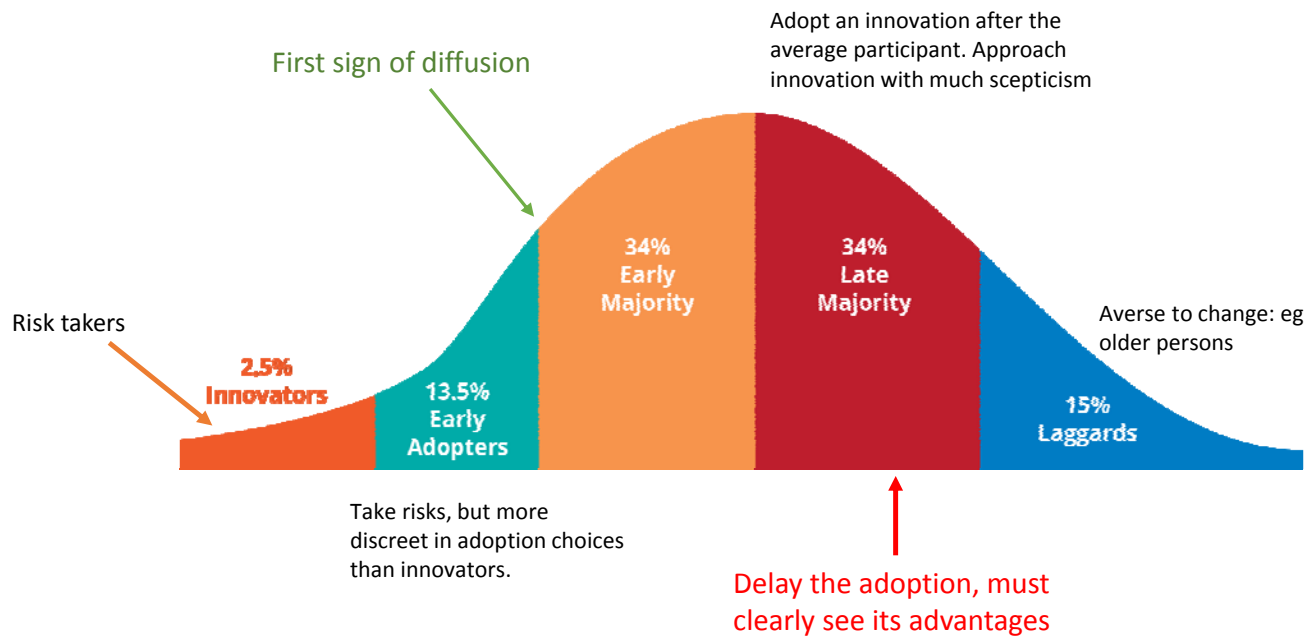
Survey/Micro Data

- Boeschoten (1999) for the Netherlands (ATMs);
- Duca and Whitesell (1994) for the United States.
- Stix (2004) for Austria
- Stavins, 2001; Borzekowski et al. 2006; Nasri, 2011;
- Kosse (2014); Bagnall et al. (2014), van der Cluijsen, (2014); Wakamori and Welte (2017)

Macroeconomic Data

- Humphrey et al. (1996);
- Mustafa and Hakan (2007)
- Snellman et al. (2001), Guariglia and Loke, 2004;
- Goczek and Witkowski, 2016)
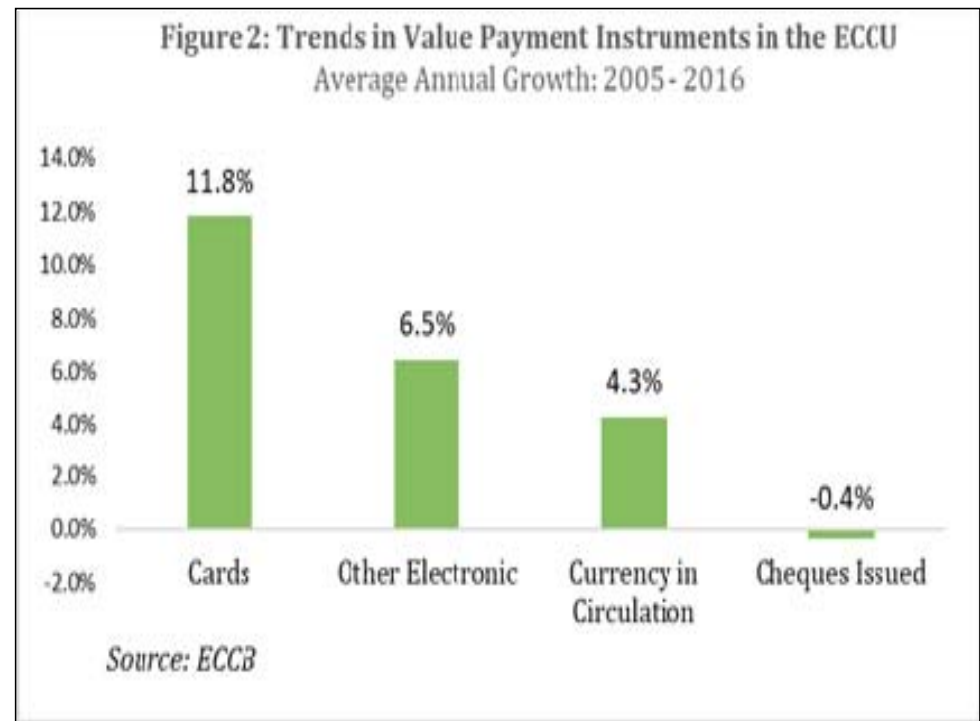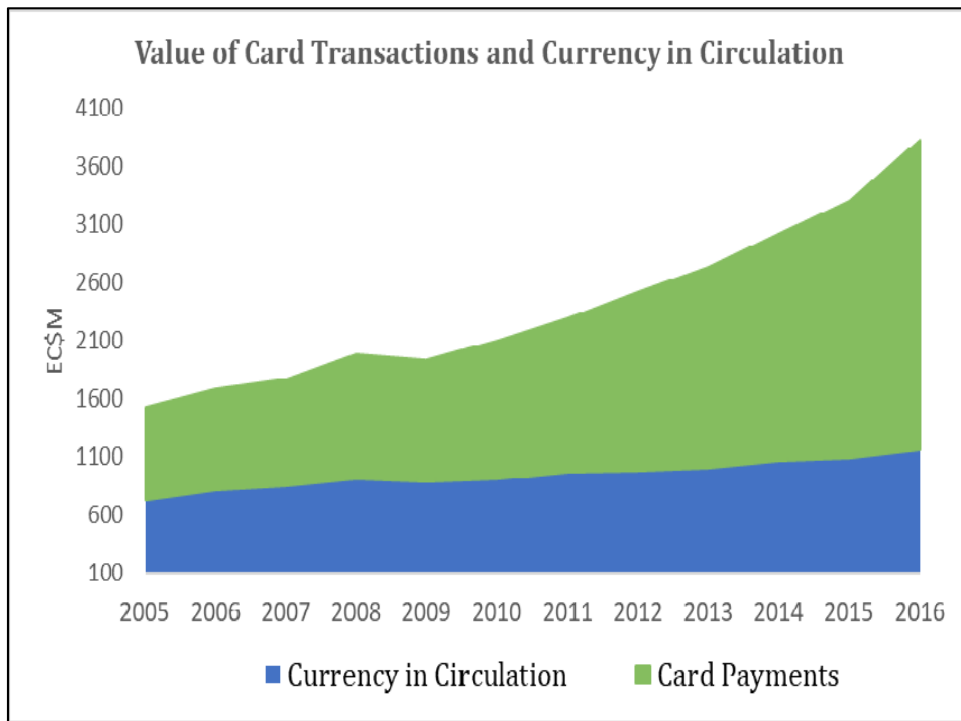- Saraswati, N., and Mukhlis, (2018).

Adoption of innovation over time

First sign of diffusion

Adopt an innovation after the average participant. Approach innovation with much scepticism

Innovations do not spread equally over different segments, but through 5 stages with particular profile of reaction.

Risk takers

2,5% Innovators

13.5% Early Adopters

34% Early Majority

34% Late Majority

Averse to change: eg older persons

15% Laggards

Take risks, but more discreet in adoption choices than innovators.
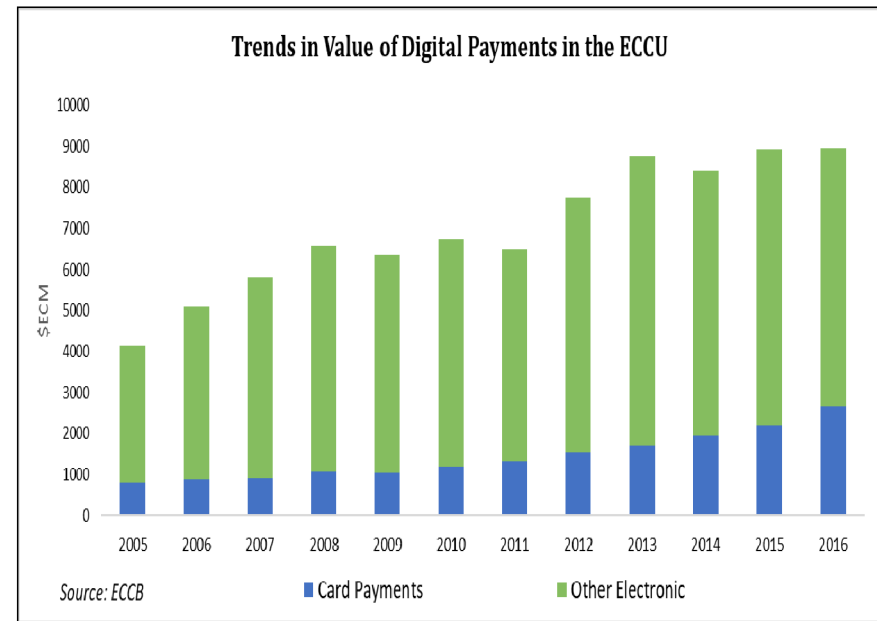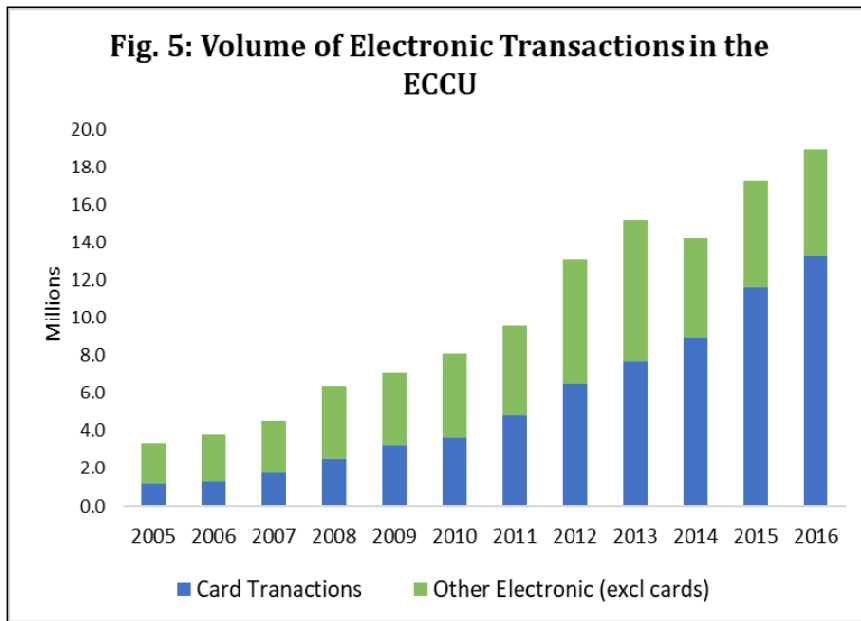
Delay the adoption, must clearly see its advantages

Trends in ECCU Digital Payments

Trends in ECCU Digital Payments II

Fig. 5: Volume of Electronic Transactions in the ECCU

Trends in Value of Digital Payments in the ECCU

Trends in ECCU Digital Payments III

Fig 10: Digital Payments Per Person

Figure 4: Trends in Currency in Circulation in the ECCU
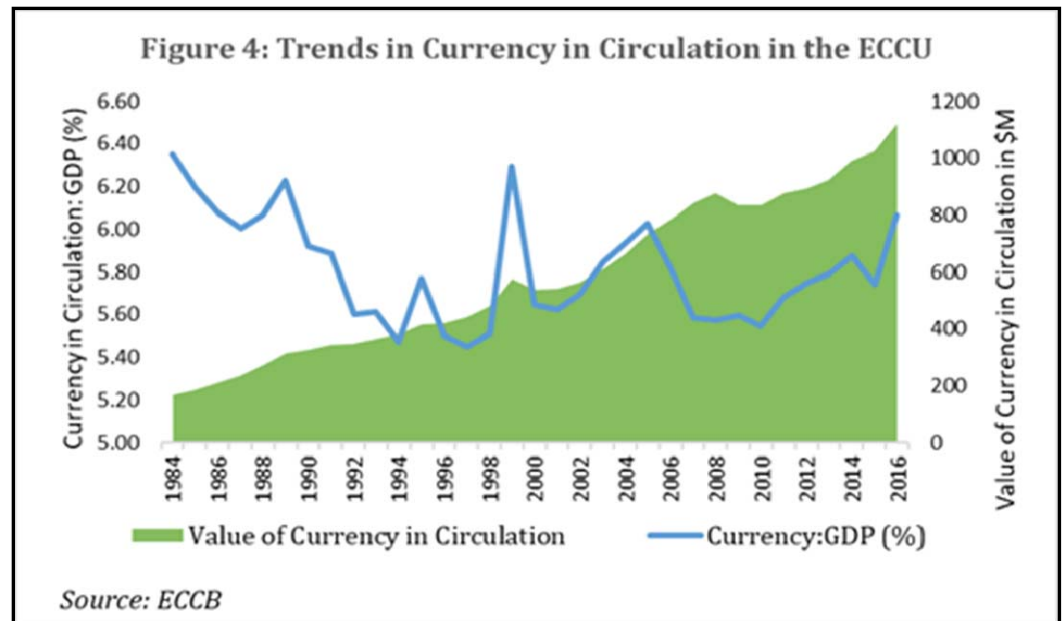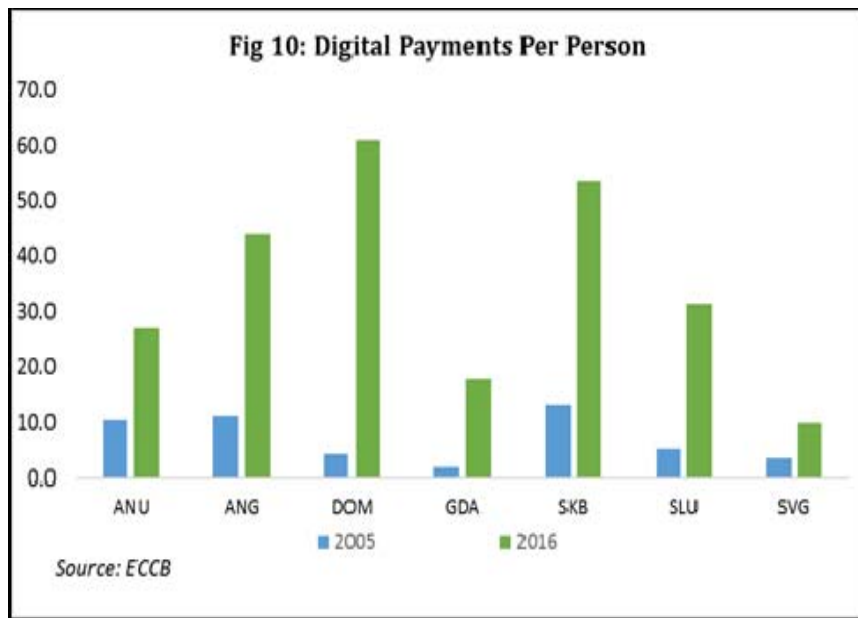
Data and Methodology

- Annual dataset 2005 to 2016

- Seven member countries covered (excludes Montserrat)

- Two measures of electronic payments:
  - Volume of card payments per person
  - Volume of electronic transactions per person

- Two measures of cash employed:
  - Cash in circulation/M1
  - Currency with the Public/M1

- Choice of data informed by the literature and data availability

Methodology

- Robust Fixed Effects

- Driscoll-Kraay for FE

- Feasible Generalised Least Squares (FGLS)

Empirical Specification I – Card Payments

$$CARD_{it} = \alpha + \beta_1 GDPPC_{it} + \beta_2 POS_{it} + \beta_3 CASH_{it} + (\beta_4 ATM_{it}) + \varepsilon_{it}$$

$CARD$: measures the volume of card payments per person

$GDPPC$ (+): measures the log of real per capita GDP

POS (+): Number of point of sale (POS) terminals per 1,000 inhabitants

$CASH$ (-): Currency in circulation/M1 (proxy for the use of cash)

ATM (+/-): Number of ATMs per person

Empirical Specification II – E-Payments

$$EPAY_{it} = \alpha + \beta_1 GDPPC_{it} + \beta_2 POS_{it} + \beta_3 CASH_{it} + \beta_4 CHEQUE_{it} + \varepsilon_{it}$$

$EPAY$: measures the number of electronic payments per person

$GDPPC$ (+): measures the log of real GDP per capita

POS (+): Number of point of sale (POS) terminals per 1,000 inhabitants

$CASH$ (-): Currency in circulation/M1 (proxy for the use of cash)

$CHEQUE$ (-): Volume of cheque transactions per person

Panel Data Models - Challenges

- Panels are attractive since they often contain more information than single cross-sections and thus allow for an increased precision in estimation.

- Panel data may however be characterized by complex error structures:

  - Heteroskedasticity *(Modified Wald Test)*

  - Serial correlation (*Wooldridge Test*)

  - Cross-sectional dependence (*Peseran's CD Test*)

- The presence of these errors can generate inefficiency in coefficient estimation and bias in the estimation of standard errors.

Results

Table 2: Regression Results for Card Payment Volume per Person

VARIABLES	(1) Fixed Effects	(2) Driscoll-Kraay	(3) FGLS
GDP per capita	1.059***	1.059**	0.190**
	(0.203)	(0.393)	(0.086)
Point of Sales per '000 pop.	0.651***	0.651*	0.235***
	(0.151)	(0.336)	(0.078)
Currency in Circulation: M1	-0.089	-0.089	-0.037
	(0.176)	(0.095)	(0.063)
Observations	84	84	84
R^2	0.520		
R^2- Adj	0.461		
F-stat	0	0.0160	
ρ	0.912		
Number of groups	7	7	7
R^2 - Within		0.520	
$\chi 2$			22.40

Hausman Test = 21.19 (0.000)
Heteroskedasticity test $\chi 2$ = 4227.53   Pr > $\chi 2$ = 0.000
Autocorrelation Test F(1, 6) = 3.587   Pr > F = 0.107
Cross-sectional dependence test = 7.553   Pr = 0.000

Notes: The models are estimated by Fixed Effects, Driscoll-Kraay robust S.E., and Feasible Generalised Least Squares (FGLS). Standard errors and robust standard errors are reported in parenthesis below each coefficient estimate. The p-values for Hausman test are in parenthesis. A constant term was estimated but is not reported.

*, **, *** denote significance at 10%, 5% and 1% levels.

Table 3: Regression Results for Card Payment Volume (Currency with Public)

VARIABLES	(1) Fixed Effects	(2) Driscoll-Kraay	(3) FGLS
GDP per capita	1.093***	1.093**	0.167*
	(0.194)	(0.389)	(0.088)
Point of Sales per '000 pop.	0.656***	0.656*	0.193***
	(0.151)	(0.338)	(0.066)
Currency with the Public:M1	0.021	0.021	0.019
	(0.128)	(0.089)	(0.050)
Observations	84	84	84
R^2	0.518		
R^2 - Adj	0.459		
F-stat	0	0.0122	
ρ	0.915		
R^2 - Within		0.518	
Number of groups	7	7	7
$\chi 2$			14.15

Hausman Test = 21.35 (0.000)
Heteroskedasticity test $\chi 2$ = 6144.68   Pr > χ^2 = 0.000
Autocorrelation Test F(1, 6) = 3.358   Pr > F = 0.117
Cross-sectional dependence test = 7.709   Pr = 0.000

Notes: The models are estimated by Fixed Effects, Driscoll-Kraay robust S.E., and Feasible Generalised Least Squares (FGLS). Standard errors are reported in parenthesis below each coefficient estimate. The p-values for Hausman test are in parenthesis. A constant term was estimated but it is not reported.

*, **, *** denote significance at 10%, 5% and 1% levels

Results

Table 6: Regression Results for Card Payment Volume (ATM per person)			
	(1)	(2)	(3)
VARIABLES	Fixed Effects	Driscoll-Kraay	FGLS
GDP per capita	0.978***	0.978***	0.179**
	(0.211)	(0.278)	(0.089)
Point of Sales per '000 pop.	0.500***	0.500**	0.201***
	(0.094)	(0.215)	(0.070)
ATM per person	0.043***	0.043***	-0.001
	(0.007)	(0.010)	(0.004)
Currency with the Public:M1	-0.106	-0.106	0.026
	(0.125)	(0.076)	(0.050)
Observations	84	84	84
R^2	0.657		
R^2 - Adj	0.640		
R^2 - Within		0.657	
F-stat	0.000	0.004	
ρ	0.967		
Number of groups	7	7	7
χ^2			14.88***

Results

Table 4: Regression Results for Electronic Payment Volume (Currency in Circulation)

VARIABLES	(1) Fixed Effects	(2) Driscoll-Kraay	(3) FGLS
GDP per capita	1.423***	1.423***	0.438***
	(0.356)	(0.439)	(0.147)
Point of Sales per '000 pop.	0.716**	0.716**	0.293**
	(0.305)	(0.289)	(0.128)
Cheque Volume per capita	-0.249	-0.249	-0.274
	(0.329)	(0.610)	(0.185)
Currency in Circulation: M1	-0.311	-0.311**	-0.083
	(0.310)	(0.121)	(0.139)
Observations	84	84	84
R^2	0.403		
R^2 - Adj	0.321		
R^2 - Within		0.403	
F-stat	0.000	0.00122	
ρ	0.835		0.759
Number of groups	7	7	7
χ^2			31.54***

Hausman Test = 35.33 (0.000)
Heteroskedasticity test Chi2 = 9243.78   Pr > χ^2 = 0.000
Autocorrelation Test F(1, 6) = 95.469   Pr > F = 0.000
Cross-sectional dependence test = 3.599   Pr = 0.000

Table 5: Regression Results for Electronic Payment Volume (Currency with the Public)

VARIABLES	(1) Fixed Effects	(2) Driscoll-Kraay	(3) FGLS
GDP per capita	1.526***	1.526***	0.341**
	(0.342)	(0.436)	(0.139)
Point of Sales per '000 pop.	0.735**	0.735**	0.261**
	(0.306)	(0.300)	(0.112)
Cheque Volume per capita	-0.240	-0.240	-0.118
	(0.331)	(0.617)	(0.162)
Currency with the Public:M1	-0.071	-0.071	0.050
	(0.226)	(0.085)	(0.062)
Observations	84	84	84
R^2	0.395		
R^2 - Adj	0.312		
R^2 - Within		0.395	
F	0.000	0.006	
ρ	0.860		0.913
Number of groups	7	7	7
$\chi2$			15.81**

Hausman Test = 8.36 (0.079)
Heteroskedasticity test χ^2 = 4161.89   Pr > χ^2 = 0.000
Autocorrelation Test F(1, 6) = 85.399   Pr > F = 0.000
Cross-sectional dependence test = 2.625   Pr = 0.009

Findings and Discussion

- The income variable shows a consistent positive relationship, highlighting electronic payment transactions increase with income levels.

- The available payment technology (proxied by POS diffusion ratio), had a consistently positive and significant impact on the volume of electronic transactions…

    - …suggesting that greater availability of Point of Sale terminals may enhance the frequency of making these payments.

- The findings do not indicate any statistically significant negative association between cash in circulation…

    - ….possibly reflective of a weak substitution effect; Use of ATMs; cash use for low-valued transactions; Prevalence of small merchants in the economy?

- Findings do not show a negative link between cheque volumes per capita and electronic payments' use during the period….

    - …may reflect the continued use of cheques in large-valued transactions; and for the payment of government services during the review period.

Conclusion

- Technology is transforming the global and regional payments system.

- Over the period the use of non-cash payments in the ECCU has expanded in value and volume.

- These trends highlight the increasing significance of non-cash payments in the region.

- The findings suggest that the increase in card payments is driven, in part, by greater availability of financial infrastructure (proxied by point-of-sale terminals) and per capita income.

- Weak substitution between cash and cheque volume with electronic payments, may be reflective of economies being at the early stages of the substitution process from cash to electronic payments.

- May present concerns for vulnerable groups - poor, elderly and illiterate (Chikalipah, 2017)

Limitations and Further Research

- Data
  - Analysis was restricted by data availability (2005 – 2016)
  - Without survey data on actual cash use, the research opted to using proxies for cash payments.

- Empirical methodology
  - Challenges with dealing with autocorrelation, cross-sectional dependence and heteroscedasticity simultaneously; FGLS attempts to correct these difficulties.

- No single methodology may have solved all of the challenges.

- Aggregate, macro-level data can only reveal so much.
  - Need for micro-level surveys which help uncover factors that affect individual consumer payment behaviour.

Opportunities for E-Payment Adoption

Thank you

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Sustainable Development

Session 2

Policy Recommendations for Valuing and Accounting of Ecosystem Services in Saint Lucia

Department of Sustainable Development

Background

IYANOLA REGION stretches from Cap Estate in the north to Dennery in the South. It is home to unique ecosystems including 1) Marine coral reefs, 2) Dry Coastal Forests 3) Evergreen Rainforests and 4) Mangroves

These ecosystems perform functions such as water filtration, soil stabilisation, provision of food and freshwater and support to livelihoods.

The value of ecosystems is an important consideration in the planning and management of natural resources. Thus an excercise was undertaken to quantify these values using qualitative, quantitative and methods.

Key Ecosystem Species of Iyanola

Land Cover (British Geological Survey 2014):
- Lowland forest (e.g. Evergreen and seasonal Evergreen)
- Evergreen forest
- Semi- or Drought Deciduous and mixed forest
- Elfin and Sierra Palm tall cloud forest
- Pastures, cultivated land and herbaceous agriculture
- Woody agriculture (e.g. cacao, coconut, banana)
- Roads and other built-up surfaces (e.g. concrete, asphalt)
- Buildings

Legend:
- Proposed Iyanola Border
- Forest Reserve Protected Areas
- Mangrove Area · St. Lucia Forestry Dep 2017
- Latanye · St. Lucia Forestry Dep 2017
- ▲ Akoma (Sideroxylon foetidissimum) · St. Lucia Forestry Dep 2017
- ▲ Arkokwa (Zanthoxylum flavum) · St. Lucia Forestry Dep 2017
- ▲ Gayak (Guaiacum officinale) · St. Lucia Forestry Dep 2017
- St. Lucia Iguana 95% Home Range · 2004/05 Survey
- White Breasted Thresher 50% Home Range · 2000/16/17 Survey
- St Lucia Anole 50% Home Range · 2016/17 Survey
- Pygmy Gecko Sightings · 2016/17 Survey
- St. Lucia Boa · 2007 3 Estates Survey
- Thread Snake · 2007 3 Estates Survey
- ● Leatherback Nesting Sites · 2009 Marxan Workshop
- Elkhorn Coral Reef · Nature Conservancy 2016
- Queen Conch Habitat (Seasonal) · Projected

Inset map labels: St. Lucia, Caribbean Sea, Atlantic Ocean, Castries, Anse la Raye, Canaries, Dennery, Soufriere, Fond St. Jaques, Micoud, Vieux Fort

Coastal place labels: Cas en Bas, Esperance, Petit Anse, Grand Anse, Anse La Sorcière, Anse Louvet, Fond d'Or

Produced by OIKOLO

Scale 1:12

Coordinates: 61°4'W, 61°W, 60°56'W, 60°52'W

Hypothesis

- Ecosystem services can be valued and quantified based on function and benefit to society.

Objectives

- To value and quantify ecosystem services within four ecosystems in the Iyanola Region, based on function and benefit to society.

Methods

Step 1: identify the policy or environmental management strategy that needs addressing, and use valuation and accounting methodology to collect the necessary data

Step 2: identify the geographic areas and population groups benefitting from the ES

Step 3: is to plan the study. This involves collecting data and identifying where more information is needed, as well as determining the appropriate consultation process and methodology to use

Step 4: is to perform the valuation itself, using information gathered from the previous steps

Types of Valuation Instruments

Ecosystem services	Market prices	Production function	Travel costs	Hedonic pricing	Cost- based	Stated preferences	Value transfer	Ecological production function
Provisioning	s	s			s			s / s
Regulating		s		s	s	s	s	s / s
Cultural	s	s	s			s	s	s / s

Note:

s - Reads as 'strong applicability'

o - Reads as 'weak applicability'; a blank read as 'not-applicable'

Data Analysis

Ecosystem service		Assets	Economic Value	Direct Use Value (DUV)	Indirect Use Value (IUV)	Methodology
Provisioning services	Food	Queen Conch	Conch: EC$388,378 Lobster: EC$23.342 Reef Fish: EC$83,945 Total: EC$776,756 Total: $87,415 USD	x		**Direct Market Pricing (DMP)** Conch: EC$2,589,193.00 ** Lobster: EC$155,612.00 ** Sea Urchin: No Data Reef Fish: EC$559,636.00 ** Assuming Yield from Iyanola MR is 15% of Total ** from Gros Islet & Dennery (major landing sites for Iyanola) 2018 [1]
		Lobster				
		Sea Urchin				
		Reef Fish Species [2]				
	Raw material	Seabed Minerals	Raw Material Value Coastal Marine: $127,968 Raw Material Value Reef: $27,211,392 Total: $27,339,360 USD	x		**Direct Market Pricing (DMP)** Raw Material Value for Coastal: $12/Ha/Year [3] Iyanola Coastal Area: 10,664 Ha Raw Material Coastal Value = $127,968 Raw Material Value for Reef: $21,528/Ha/Year [3] Reef Area: 1264 Ha [4] Raw Material Reef Value = $27,211,392
		Sand for (Illegal) Mining [5]				
	Genetic resources	Elkhorn Coral Reef	$41,772,672 USD	x		**Direct Market Pricing (DMP)** Genetic Value for Reefs: 33,048 $/Ha/Year [3] Coral Reef Area Iyanola: 1264 Ha [6] Value = $41,772,672
		Seagrass [7]				
	Medicinal resources	Potential Source of anticancer, antimicrobial, anti-inflammatory and anticoagulating substances among coral fauna and flora [8][9]	$3,209,864 USD	x		**Direct Market Pricing (DMP)** Medical Resources Coastal Value = 301 $/Ha/Year [3] Marine Coastal Area: 10,664 Ha Medical Resources Marine Value = $3,209,864 USD
	Habitat	Productive Reef Areas Are Protected as Actively Management Marine Reserves [2]	$69,932 USD	x		*Contingent Valuation (CV)* Fisheries Yield from Iyanola is $87,415.26 USD Reef provides nursery to majority (80%) of fish landed from Iyanola = 80% * Yield = $69,932 USD
	Ornamental resources	Seashells, Coral, Sponge	NO DATA			

Data Analysis Continued

Regulating services	Gas regulation	Breakdown of Waste & Detoxification [10] [11]	$ 405,232 USD		x	*Replacement Cost Method (RCM)* Gas Regulation Marine Environment: 38 $/Ha/Year [12] Marine Area: 10,664 Hectares Marine Value = $ 405,232 USD
		Nitrogen Fixation [11]				
	Climate regulation	Blue Carbon Sequestration [10] [11]	Coral Reef: $1,501,632 Seagrass: $1704 Marine: $ 693,160 Total: $2,196,496 USD	x		*Direct Market Pricing (DMP)* Coral Reef Climate Regulation Value: 1188 $/Ha/Year [3] Coral Reef Area Iyanola: 1264 Ha [6] Coral Reef Value = $1,501,632 Seagrass Climate Regulation Value: 23.4 $/Ha/Year [13] Seagrass Area Iyanola: 71 Ha Seagrass Value = $1704 Marine Climate Regulation Value: 65 $/Ha/Year [3] Marine Area: 10,664 Hectares Marine Value = $693,160
	Coastal protection	Coral Reef Sediment Trapping	Potentially Avoided Damages of $15,820,000	x		*Avoided Damage and cost (AC)* Value of shoreline protection services provided by coral reefs is estimated to be between $28 and $50 million for St. Lucia [14] [15] (Average:$39) Iyanola has 28 km coral protected shoreline [16] St Lucia has 69 km coral protected coastline [6] => (28 km / 69km) *$39M = $15.82 M
		Wind Attenuation				
		Wave Attenuation [11] [17]				
	Water regulation	Some regulation of water and sediment quality [18]	NO DATA			
	Water supply	N/A	N/A			
	Soil retention	Sediment stabilization and soil retention in seagrass root structure [17]	NO DATA			
	Soil formation	N/A	N/A			
	Nutrient regulation	High Primary Productivity [10]	$ 1,258,352 USD		x	*AC* Nutrient Cycling for Marine Env: 118 $/Ha/Year [12] Marine Area: 10,664 Ha Marine Area Value = $ 1,258,352 USD
		Nutrient Cycling				
	Waste regulation	Water Cycling	$107,440 USD		x	*RCM* Waste Treatment Coral Reef = 85$/Ha/Year [3] Coral Reef Area = 1264 Ha Coral Reef Value = $107,440 USD
		Detoxifies Waste Input [10] [11]				

Data Analysis Continued

	Recreation/Tourism	Diving	$7,320,000 USD	x		*DMP* Coral reef-associated tourists contributed an estimated $91.6 million to the economy of St. Lucia in 2006 [14][15] Iyanola Region = 8% St Lucia land mass
		Sailing				
		Turtle Watching				
		Sport Fishing [19]				8% * 91.6 $M = $7.32 M USD
	Aesthetics	Long Coastal Beaches [19]	NO DATA			
Cultural services	Science and education	Fisheries Data Collection; Coral-Reef Monitoring; Mangrove, Lobster Assessment and Cetacean Assessment [2]	NO DATA			
	Spiritual and historic	Historical and Modern Provider of Food & Trade	$223,944 USD		x	*CV* Value of Spiritual Experience in Coastal Ecosystem: 21$/Ha/Year [20] Marine Area = 10,664 Hectares Marine Spiritual Value = $223,944

Data Analysis Continued

Type of service	Marine and Coastal Ecosystem	Mangroves Ecosystem	Evergreen Ecosystem	Deciduous Ecosystem	Total
Provisioning services	$72,479,243 USD	$948,433 USD	$65,700 USD	$4,745,894 USD	**$78,234,270 USD**
Regulating Services	$27,512,752 USD	$417,521 USD	$2,029,950 USD	$5,779,943 USD	**$35,740,166 USD**
Cultural Services	$223,944 USD	$39,100 USD	$782,100 USD	$8,528 USD	**$1,053,672 USD**
Total	**$100,215,939 USD**	**$1,405,054 USD**	**$2,877,750 USD**	**$10,534,365 USD**	**$115,033,108 USD**

Data Analysis Continued

Example of responses from one valuation survey tool

Conclusion

– a) Valuation and accounting of ecosystem goods and services is complex but vital for Small Island Developing States

– b)analysts can re-classify the suitability of many economic valuation techniques for use in island states.

– c)market prices,production function, stated preferences and value transfer are important tools for use in SIDS. These are particularly useful for valuing fish and marine resources, as well as non-consumptive services such as tourism and coastal recreation.

– d) using a combination of valuation techniques/methods is most effective in assigning a true value on ecosystem services

– A suite of policy recommendations for the Iyanola Region

Building Resilience for Disaster Risk Management

Ronald James, Economist

14-15 October, 2019

AGENDA

- **CDB's Mandate**
- **Regional Development Challenges**
- **Vulnerability to Environmental Threats**
- **Disaster Risk Management Strategies**
- **Building Resilience**
- **CDB's role and interventions**
- **Main Takeaways**

Regional Development Challenges

Macroeconomic

Low economic growth
  average 0.4% over a decade

High debt and declining reserves
  regional median 65% of GDP;
  175% of GDP

Financial sector vulnerabilities

Low Productivity & Competitiveness

Jamaica is the 70th country in the WB Ease of Doing Business – highest BMC

Large infrastructure gaps

Inefficient and costly transport links and high energy costs

Poor Human Development

High poverty (43.7%) and youth unemployment (18-47%)

Poor education outcomes, skills mismatch and brain drain

High crime and citizen insecurity

Environmental Threats

High annual damage and losses from natural hazard impacts

  on average ~2% of GDP

Underutilization of Risk Transfer Mechanisms

Lack of enforcement of building codes

Limited climate change actions

Implementation Gap

Regional Approach Gap

Vulnerability to Environmental Threats
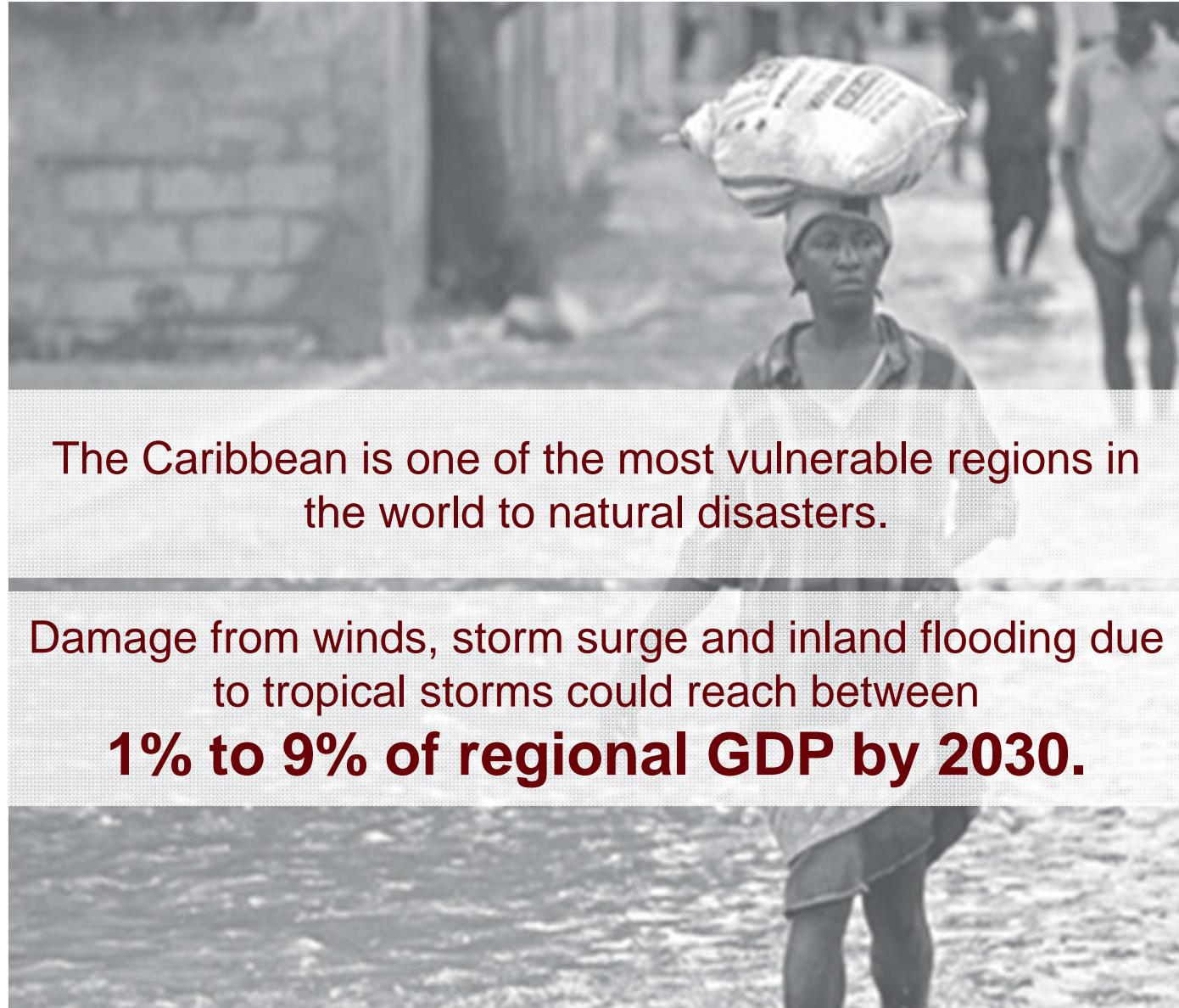
The Caribbean is one of the most vulnerable regions in the world to natural disasters.

Damage from winds, storm surge and inland flooding due to tropical storms could reach between **1% to 9% of regional GDP by 2030.**

Sources: IMF, CCRIF

The economic toll of disasters is often very high and recovery can take several years….

Natural Disasters, 1950 – 2014
Number of disasters per 1,000 km²

World Average

Categories (x-axis): BMU, MSR, AIA, VCT, LCA, KNA, ATG, CYM, BRB, CARIBBEAN, ...bean, DMA, VIR, MTQ, VGB, TCA, GLP, HTI, JAM, PRI, TTO, BHS, DOM, BLZ, CUB, GUY, SUR
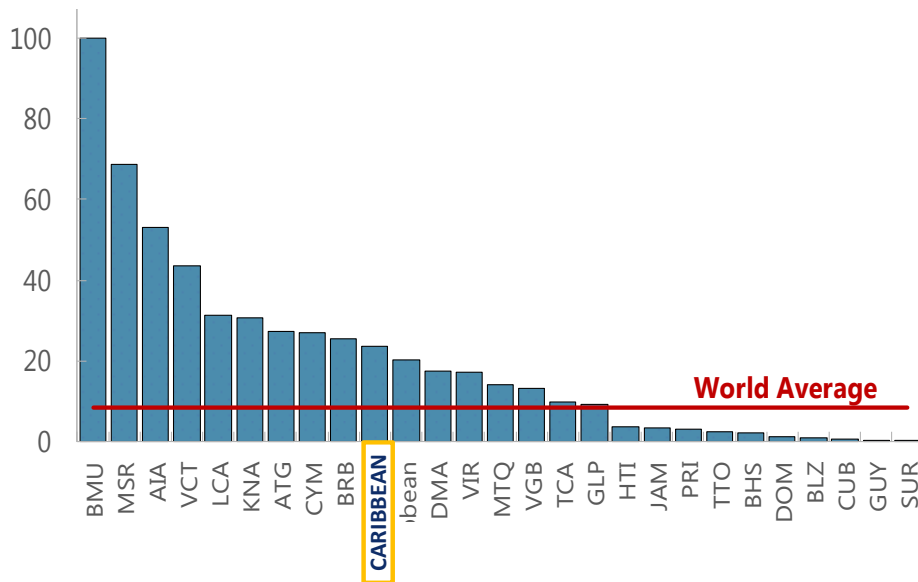
Average Annual Effects of Natural Disasters, 1990 – 2014

■ Other States   ■ Small States   ■ Caribbean

Damage (% of GDP): 4.5x, 6x
Disaster frequency*: 2x, 7x
Affected population (% of total)
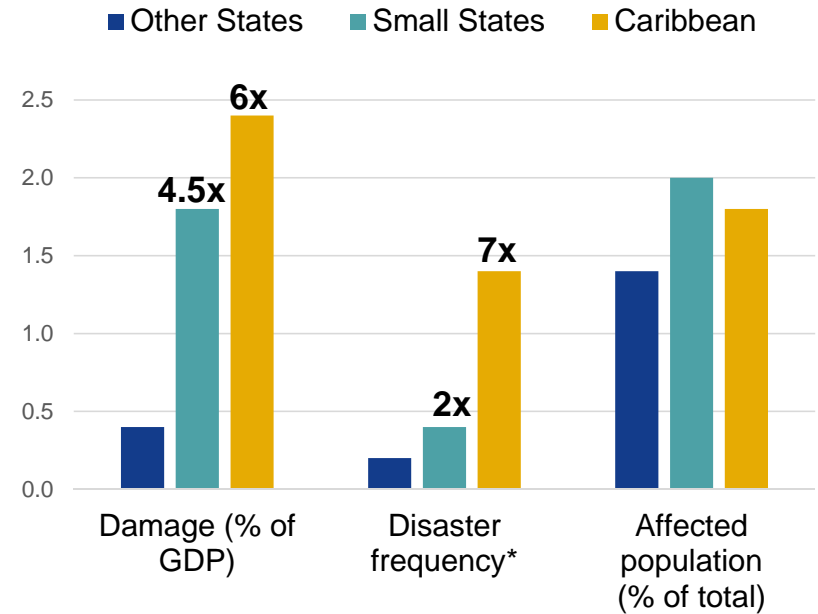
Sources: EM-DAT, IMF

Recent natural hazard events

Between 2000-2017, 13 of CDB's BMCs experienced high rates of loss and damage from natural events estimated at **USD27 bn**

USD8.1 bn or **114% of Haiti's GDP**

⎍ Great Earthquake

USD162 mn or **15% of Antigua and Barbuda's GDP**

⟳ Hurricane Irma

2000   **2010**   **2015**   **2017**

⛈ Tropical Storm Erica

USD483 mn or **90% of Dominica's GDP**

⟳ Hurricane Maria

USD 1.3 bn or **200% of Dominica's GDP**
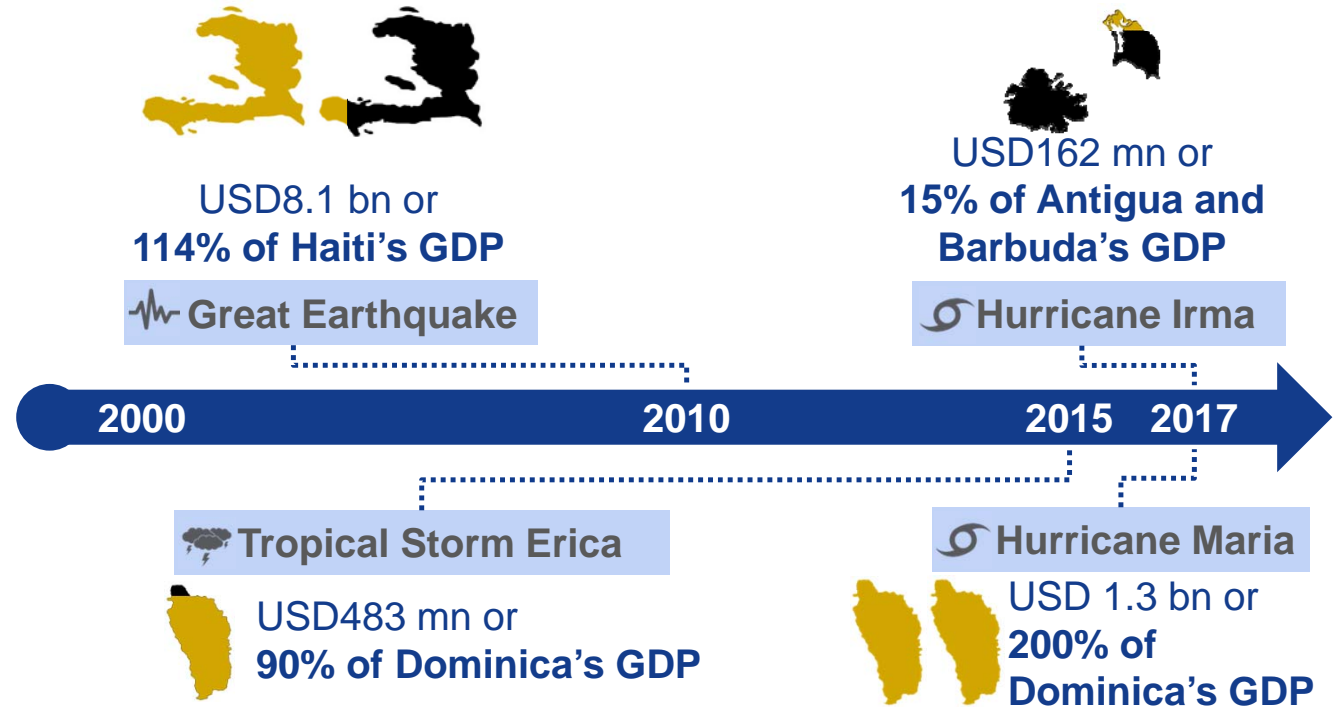
Remarkably, the total death toll in CARICOM member countries after the 2017 climate events of was less than **50 persons**

Sources: CDEMA, national estimates

DISASTER RISK MANAGEMENT STRATEGIES

Disaster risk management strategies include risk reduction by increasing investment in mitigation and prevention– but also include a series of alternative instruments for loss financing – commonly referred to as risk financing instruments

EX-ANTE ⇦ ⇨ EX-POST

Ex-ante risk financing instruments require **proactive advance planning** and really involves investing in national catastrophe risk management **prior to a natural disaster occurring**

Ex-post instruments are sources that can include budget reallocation, domestic credit, external credit, tax increase, and donor assistance

Ex-post strategies **provide emergency response, rescue and emergency relief services in the aftermath of natural disasters** and really is an example of a pure public good

Sources: CCRIF SPC

Disaster Risk Management Financing Strategies
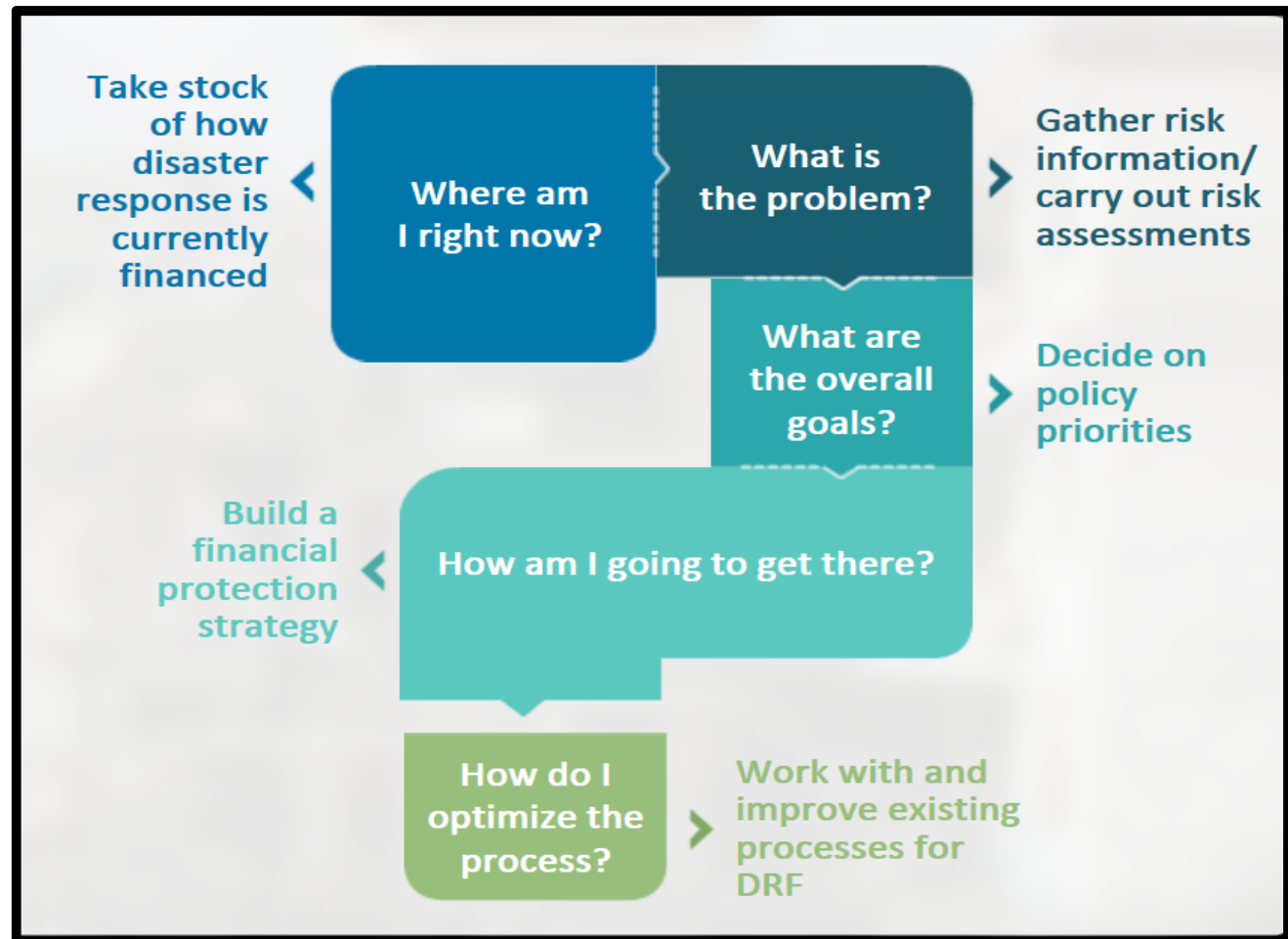
Disaster Risk Management Financing Approaches

- Building Fiscal Buffers
- Insurance Approaches
- Mainstreaming Climate Risk into Infrastructure Lending
- Innovative Financing Mechanisms
- Blended Finance Approaches
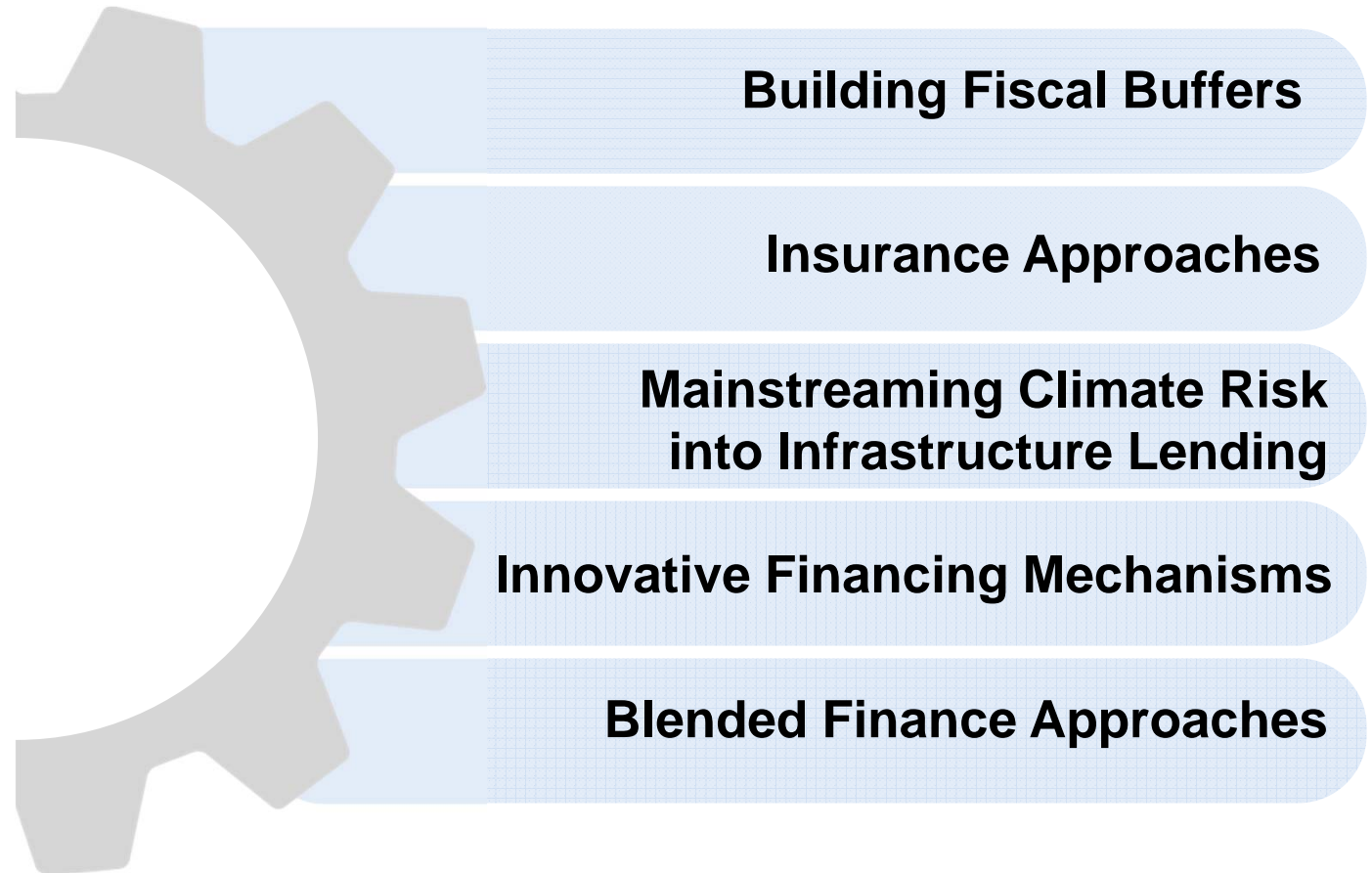
Public spending/investment on risk reduction should be consistent with fiscal space, debt sustainability and macroeconomic absorptive capacity

Resilience involves budgeting for a disaster *before* it occurs

66 EX-ANTE BUDGETING

the practice of recognizing the cost of public policy for disaster relief and recovery *before* a loss event"
- OECD

If Governments:

- Adopted effective ex-ante policies, e.g. Resilience/Savings Fund; Fiscal Responsibility Framework

- Focused on DRM reduction and management through insurance or other risk transfer mechanisms

They could **increase long-term well-being** in the face of disasters

Increased national savings

Effective mitigation

Disciplined pre-commitment to provide post disaster relief and recovery

Countries that employ fiscal responsibility framework should include well-defined escape clauses in their frameworks

Governments can transfer some of their natural disaster risk through the use of:

Traditional Insurance

Parametric Insurance e.g. CCRIF SPC

Both are required to ensure there is adequate coverage to mitigate risks of damage to critical public assets as determined by disaster risk assessments.

Climate Finance Flows to BMCs

Climate Finance Flows for Disaster Prevention and Preparedness, 2010 – 2015
USD million

Saint Lucia: 27.6
Dominica: 21.1
Haiti: 20.18
Jamaica: 7.26
St. Vincent and the Grenadines: 5
Grenada: 0.51
Trinidad and Tobago: 0.09
Suriname: 0.03
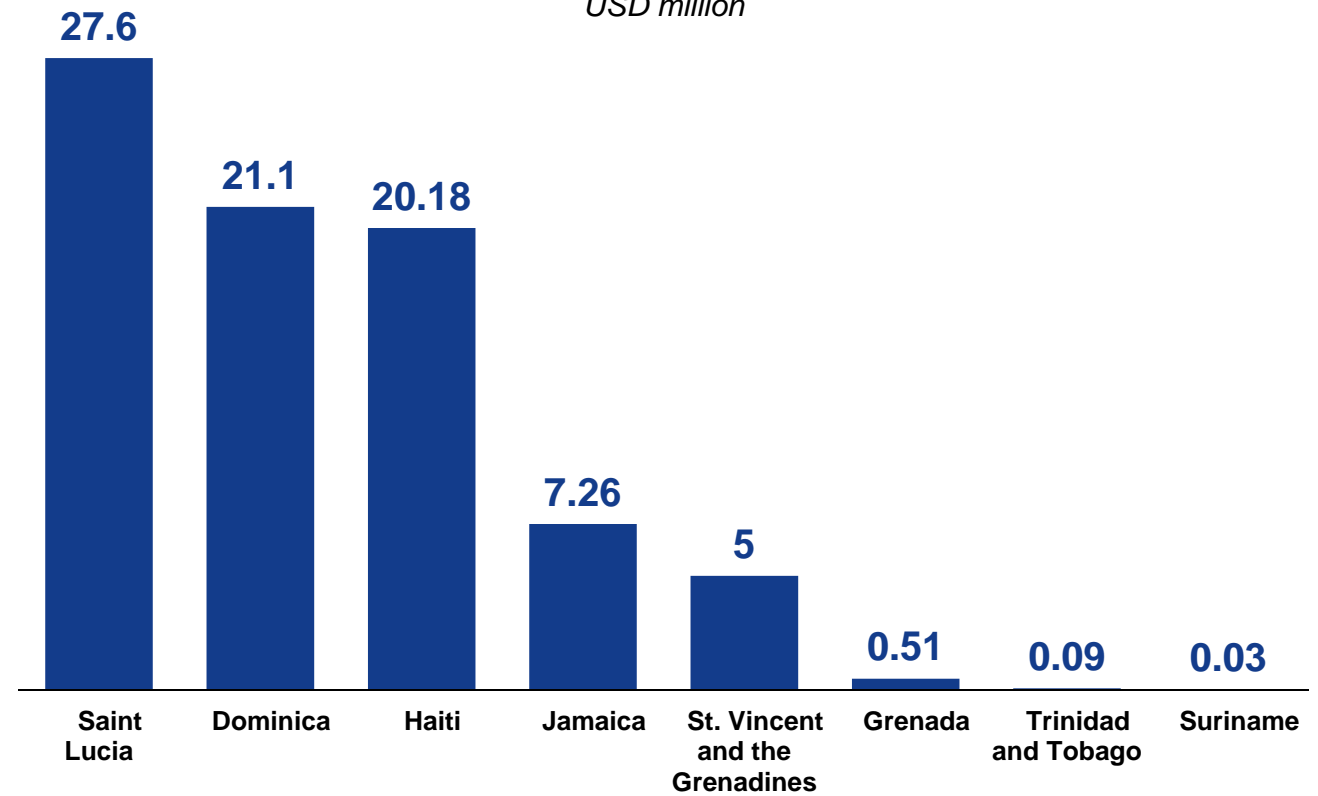
Sources: Stockholm Environment Institute (OECD Database)

Exploring new financial instruments and strategies is critical

Climate Funds

Domestic (Levy & Insurance)

Impact Bonds

Debt Swaps

Crowd Sourcing-Diaspora Financing

Contingent Recoverable Grants

Blended Financing
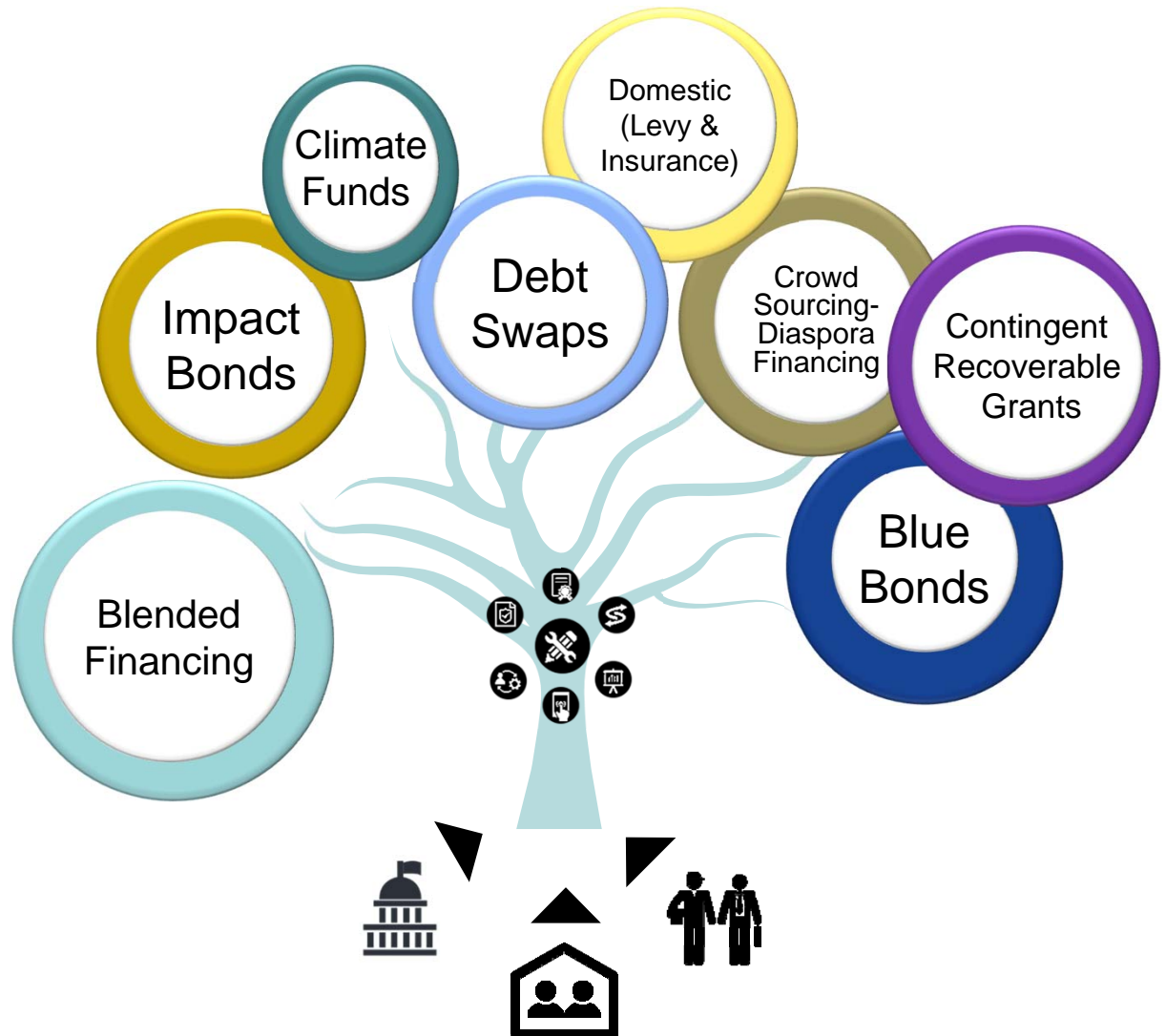
Blue Bonds

Country Case Studies

Dominica
Natural Disaster Fund

Grenada
State-Contingent Debt Instruments

Blue Economy World Impact Bond
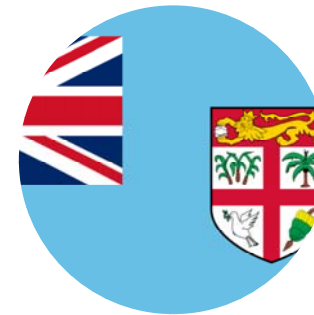
Fiji
Green Bond

Seychelles
Blue Bonds

What is CDB doing?

Mainstreaming

Building climate resilience through:
(1) new climate resilience strategy,
(2) revised urban policy (draft), and
(3) new housing policy

Strengthening early warning systems (climate screening of projects), which are critical to reducing risk in vulnerable sectors and communities.

Technical Assistance

- Supporting improved **building standards**

- Supporting BMCs in developing tools to strengthen resilience in infrastructure (road, transport, and water sectors) under **ACP-EU-CDB** project

Research

Financing the Blue Economy

Policy Blueprint for Caribbean Economies

Vulnerability and Resilience

What is CDB doing?

Funding

- CDB is an accredited entity to the **Green Climate Fund** (for USD50mn projects) and the **Adaptation Fund** (for USD10mn projects)

- In 2017 CDB and the Government of Mexico approved a grant of USD14 mn for CCRIF-SPC

- CDB received a EUR12mn grant from the **EU-CIF** to support geothermal exploration in the Eastern Caribbean under CDB's **GeoSmart Initiative**

- CDB follows its **Disaster Management Strategy and Operational Guidelines** to provide BMCs with: emergency relief grants (US$100,000), immediate response, and rehabilitation and reconstruction loans

Partnerships

CCRIF SPC
The Caribbean Catastrophe Risk Insurance Facility

GREEN CLIMATE FUND

NDRM
Natural Disaster Risk Management
In the CARIFORUM

Building Resilience to Disasters/Climate Change:
Better Preparation, Risk Mitigation, and Response

Mitigating Risk

- Build risk into macro-fiscal macro-financial frameworks
- Build fiscal buffers/self-insurance
- Risk-transfer instruments
- Ex-ante financing arrangements

Reducing Risk/Vulnerability

- ▪ - Build resilient infrastructure
- ▪ - Build risk maps, EWS
- ▪ - Enforce land use/zoning rules, building codes, retrofitting

Disaster response

- Contingency plan for better post-disaster intervention
- Rapid access to financing

Strengthening resilience to natural disasters and climate change

Source: IMF

Main takeaways

1

Financial Resilience to Disasters can support development outcomes.

Improved financial resilience helps break the poverty cycle often perpetuated by disasters and can prevent countries from losing years of development gains.

2

Funding for DRM should be sustainable.

Funding that is programmatic and long-term are important to help build resilience for the smaller and more frequent hazards that can lead to larger cumulative loss and damage.

3

Disaster Risk Management Financing should be comprehensive.

An effective disaster risk finance approach should bring together a combination of financial instruments, to protect against hazards of varied frequency and severity.

Main takeaways

4

Disaster Risk Financing should be integrated into national planning and budgeting.

DRF approaches must be effectively integrated with budget systems to rapidly and effectively execute funds in the aftermath of a natural disaster.

5

Modeling the Economic and Fiscal Risks for Disasters is critical.

Government's should integrate probabilistic assessments of the frequency and severity of natural disasters and the potential fiscal costs into their MTFF and DSA analysis.

6

Building smarter can reduce vulnerability to Disasters.

Focus should not be only on building back better but on *building smarter, maintaining what we build and adjusting where we build*.

THANK YOU

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Real and Fiscal Issues

Session 3

The Significance of Climate Related Natural Disasters on Agriculture Production in Saint Lucia

Petriana Daniel
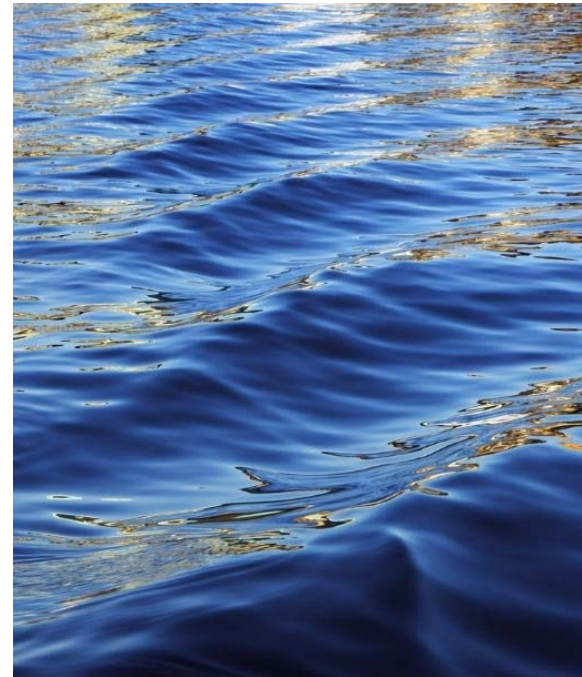
INTRODUCTION

❖ In most recent past countries as Dominica, Grenada and Saint Vincent have suffered major damages from natural disaster ranging from floods, drought, hurricanes

❖ The frequency of these events in the region more so in the case of Saint Lucia has impacted productive sectors as agriculture due to the loss in land, the damages of crops and the cost to rehabilitate farms.

❖ Saint Lucia's agriculture sector contribution to total GDP has been on a downward path, moving from 11.6% in 1995 to 5.92% in 2001, and has continued to decline registering a contribution of 1.9% to GDP in 2018.

OBJECTIVES

This paper seeks to assess the significance of climate change related disasters and other variables as institutional, infrastructural, technological and socio-economic factors on the agriculture sector in Saint Lucia.

LITERATURE REVIEW

Solomon, et al, 2007

In the study on climate change and agriculture in the Caribbean region stated that the impact on agriculture production is dependent on other factors and its interaction with weather; topography, soil types, water availability, kind of crops, livestock, species of trees used by the farmers in their agro-ecosystems.

Quasem, et al 2011

Indicated that a direct relationship exist between agriculture and climate change. The literature suggest that the agriculture sector remains the most vulnerable given its worldwide distribution and dependency on climate and environmental factors

HYPOTHESIS

To assess the determinants of agriculture production while highlighting the effects of climate related conditions on agriculture production in the short and long run.

AGRICULTURE PRODUCTION FUNCTION

Production is mainly affected by the major factors as environmental, socio-economic, infrastructural, institutional and technological.

In this context, agriculture production function can be defined as:

Agriculture Production = Environmental + Socio-economic + Infrastructural + Institutional +Technological

DETERMINANTS OF AGRICULTURE PRODUCTION

$$AGDP\ t = \alpha + \beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \varepsilon_t$$

Environment (β1)
- Rainfall
- Temperature
- Disaster

Socio-economic(β2)
- Real GDP
- Population

Infrastructural(β3)
- Markets
- Machinery

Institutional(β4)
- Credit to the Sector
- Land Holdings

Technology (β5)
- Input
(seeds, fertilizer, pesticide)
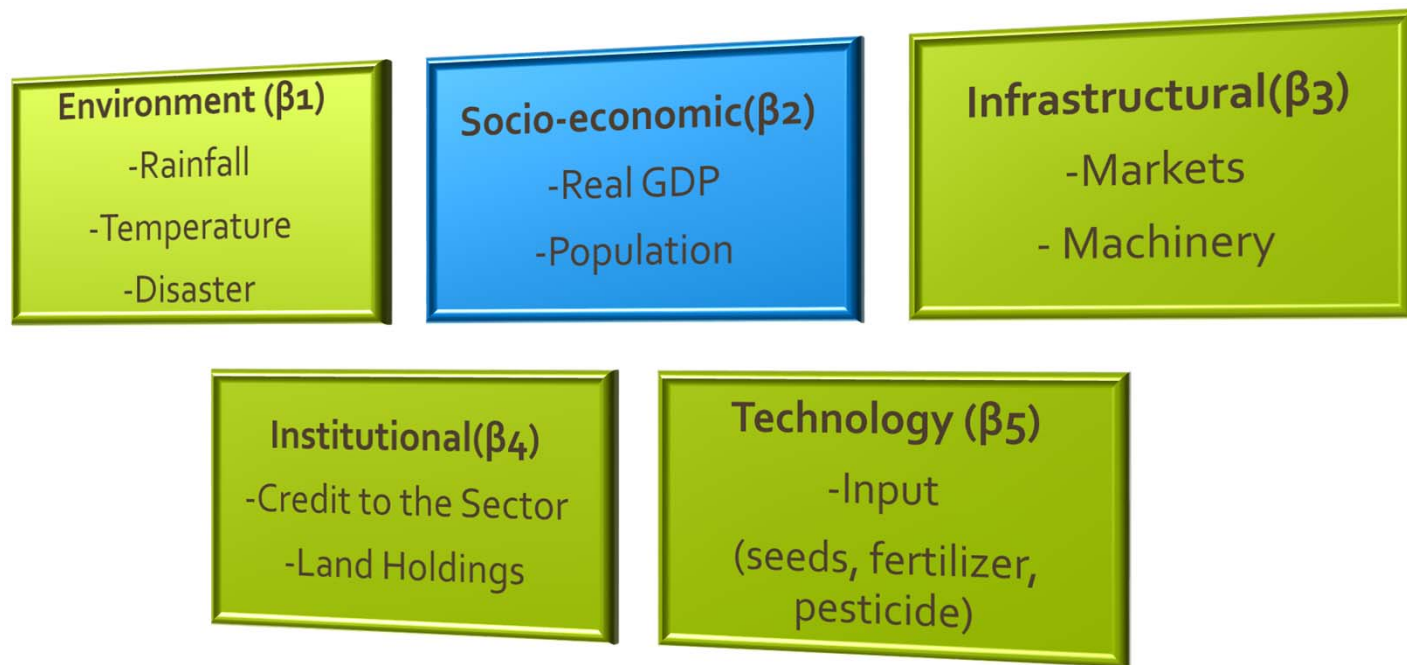
DESCRIPTIVE STATISTICS

Agriculture, forestry, and fishing, value added (% of GDP)
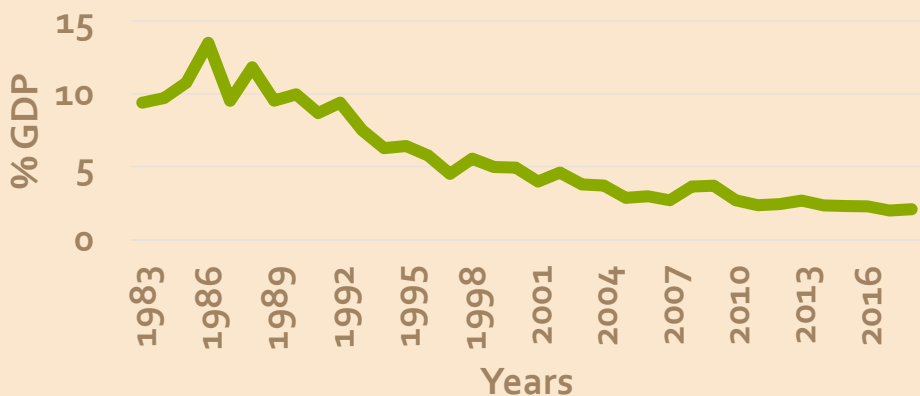
Rainfall for VFort and GFL Charles
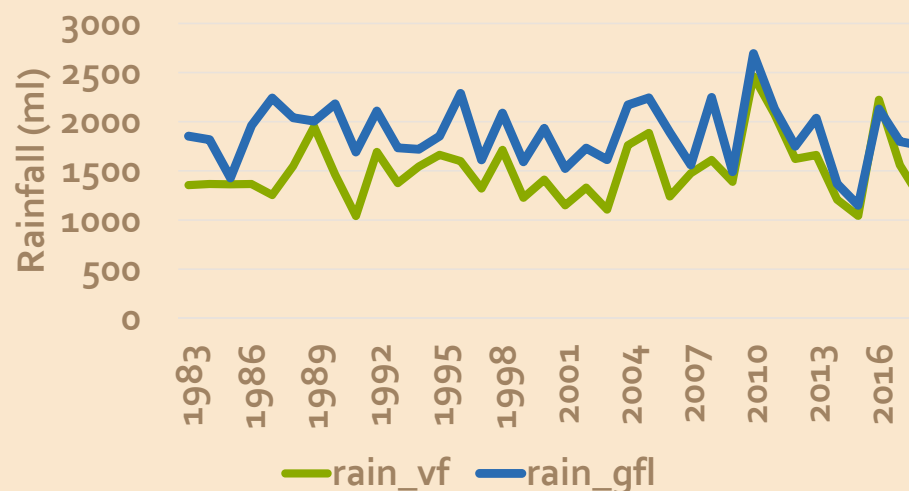
Agriculture Production by Sector
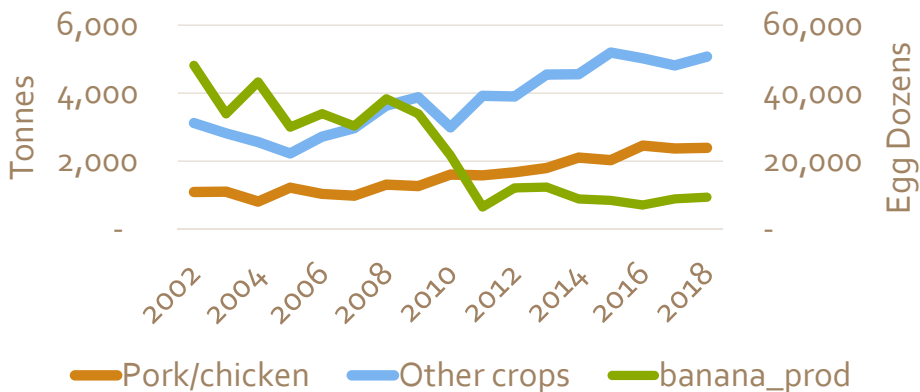
Subsectors of Agriculture GDP
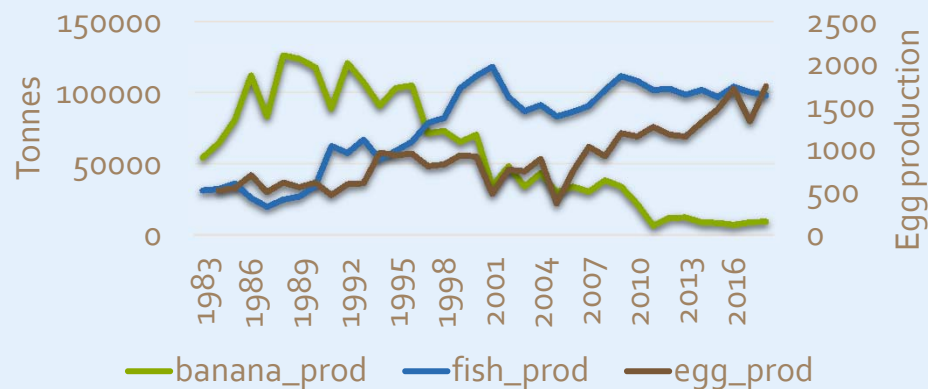
METHODOLOGY

Unit Root Test

- Augmented Dickey Fuller
- Phillipps – Peron
- Kwiatkawski-Phillips-Schmidt-Shin

Autoregressive Distributed Lag (ARDL)

- used to determine the strength of the relationship between the dependent variable which is production and a series of changing variables, known as the independent variables.

Hodrick Prescott Filter

- is data smoothing technique used to smoothen the fluctuations of short term variances. It minimizes the variance of old series around the new series.

RESULTS LONG RUN

SIGNIFICANT
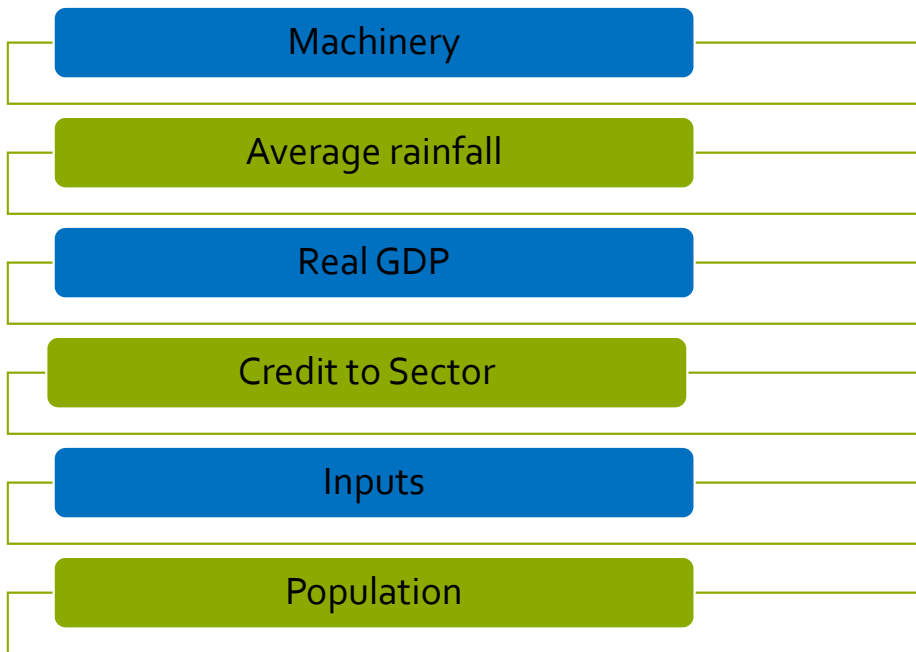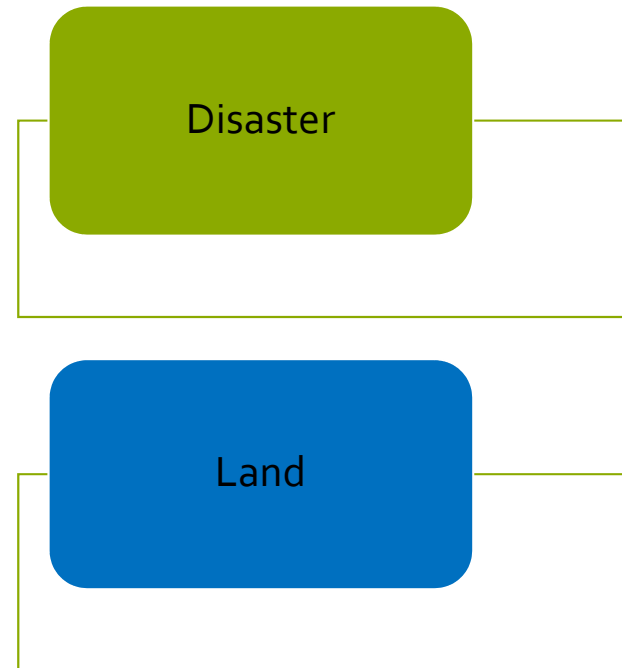
Machinery

Average rainfall

Real GDP

Credit to Sector

Inputs

Population

INSIGNIFCANT

Disaster

Land

HP FILTER FOR GDP

Ec Millions

Cyclone · Danielle · Emily gilbert · Debby · Landslide · Lenny · Ivan · Dean · Tomas · Flood Slide · Mathew · Kirk

■ Disaster   ━ Potential   ━ Actual
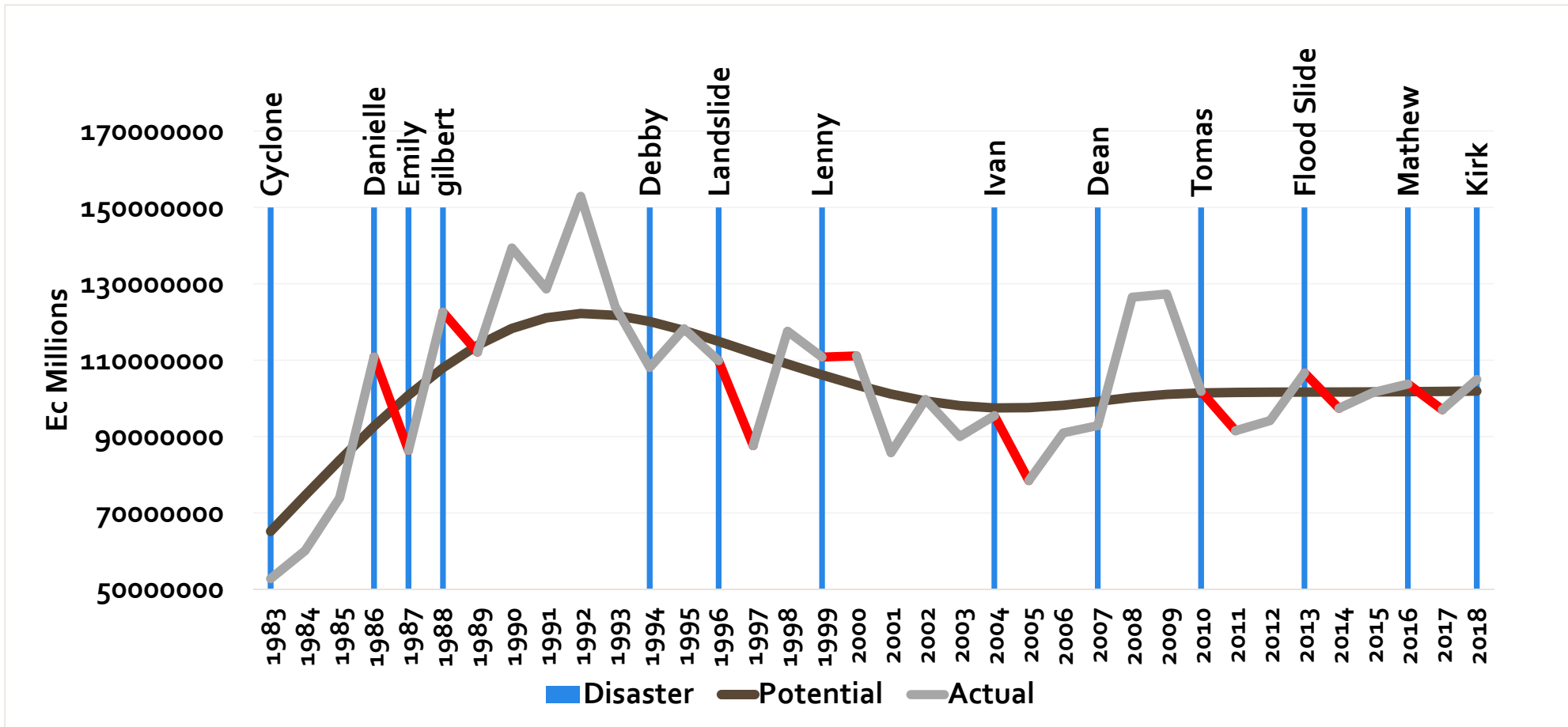
CONCLUSION

❖ Environmental factors (rainfall, disasters) have had a negative impact on agricultural production in Saint Lucia in the short run but disasters do not have a longer run impact on production.

❖ Hodrick Prescott filter suggests that agriculture performance have been below potential.

❖ In addition to environmental factors, infrastructural, institutional, technological and socio-economic factors are more significant to agricultural production in the long run than disasters.
   ❖ Credit to Sector
   ❖ GDP
   ❖ Population

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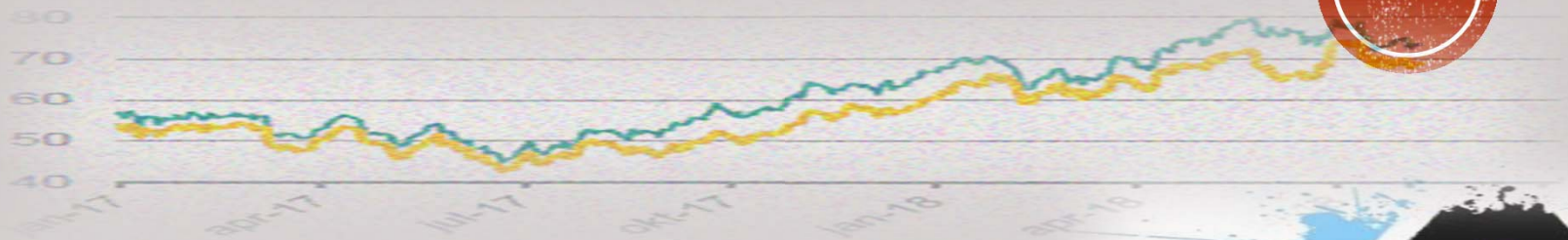
OBJECTIVE/MOTIVE

Problem Statement:

Domestic consumers continuously question the rationale or methodology used to calculate fuel prices, particularly for

Unleaded Gasoline (ULG) and Diesel. As such, this paper seeks to:

Determine the extent to which the Average Base CIF mirrors international fuel prices.

Determine the extent to which the domestic fuel prices reflect international fuel price developments

Using historical fuel data for the period 2015 - 2019 and WTI which is the proxy for international prices

BACKGROUND OF FUEL PASS-THROUGH REGIMES

2009-2011

One-month Fuel Pass-through (use 1 month average to calculate base CIF)

Implemented following a decision by the Monetary Council of the Eastern Caribbean Central Bank (ECCB).

This required all member states to adopt a pass-through mechanism for fuel given the escalation of international oil prices in 2008

2012- 2014

Three-month Fuel Pass-through (use 3 month average to calculate base CIF)

The Mean Caribbean Posting methodology was abandoned and the excise tax rate and CIF were used in the calculation process.

Excise tax rate: $2.50

2015>>>

Three-week Fuel Pass-through (use 3 week average to calculate base CIF)

On July 03rd 2017 a policy decision was taken to increase the excise tax rate by $1.50 in excess on $2. 50 which existed.

Following this, two caps were introduced to avoid a spike in domestic prices:

Cap 1: $12.75 (3rd July 2017- 2nd April 2018)

Cap 2: $13.95(23rd April to date)

Average Base CIF (Average CIF of Sol & Rubis) + **Service Charge** (6% of Base CIF) + **Excise Tax** (Variable)

Landed Cost

Company Margin ($1.01)

+

Wholesale Price

Retail Margin ($1.10)

=
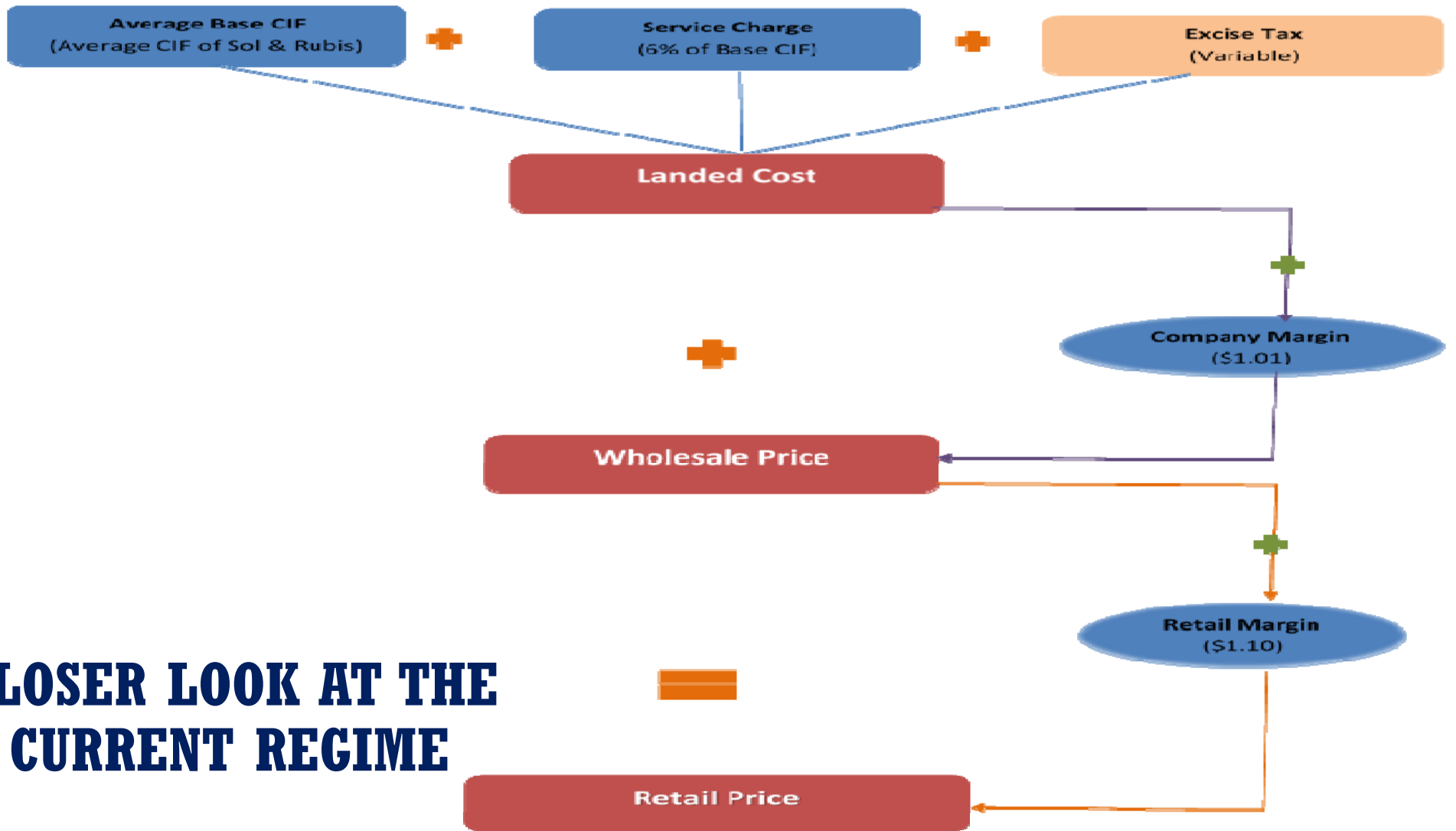
CLOSER LOOK AT THE CURRENT REGIME

Retail Price

SNAPSHOT OF HISTORICAL RETAIL PRICES, EXCISE TAX RATES AND WTI

Comparison of Excise tax and WTI

Comparison of Domestic retail prices and Excise tax
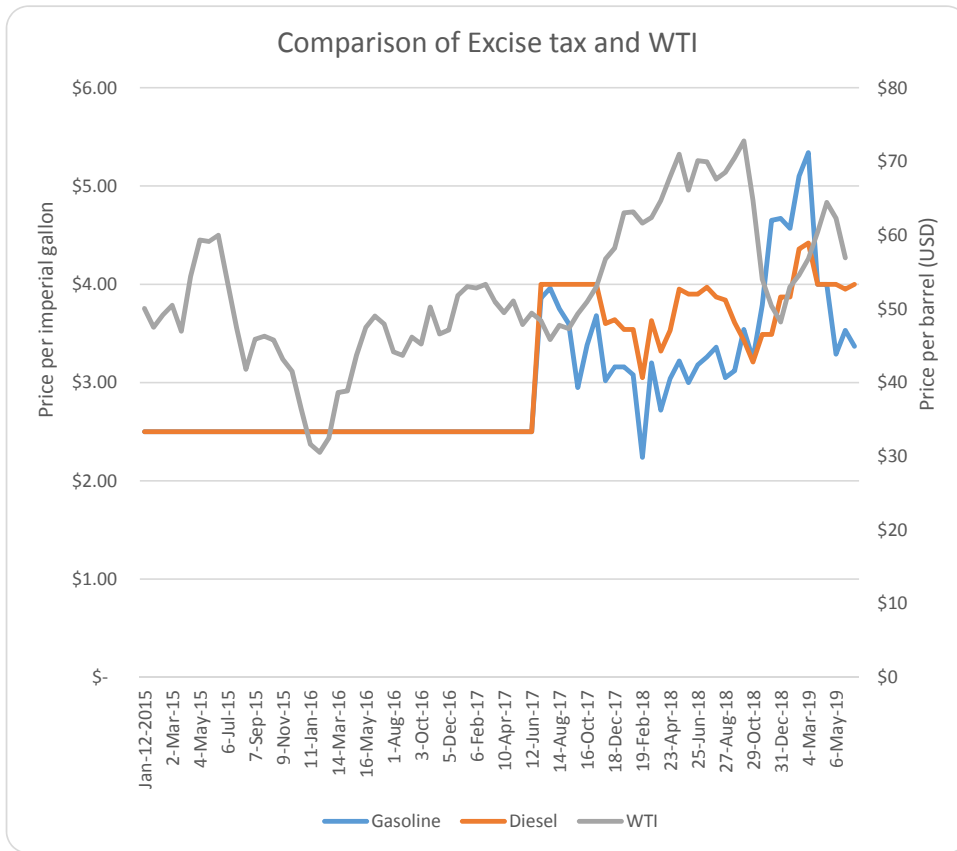
- Excise tax rate remained fixed in periods of volatility in the international market but became volatile after the revision of the excise tax rate
- Increases in international oil price in the latter part of 2017 led to an internal decision to increase the fuel cap to $13.95
- Nonetheless, there were instances where the excise tax rate was far below the $4.00 mark.

METHODOLOGY

A Pearson correlation coefficient also known as a "Product Moment Correlation Coefficient" (PMCC) is a statistical measure of the strength of a linear relationship between paired data.

Denoted by: -1≤ r ≤ 1

$$r_{xy} = \frac{n \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n \sum x_i^2 - (\sum x_i)^2} \sqrt{n \sum y_i^2 - (\sum y_i)^2}}$$

r_{xy} = Pearson r correlation coefficient between x and y
n = number of observations
x_i = value of x (for ith observation)
y_i = value of y (for ith observation)

(≥ 1) Positive relationship   (< 1) Negative relationship

Perfect relationship	If the value is near ± 1
High degree	between ± 0.50 and ± 1
Moderate degree	between ± 0.30 and ± 0.49
Low degree	below + .29
No correlation	If the value is 0
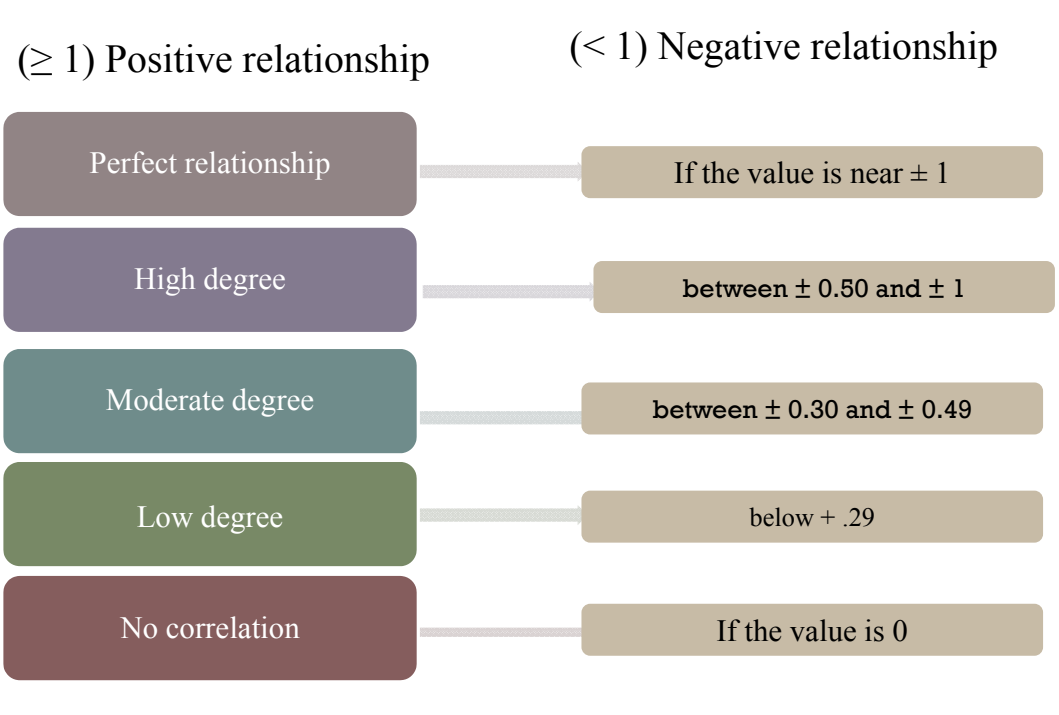
This analysis was conducted in Stata(a statistical software)

Average Base CIF vs WTI	Domestic Retail price vs Spot WTI	Domestic Retail price vs WTI
Determines the relationship between average c.i.f. and international prices	*Determining the relationship between retail and international spot prices (particular day)*	*Determining the relationship between retail and international prices-reference periods (21 days)*
High correlation between Average Base CIF and WTI	Moderate correlation between Retail prices and spot WTI	High correlation between Retail prices and WTI (reference period)
Gasoline: 0.82 **Diesel:0.85**	**Gasoline: 0.73** **Diesel:0.79**	**Gasoline: 0.80** **Diesel:0.81**
67.7 % and 71.4% of the change in base c.i.f for gasoline and diesel respectively is explained by changes in the WTI	53.9 % and 62.9% of the change retail prices for gasoline and diesel respectively is explained by changes in the Spot WTI	64.5 % and 66.9% of the change retail prices for gasoline and diesel respectively is explained by changes in the WTI

DOMESTIC RETAIL PRICE AND WTI USING REFERENCE PERIODS

	Pearson Correlation Coefficient Values (r-value): measures the relationship of two variables and their interaction	
	Price-WTI	
	Reference (3 Week)	
Year	**Gasoline**	**Diesel**
2015	0.66	0.57
2016	0.88	0.91
2017	-0.76	0.19
2018	0.25	0.25
2019	-0.31	-0.16
Entire Period	**0.80**	**0.81**

IMPACT OF TAXES, GUARANTEED MARGINS AND PRICE CAP ON RETAIL PRICES

Difference	Difference between the coefficients of determination derived using the Reference Period methodology and Average Base CIF	
Year	Gasoline	Diesel
2015	-1.6%	-0.3%
2016	0.0%	0.0%
2017	42.8%	-38.0%
2018	-69.4%	0.7%
2019	-39.3%	-0.8%
Entire Period	-3.3%	-4.5%

Mixed results over the period

.

A negative sign means Base CIF coefficient was larger which implies that it was more consistent with international prices
A positive sign means that the reference period was larger indicating that it was more consistent with international price developments

RECAP

Does the Base CIF mirrors international fuel products?

Base CIF strongly mirrors international oil prices despite an estimated gap of 30 percent.

Does domestic

retail prices

of fuel reflect international fuel price developments?

However, this gap is wider as a result of the addition of the domestic taxes, guaranteed margins and price caps.

Base CIF

5.0 percent

Retail Prices

Excise Tax

Service Charge

Distribution margins

Price Caps
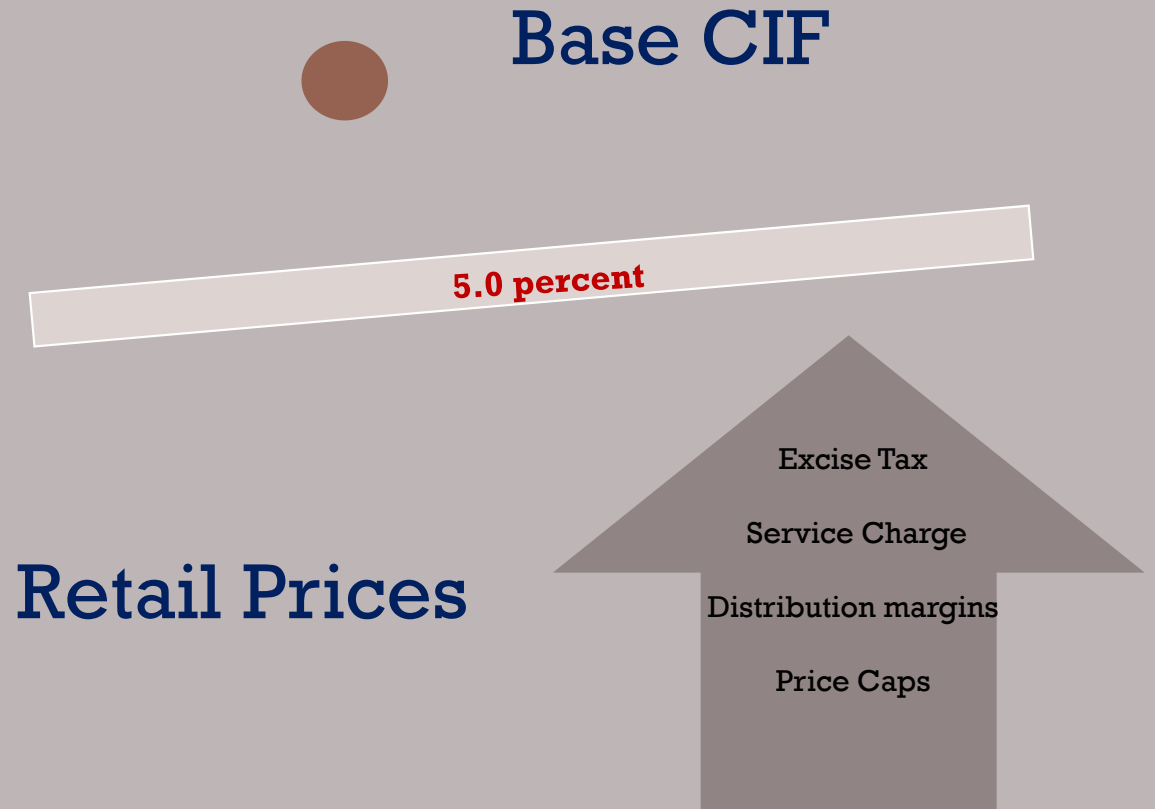
RECOMMENDATIONS

The Government of Saint Lucia in an attempt to safeguard fuel tax revenues should ensure that taxes are calculated in an efficient and equitable manner to avoid higher or distortionary taxes elsewhere in the economy. The following can be done in this regard:

Excise Tax

- Conduct a cost-benefit analysis to identify which component of the excise tax should be fixed and which should be variable. Currently, the fixed component is the $1.50 while the variable is $2.50…..

- Consider a lumped approach with no variable component for which tax levels are fixed at the target benchmark .

Price Cap

- Conduct research to identify an optimal price cap or discontinue the price cap and allow a full pass-through of fuel prices.

- However, the preferred approach would be to allow a full pass-through in which only the excise tax component is variable;

- Maintaining a price cap and a variable excise tax component simultaneously does not always maximize government excise revenue.

Thank You!

TAXES AND THE DEMAND FOR INTRA-REGIONAL TRAVEL

Research and Policy Unit

Javan Lewis

INTRODUCTION

Tourism Became The Main Sector Mid 1990's

Taxes Fees and Charges

Demand For Intra-Regional Travel

OBJECTIVES

1	What is the PED for intra-regional travel
2	What will be the impact on government revenue if TFC's are reduced
3	To recommend appropriate policy

LITERATURE REVIEW

Intervistas Consulting Inc., 2007

Caribbean Development Bank,2017

Breakdown Of Roundtrip Prices To and From St. Lucia

Legend: Total Airfare | Airline Base Fee | TFC's

Y-axis: PRICE (USD)

Destination	Total Airfare	Airline Base Fee	TFC's
Antigua	$593.39	$237.39	
Barbados	$364.15	$214.15	
Dominica	$497.75	$199.75	
Grenada	$399.71	$222.71	
Guadeloupe	$585.66	$203.66	
Guyana	$802.84	$232.84	
Martinique	$397.12	$213.12	
St. Kitts	$679.35	$217.35	
St Vincent	$310.07	$185.07	
Trinidad	$336.35	$186.35	
Average	$496.64	$211.24	
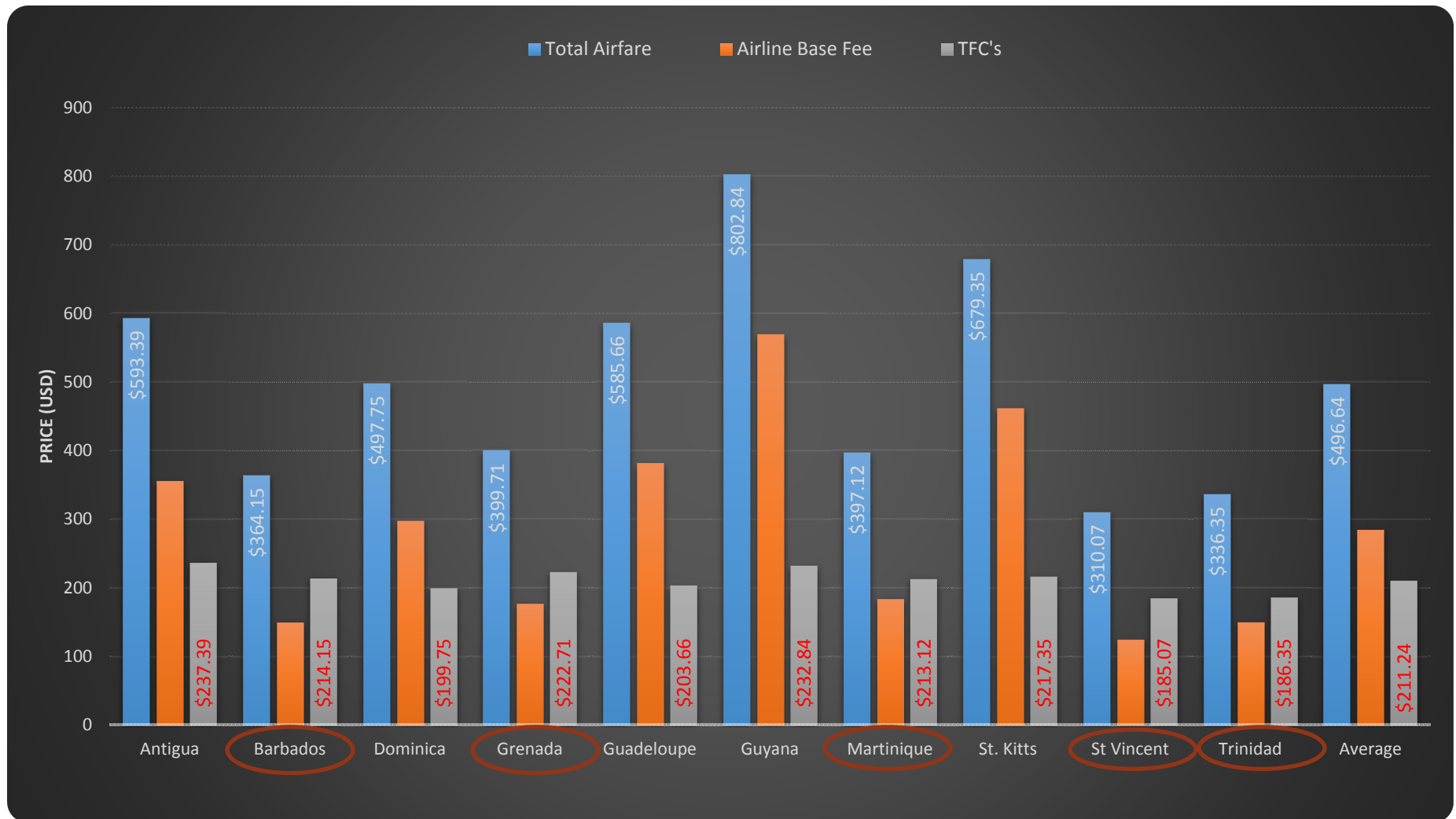
STYLIZED FACTS

St Lucia Caribbean Arrivals

Year	Arrivals
2005	84729
2006	78464
2007	59047
2008	59757
2009	60083
2010	53998
2011	58876
2012	56067
2013	60521
2014	55484
2015	62745
2016	67226
2017	76349
2018	77548
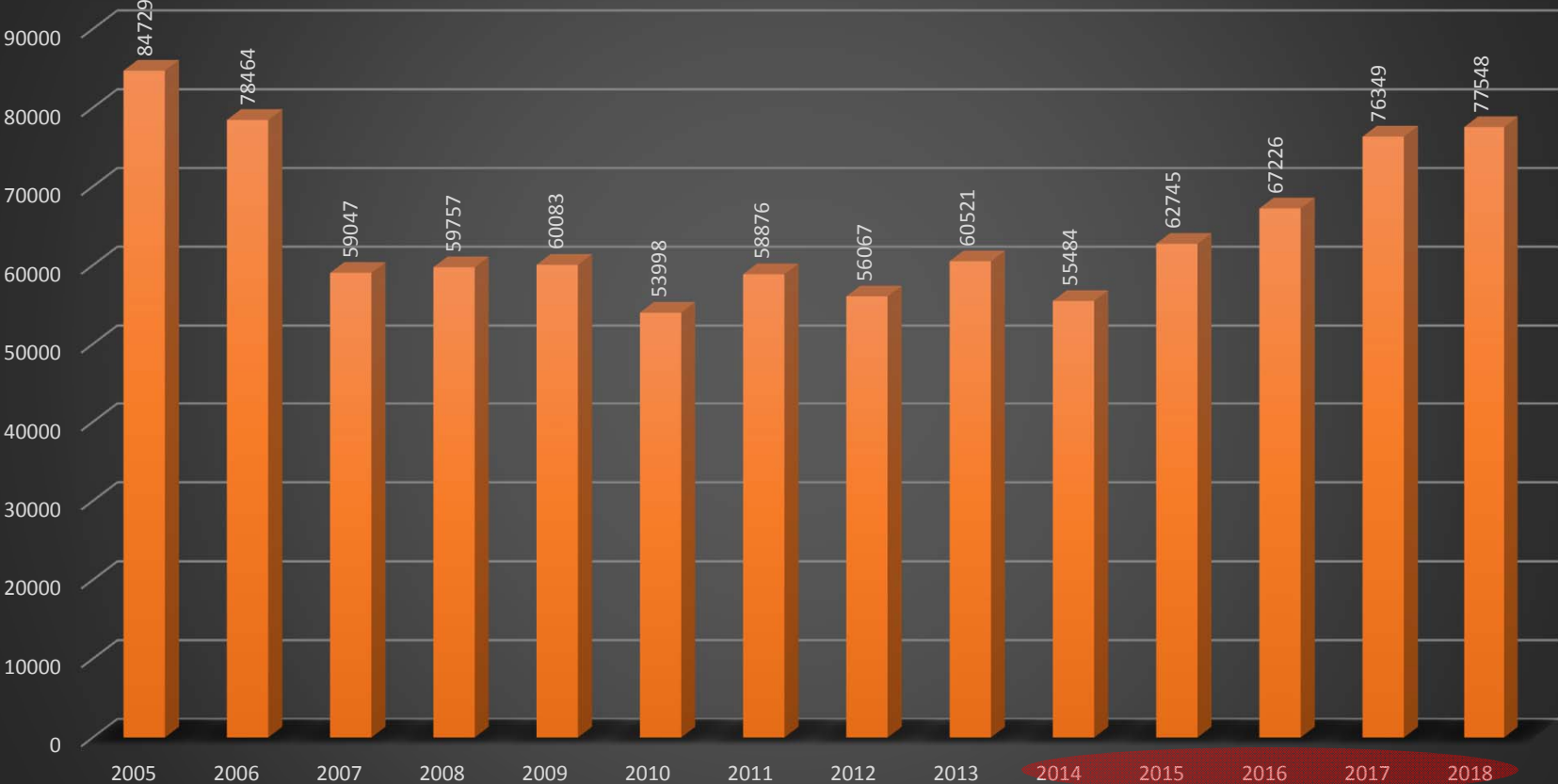
Relationship Between TFC's and Intra-regional Travel

TFC's

PED

Intra-regional travel
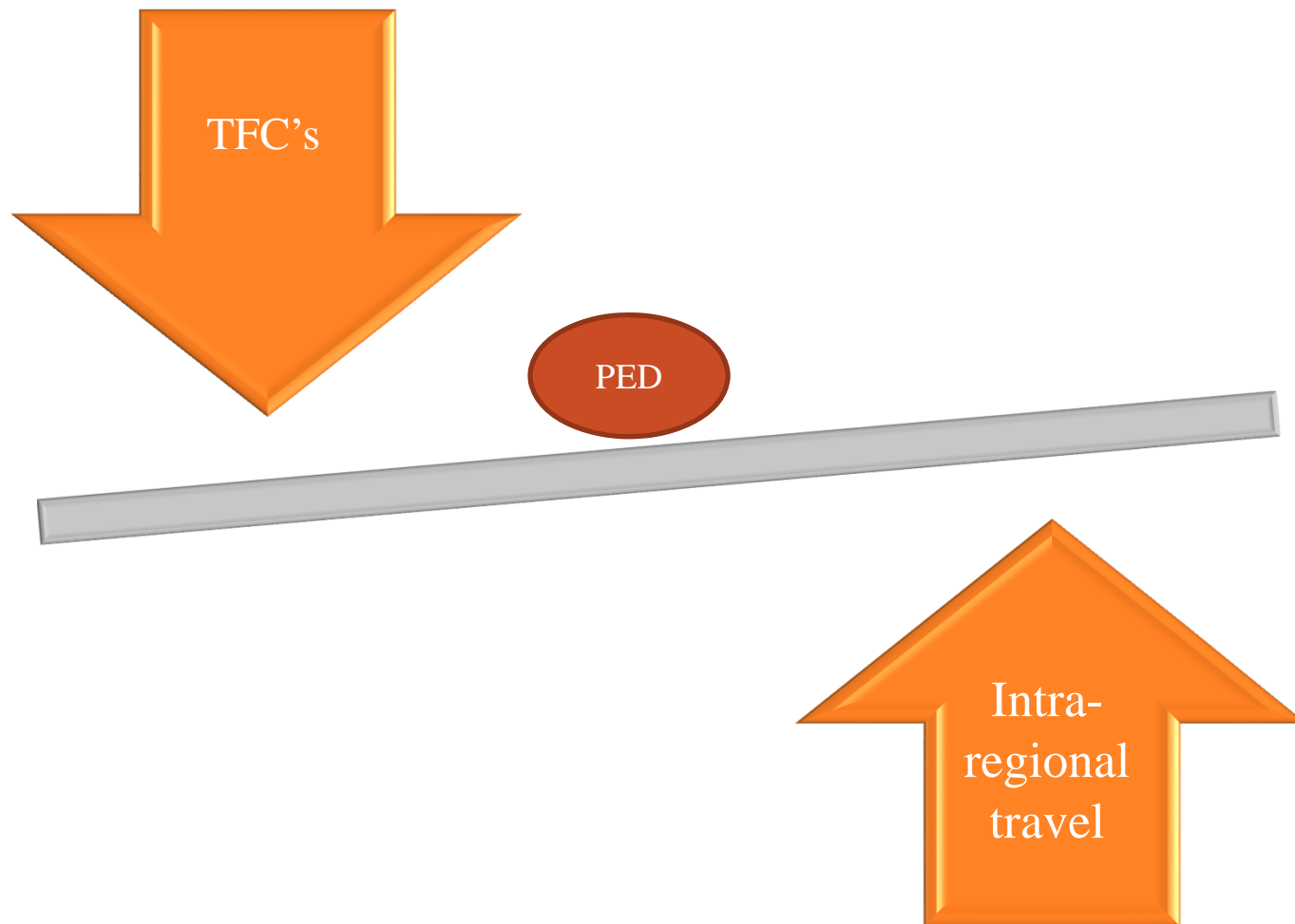
LIMITATIONS

- ❑ *Data Sets*

- ❑ *Region Classification*

METHODOLOGY

Intra South America	1.25	There is an emerging middle class which makes the market more elastic than sub-Saraha Africa, and LCCs are emerging in Brazil, Chile, and Mexico.

Base Elasticity (-0.8) ✖ Geographic Elasticity Multiplier (1.25) ➡ Air Travel Elasticity (-1)
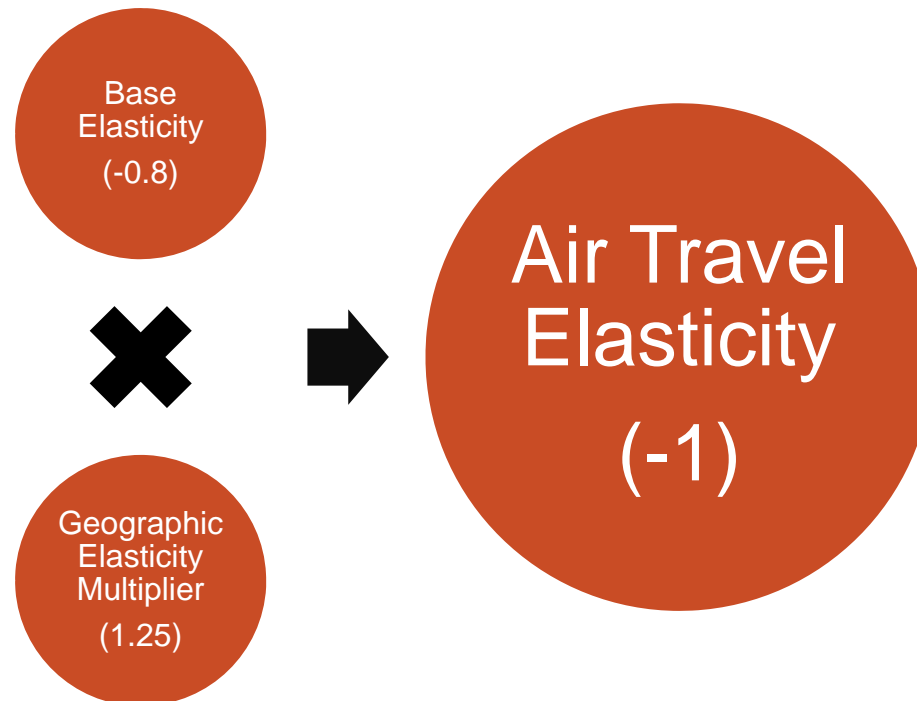
DATA ANALYSIS AND RESULTS
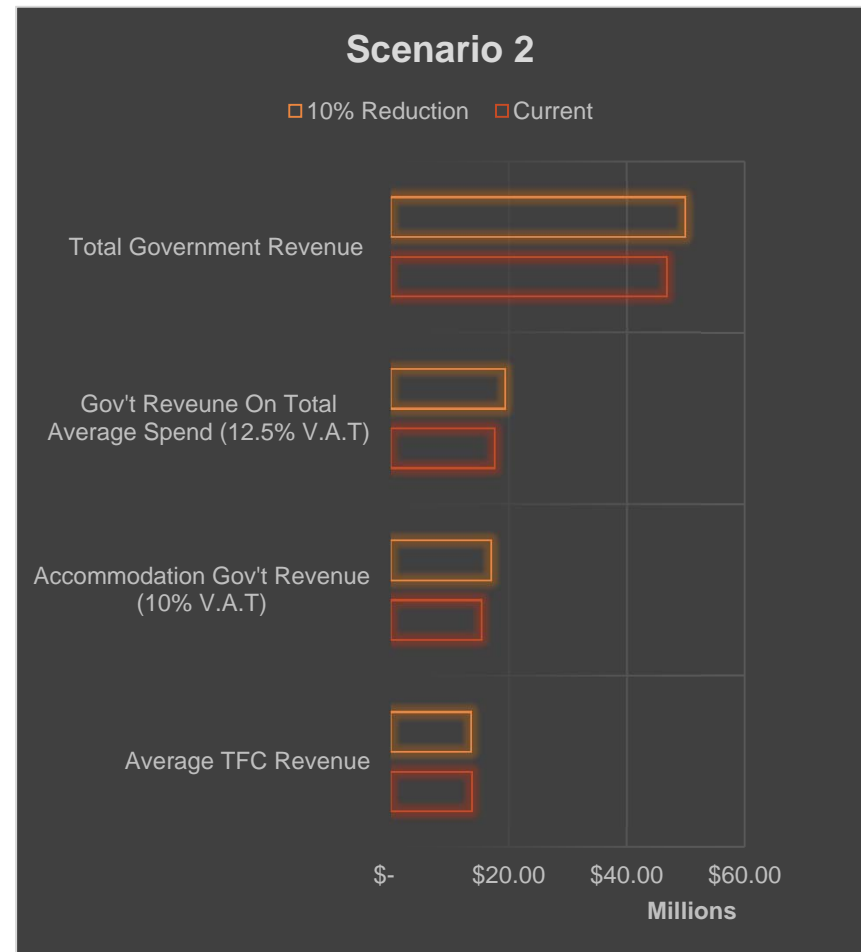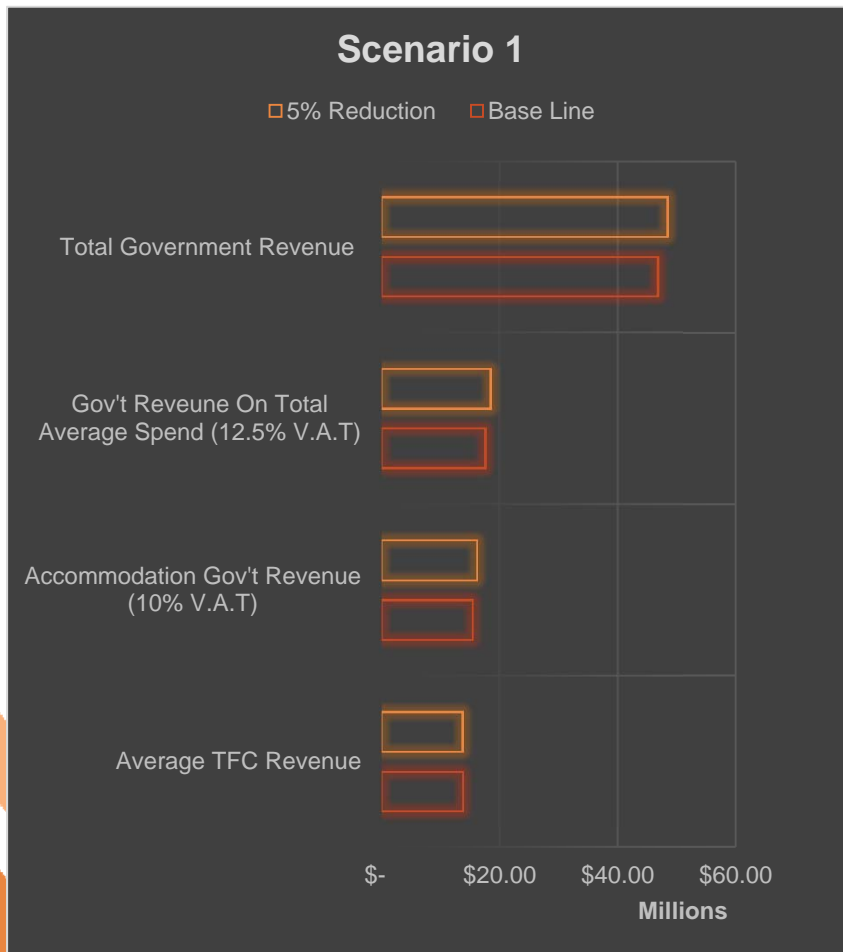
CONCLUSION

Steady increase in intra-regional travel shows the potential in the market

A reduction in TFC's will cause a proportionate change in intra-regional travel demand

Government revenue grows by 3% and 7%

RECOMMENDATIONS
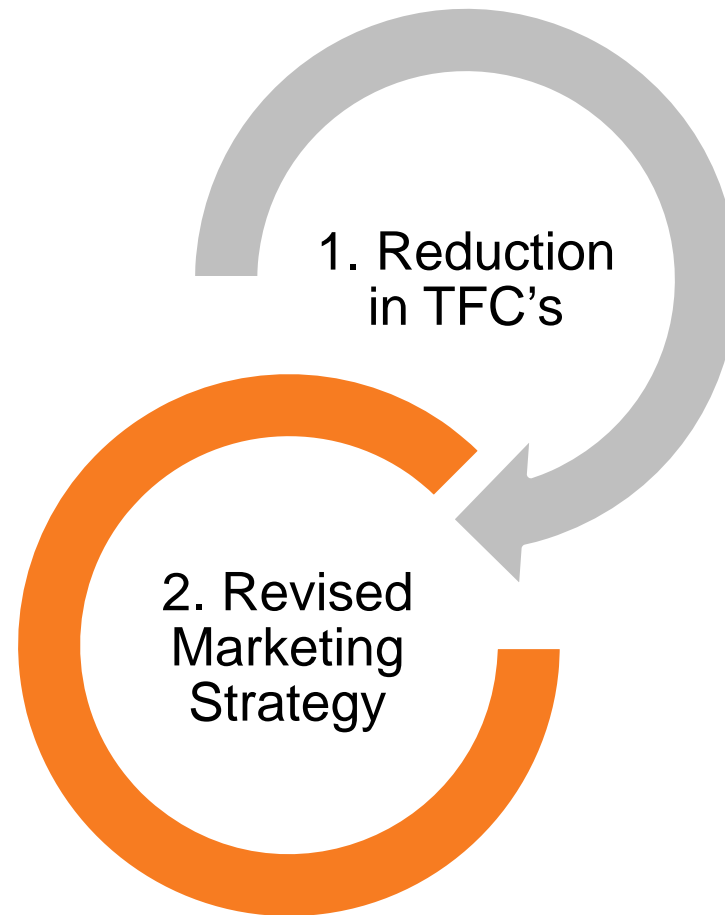
1. Reduction in TFC's

2. Revised Marketing Strategy

THANK YOU

RESEARCH PROBLEM

Poor Quality Projects

Delays in Project Implementation

Cost Over runs

Low rate of project implementation

LITERATURE REVIEW

A project is a temporary endeavor with a beginning and an end designed to create a unique product, service or result (PMI A Guide to Project Management Body of Knowledge).

Project Implementation is defined as a specified set of activities designed to put into practice an activity or programme of known dimensions (National Implementation Research Network 2014).

Kerzner (2003) and Venter (2005: 81) state that resources must optimally be utilized to ensure that a project's output adheres to time, budgetary and quality constraints.

METHODOLOGY

Analysis of 10 years historical data on Projects

Compare with operating cost of PIUs for corresponding years

Based on prudential ratios, determine the efficiency of project implementation

STRUCTURE OF PROJECT MANAGEMENT
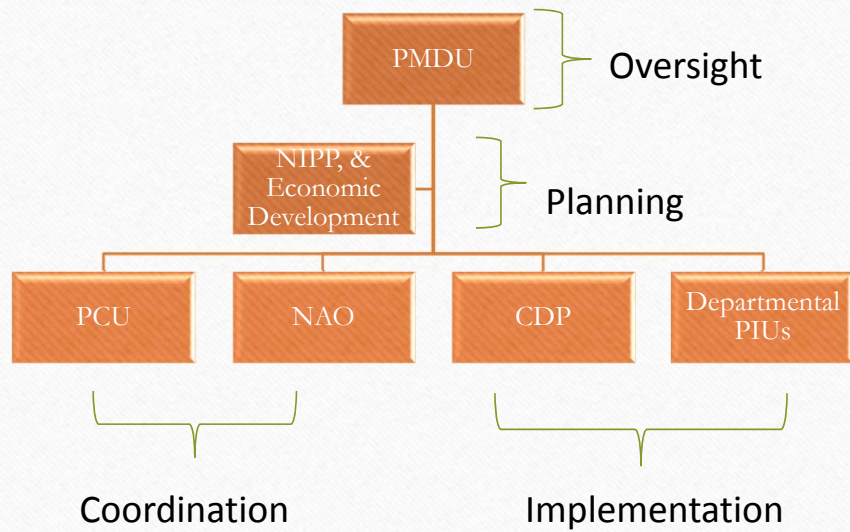
PROJECT OPERATING COST
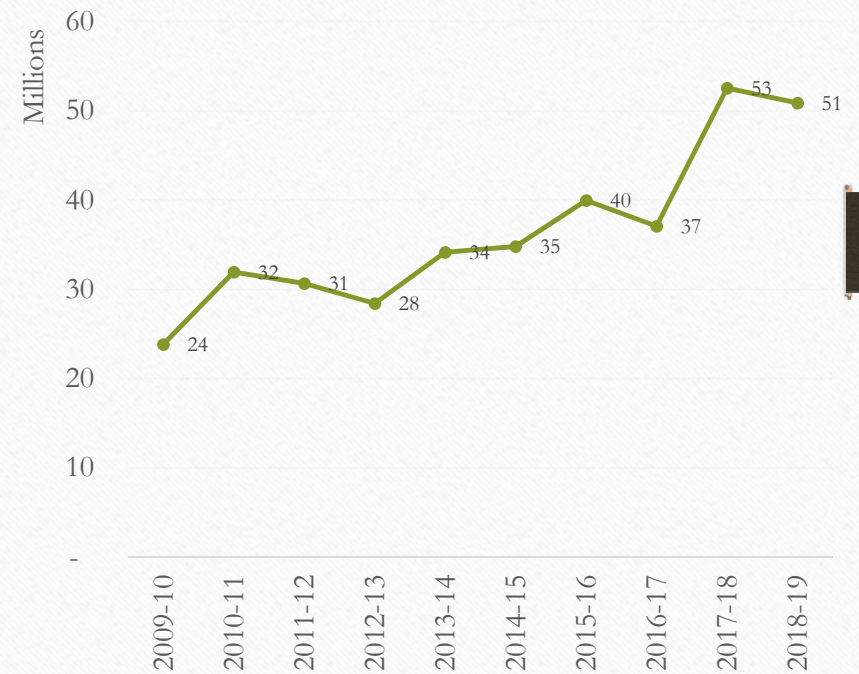
Expenditure by Functional Classification in EC$M

Key Priority Areas (MTDS)

Roads and Infrastructure — $572.7 m
- Roads- $341m
- Desilting-$24m
- Bridges and Culverts-$30m
- Drainage-$6m

Tourism — $414.2 m
- Tourism Marketing- $381.2 m
- Improving Competitiveness of Rural Tourism $3.9m
- Technical Assistance for Eco/Agro Tourism Sector Programme)- $2.1m

Health — $404.2 m
- NNH- $178m
- St Judes Hospital - $109.5m
- Home Care Givers programme - $13.3m
- HIV Aids Prevention and Control – $7.2m
- Senior Citezens Home- $ 6.0m

Education — $128.4 m
- School feeding programme -$17.3 m.
- Basic Education Enhancement Project - $27.3m
- Education Enhancement through ICT- $11.4 m
- OECS Skills for Inclusive Growth- $10.8m

Agriculture — $134.2 m
- National Abbatoir Project -$17.3 m
- Banana Commercialization & Agriculture Diversification- S7.0m
- Management of Black Sigatoka- $12.0 m
- Agricultural Development Project -$6.8m

Law & Order — $42.1 m
- CCTV Security System - $4.9m
- Rehabilitation of BTC, High Court, Police Stations- $6.3m
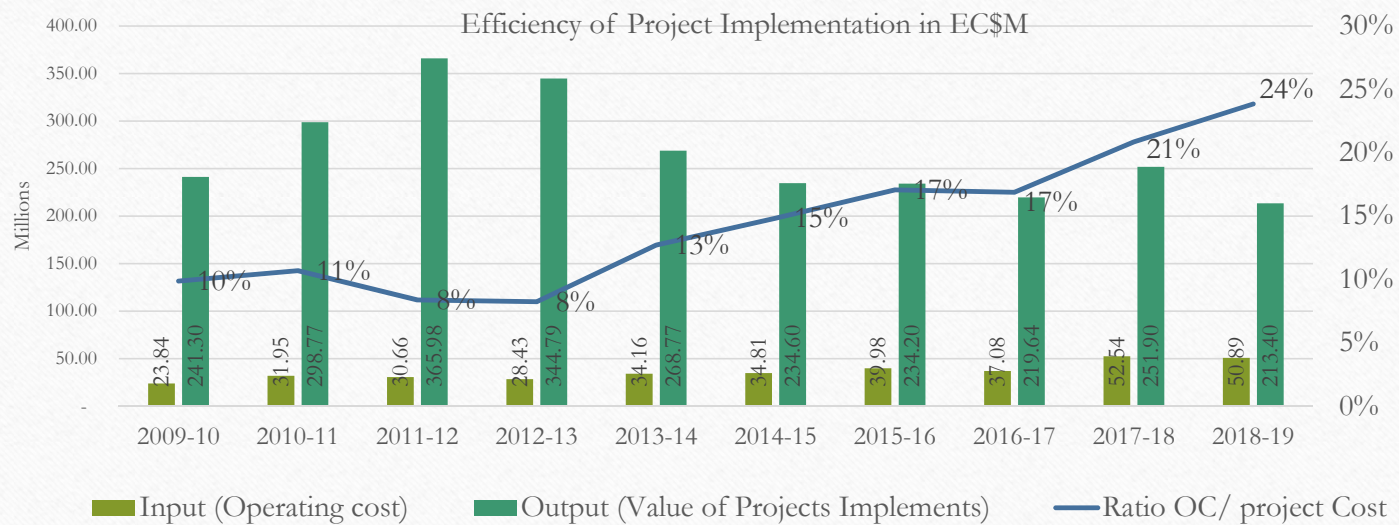- Establishment of Forensic Lab- $1.2m

The value of projects implemented in the last decade has declined

Budgeted verses Actual Capital Expenditure in EC$ mil

RESULTS

Efficiency of Project Implementation in EC$M
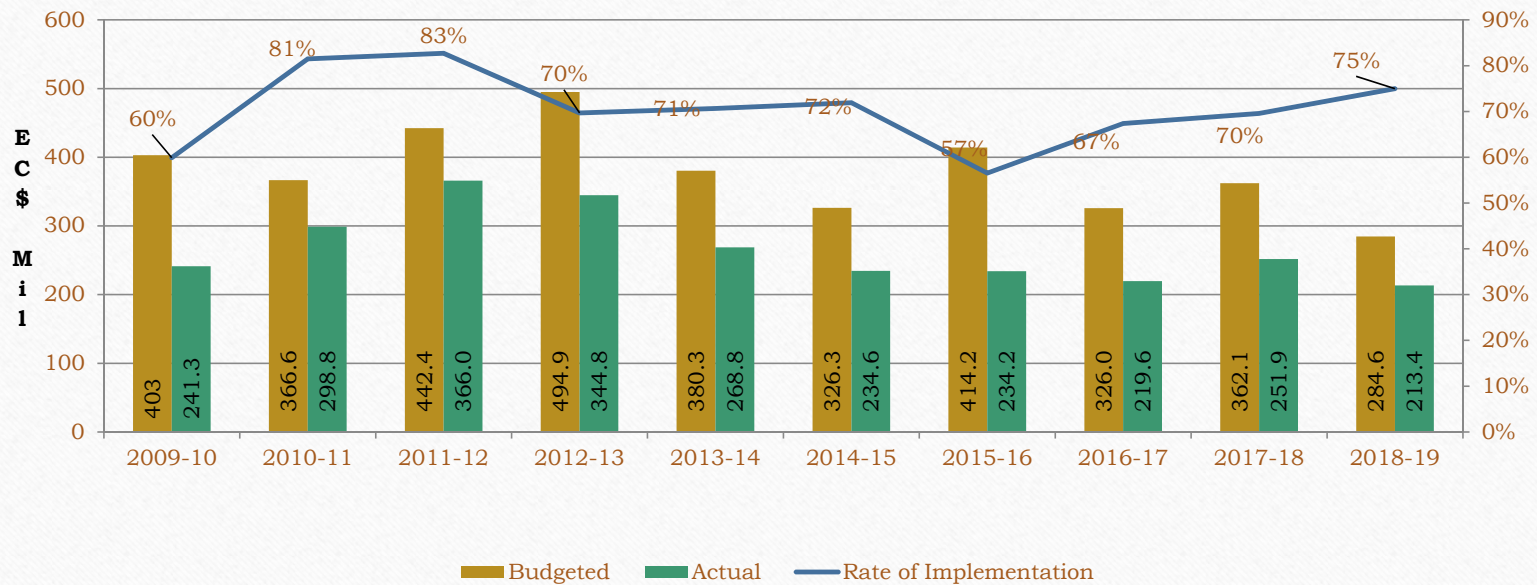
RECAP OF FACTS

- Estimated 1,345 projects undertaken in the last 10 years ranging between $1m to $130 m

- $2,665.7 million expended on projects averaging $261 M of projects being implemented annually

- Eleven (11) Departmental PIUs plus three coordination units and 3 project management units with estimated operating cost of $364.2 m

Specific Concerns of Project Coordinators

Inadequate use of PM Software

Lack of Project Management skills

Lack of Contract management skills

Inability to manage project risks

Technical abil;ity to prepare specifications/TORs

Clear division of operational responsibilities

Skill gaps- legal, IT

Lack of Interdepartmental coordination

CONCLUSION

- Scope exist to enhance the efficacy of project implementation in the Public Service.

- Springboard for further analysis to be done in the area of project implementation in Saint Lucia.

THANK YOU

Education

Session 4

AGENDA

1   Objectives

2   Review of Vulnerability Metric

3   Results

4   Takeaways

WHY IS THIS STUDY IMPORTANT?

It supports evidence-based policy formulation.

Resurgence of interest in the quantification of vulnerability indices.

It has a role in the allocation of financial resources.

Aligns with BMCs' priorities to assess their vulnerabilities.

It can be used to develop innovative financing mechanisms.

Updates the CDBs' vulnerability index.

OBJECTIVE

To quantify BMCs' relative vulnerability to external shocks.

VULNERABILITY

the inherent, permanent or quasi-permanent features of a country which renders that country **exposed to forces outside its control**.

RESILIENCE

the extent to which an economy can **withstand** or **bounce back** from the negative effects of external shocks.

Multi-Dimensional Vulnerability Index

Economic Vulnerability Index
- Guided by **Briguglio** (1992, 1997, 2014)
- Pioneered by **Tom Crowards** (2000)
- **Hartman** (2011)

Multidimensional Vulnerability Index
Revised and updated (2019)

Economic   Social   Environmental

Basic Criteria

| Simple | Comprehensive | Comparable |

Constructing the Vulnerability Index

01 — Determine causes of vulnerability
(e.g., lack of diversification, dependence on external finance, predisposition to natural disasters, social susceptibility)

02 — Select and compile proxy indicators

03 — Apply normalization methodology to data
$X_{ij} = (X_{ij} - Min\ X_j)/ (Max\ X_j - Min\ X_j)$

04 — Compute sub-indices
*Composite index constructed by applying an equal weighting system*

In combining the indicators, a number of studies have recommended and embraced the assignment of equal weight to the different items (Briguglio, 1995; Crowards and Coulter, 1999; Morris, 1979; UNDP, 1991; Commonwealth (2014); St. Bernard (2007) and and Ogwang, 1994).

# Economic, Social, and Environmental Vulnerability
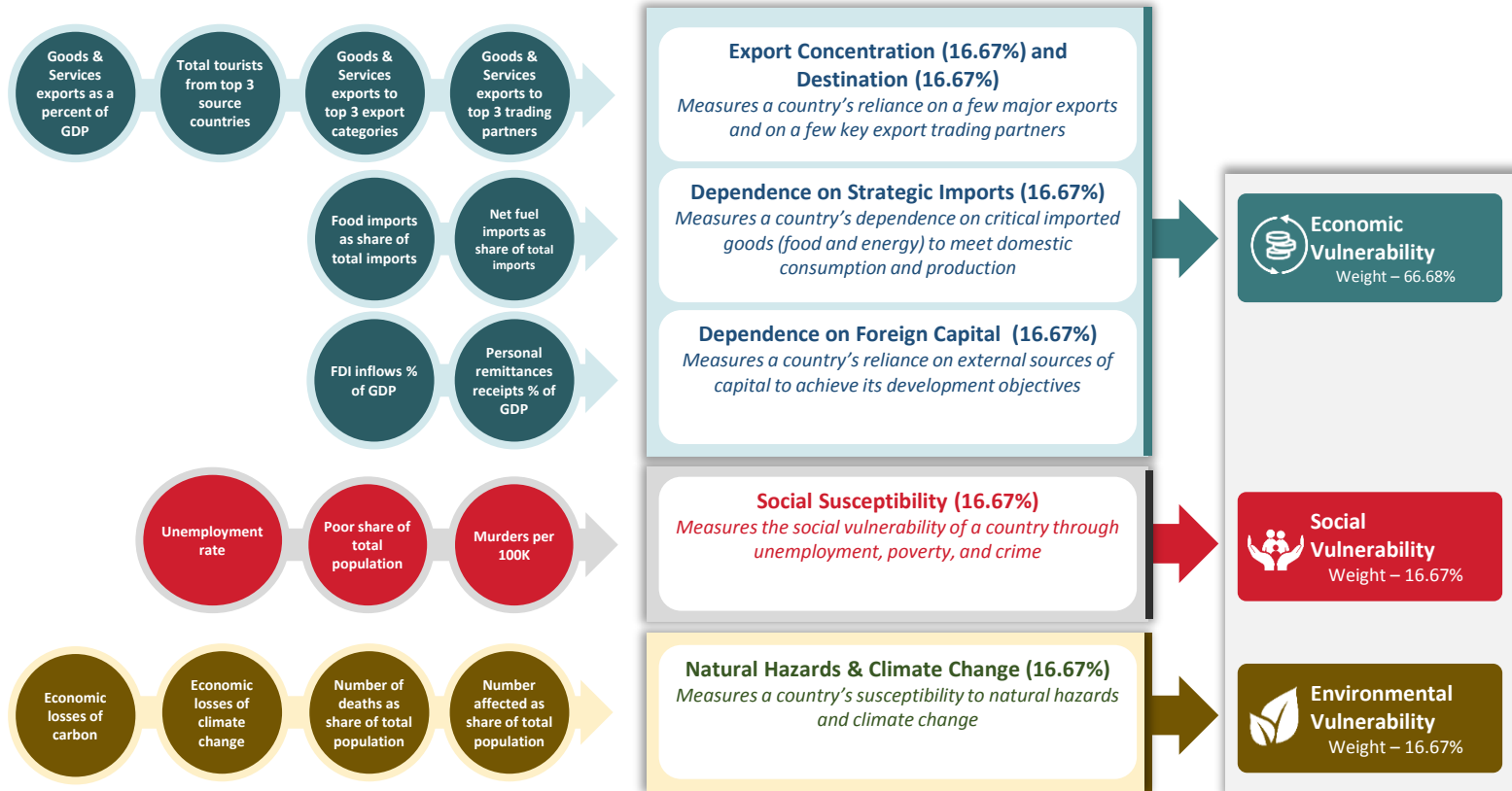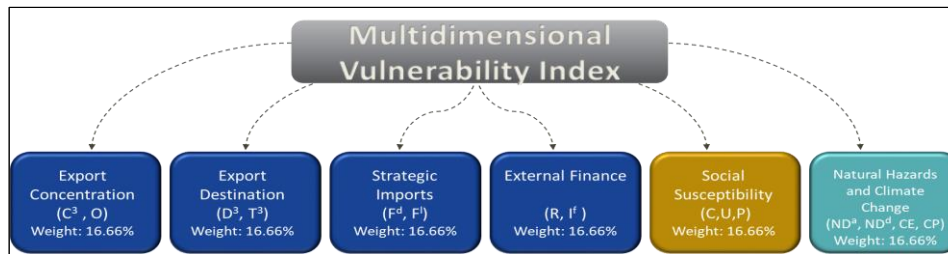
The proxy indicators in the Vulnerability Index are as follows:

Vulnerability = average (E^3, O); (D^3, T^3); (F^d, F^l); (R, I^f); (C, U, P); $(ND^a, ND^d; CE, CP)$

E^3	= the proportion of total exports of goods and services represented by the top three export categories.
O	= total exports of goods and services[1] as a percentage of GDP.
D^3	= the proportion of total exports of goods converging on the top three export destinations.
T^3	= the proportion of total tourists from the top three source countries.
F^d	= Food imports as a percentage of total imports.
F^l	= Fuel imports as a percentage of total imports.
R	= the ratio of annual remittances to GDP.
I^f	= the ratio of the annual flow of FDI to GDP.
C	= the number of intentional homicides per 100,000 population.
U	= the rate of unemployed persons in the labour force.
P	= the rate of persons living in poverty.
ND^a	= the number of persons affected by natural disasters, as a proportion of total population.
ND^d	= the number of deaths resulting from natural disasters, as a proportion of total population.
CE	= the economic losses or gains of climate change (Dara Climate Index).
CP	= the economic losses or gains of carbon (Dara Climate Index).

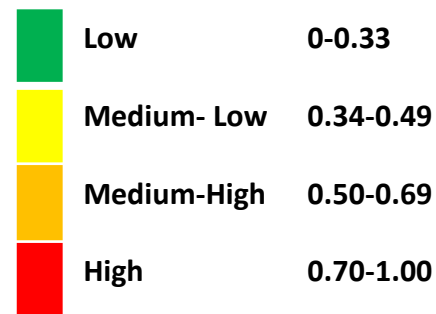Multidimensional Vulnerability Index: 2017 vs. 2016
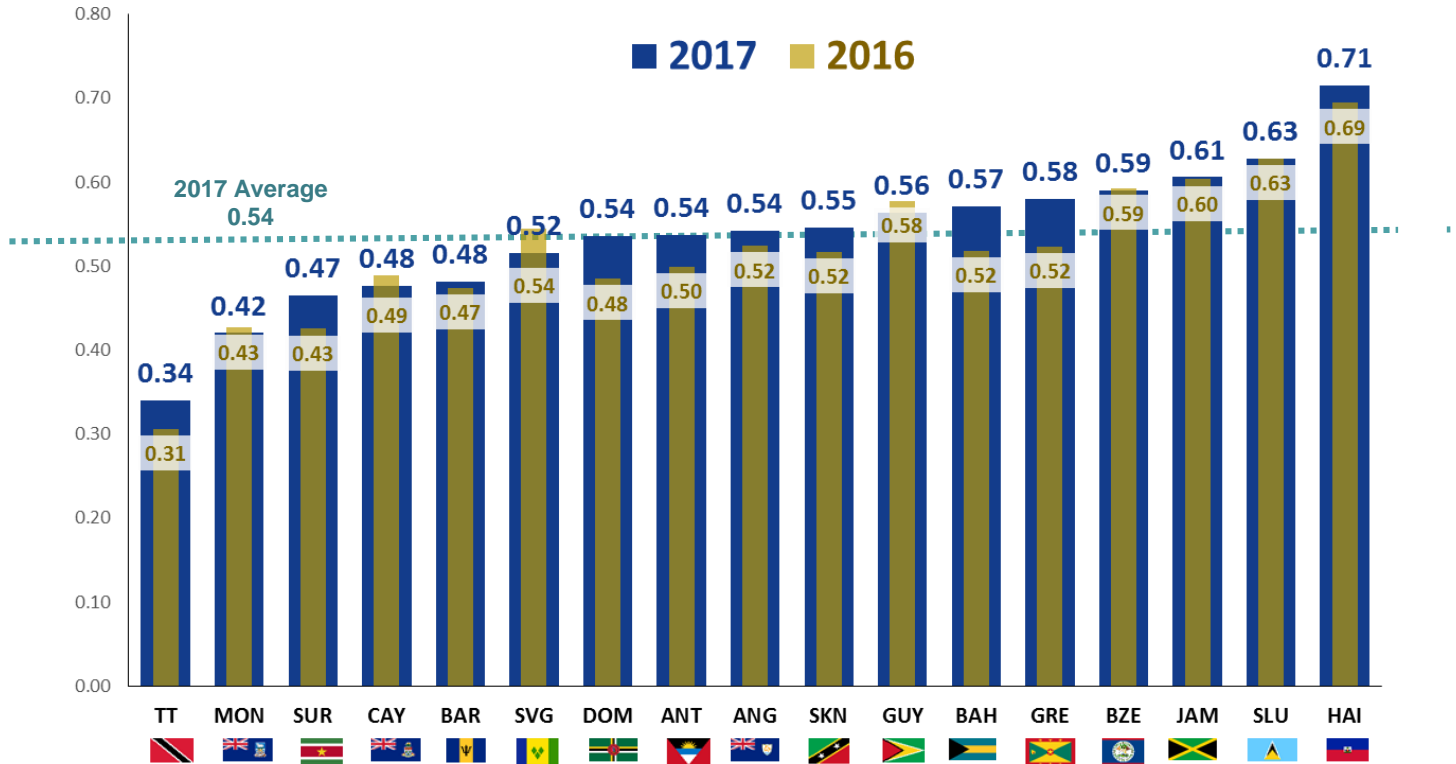
Multidimensional Vulnerability Index: Scoring System

Country	2017				2016			
	High Vulnerability (0.70 to 1.00)	Medium-high Vulnerability (0.50 to 0.69)	Medium-low Vulnerability (0.34 to 0.49)	Low Vulnerability (0 to 0.33)	High Vulnerability (0.70 to 1.00)	Medium-high Vulnerability (0.50 to 0.69)	Medium-low Vulnerability (0.34 to 0.49)	Low Vulnerability (0 to 0.33)
ANG		0.54				0.52		
ANT		0.54				0.50		
BAH		0.57				0.52		
BAR			0.48				0.47	
BZE		0.60				0.59		
CAY			0.48				0.49	
DOM		0.54					0.48	
GRE		0.58				0.52		
GUY		0.56				0.58		
HAI	0.71					0.69		
JAM		0.61				0.60		
MON			0.42				0.43	
SKN		0.55				0.52		
SLU		0.63				0.63		
SVG		0.52				0.54		
SUR			0.47				0.43	
TT			0.34					0.31

Economic, Social and Environmental Vulnerability Sub-Components

	2016					2017			
	Overall	Economic	Social	Environ		Overall	Economic	Social	Environ
Anguilla	0.52	0.55	0.42	⬛		0.54	0.58	0.39	0.55
Antigua and Barbuda	0.50	0.52	0.50	0.41		0.54	0.55	0.60	0.42
Bahamas	0.52	0.57	0.51	0.32		0.57	0.65	0.52	0.30
Barbados	0.47	0.58	0.43	0.11		0.48	0.58	0.45	0.10
Belize	0.59	0.63	0.71	0.32		0.60	0.65	0.71	0.30
Cayman Islands	0.49	0.61	0.05	0.45		0.48	0.60	0.07	0.40
Dominica	0.48	0.45	0.54	0.56		0.54	0.48	0.62	0.66
Grenada	0.52	0.51	0.69	0.41		0.58	0.60	0.69	0.39
Guyana	0.58	0.56	0.64	0.59		0.56	0.55	0.61	0.56
Haiti	0.69	0.73	0.64	0.60		0.71	0.77	0.64	0.59
Jamaica	0.60	0.67	0.70	0.22		0.61	0.69	0.68	0.20
Montserrat	0.43	0.42	0.62	0.26		0.42	0.41	0.62	0.24
Saint Kitts and Nevis	0.52	0.49	0.61	⬛		0.55	0.53	0.61	0.42
Saint Lucia	0.63	0.63	0.79	0.46		0.63	0.69	0.68	0.34
Saint Vincent and the Grenadines	0.54	0.53	0.73	0.41		0.52	0.50	0.78	0.33
Suriname	0.43	0.39	0.60	0.39		0.47	0.47	0.56	0.35
Trinidad and Tobago	0.31	0.34	0.46	0.00		0.34	0.38	0.51	0.00
Average	0.52	0.54	0.57	0.32		0.54	0.57	0.57	0.36

Low — 0-0.33
Medium- Low — 0.34-0.49
Medium-High — 0.50-0.69
High — 0.70-1.00

Multidimensional Vulnerability- Proxy Indicators

	Overall VI	Export Concentration		Export Destination		Strategic Imports		External Finance		Social Susceptibility			Climate and Natural Hazards			
		E3	O	D3	T3	F	E	F(F)	F(R)	C	U	P	ND	NA	CE	CP
ANG	0.54	0.61	0.94	0.63	0.72	0.29	0.63	0.31	0.51	0.54	0.40	0.21	0.22	0.88		
ANT	0.54	0.92	0.93	0.00	0.83	0.41	0.71	0.19	0.43	0.57	0.67	0.54	0.04	0.58	0.19	0.85
BAH	0.57	0.76	0.72	0.93	0.99	0.48	0.76	0.24	0.33	0.72	0.52	0.33	0.16	0.37	0.22	0.45
BAR	0.48	0.50	0.92	0.50	0.75	0.60	0.72	0.22	0.47	0.33	0.47	0.55	0.03	0.13	0.03	0.19
BZE	0.59	0.65	1.00	0.77	0.78	0.59	0.63	0.20	0.59	0.81	0.46	0.84	0.08	0.28	0.46	0.10
CAY	0.48	0.37	0.92	1.00	0.97	0.00	0.52	1.00	0.00	0.00	0.20	0.00	0.08			
DOM	0.54	0.21	0.88	0.77	0.00	0.68	0.54	0.19	0.61	0.48	0.68	0.70	0.39	0.72	0.23	1.00
GRE	0.58	0.70	0.85	0.56	0.61	0.64	0.67	0.23	0.53	0.26	1.00	0.81	0.25	1.00	0.20	0.42
GUY	0.56	0.64	0.79	0.59	0.27	0.46	0.77	0.22	0.67	0.43	0.60	0.79	0.10	0.71	1.00	0.35
HAI	0.71	0.84	0.68	0.99	0.92	1.00	0.49	0.20	1.00	0.23	0.69	1.00	1.00	0.81	0.18	0.25
JAM	0.61	0.62	0.73	0.78	1.00	0.51	0.77	0.22	0.86	0.99	0.59	0.46	0.07	0.92	0.14	0.03
MON	0.42	0.00	0.78	0.10	0.34	0.52	0.76	0.25	0.57	0.82	0.26	0.79		0.24		
SKN	0.55	0.35	0.86	0.65	0.72	0.71	0.28	0.28	0.38	1.00	0.22	0.63				
SLU	0.63	1.00	0.87	0.90	0.60	0.43	1.00	0.22	0.47	0.45	0.89	0.70	0.16	0.95	0.09	0.17
SVG	0.52	0.56	0.77	0.25	0.25	0.65	0.64	0.26	0.60	0.78	0.84	0.72	0.15	0.67	0.09	0.40
SUR	0.47	0.67	0.95	0.64	0.71	0.57	0.00	0.00	0.23	0.32	0.46	0.90	0.04	0.29	0.77	0.29
TT	0.34	0.59	0.82	0.53	0.38	0.32	0.00	0.12	0.32	0.79	0.19	0.54	0.00	0.00	0.00	0.00
AVERAGE	**0.54**	**0.59**	**0.85**	**0.62**	**0.64**	**0.52**	**0.58**	**0.26**	**0.50**	**0.56**	**0.54**	**0.62**	**0.18**	**0.57**	**0.28**	**0.35**

Takeaways

1	2	3

BMCs: middle to high vulnerability countries

The vulnerability of BMCs are concentrated in the areas: of dependence on strategic imports, export concentration and exposure to natural hazards.

MVI supports evidence-based policy formulation

There is the potential for the MVI to be used by BMCs to assist in determining or justifying development priorities.

Potential role in CDB Financial resource allocation framework

Consideration is being given to how the MVI can be used to improve the allocation of financial resources.

The Effects of Tactile Learning Strategies on Attitudes of Form 4 CCSLC Mathematics Students

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UNIVERSITY OF THE WEST INDIES - SIR ARTHUR LEWIS COMMUNITY COLLEGE

Introduction

This action research investigates the impact of tactile learning strategies on the attitudes and performance of Four 4 CCSLC Mathematics students of the School X in the teaching of geometry.

Research Questions

▶ What are Form 4 CCSLC Mathematics students' attitudes towards mathematics before applying tactile learning strategies?

▶ How does the use of tactile learning strategies affect Form 4 CCSLC Mathematics students' attitudes toward Mathematics?

Instruments Used

▶ **Qualitative Instruments**

Exit Slip, Observation Checklist

▶ **Quantitative Instruments**

Attitude scale checklist, students' grades.

Significance of the Research

The results of this research study will seek to influence how teachers at School X teach Mathematics and eventually change the overall performance of students at the school, in spite of the students having gained entry with low Mathematics grade.

Methodology
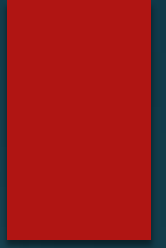
Participants

The participants involved in this research paper are all students for the Form 4 CCSLC Mathematics class of School X. This group of students is comprised of Eighteen (18) students participated in this research; 4 females and 14 males. The participants all live in the Vieux-Fort and Laborie district.

Setting

The research will be carried out during regular Mathematics lessons scheduled for the Form 4 students. This involves a total of 8 periods out of a 48-period cycle without any interruptions to the regular school day.

Research Design

▶ The research design selected for this study was action research. This design was selected because of the nature of the action research and the setting within which the research will be taking place. Action research allows for the careful examination of educational practices and for the elaboration of research in cycles.

Description of Intervention

- This action research was elaborated over a five to six weeks period. During the research period the students will make use of various resources such as geoboards, popsicle sticks, coloured paper and measuring instruments during the implementation of the lesson to facilitate learning. The participants will use these materials in various hands on activities set out during the lesson.

Administering Instruments

▶ Exit Slips

▶ Attitude Scale Checklist

▶ Observation Checklist

Ethical issues

- School Administration
- Parents
- Owners of Instruments

Application of Intervention

- Specific to the lesson

Intervention

Data Analysis

Research Question	Proposed Instrument
What are Form 4 CCSLC Mathematics students' attitudes towards Mathematics before applying tactile learning strategies?	Pre-Attitudinal scale Post Attitudinal scale
How does the use of tactile learning strategies affect Form 4 CCSLC Mathematics students' attitudes toward Mathematics?	Observation Checklist Exit Slips

Attitude Scale Checklist

Attitude	Question Number	Total Questions
Attitude 1: Indicator of positivity toward Mathematics and school	1, 2, 7, 13, 14, 22, 23	7
Attitude 2: Indicator of effect of working collaboratively	4, 12, 15,16, 18, 19, 21, 24	9
Attitude 3: Indicator of working privately	3, 5, 20	3

	Attitude 1	Attitude 2	Attitude 3
Student 1	2	1.22	1.33
Student 2	3	2.33	1.33
Student 3	2.86	1	2.33
Student 4	3.29	2.78	1.33
Student 5	2.43	1.67	1.67
Student 6	3.29	2.56	2
Student 7	2.71	2.44	1.67
Student 8	2.29	1.56	2.67
Student 9	2.29	2.22	2
Student 10	2.43	1.44	2
Student 11	1.71	2.33	2.33
Student 12	2.57	1.67	3.67
Student 13	1.71	2.89	1.67
Student 14	2.71	2.33	3.67

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Attitude1	14	1.71	3.29	2.5204	.50307	.253	-.110	.597
Attitude2	14	1.00	2.89	2.0317	.59505	.354	-.293	.597
Attitude3	14	1.33	3.67	2.1190	.76914	.592	1.156	.597
Valid N (listwise)	14							

- There were noted changes in the comments made by students which include:
  - *"That's so easy." James.*
  - *"That's what I did not know before." Jennifer.*
  - *"Miss, you should have more classes like these." Jack.*
- The researcher also noted an increase in the frequency of attendance of the participants.

Observation Checklist

Indicators of Positivity Toward Mathematics	Indicator of Student Collaboration.	Indicator of Student working Privately
• **Asking and Responding to Questions** • **Listening & Note Taking** • **Participating in the Discussion.** • **Participating in guided Practice.**	• Students have defined responsibilities. • Students encourage one another. • Collaboratively producing a product. • Collaboratively problem-solving. • Participating in discussion. • Presenting.	• Independently producing product. • Independently solving a problem. • Independent practice. • Presenting. • Writing Activities. • Researching information. • Silent reading

Results

Results

	N	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Attitude1	12	1.57	3.43	29.29	2.4405	.14760	.51131	.261
Attitude 2	12	1.22	3.00	24.89	2.0741	.15372	.53252	.284
Attitude 3	12	1.00	3.00	21.00	1.7500	.16979	.58818	.346
Valid N (listwise)	12							

Correlations			ChangeAtt 1	ChangeAtt 2	ChangeAtt 3
	ChangeAtt1	Correlation Coefficient	1.000		
	ChangeAtt2	Correlation Coefficient	.822**	1.000	
	ChangeAtt3	Correlation Coefficient	.043	.216	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

Reflection

Reflection

- the use of hands-on strategies in the Mathematics classroom can positively influence students' attitude toward the learning, Mathematics and school.

- use of hands-on resources and activities in the Mathematics classroom in a collaborative setting positively influence students' attitudes to group work and Mathematics

- regardless of the positive effect of the use of tactile teaching strategies in Mathematics, a few students still preferred to work alone rather than in groups. Fourthly, an improvement in Mathematics students' interest and desire can be attributed to the use of hands-on teaching strategies in Mathematics lessons.

- an improvement in Mathematics students' interest and desire can be attributed to the use of hands-on teaching strategies in Mathematics lessons.

Recommendation

Recommendation

▶ The use of hands-on teaching strategies and activities to be utilized as often as possible within the Mathematics classroom as this helps to improve students' attitudes toward Mathematics.

▶ The acquisition of Mathematics resources for example, geoboards, beets and straws, fraction tiles, algebra tiles, etc., that can be used in and out of the Mathematics classroom.

▶ Setting up a Mathematics room with hands-on resources to be used by students both in the classroom under the direction of the class teacher and by students in their spare time to encourage development of mathematical skill.

- Proper design of lessons where hands-on activities is to be used, these lessons should cater for both the development of mind and hands of the students involved.

- Implementation of tactile learning in the lower forms of School X to remedy or prevent the development of negative attitudes to Mathematics.

- Further investigation to determine the effect of tactile learning on the performance of students in the Mathematics class.

The End

Health

Session 5

To Have or Not to Have Health Insurance Coverage ?

Janai Leonce and Dr Marisa Jacob-Leonce

October 2019

The 2016 Survey of Living Conditions and Household Budgets notes that 18.1 percent of the populace has medical health insurance coverage ..

..within this same environment the Government of Saint Lucia has been reviewing modalities to appropriately finance health reform, one of which has been health insurance…

Cognisant of the health reform debate we have two objectives;

- *Determine what are the contributing factors to having health insurance*
- *Highlight the demographic most likely to not have health coverage*

Our objective can be achieved by leveraging information from the 2016 Survey of Living Conditions and Household Budgets

- *Stratified two stage probability design*
- *4,568 participants*

Hypothesis

* That the low incidence of health insurance coverage is due to cultural attitudes, <u>information asymmetries</u> regarding the cost and need for health coverage and a <u>rural urban</u> and <u>gender</u> divide.

How do we test this hypothesis ?

Proxy for our hypothesised variables

Urban/Rural
Gender
Has a non-communicable disease
Recently visited a hospital

Control for other factors known to affect health choices

Educational attainment
Religon
Union status
Household Status

Determine a model and specification

Logit
Regression
Dataset

What is the survey of living conditions and household budgets survey?

#	Name	Label	Type	Format	Valid	Invalid	Question
		File persondetailM					
1	Id	Id	discrete	character-2	4627	0	-
2	name	persons name	discrete	character-31	4578	0	-
3	p1_1	relationship to head of household	discrete	numeric-2.0	4577	56	What is %rostertitle%'s relationship to the head of household?
4	p1_2	sex of person	discrete	numeric-1.0	4581	52	What is your %rostertitle%'s sex?
5	p1_3	age last birthday	continuous	numeric-3.0	4580	53	How old was %rostertitle%'s on his/her last birthday?
6	p1_3a	estimated age	continuous	numeric-2.0	2	4631	If %rostertitle% refuses: Provide an estimate of age
7	p1_4	ethnicity	discrete	numeric-2.0	4574	59	To what ethnic, racial or national group do you think %rostertitle%'s belongs?
8	p1_5	1.5 what is %rostertitle%s religion/denomination?	discrete	numeric-2.0	4577	56	What is %rostertitle%'s religion/ denomination?
9	p1_6	martial status	discrete	numeric-1.0	3454	1179	What is (%rostertitle%'s) Marital Status?

household_position	gender	age
partner of head	male	40
head	male	61
child of head and spouse/partner	male	5
head	male	31
child of head and spouse/partner	male	25
spouse/partner of child of head/spouse/partner	male	52
head	male	38
head	male	60
child of head only	male	21
grandchild of head/spouse/partner	male	33
other relative of head/spouse/partner	male	8

1,493 households

↓

4,568 participants

51.8% female

48.8% male

801 persons with health coverage

3,767 no health coverage

What is the specification used?

$$Pr(HealthCoverage) = constant + B1(Socioeconomics) + B2(InformationAsymetry) + B3(Financial)$$

What model can I use to answer my hypothesis?

At first glance what was the descriptive statistics of the data?

Health Insurance Coverage

Legend: Has Health Covg, No Health Covg

- 81% (No Health Covg)
- 18.2% (Has Health Covg)
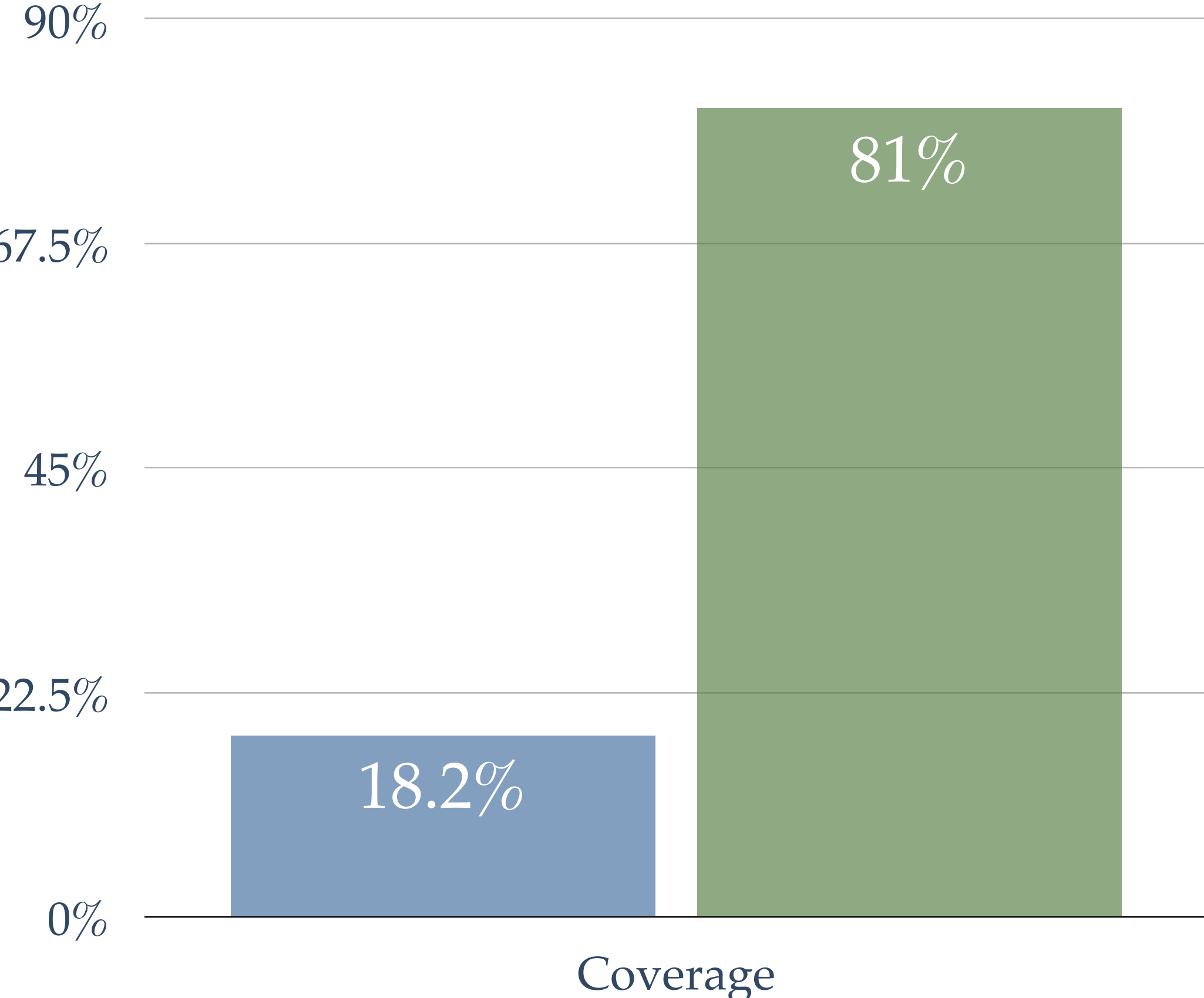
Health Insurance Coverage by Gender
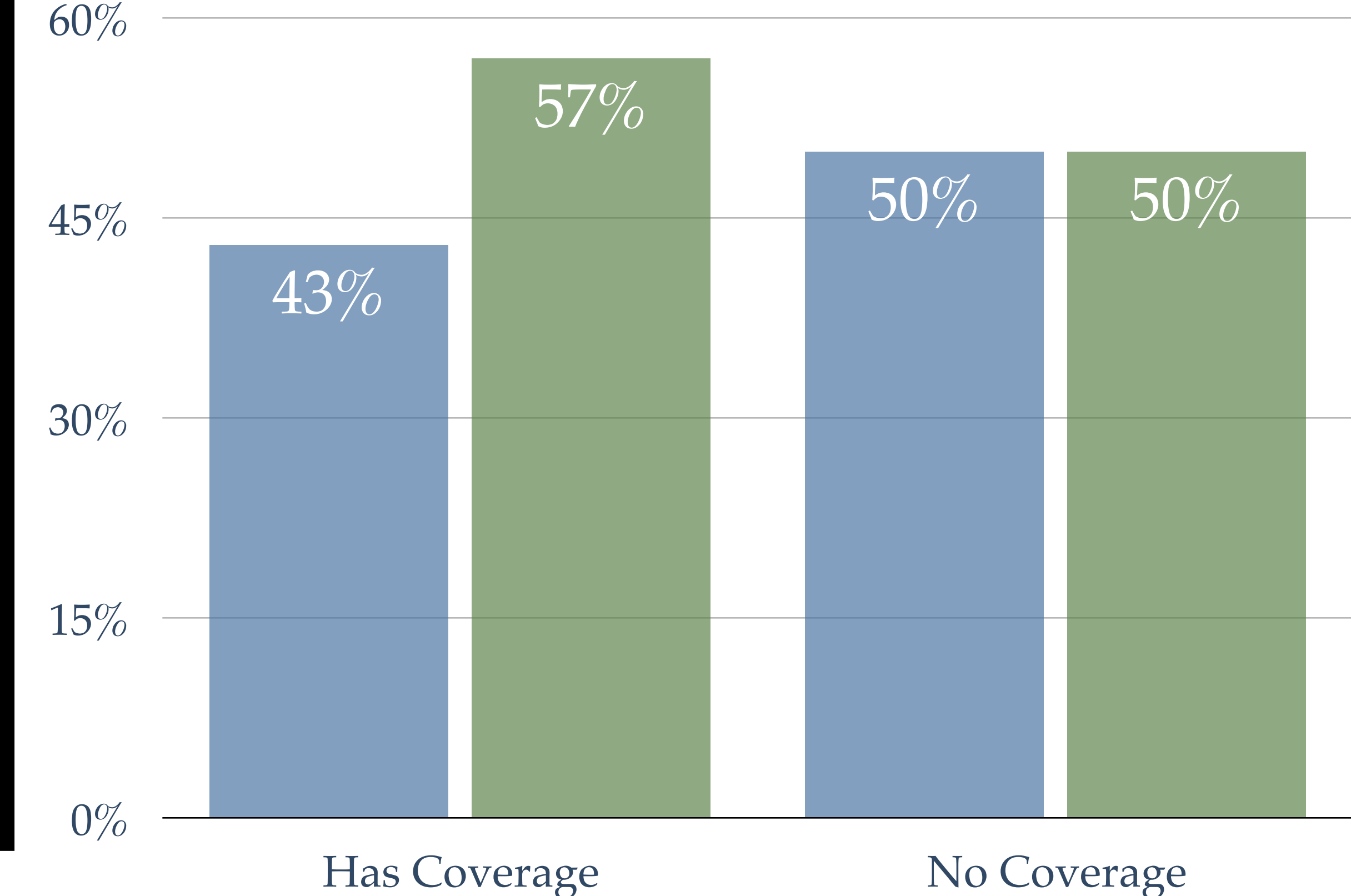
Legend: Male, Female

Has Coverage: Male 43%, Female 57%
No Coverage: Male 50%, Female 50%
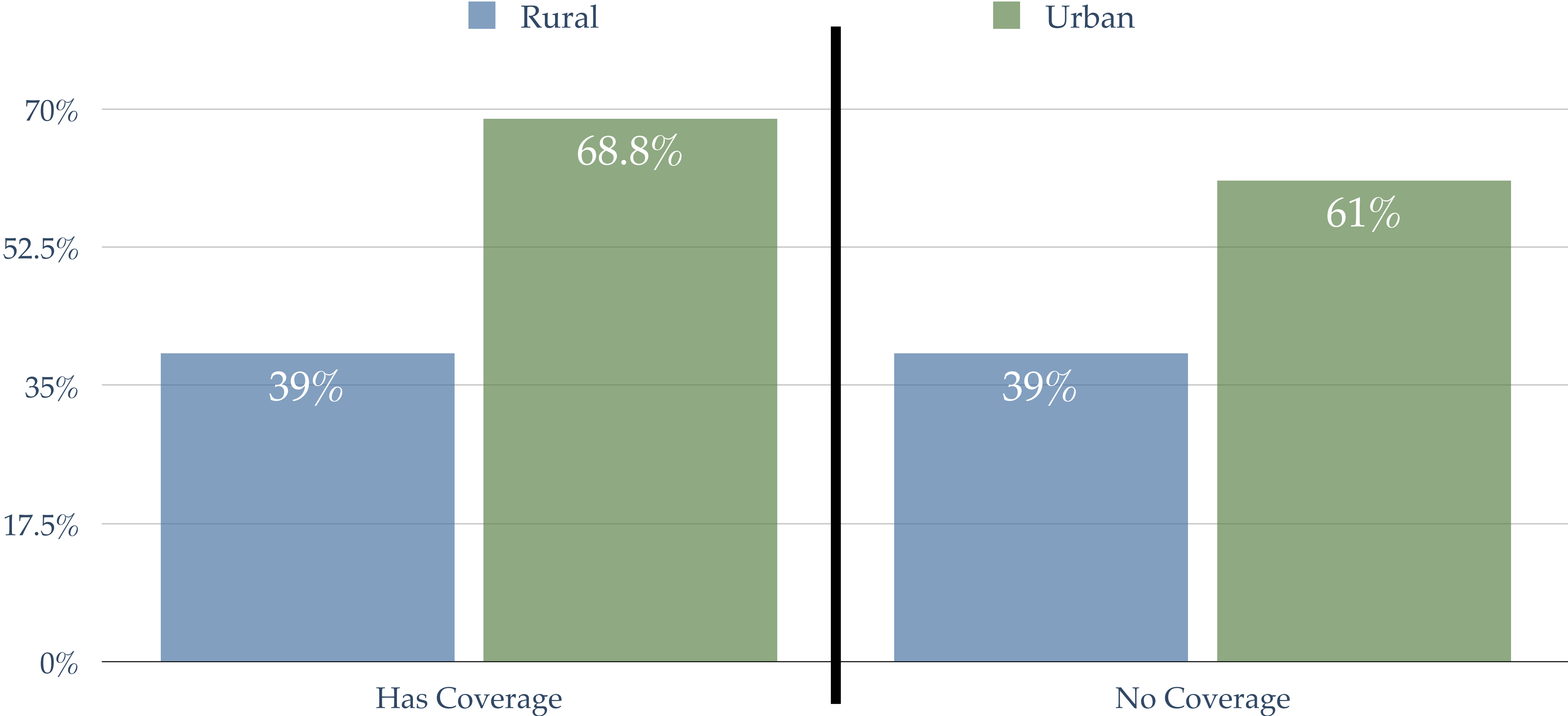
At first glance what was the descriptive statistics of the data?
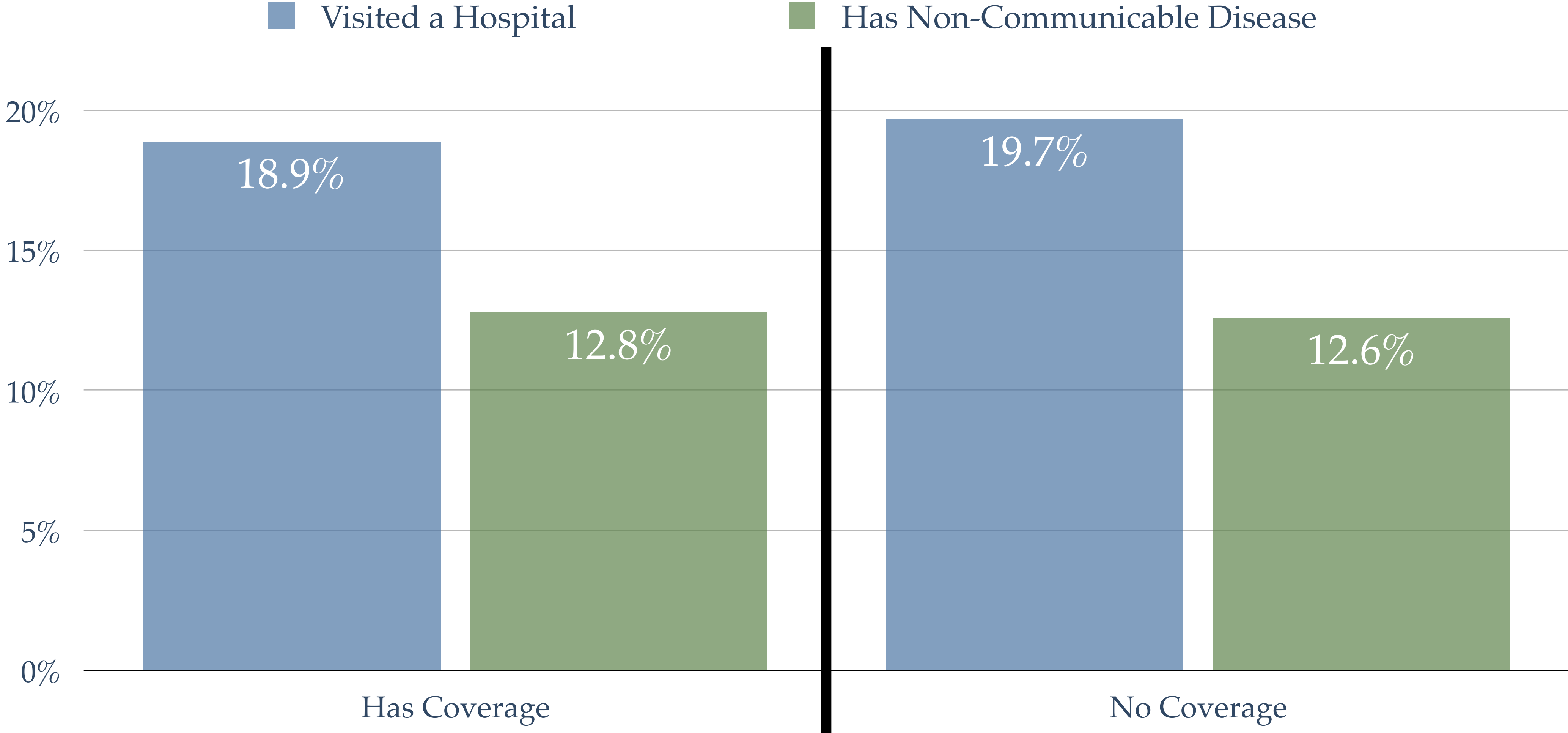
Categorical and non-categorical logit specifications were used, key findings;

1. Urban or rural divide not significant.
2. Information asymmetry proxies not significant
3. Gender only marginal significant in some specifications

Significant drivers were
1. Income and
2. Factors correlated with income

	(1) With Married (No Gender)	(2) With Gender (No Married)
Age	0.0111	0.0191**
	(1.03)	(2.53)
Head Household	-0.189	-0.0838
	(-0.80)	(-0.59)
Married or Common Law	0.442*	
	(1.95)	
Education	0.402***	0.485***
	(4.03)	(6.91)
Urban=1	0.166	0.0276
	(0.75)	(0.16)
Has Diabetes or hypertension	0.381	0.316
	(1.22)	(1.16)
Visited St Jude or Victoria	-0.134	0.0349
	(-0.58)	(0.21)
Self employed	-0.695*	-1.045***
	(-1.81)	(-4.07)
Monthly income	0.000420***	0.0000150
	(4.50)	(0.57)
Occupation Type	-0.0795	-0.155***
	(-1.37)	(-3.87)
Religion	-0.0134	-0.0167
	(-0.50)	(-0.89)
Gender (Female=1)		0.256*
		(1.94)
_cons	-3.361***	-2.844***
	(-4.22)	(-4.79)
N	796	1788

The most significant driver of having coverage was income

Health Coverage Prob (with Confidence Intervals)
Saint Lucia 2016 Survey of Living Conditions and Household Budgets
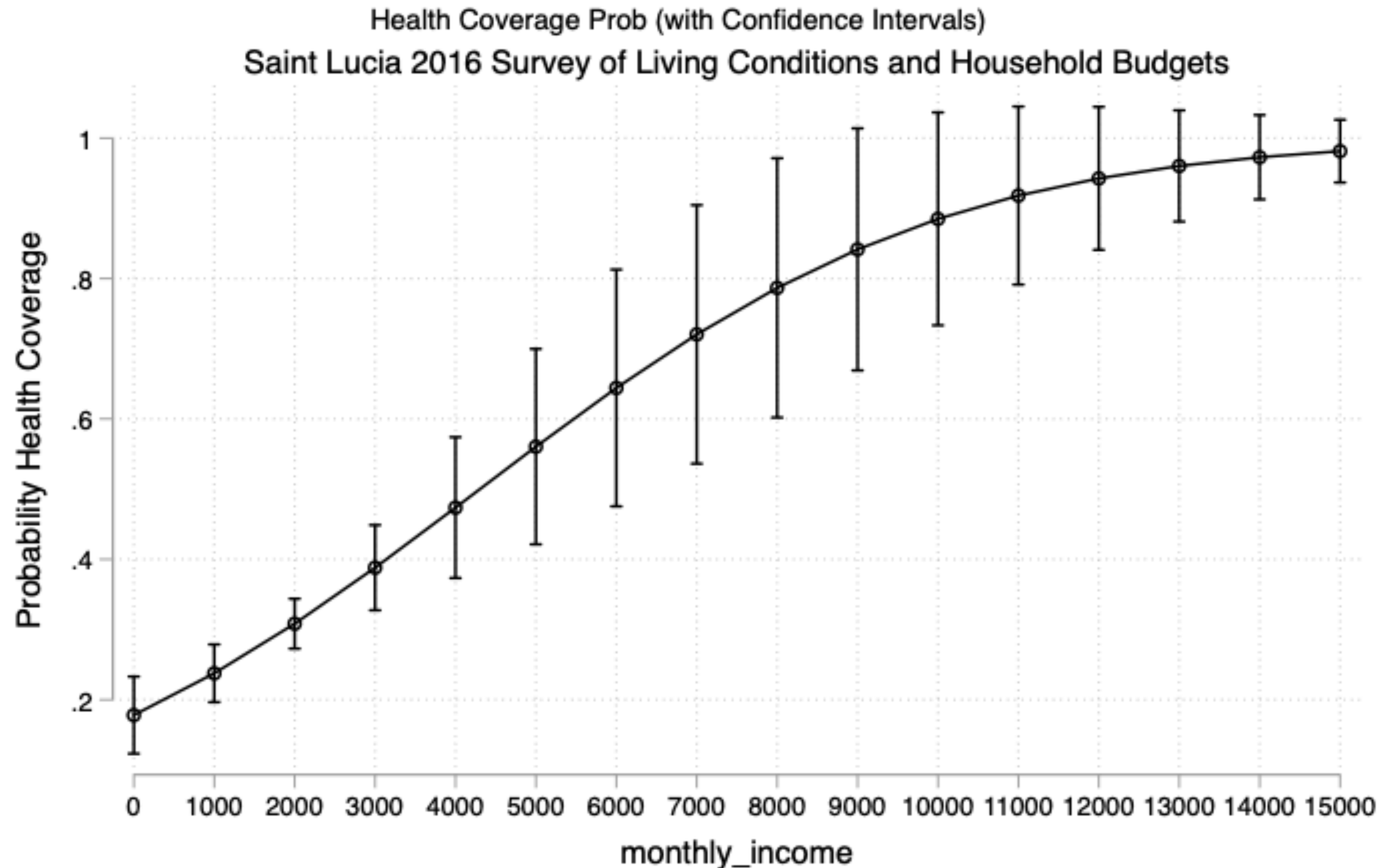
Likelihood of having health coverage approaches 50/50% at $5,000 monthly

At $2,000 monthly the likelihood is less than 30%

Confidence intervals are smaller for lower income groups indicating more certainty

Income is a key driver of coverage but the vast majority of Saint Lucians earn less than $2,000
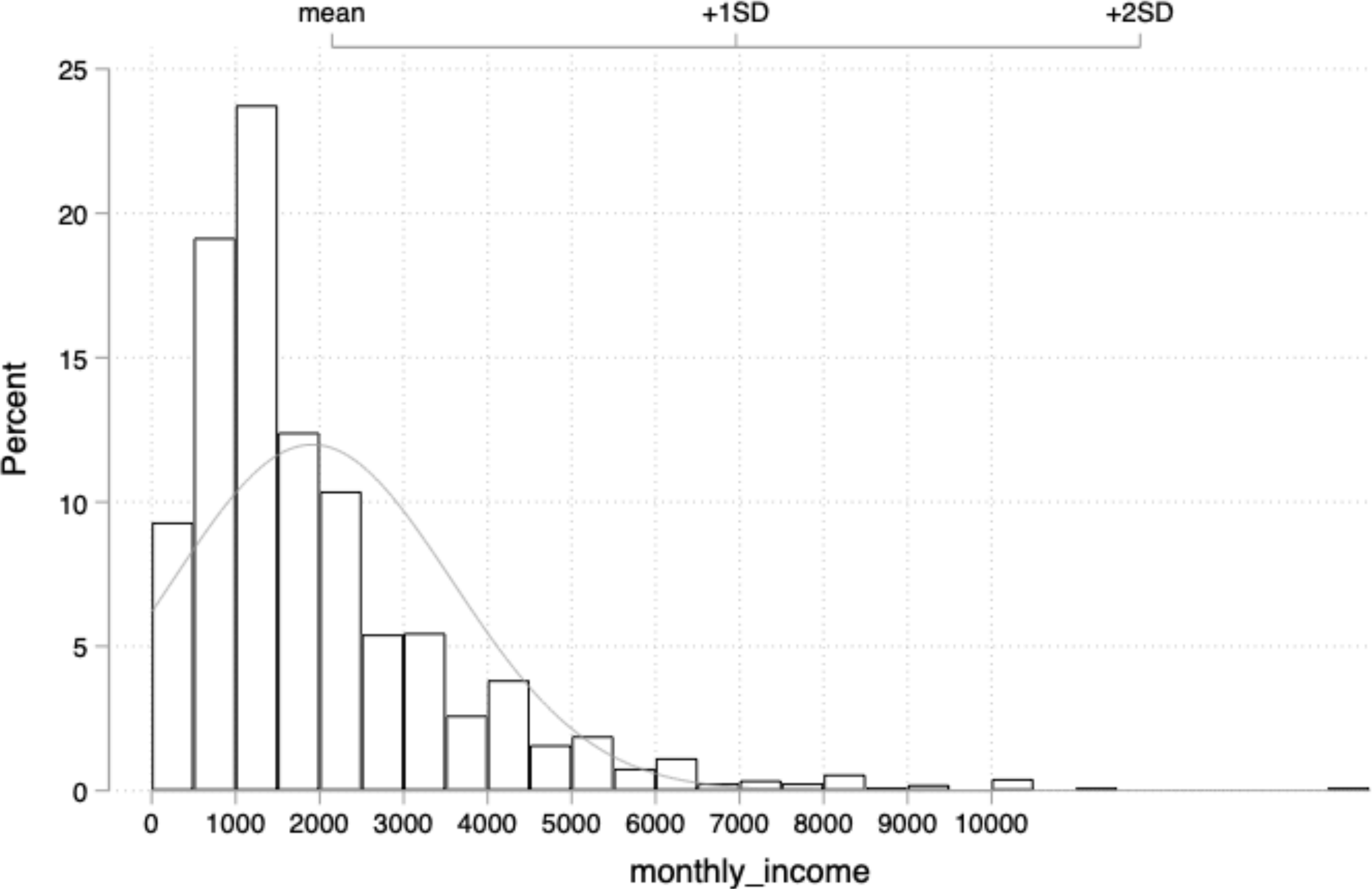
The mean monthly income in Saint Lucia $2,200

The median is $1,400 monthly

65% of the populace earns less than $3,000 monthly

The likelihood of having health coverage at our median and mean are 25-30%

Educational attainment is another driver of health coverage
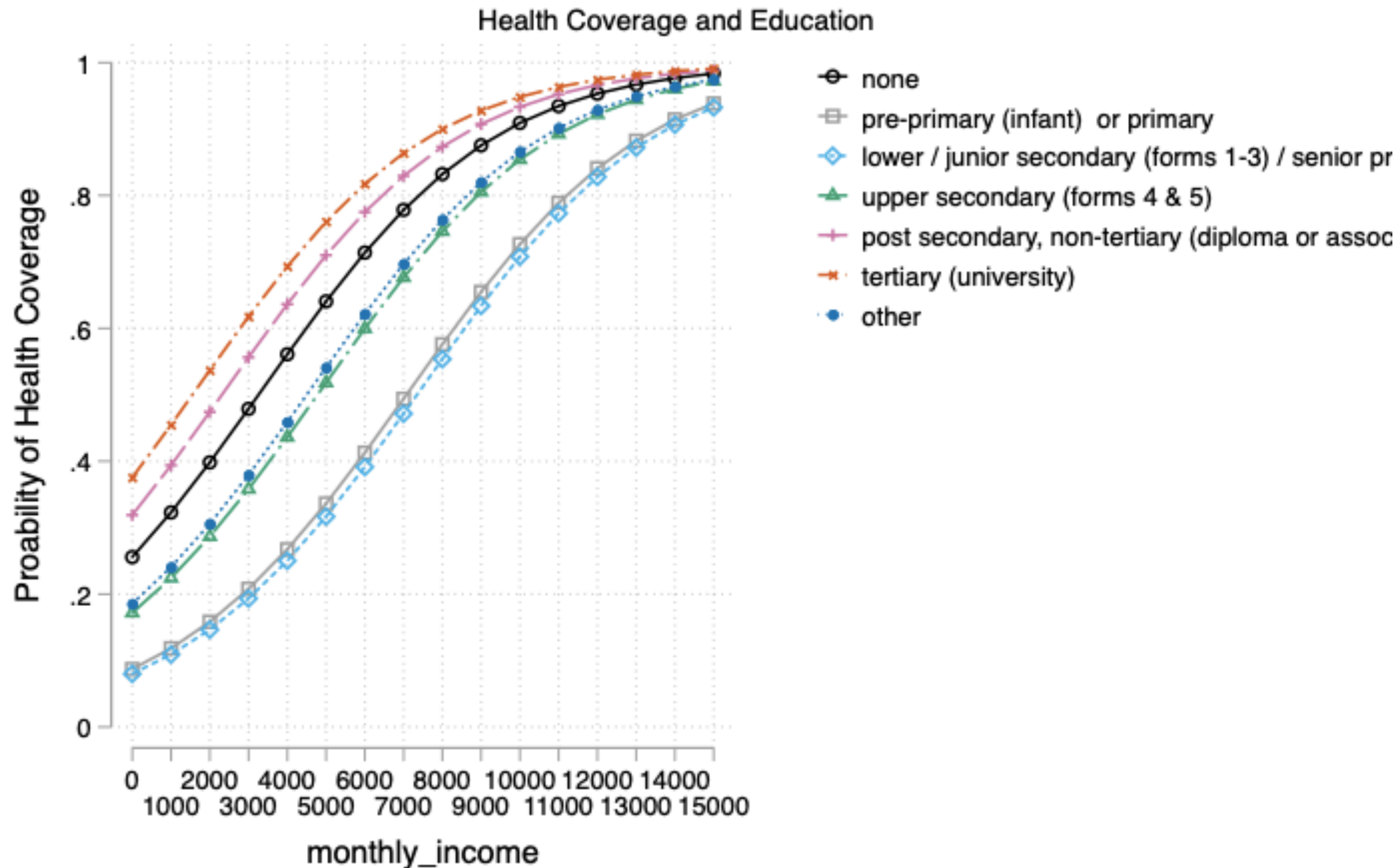
Having university education or post secondary education raises your likelihood of health coverage for all income levels

Post secondary raised odds by a factor of 1.2

Tertiary by a factor of 1.5

Only 14% of Saint Lucians have the educational attainment levels shown to positively impact having health coverage
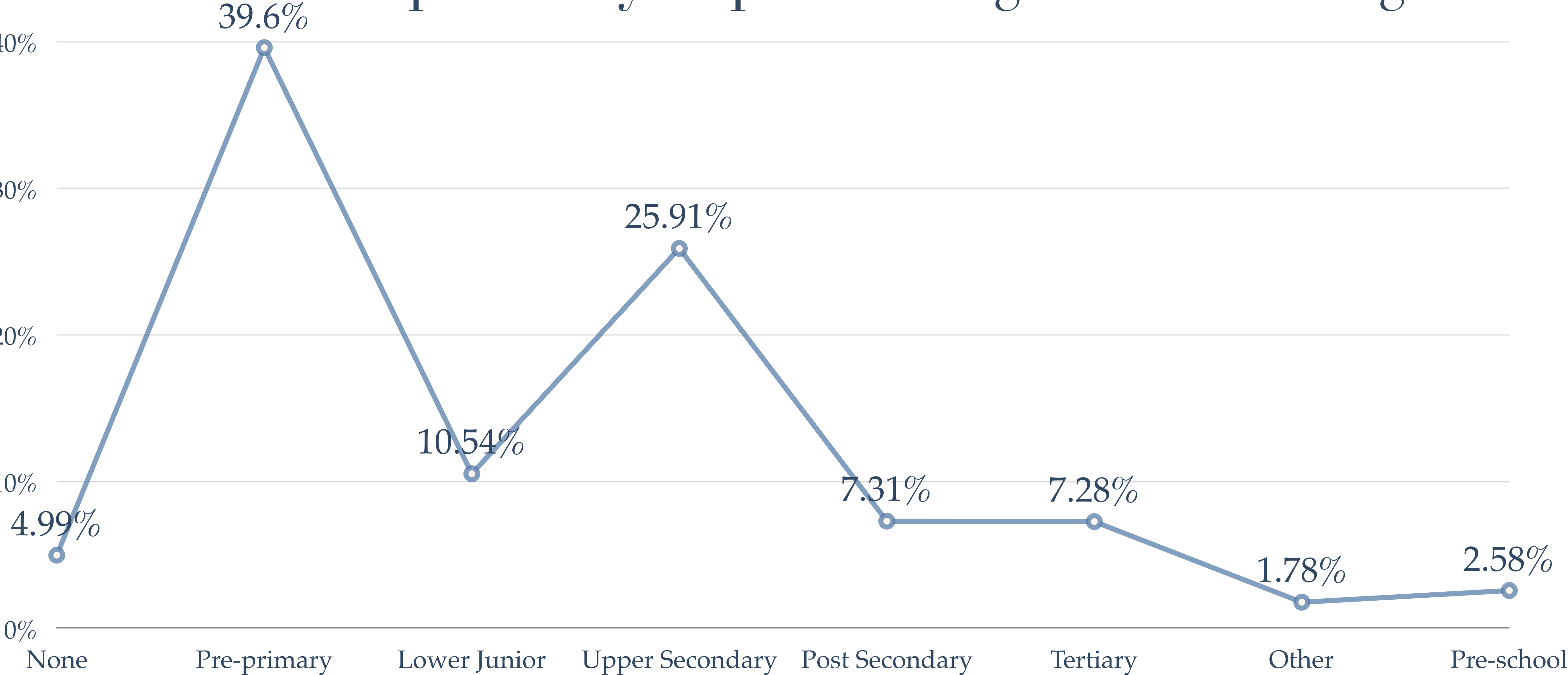
Union status was a significant predictor of health coverage.

Union Status, Income and Health Coverage

x-axis: monthly_income, y-axis: Probability of Health Coverage

Legend:
- married
- common-law
- visiting
- no longer living with husband
- no longer living with common law partner
- not stated
- not in union
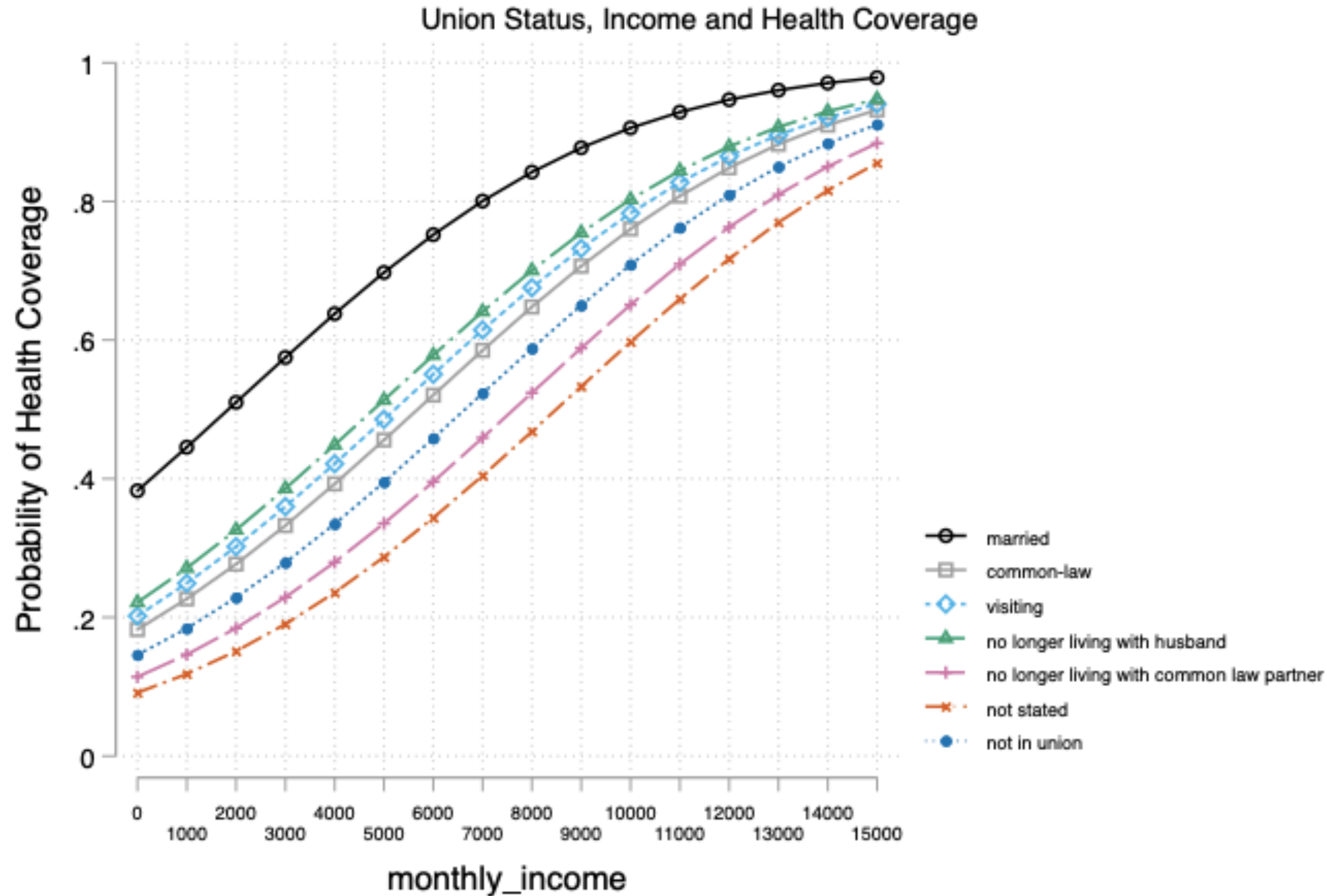
In non-categorical regressions a dummy of married and common-law raised odds of having coverage by a factor of 0.4

In categorical specifications non married actually lowered your odds of having health coverage

The predominant union status is to not be in any..which has been shown to reduce the odds of having health coverage
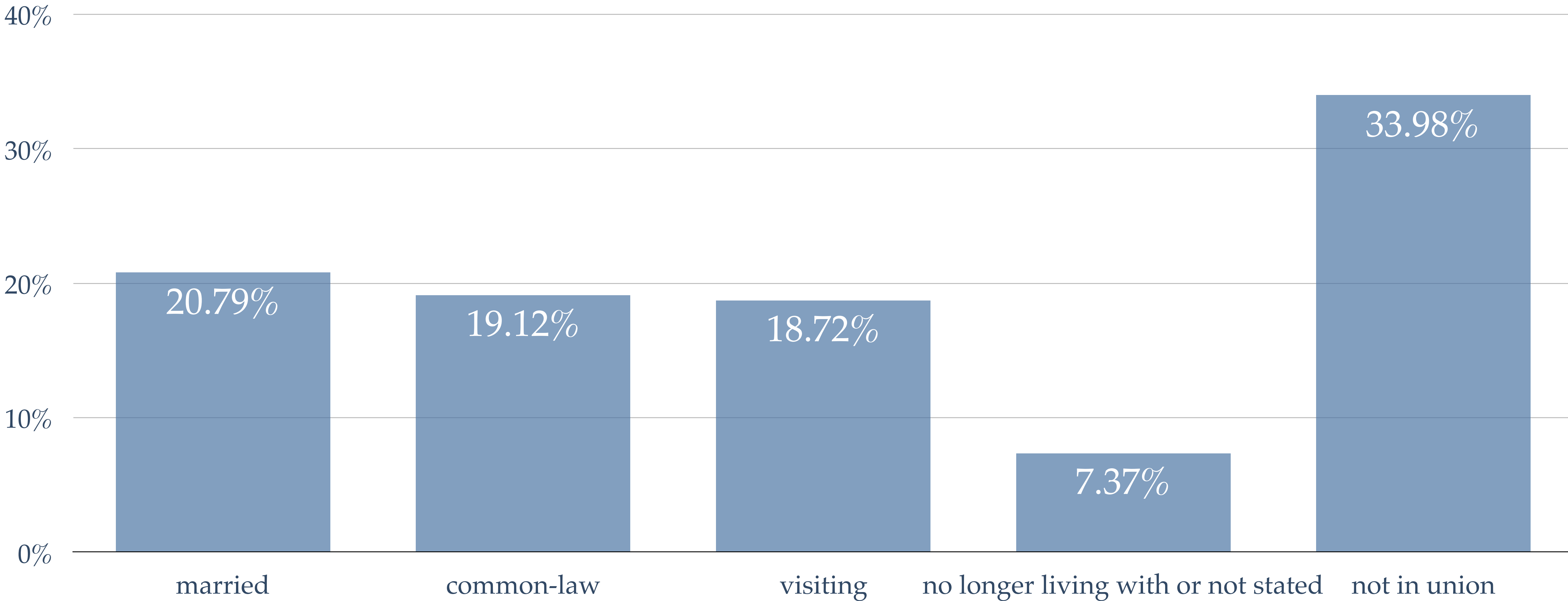
Your relative position in your place of employment and your place of employment affect health coverage likelihoods

Being a plant and machinery workers have a positive factor of 1.8 on health coverage in one specification but was insignificant in another

Agriculture and craft workers negative odds (~1.2) in some significant but in other specifications this was insignificant

Self employed persons have negative odds of health coverage of approx. 1.2 in both specifications used

Other employment types had insignificant effects on health coverage

Health Coverage Probability (Type of Worker)
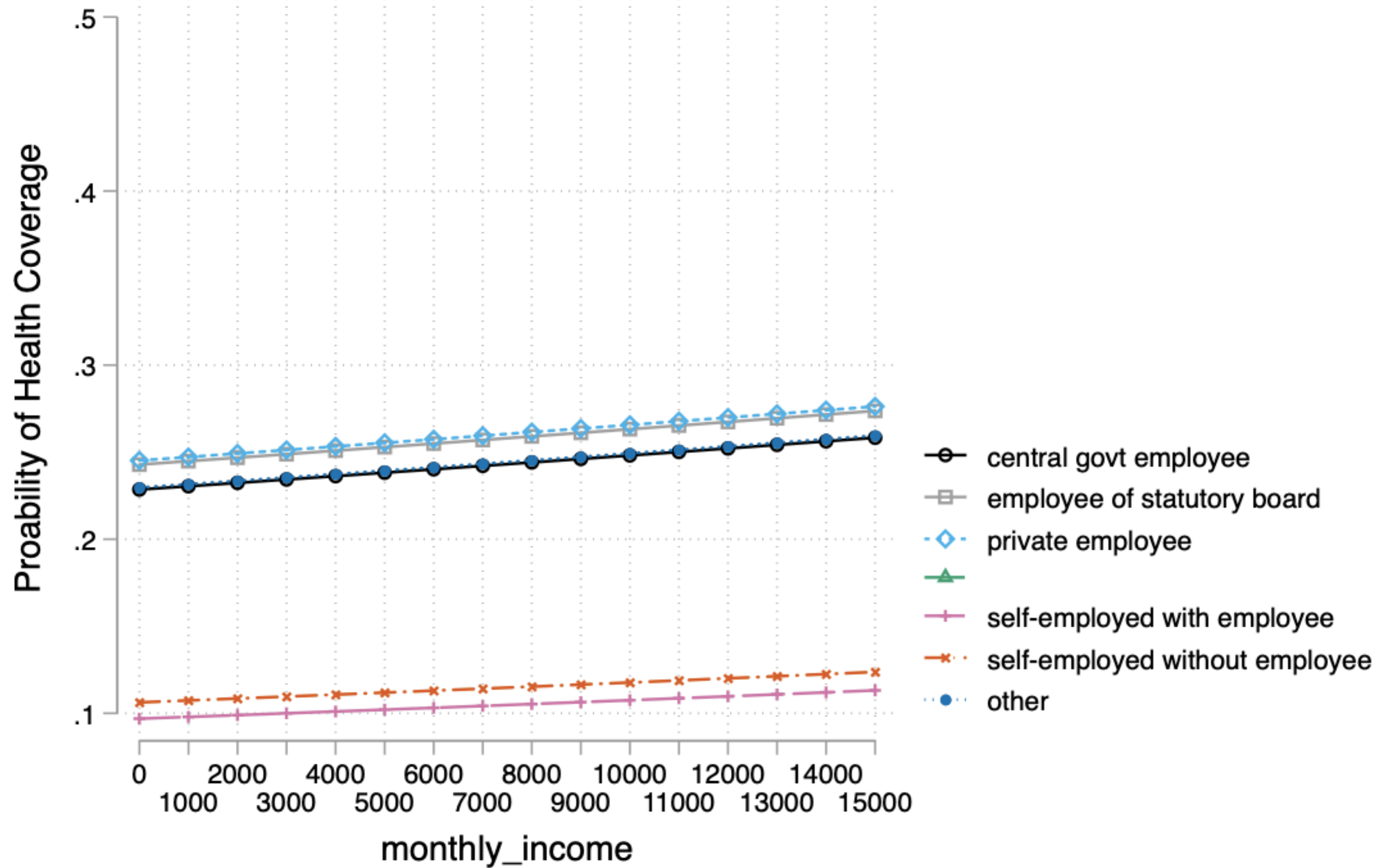
Self employed persons had the lowest predicted odds of health coverage of any category studied

A significant amount of the populace work in the private sector but a large self employed sector exist

1%

16%

23%

2%

57%

Central Govt

private

self-emp

other

SOE

apprentist

unpaid
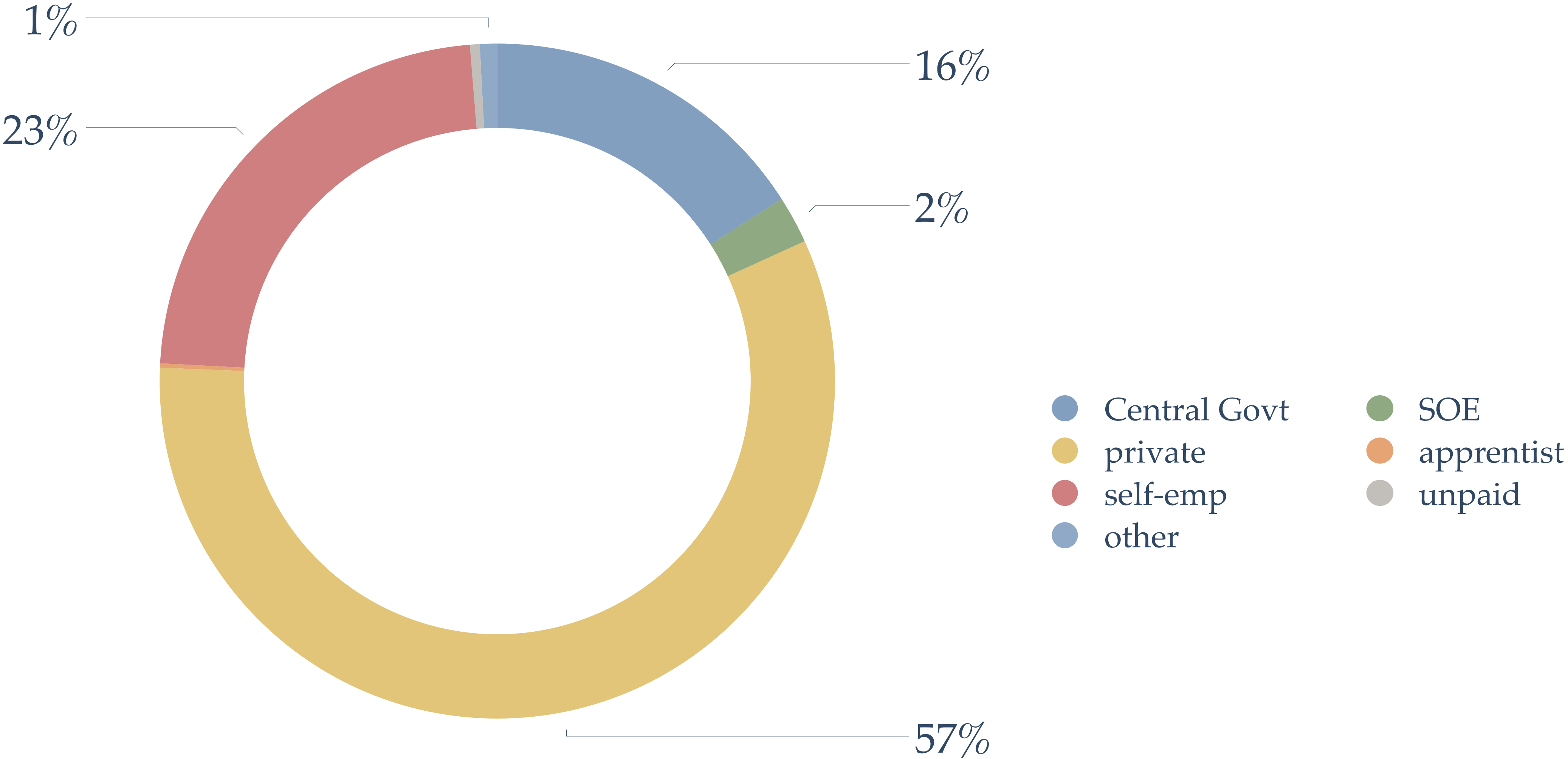
Health Insurance Coverage Probabilities
Not in a Union, Only Primary Education, Self Employed
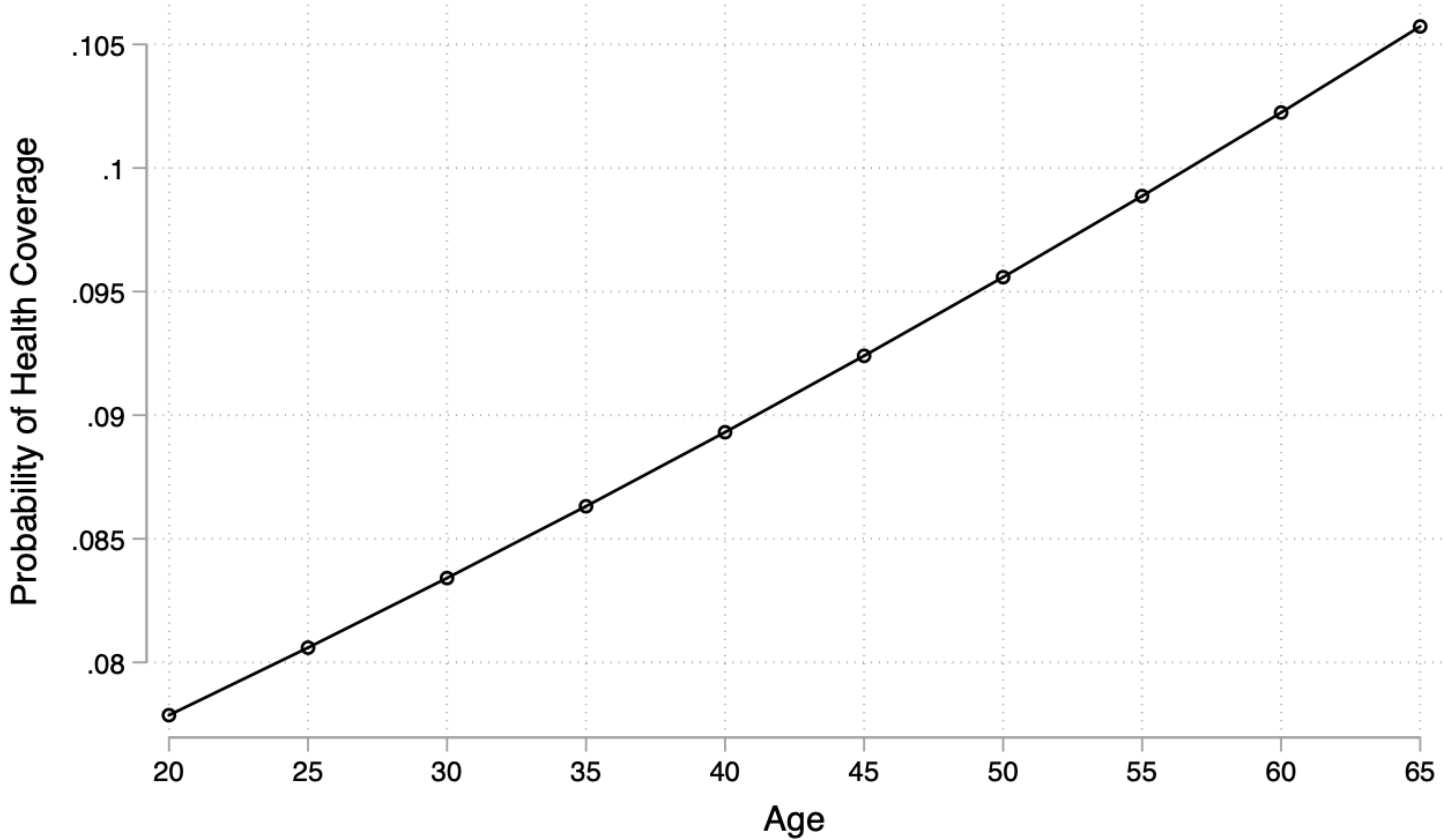
Persons who are not in a union, have only pre primary education and self employed have likelihoods of less than 10% to have health coverage.

These are all the most prevalent socioeconomic states in St Lucia

Health Insurance Coverage Probability
Private Employee with Tertiary Education and Married
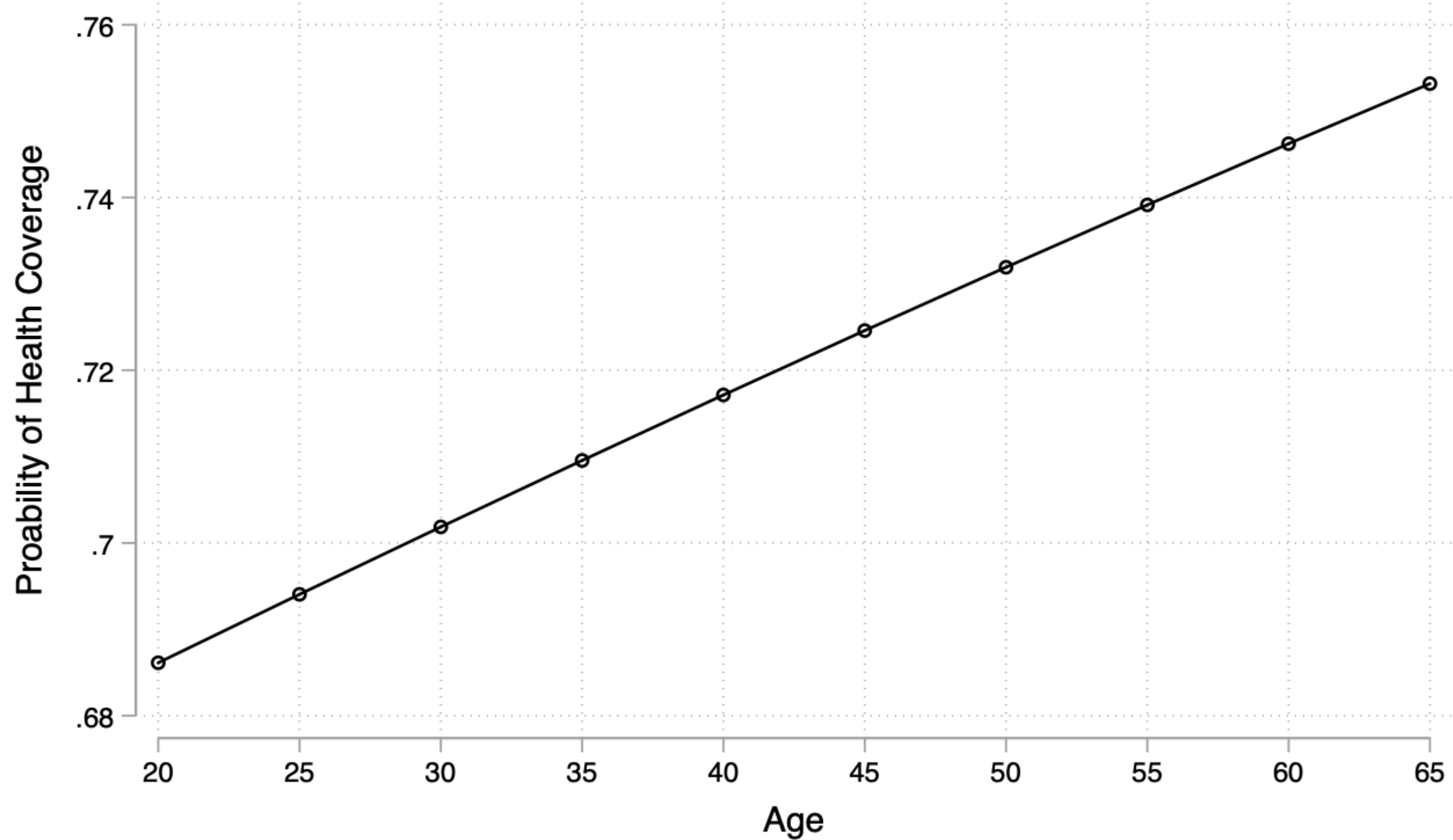
Persons who are married, with university education and work in the private sector have likelihoods of 70% re health coverage.

Almost 60% points above the previous chart

This demographic is the least likely in the composition of St Lucia

Policy Recommendations

✤ Minimal health coverage rates appear to be tied to the fact that earnings are low. Low earnings cannot be addressed in the short or medium term suggesting that access may have to be improved through cross subsidisation.

Social determinants of adherence and disease severity among people living with lupus in a small island developing state: a report from Saint Lucia, West Indies

Amanda King[1], Cleopatra Altenor[1], Ian Hambleton[2], Catherine Brown[2]
Bay Medical Centre, St. Lucia[1], Chronic disease research centre, University of the West Indies, Barbados[2]

Background

- Systemic lupus erythematosus (lupus) is a complex, systemic autoimmune disease which is known to be more prevalent and appears to be more severe in Afro-Caribbean populations than in Caucasian. It is unclear whether ethnicity or socioeconomic position (SEP) is the major reason for this.

African American and Afro Caribbean people in UK-

- More lupus
- More severe lupus
- Higher mortality

Background

- Saint Lucia is a small, poor, Afro-Caribbean island. This is a first look at SEP and lupus there.

- Why?
- Genetic
- Environmental- Socio-economic- poverty, unemployment, lack of education, cultural beliefs, poor adherence

Hypothesis

There is a greater incidence of lupus in Afro-Caribbean people and it may be more severe, however

poorer outcome is related more to socioeconomic reasons than to ethnicity

Aim

To assess the effects of socioeconomic position (SEP) on adherence and disease severity

WHAT IS SLE?

- CHRONIC
- RHEUMATIC
- SYSTEMIC
- AUTOIMMUNE
- INFLAMMATORY
- GREAT IMITATOR
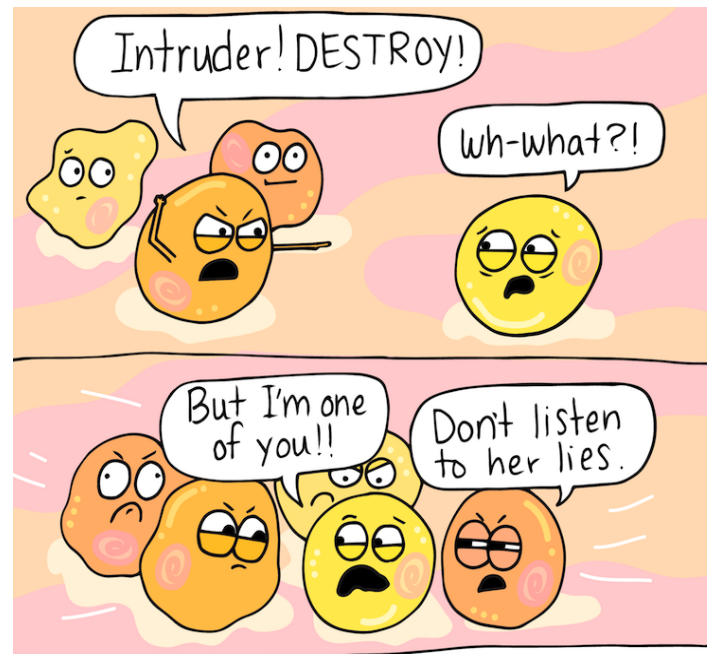
Autoimmune disorders in a nutshell.
•Beatrice the Biologist•

DIAGNOSIS: ACR CRITERIA

- **The "Eleven Criteria"**

- **4+/11 = LUPUS**

- Malar rash: butterfly-shaped rash across cheeks and nose.

- Discoid (skin) rash: raised red patches.

- Photosensitivity: skin rash as result of unusual reaction to sunlight.

- Mouth or nose ulcers: usually painless.

- Arthritis (nonerosive) in two or more joints, along with tenderness, swelling, or effusion. With nonerosive arthritis, the bones around joints don't get destroyed.

DIAGNOSIS: ACR CRITERIA

- Cardio-pulmonary involvement: inflammation of the lining around the heart (pericarditis) and/or lungs (pleuritis)

- Neurologic disorder: seizures and/or psychosis.

- Renal (kidney) disorder: excessive protein in the urine, or cellular casts in the urine.

- Hematologic (blood) disorder: hemolytic anemia, low white blood cell count, or low platelet count.

- Immunologic disorder: antibodies to double stranded DNA, antibodies to Sm, or antibodies to cardiolipin

- Antinuclear antibodies (ANA): a positive test in the absence of drugs known to induce

SLICC[†] Classification Criteria for Systemic Lupus Erythematosus

Requirements: ≥ 4 criteria (at least 1 clinical and 1 laboratory criteria)
OR biopsy-proven lupus nephritis with positive ANA or Anti-DNA

Clinical Criteria

1. Acute Cutaneous Lupus*
2. Chronic Cutaneous Lupus*
3. Oral or nasal ulcers *
4. Non-scarring alopecia
5. Arthritis *
6. Serositis *
7. Renal *
8. Neurologic *
9. Hemolytic anemia
10. Leukopenia *
11. Thrombocytopenia (<100,000/mm^3)

Immunologic Criteria

1. ANA
2. Anti-DNA
3. Anti-Sm
4. Antiphospholipid Ab *
5. Low complement (C3, C4, CH50)
6. Direct Coombs' test (do not count in the presence of hemolytic anemia)

[†] SLICC: Systemic Lupus International Collaborating Clinics
* See notes for criteria details

Petri M, et al. Arthritis and Rheumatism. Aug 2012

Methods

Data was extracted from the lupus registry (1995-2018) of the sole rheumatologist on island

143 patients fulfilled ACR/SLICC criteria

Severity was defined as the presence of any of 3 complications-cerebritis, nephritis, dialysis, and presented as both an indicator of severity (yes/no) and as a severity count (0-3)

Severity was also indicated by number of immunosuppressants used, defined as a count of azathioprine, mycophenolate mofetil and cyclophosphamide

Two other primary outcomes were

a) Completion of Stanford's Chronic disease self-management program, known as 'Viv Byen', run by the St. Lucia Arthritis and lupus association (SLALA) on a voluntary basis

b) Adherence, defined as 80% adherence by -

- Questioning patients at consultation about compliance
- Filling prescriptions before medication ran out
- Attending scheduled consultations.

- The predictive effect of selected markers of SEP on disease severity (yes/no) and adherence (yes/no) were explored using logistic regression, adjusting for the effects of age and sex

- Indicators of SEP used were education level (primary or secondary, tertiary), and patients discounted/exempted from cost of rheumatologist visit

- The effect of completion of the self-management program on both regression outcomes was explored as well as the effect of adherence on disease severity

- All analyses were performed using Stata statistical software (Stata Corp.2015. Stata Statistical Software.Release 15. College Station, TX: StataCorp LP.)

Management team

- On site team- rheumatologist, general practitioner, physiotherapist, counsellor, psychiatrist, surgeon, Viv byen program, Tai Chi and yoga classes.
- Care is shared with patients' health practitioners, health centres, hospitals…
- Support is provided by SLALA (St. Lucia Arthritis and Lupus Association)
- Discussion of difficult patients is facilitated by CAR (Caribbean Association for Rheumatology)

Management

- New patients 1 hour, returns ½ hour
- Risk factors are assessed, screening performed,

  comorbid conditions are managed to target

- Condition is discussed, written information given,

  support group (SLALA) membership and Viv Byen
  recommended

- Urine strips are provided for monthly home urine protein
  detection

- Patients are given follow-up appointments and encouraged to call/walk-in if problems

- Healthy lifestyle and sun protection are discussed.

- Omega 3 and vitamin D3 vitamins recommended

- All are prescribed Hydroxychloroquine, which is a mild anti-malarial shown to prevent complications of SLE (especially renal complications)

St.Lucia Demographics

- African
- Mixed
- East Indian
- Other
- Caucasian

11.9%

81%
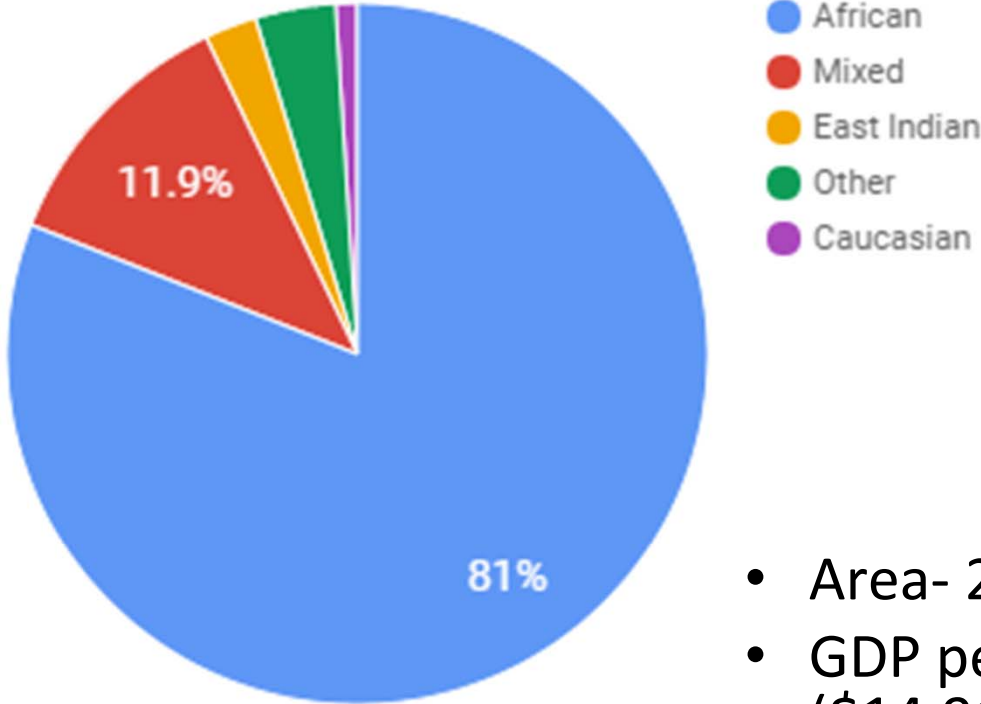
- Area- 238 sq. miles
- GDP per capita $7,328 US ($14,917 US in Barbados, $51,958 US in Canada)[1]

Variable	N †	Summary statistic
Age at diagnosis (yrs) (mean, SD)		
All	143	32.5 (12.0)
Women	132	32.8 (12.0)
Men	11	28.4 (11.4)
Sex (% female)	143	92
Education level Primary or secondary (%) Tertiary (%)	139	 60 40
Discount/exempt from pay (%)	143	33
First degree relative with SLE (%)	140	16
† Denominator may not total 143. This is generally due to participant non-response.		

Lupus incidence female per 100,000
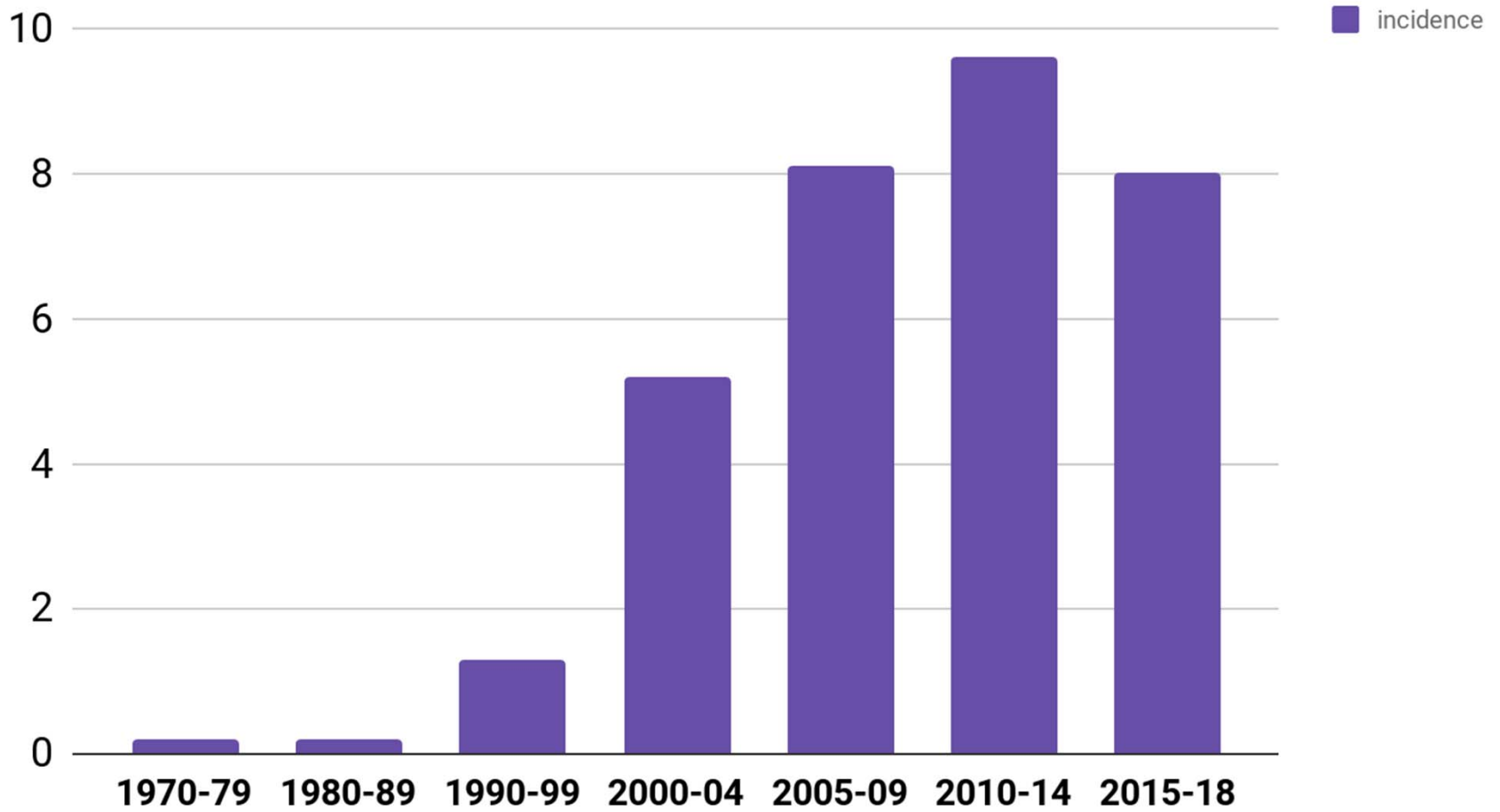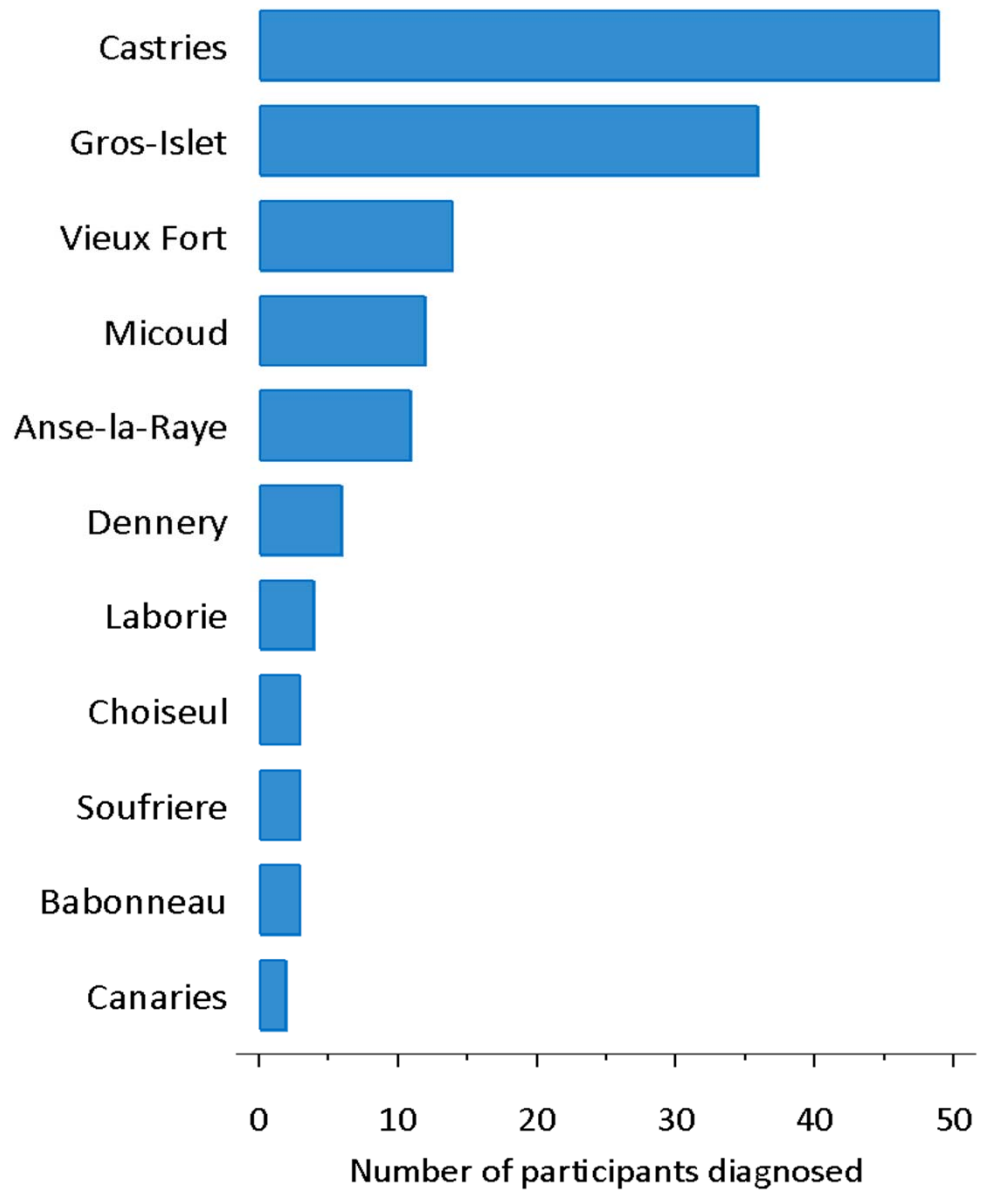
Lupus incidence (per 100,000 person years)

5 - 6
4 - 5
3 - 4
2 - 3
1 - 2

Occupation

professional
16.0%

16.0%

unemployed
28.0%

28.0%

intermediate
46.0%

46.0%

routine/manual
10.0%
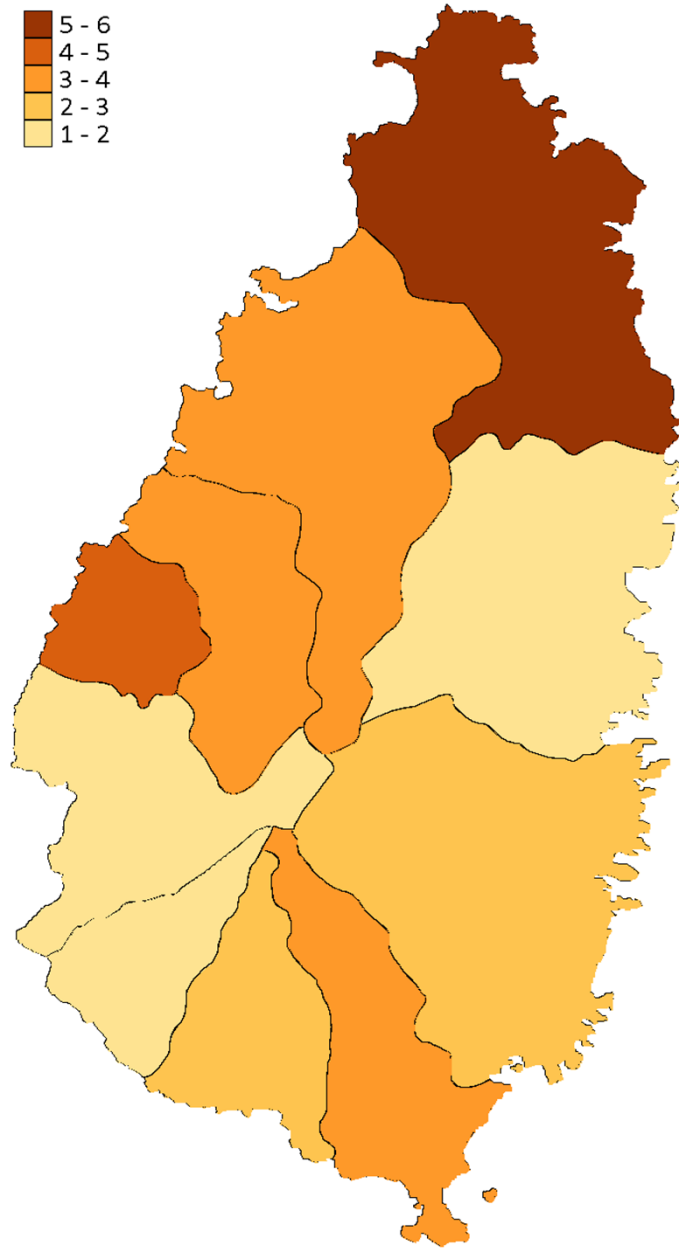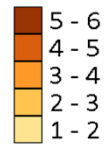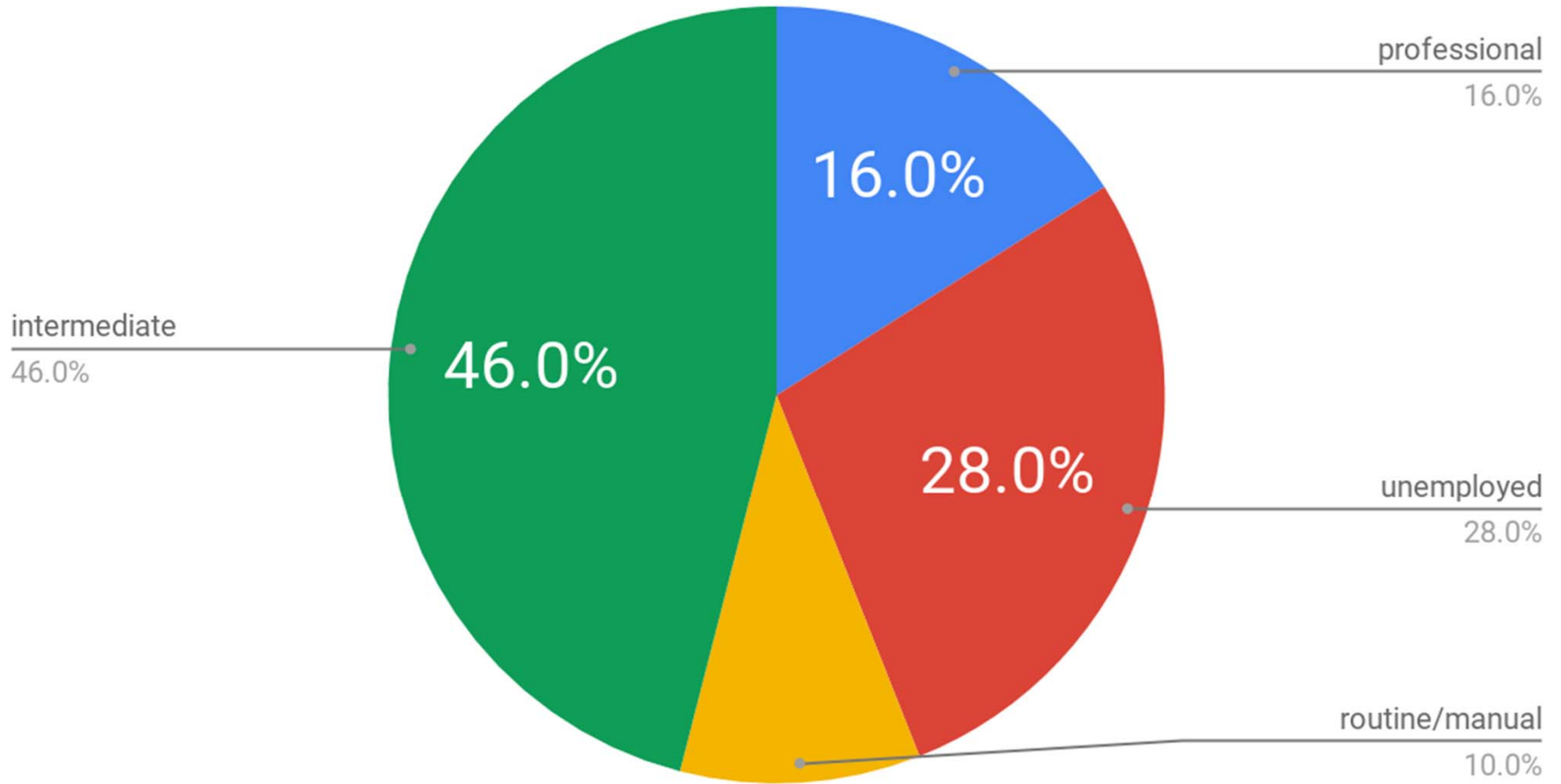
Presenting features

Developed features

Feature	Proportion (%)
Proteinuria	17
Alopecia	15
Neuro (seizures or	13
Pleuritic chest pain	11
Raynaud's	10
Discoid rash	8
Thrombocytopenia	7
Photosensitivity	6
Fever	6
Arthritis	6
Oral/nasal ulcers	6
Malar rash	4
Dry mouth/eyes	4
Lymph nodes	4
Hemolytic anaemia	3
Lymphopenia	3
Myalgia/Myositis	3
Fatigue	2
Miscarriage	1
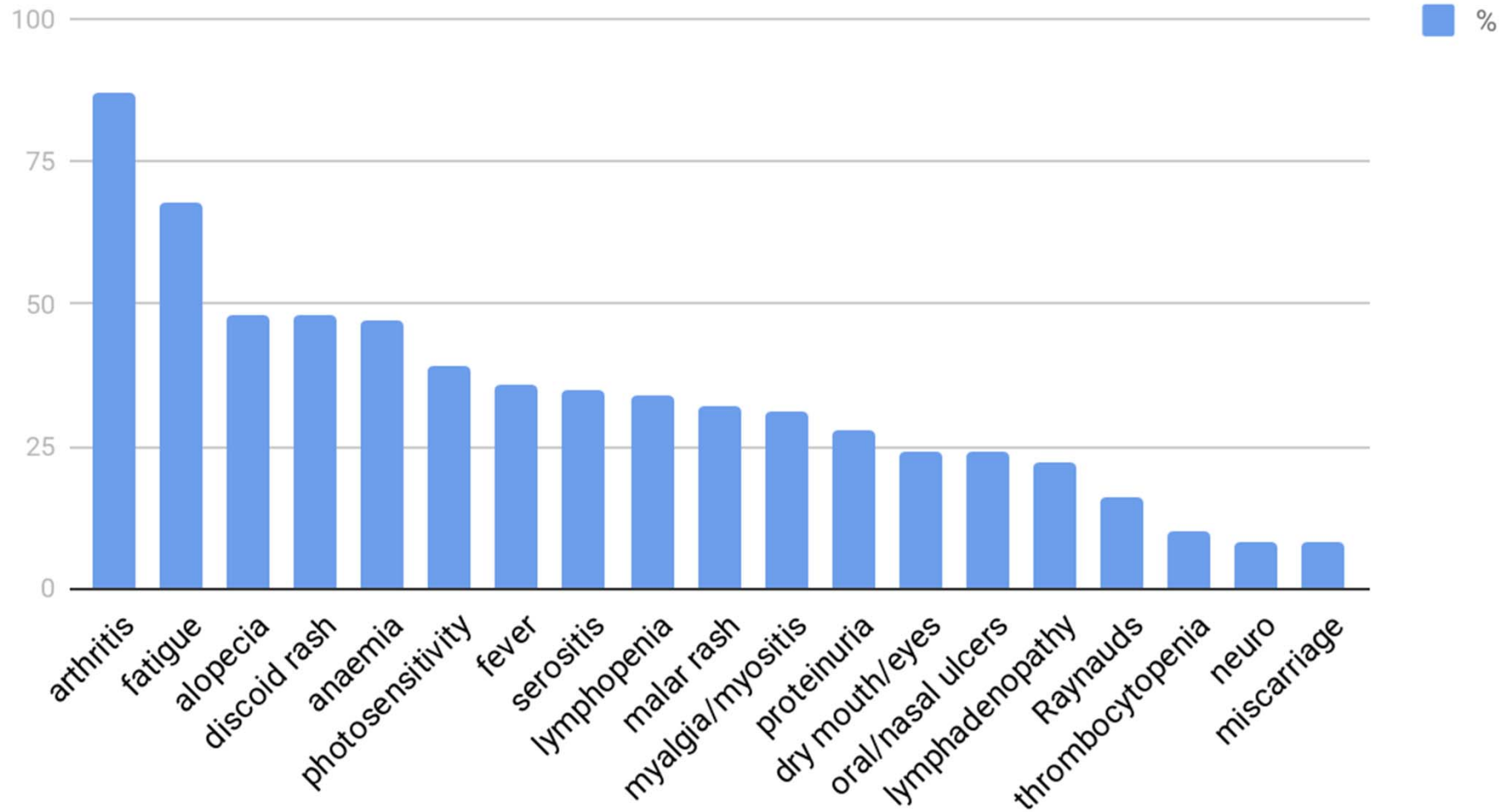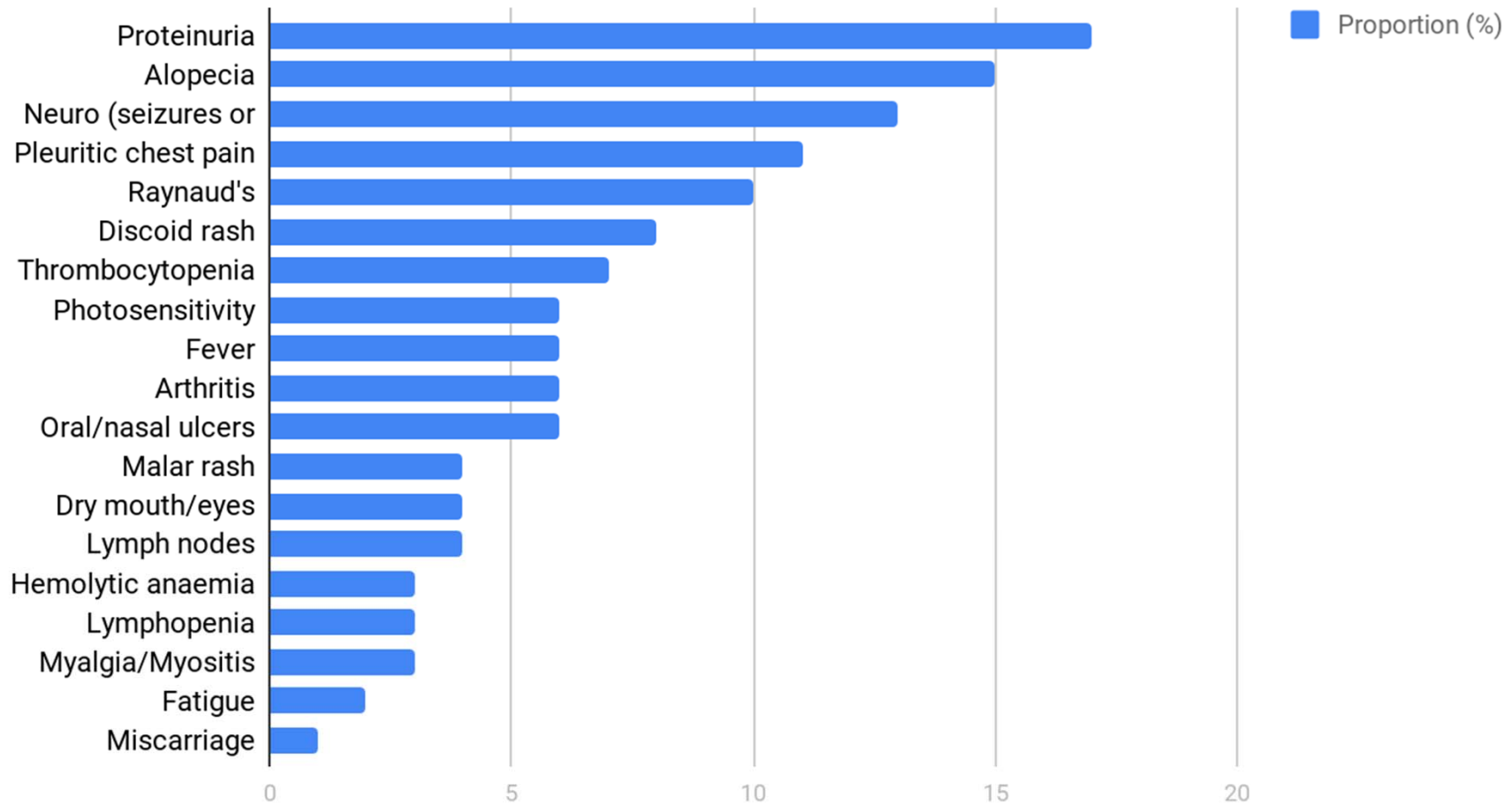
Comorbidities and complications
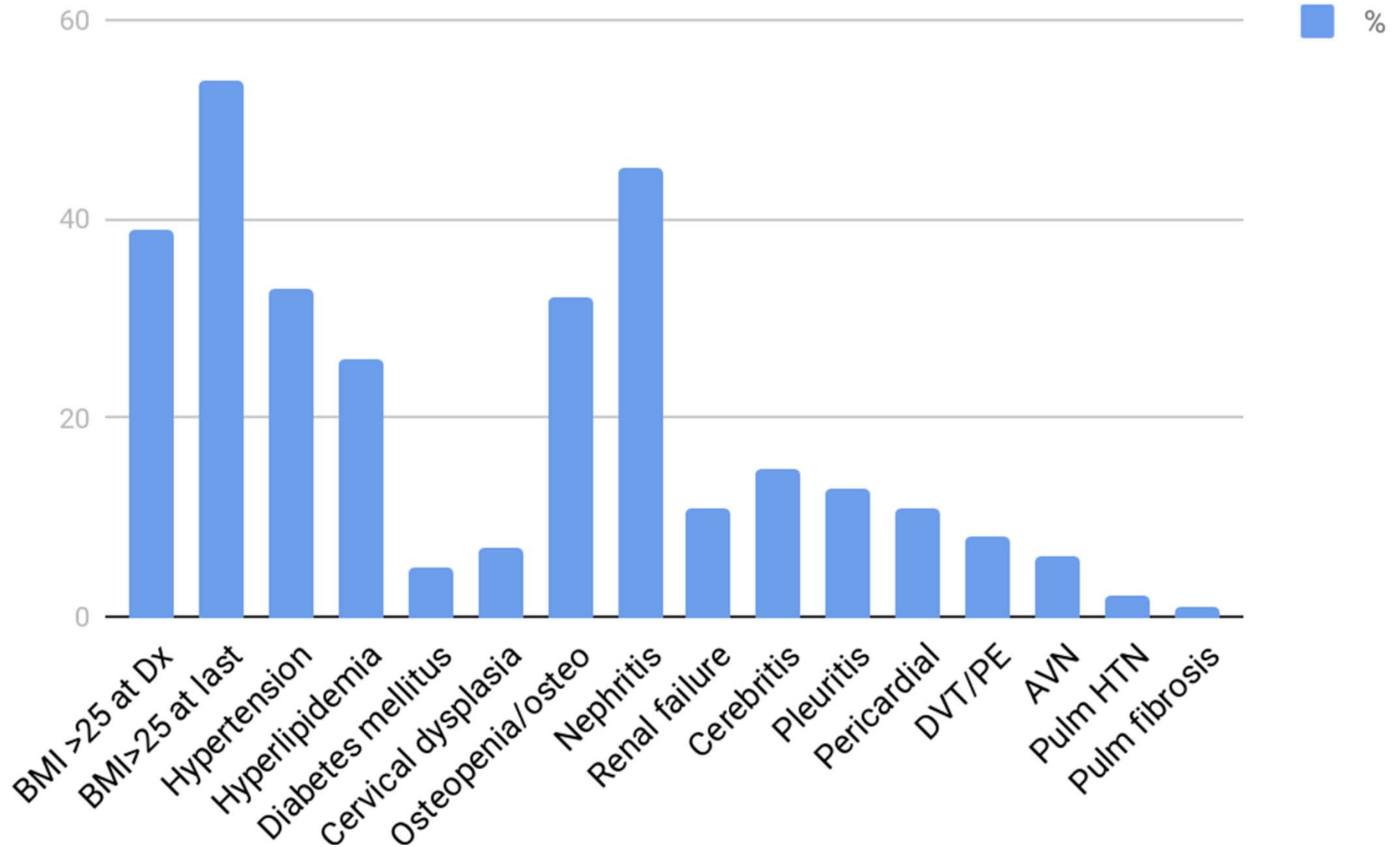
Years between first symptoms and diagnosis (median, IQR) (mean, SD)	143	0 (0 – 1) 1.6 (3.2)
Survival **5YSR** **10YSR**		97.5 %(95% CI 92.4 to 99.2) 87.7%(95% CI 77.8 to 93.4)

Adherence to medication

	n	Adherent † (%)
Education level		
Primary or secondary	82	40
Tertiary	55	64
Occupation level		
Not in employment	39	44
Routine/manual	13	54
Intermediate	64	50
Professional	23	61
Pay status		
Exempted or discounted	47	32
Not exempted or discounted	94	60

† Adherent is defined by self-report as taking SLE medication $\geq 80\%$ of the time.

The effect of multiple predictors on medication adherence †

OUTCOME	CONFOUNDER	OR ‡	95% CI	P value
Adherence	Age (1-yr increase)	0.96	(0.94 – 0.99)	0.01
	Sex (male)	1.86	(0.52 – 6.67)	0.34
	Lupus duration (1-yr increase)	1.01	(0.96 – 1.06)	0.78
	ACR criteria (1 criterion increase)	1.26	(1.04 – 1.54)	0.02
	SLICC criteria (1 criterion increase)	1.16	(1.00 – 1.34)	0.05
OUTCOME	PREDICTOR	OR ‡	95% CI	P value
Adherence	Education	2.68	(1.27 - 5.67)	0.01
	Discount	2.36	(1.07 - 5.23)	0.03
	Self- management	3.42	(0.87 - 13.39)	0.08

† Adherence is defined by self-report as taking SLE medication >80% of the time.
‡ Odds ratios compare the odds of severe disease in those with: (1) primary or secondary to tertiary education; (2) discounted healthcare to those without discount; (3) those not enrolled in self-management programme to those who have are enrolled

Medication adherence by education
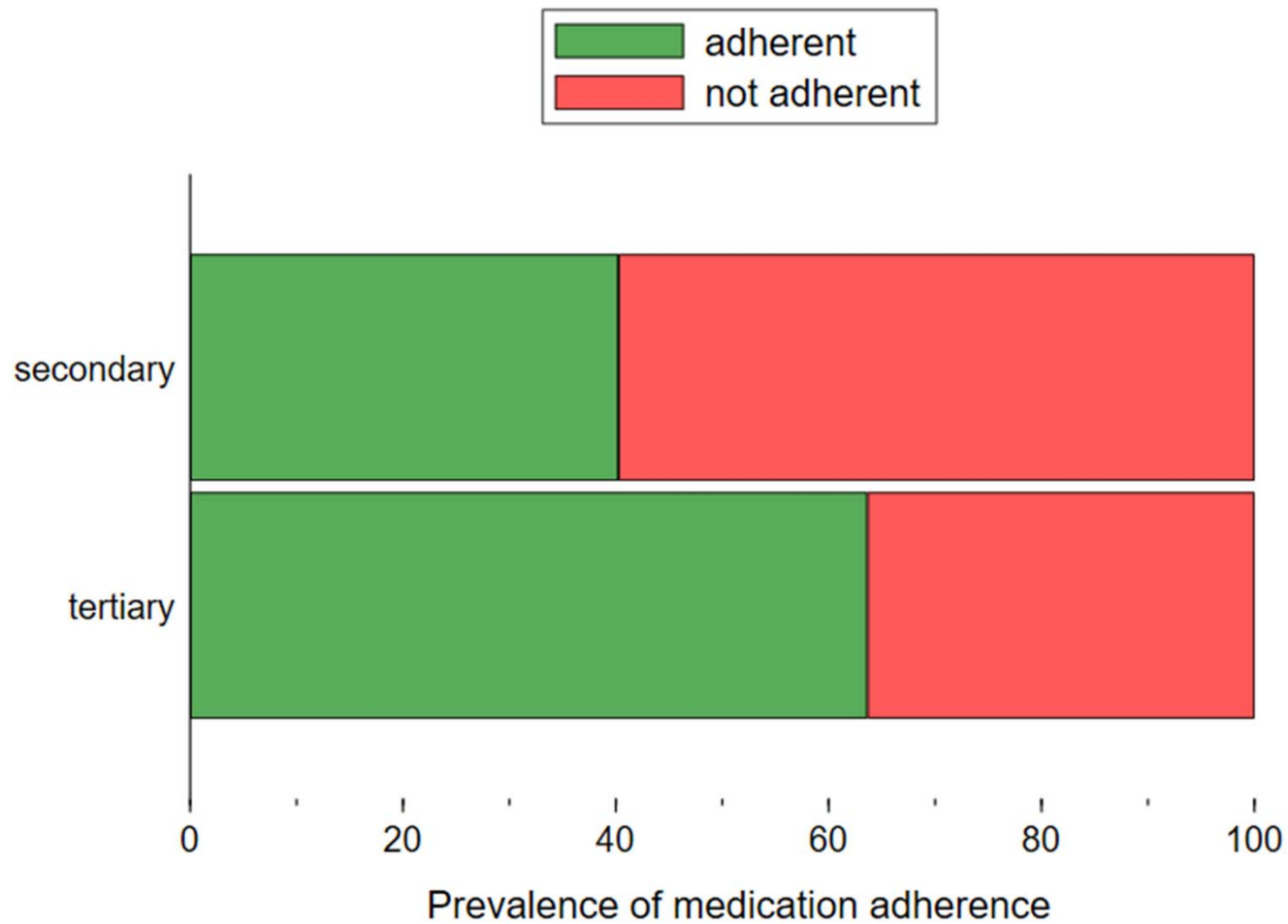
40% adherent (primary + secondary)
64% adherent (tertiary)

Self-management programme by education
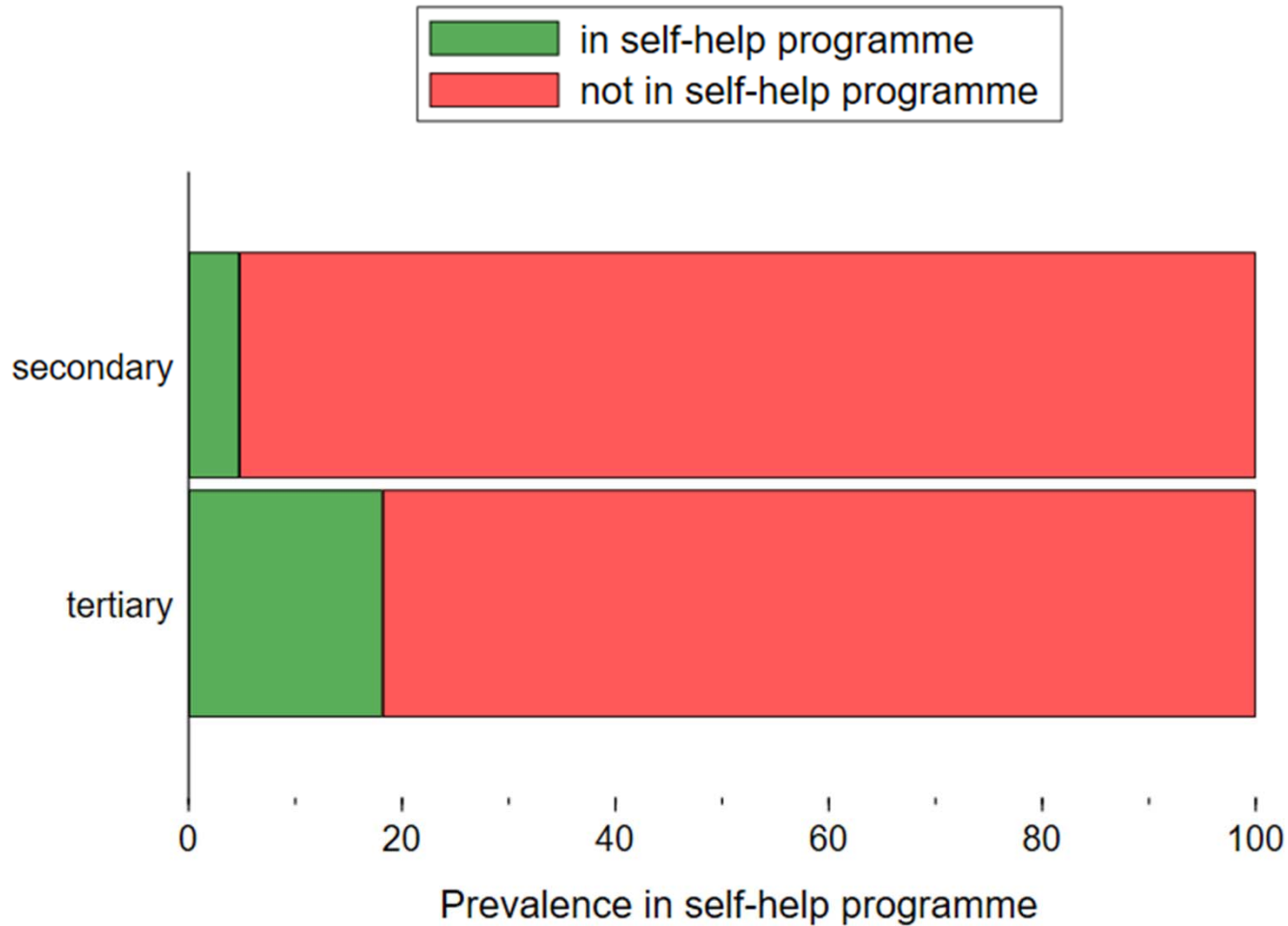
5% self-help (primary + secondary)
18% self-help (tertiary)

Immunosuppressant count by education
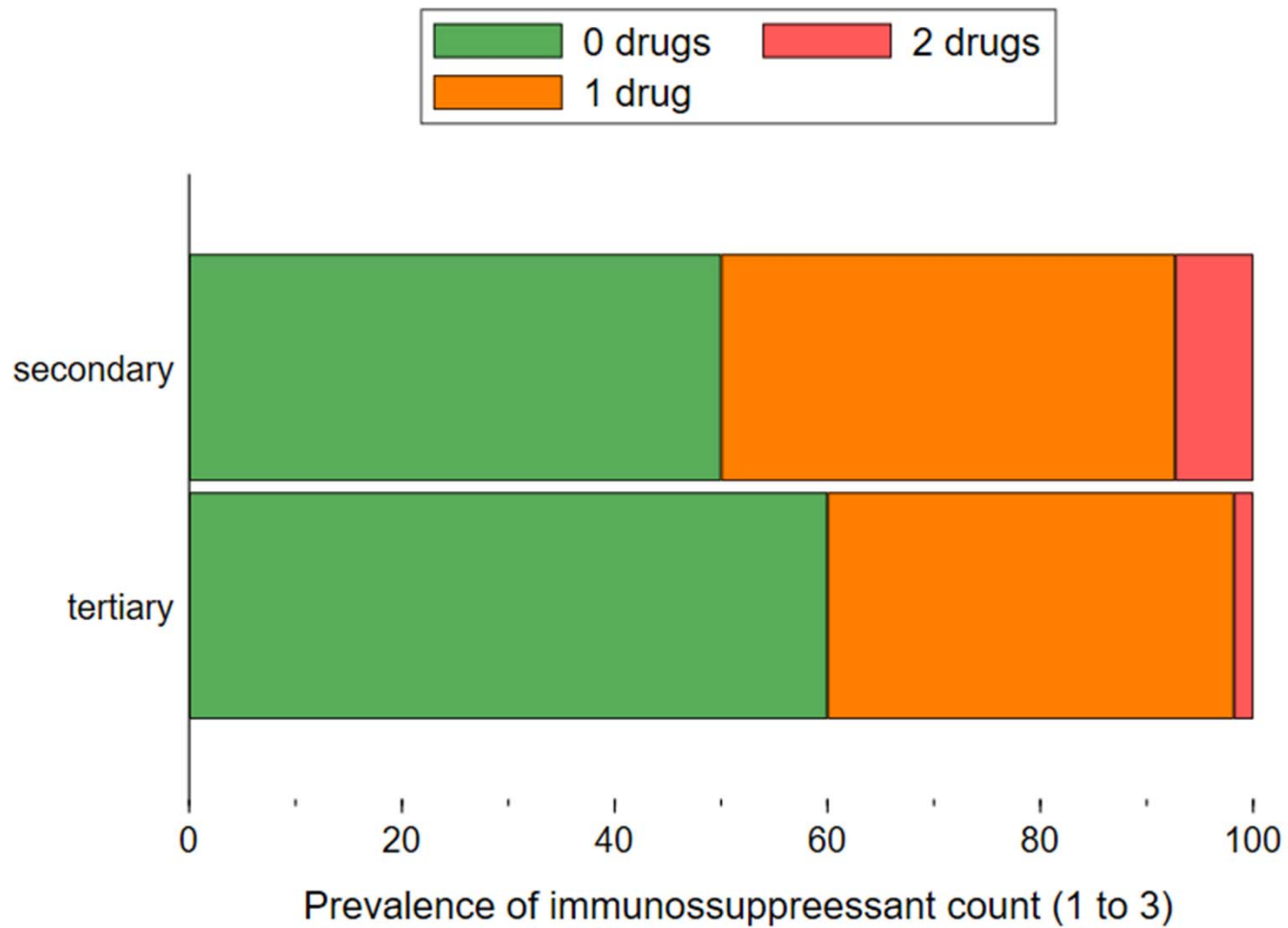
51% zero meds(primary + secondary)
60% zero meds (tertiary)

The effect of multiple predictors on disease

OUTCOME	CONFOUNDER	OR ‡	95% CI	P value
Disease severity	Age (1-yr increase)	0.97	(0.94 – 0.99)	0.02
	Sex (male)	5.08	(1.05 – 24.42)	0.04
	Lupus duration (1-yr increase)	0.99	(0.95 – 1.05)	0.84
	ACR criteria (1 criterion increase)	2.43	(1.79 – 3.29)	<0.001
	SLICC criteria (1 criterion increase)	1.85	(1.50 – 2.28)	<0.001
OUTCOME	PREDICTOR	OR ‡	95% CI	P value
Disease severity	Education	1.60	(0.77 - 3.29)	0.21
	Discount	**3.45**	**(1.51 - 7.88)**	**0.003**
	Self-management	1.00	(0.32 - 3.15)	0.99
	Adherence	1.88	(0.92 – 3.83)	0.08

Severity defined dichotomously as
(1) Severe: cerebritis OR nephritis OR dialysis
(2) Not severe: NO cerebritis NO nephritis AND NO dialysis.
‡ Odds ratios compare the odds of severe disease in those with: (1) primary or secondary to tertiary education; (2) discounted healthcare to those without discount; (3) those who completed self-management programme to those who did not ; and (4) current medication non-adherent to current adherent.

Severity count by education
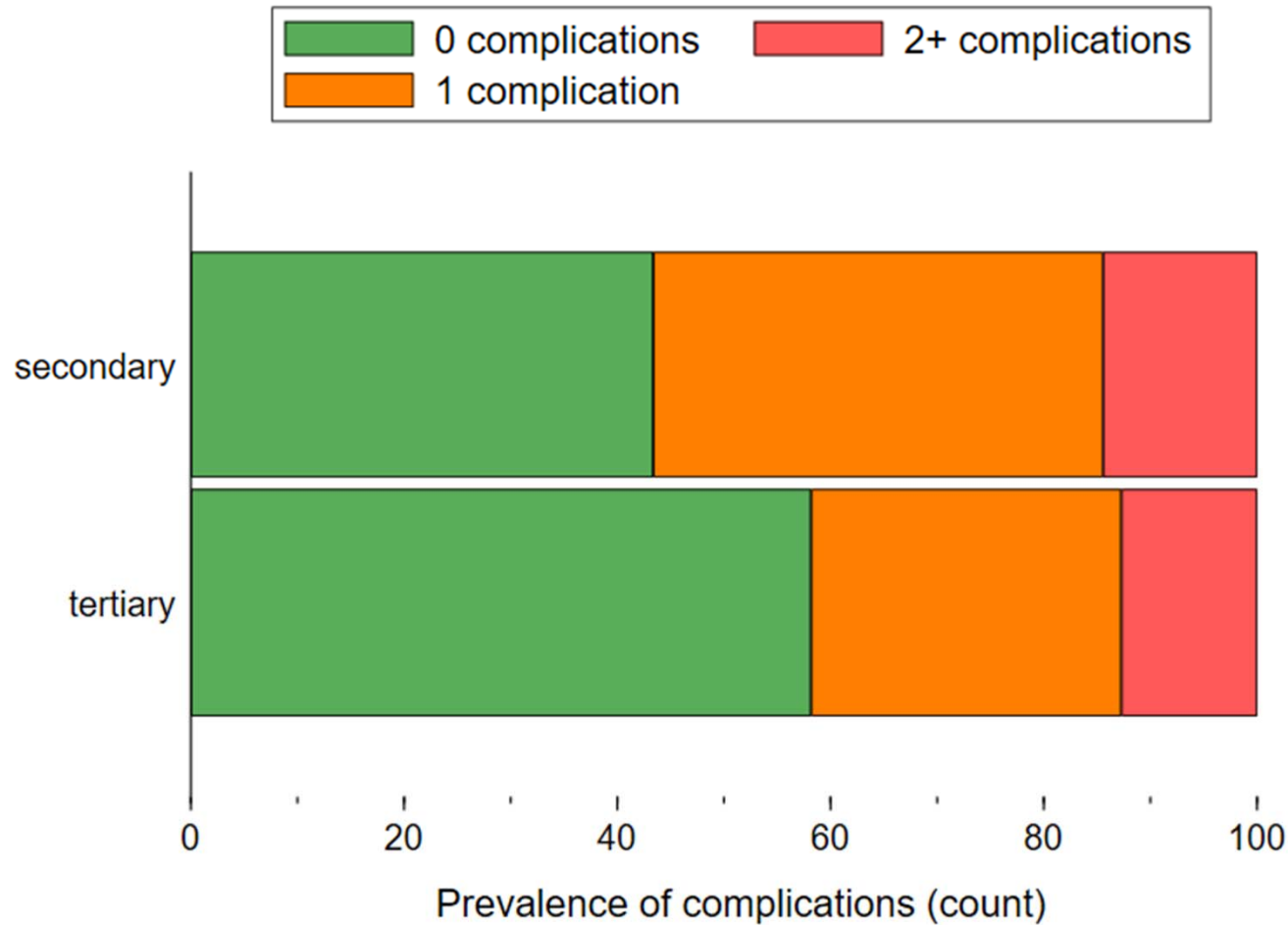
43% zero complications (primary + secondary)
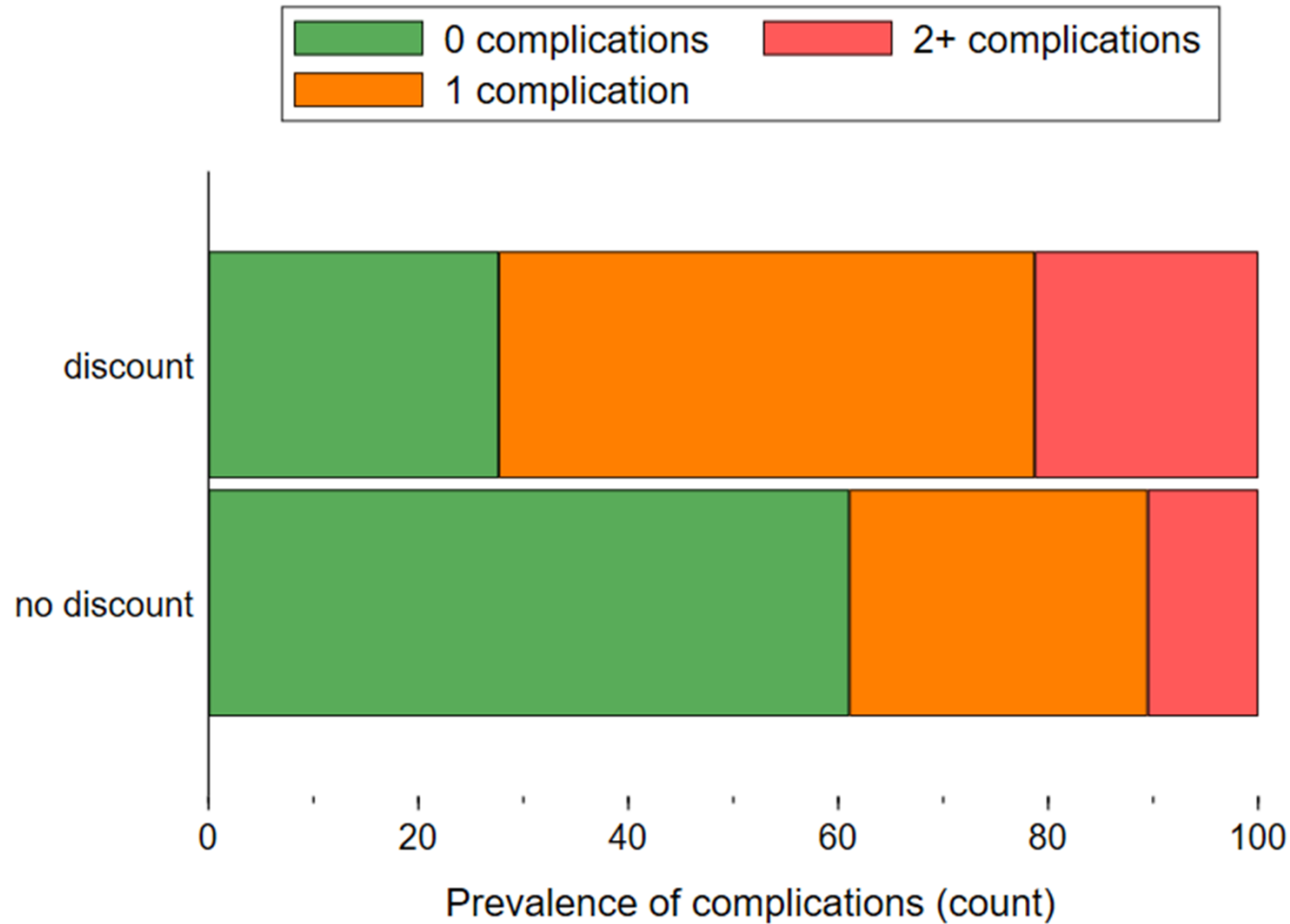58% zero complications (tertiary)

Severity indicator by education
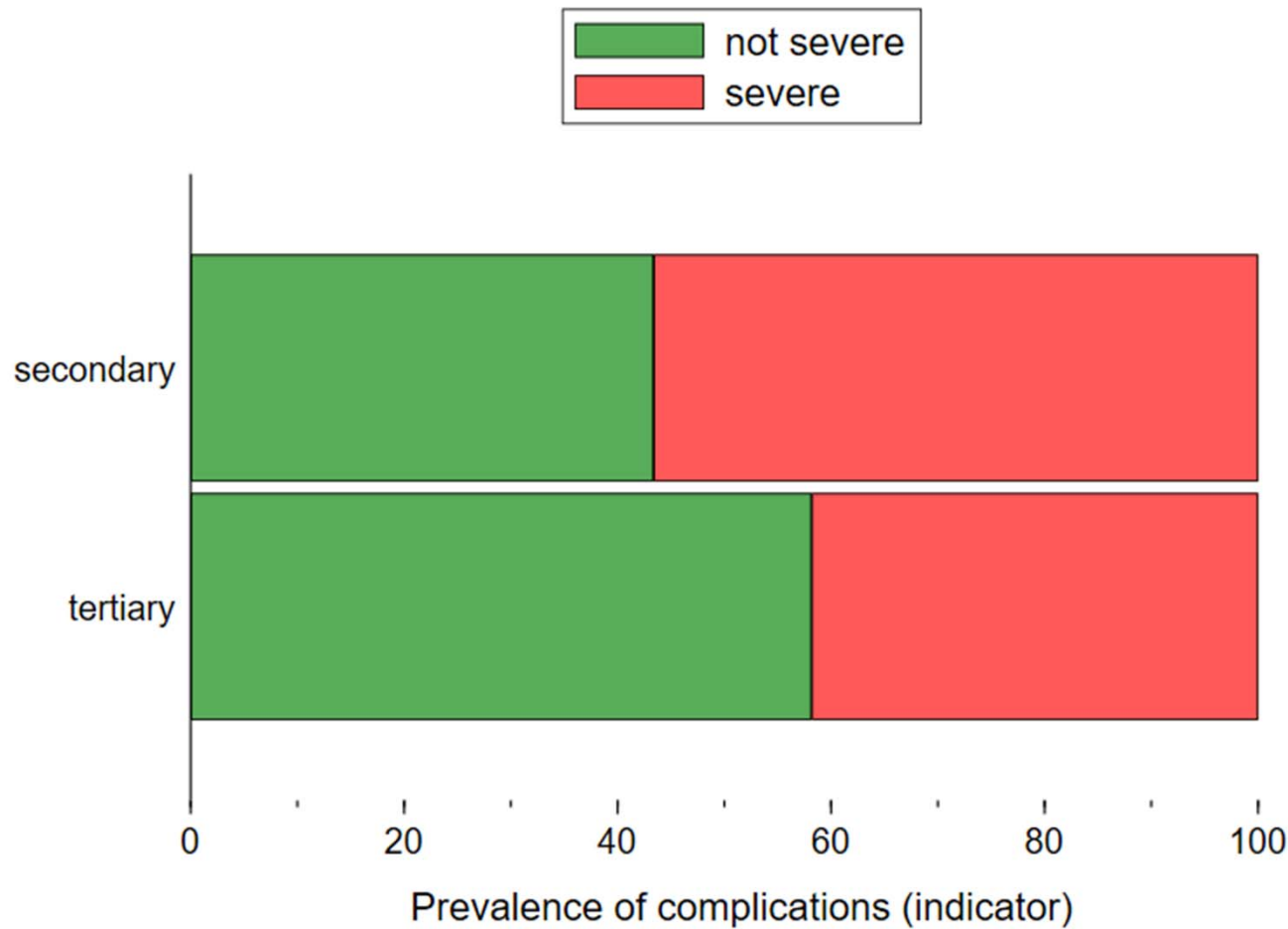
43% zero complications (primary + secondary)
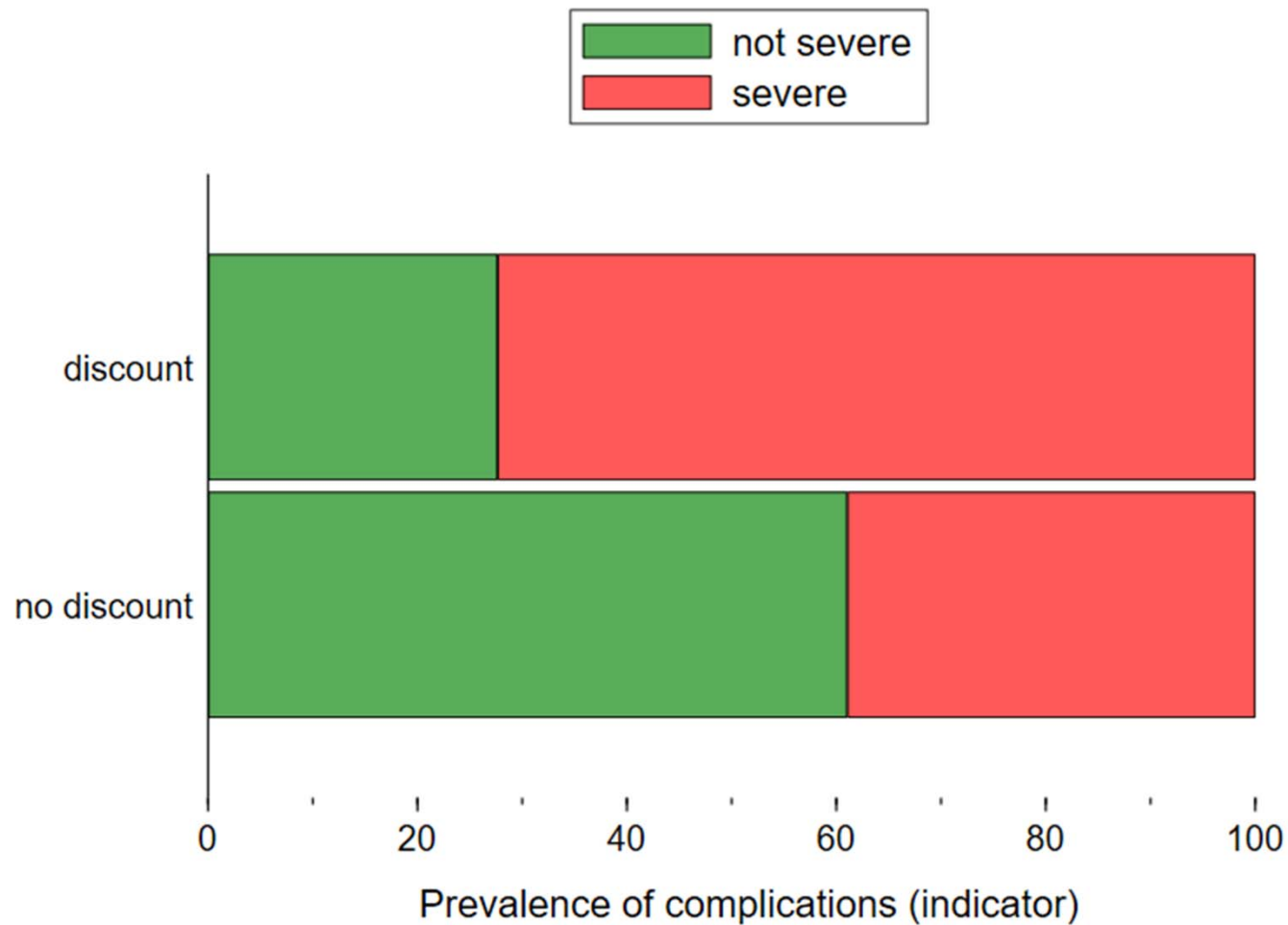58% zero complications (tertiary)

Severity count by treatment exemption status

Legend: 0 complications (green), 1 complication (orange), 2+ complications (red)

X-axis: Prevalence of complications (count), from 0 to 100
Y-axis categories: discount, no discount

28% zero complications(discount)
61% zero complications (no discount)

Severity indicator by treatment exemption status

28% zero complications (discount)
61% zero complications (no discount)

CONCLUSION

Adherence

Lupus patients of lower SEP as indicated by less education and exemption/discount, are less adherent

They are also less likely to do the self management program.

Lupus patients who do the self management program are more adherent

Non adherence is associated with severe complications- eg 8 of the 9 patients on dialysis are/were not adherent

CONCLUSION

Severity

Lupus patients with better education have fewer complications.

Lupus patients with better education have less need for immunosuppressive medication, i.e less severe disease.

Lupus patients who are exempt or discounted (therefore lower SEP) have more severe disease, with more complications

Unemployed lupus patients have more severe disease

Discounting and exempting patients affords them the care of the rheumatologist but is not enough.

The prime reason for non-adherence cited by these patients is

CONCLUSION

1.Epidemiological features of lupus in Saint Lucia are similar to other populations of African descent including Afro Caribbean populations

Except that

5 year survival rate (YSR) is higher than expected and is comparable to that of Martinique and Caucasian populations in developed countries

10 YSR is lower

2.Persons with lupus of lower socioeconomic position (SEP) are less adherent and have more severe disease than those of higher SEP, irrespective of the SEP definition

Discussion

5YSR has improved in developed countries from 50% in 1950 to 95% in 21st century

This is attributed to greater awareness, early diagnosis of milder disease, support, more judicious use of steroids

Outcome is improved with specialist care

There is a higher incidence of lupus in St. Lucia and other Caribbean islands than in Caucasian populations. In St. Lucia 5YSR of 97.5% is similar to higher income countries but 10YSR of 87.7% is closer to lower and middle income countries.

The lower 10 YSR we believe is due to -

Cumulative damage

Lack of adherence - cannot afford the medication and the tests, frustration

Too much steroid, non-adherence to plaquenil

Inadequate empowerment

I.e poverty, lack of education

"The fundamental cure for poverty is not money, but knowledge" Sir Arthur Lewis

The better than expected early outcome, we think is due to

- awareness achieved through efforts of SLALA since 1997, leading to early diagnosis (mean<1 year)
- SLALA lupus support group
- Dedicated rheumatology team with easy access to rheumatology opinion and care
- Time spent listening to patients
- Self-management program availability increasing self-efficacy
- Education of health practitioners through SLALA and CAR and willingness to share care

Comparative incidence and prevalence data

	ST.LUCIA 1995-2018	BARBADOS[3] 2000-09	MARTINIQUE[5] 1990-99	CURACAO[7] 1980-89	INTERNATIONAL
INCIDENCE	3.9?	7.5	4.7	4.6	4.6-5.6 CDC
PREVALENCE	?	84	64.2	47	62-84.8 20-150
5 YSR	97.5%	79.9%	96.4%	60.1%	95 high income 92 low income
10 YSR	87.7%		91.8%	45.7%	89 high income 85 low income

Comparison of renal involvement (%)

Renal	St. Lucia	Barbados	Martinique	Curacao	International
Nephritis	45	47	48.6	78	16-38

Limitations

1. This is a clinic-based, private review
2. Method of measuring adherence and Socioeconomic position are not completely objective
3. Definition of severe disease is not all encompassing

A Prospective International Study on Adherence to Treatment in 305 Patients With Flaring SLE: Assessment by Drug Levels and Self-Administered Questionnaires

Clinical pharmacology and therapeutics March 2018

Nathalie Costedoat-Chalumeau[1,2,3], Frédéric Houssiau[4], Peter Izmirly[5], Véronique Le Guern[1,2,3], Sandra Navarra[6], Meenakshi Jolly[7], Guillermo Ruiz-Irastorza[8], Gabriel Baron[9], Eric Hachulla[10], Nancy Agmon-Levin[11], Yehuda Shoenfeld[11], Francesca Dall'Ara[12], Jill Buyon[5], Christophe Deligny[13], Ricard Cervera[14], Estibaliz Lazaro[15], Holy Bezanahary[16], Gaëlle Leroux[17], Nathalie Morel[1,2,3], Jean-François Viallard[15], Christian Pineau[18], Lionel Galicier[19], Ronald Van Vollenhoven[20], Angela Tincani[12], Hanh Nguyen[21], Guillaume Gondran[16], Noel Zahr[22], Jacques Pouchot[23], Jean-Charles Piette[17], Michelle Petri[24] and David Isenberg[21]

nonadherence to treatment is a major cause of lupus flares….

Plans - National

- Inform Ministry of Health of findings to convince of need of affordable health care-to make medications and investigations accessible to all e.g. waiving all duties for these medications, and having them available on public formulary
- Inform Ministry of Education of findings in an effort to improve access to tertiary education/vocational training since higher education and employment correlate with less severe disease, greater adherence, less cost to patient (number of immunosuppressive drugs), and to country (e.g. admissions and dialysis)

- Inform the public of findings through all media to convince of need for early presentation for diagnosis and management, and that education, employment and adherence improve outcome
- Assess barriers to enrolling in the self-management program and advertise the program better nationally
- Ensure the program is taught regularly in high-risk areas- Anse La Raye/Canaries (Gros Islet, Castries, Vieux Fort)
- Continue teaching health professionals so we may diagnose patients early and manage cohesively with a patient-centred team approach
- Establish a national database

Plans - Regional

- Establish a regional registry to allow collaborative research with the Caribbean association for rheumatology (CAR)
- Work on access to international clinical trials
- CAR will create guidelines for best management of patients with lupus in the Caribbean

Acknowledgements

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Catherine Brown, CDRC, UWI, Barbados
Ethics Research Committee

Staff of Bay Medical Centre
Family
CAR

THANK YOU

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Innovation

Session 6

Motivation, Innovation and Efficiency in the Workplace

Presented by: Kurt Augustin

Research Rationale

Innovation relies on the overall performance of an organization

Advancements in technology & business require innovation

Employee satisfaction promotes a conducive workplace

Motivation is on of the main components of innovation
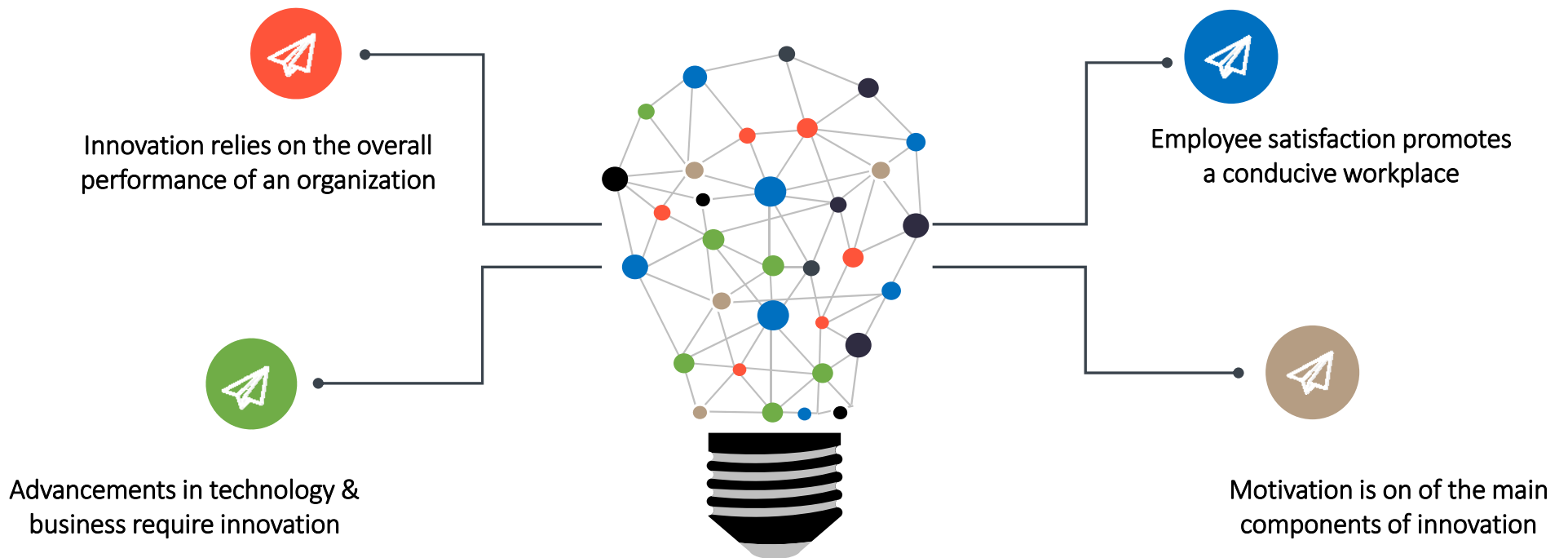
Literature Review

Motivation

Types of Motivation

o Intrinsic-Enjoyment attained in doing a task
o Extrinsic- Outcome as a result of doing a task

Motivational Theories

o Content- Maslow's Need Hierarchy, Existence, Relatedness, Growth (ERG), Mc Clelland's Achievement, Herzberg Two Factor.
o Process- Skinners Reinforcement, Vroom's Expectancy, Adams Equity, Locke's Goal Setting

Innovation

Types of Innovation

o Radical- Business Model & Technology Radically New
o Incremental- Business Model & Technology Close to Existence

Innovation Strategies

o Closed- No External Entities e.g. Apple
o Open- External Entities e.g. Samsung

Job Performance

Dimension of Job Performance

o Task Performance- Complete Task
o Conceptual Performance- Performs Extra Tasks
o Adaptive Performance- Conceptualize innovate ideas
o Counterproductive Work Behavior- Off task behavior

Employee Satisfaction

Factor Influencing Satisfaction

o Personal- age, gender, education
o Job Specific- type of work, skills, occupational status
o Organizational- wage, work conditions, benefits, opportunity for promotion

Approach

Inductive	Casual & Exploratory	Data Collection	Process
Discovering and evaluating methods which lead to a conclusion through precise observation	Determine the cause and effect relationships and discover new ideas and insights	Qualitative- Secondary data from academic material such as theories, case studies & books	• Research on all literature which satisfies objectives • Select appropriate material which provides solution to objectives • Discuss results and make comparisons to generate a conclusion

Analysis & Discussion

Motivation on Job Performance

Employee are more inclined to perform when influenced by intrinsic and extrinsic motivational factors .

70%

Theories Positively Supporting

- Vrooms Expectancy Theory

Analysis & Discussion

Motivation on Employee/Job Satisfaction

Motivation factors is known to fulfill and employee holistically since there is an expected outcome.

65%

Theories Positively Supporting

- Maslow's Theory
- Herzberg Hygiene Theory
- Mc Clelland's Theory

Analysis & Discussion

Motivational Factors Influencing Innovation

Compensation & Benefits

Employees seek rewards when they generate ideas/ innovation

Non Monetary Incentives

Studies show that 51% of employee would like their ideas to be published

Teamwork & Collaboration

Foundation for innovation is the ability to collaborate internally and externally

Leadership

Idea and collaboration friend leader with a charismatic and open personality

Analysis & Discussion

Motivational Factors Influencing Innovation

Organizational Culture	Job Design	Training & Development	Work Environment
Continuous training, promotes collaboration, identify and develop ideas	Tasks disbursed to promote creativity and meaningful work would contribute to satisfaction	Training on new thinking, problem solving and technology	Creative and open work space which enables collaboration and provides technology required for ideation

Conceptual Model

Implementation

Step 1-Analysis of Motivational Factors

- The organization should ensure that every factor is implemented or evolved to achieve full motivation

Step 2-Performance and Satisfaction Check

- Confirm that there is an increase in job performance and employee satisfaction

Step 3-Innovation Process Implementation

- A suitable innovative process frame-work should be implemented

Embrace, Inspire, Growth

"We genuinely embrace each other and inspire a positive outcome which foresters the growth of a people"

-Kurt Augustin

THANK YOU

MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT OF SAINT LUCIA.

(Department of Innovation.)

Agreement of Cooperation between the Ministry of Education of Cuba and the Ministry of Education, Innovation, Gender Relations and Sustainable Development of Saint Lucia.

Pedagogical conception and general theoretical support of the Literacy Program " Yes, I can"

Essential program supports. :

- General Methodology for the contextualization and implementation of the audiovisual program.
- Video lessons.
- Booklet "Yes, I can".
- Manual of the facilitator.
- Stages of the learning-teaching of the Reading,writing and consolodation of knowledges,skills and values.
- Final exercise.Profile of the graduate.Continuity of studies.
- System of training of the coordinators,advicers,educative agents and facilitators.
- Model of evaluation of the social impact of the program.
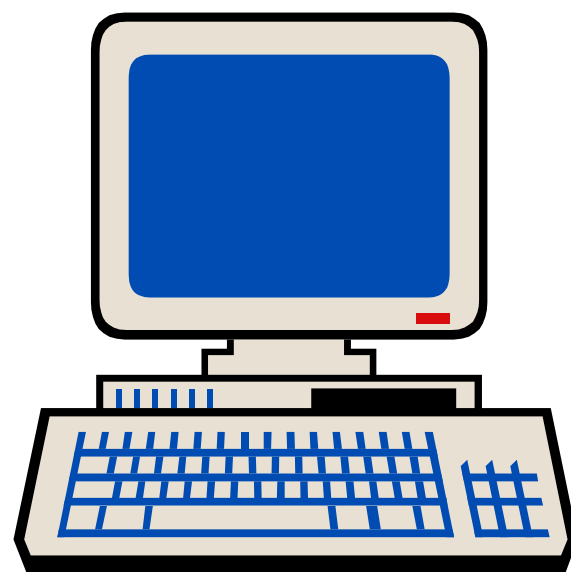
Main results

- The area costitute the first regional free of iliteracy : Cuba, Venezuela, Bolivia y Nicaragua.

- More tan 10.604.151 Young and adult people have been literate in 30 countries of Latin America and the Caribbean ,Europe, Asia Africa and Oceania

- Evaluation of the Social impact of the program by foreigners and Cuban experts (New Zeland, Mexico, Venezuela and Ecuador).

- Feasibility study of the program by experts from UNESCO to countries of Africa and Latin America.

- Mentions and awards "King Seijong" granted by UNESCO in three occasions.

Abstract

- Elaboration and Development of the Educational Strategy for the implementation of the "Yes , I can" Cuban Literacy Program in the two communities according to the literacy Schedule designed for the stage.

- Initial and systematic training of the facilitators in the pedagogical conception and methodology of the literacy program and also in the methodology of the educative Investigation to develop researchs in the ICT Centres of Canaries and Micoud.

Background

- The iliteracy rate of Young and adult people according to the last population census made in Saint Lucia.

- Current diagnosis on Young and adult people who have not developed the necessary reading, writing and arithmetic skills that allow them to accesss employment and entrepreneurship in the communities according to technical and profesional skills.

Objectives

- Contribute to the reduction of the illiteracy rate in Saint Lucia through the application of the 'Yes, I can" literacy program in its pilot and generalization stages from 2019 to 2023 according to the target population to be literate and the resources available.

Hypothesis

- **The "Yes, I can" is a socio- educational program that generates opportunities for lifelong learning and the development of knowledge, skills and values in the different districts of Saint Lucia.**

"Create more opportunities for Saint Lucians"

Methods

- Participatory action Research.

- Comparative education.

- Sistematization of experiental experiencies.

- Project of Investigation.

- Methodology of Investigation of the educative research.

- Theoretical, empirical, statistical, mathematical.

•Graduation ceremony of the literate participants from Canaries and Micoud (December, 2019).

•Socialization of the investigation results of the researcher-facilitators in the Scientific event of the Literacy program "Yes, I can" in Saint Lucia (December i 2019).
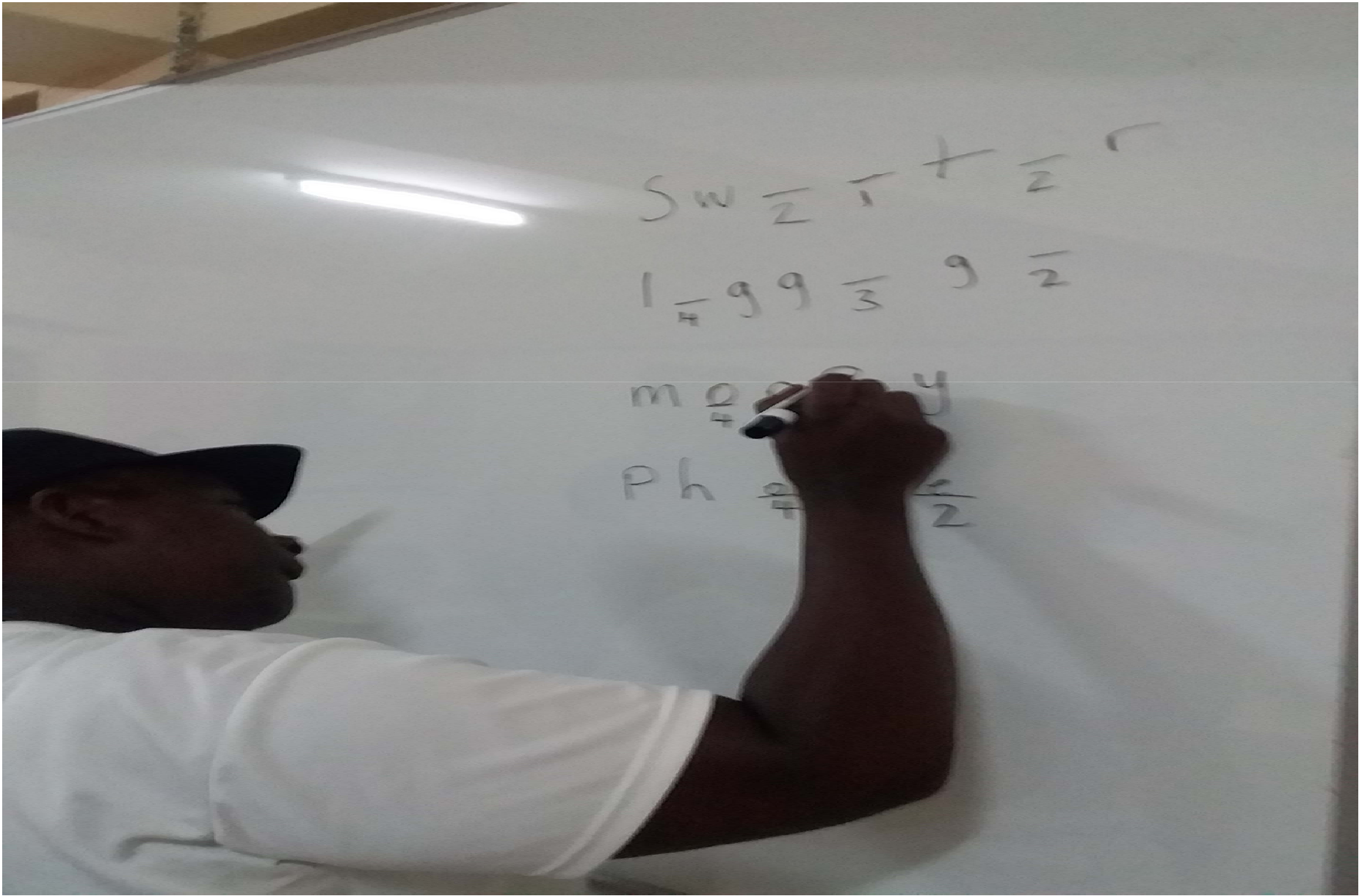
Data Analysis

Population: Training of 15 facilitators from the 11th Districs.

Intentional sample :

- 3 Facilitators with 10 participants in ICT Centre of Canaries.
- 2 Facilitators with 15 participants in ICTC Centre of Micoud.

Characterization of the sample:

•In general, the participants are mostly functional illiterates, women and men who are engaged in fishing, agriculture, handicrafts and private businesses, among others. In Micoud the average age ranges between 28 and 61 years and in Canaries between 30 and 42 years of age.

Results

- Training of 15 facilitators from the 11th Districs.

- Experimental Stage in Canaries and Micoud.

- Pedagogical visits and aplication of some evaluation instruments.

- Monthly technical Reports about the Development of the program according to the efficiency indicators.

- Information meeting, analysis and control of the program.

- Workshops with the National Unit of Enrichment and learning for Young and adult people (NELU)

Results

- Project of investigation with its lines of investigation to develop by the facilitators regarding the proposed topics.

- Elaboration and presentation of Scientific reports made by the facilitators-researchers.

- Scientific event to socialize the results by the facilitators-researchers.

- Level of progress in the learning process of the 25 participants from the two communities.
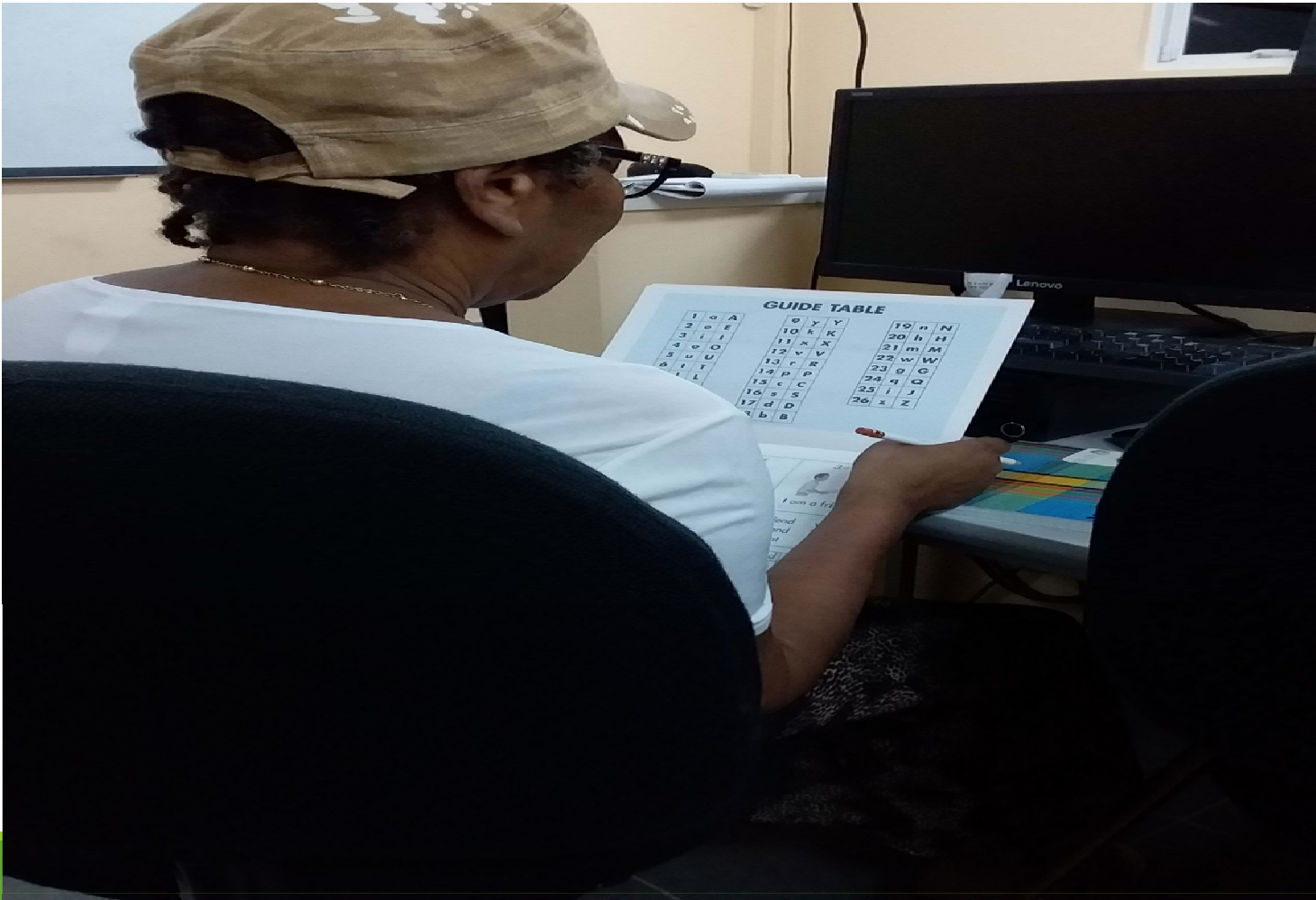
Social impact

- I really enjoy the Program to help with new videos to people.

- Having the opportunity to change people's lives is motivating.

- Continue with the Program to extend it to more people.

- Help people learn by mixing teacher with facilitator.

- The use of video classes and the effect it has on participants is remarkable and positive.

- The Program can change the lives of many people through an education for all.

- Literacy is very important for economic development.

- It is significant to use the words first and then the sounds.

Social Impact.

- At first I didn't have many expectations, but it's fantastic, very grateful to be part of the Program.
- Very informative program in a relaxed and familiar atmosphere.
- Provides a new perspective, this Program can help the ICT Centre improve its educational and community services.
- All classes start with sentences, then to break the ice and after a review of what was learned in the previous class, and then we started our corresponding new lessons to meet.
- I am fascinated by this opportunity I propose to have meetings of facilitators to help each other as many have not taught adults.
- Very good experience in Canaries to attend by a facilitator the children of the participants of the Program during the development of the meetings from Monday to Thursday.

-

Conclusion

- It is significant the application of the stages of diagnosis ,the training and piloting, the use of materials and the educational attention to the children of the participants. Also ,the presentation of the different investigations done by the facilitators in the Scientific event and , the high satisfaction rate of the participants ,families and communities.

- The satisfaction rate of the facilitators and participants is very high.