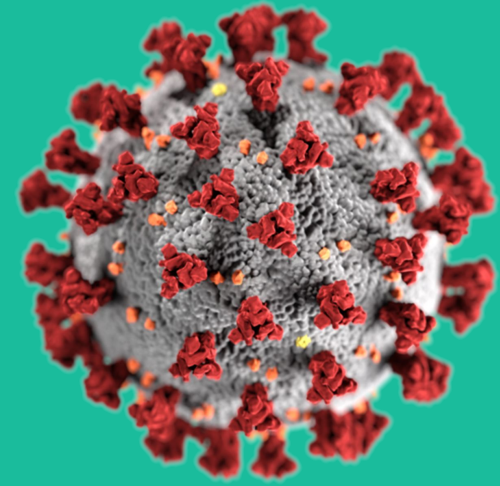


HEALTH EXPENDITURE AS A PREDICTOR OF STANDARD OF LIVING AND COVID19 SEVERITY



LOKRANJAN LAKSHMIKANTHAN
SUNNY PATEL





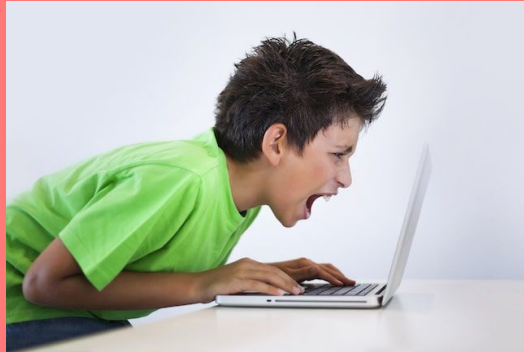
PURPOSE / GOALS

- Find out the correlation between average health expenditure for each country and the total number of COVID19 cases as a percentage of the population.
- Find how strongly different measures of health expenditure like as a percentage of total GDP correlate to standard measures of standard of living.
- Compare measures of health expenditure to a standard measure of income inequality.



DATA COLLECTION AND CLEANING PROCESS

- We chose Datasets that contain all the raw data that we will need to make our analysis of trends and correlation.
- We collected our data based on reliable organizations and their respective websites.
- We cleaned our datasets to the point where we only have common countries between the datasets we are comparing. We also handled missing values based on our own criteria.



INSIGHT 1

	Correlation Coefficient	P-Value
AVG Health Expenditure as a Percent of GDP 2007 - 2017 vs Tot Cases/1M Pop	-0.023142	0.789918
AVG Health Expenditure as a Percent of GGE 2007 - 2017 vs Tot Cases/1M Pop	-0.059960	0.489681
AVG Health Expenditure as a Percent of GDP 2007 - 2017 vs Deaths/1M Pop	0.007885	0.927679
AVG Health Expenditure as a Percent of GGE 2007 - 2017 vs Deaths/1M Pop	0.002958	0.972834
AVG Health Expenditure as a Percent of GDP 2007 - 2017 vs Tests/1M Pop	-0.061414	0.479198
AVG Health Expenditure as a Percent of GGE 2007 - 2017 vs Tests/1M Pop	-0.112916	0.192255
AVG Health Expenditure in USD 2007 - 2017 vs Tot Cases/1M Pop	0.019698	0.820606
AVG Health Expenditure in USD 2007 - 2017 vs Deaths/1M Pop	0.038159	0.660366
AVG Health Expenditure in USD 2007 - 2017 vs Tests/1M Pop	0.003902	0.964174

INSIGHT 2

	P-Values	
Correlation Coefficient		
AVG Health Expenditure as a Pecent of GDP 2007 - 2017 vs 2020 GINI Index	0.050276	0.552384
AVG Health Expenditure as a Pecent of GGE 2007 - 2017 vs 2020 GINI Index	-0.014888	0.860410
AVG Health GDP 2007 - 2017 vs 2020 GINI Index	0.047988	0.570638

INSIGHT 3

	P-Value	
	Correlation Coefficient	
AVG Health Expenditure as a Percent of GDP 2007 - 2017 vs AVG HDI 2007 - 2017	0.366915	1.250761e-06
AVG Health Expenditure as a Percent of GGE 2007 - 2017 vs AVG HDI 2007 - 2017	-0.154475	4.758136e-02
Change in Health Expenditure as a Percent of GDP 2007 - 2017 vs Change in HDI 2007 - 2017	-0.113961	1.449824e-01
Change in Health Expenditure as a Percent of GGE 2007 - 2017 vs Change in HDI 2007 - 2017	-0.092497	2.373471e-01
Health GDP per Capita in USD vs AVG HDI 2007 - 2017	0.895059	4.741916e-59
Health GGE per Capita in USD vs AVG HDI 2007 - 2017	0.880326	1.139608e-54

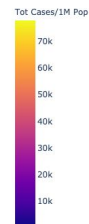
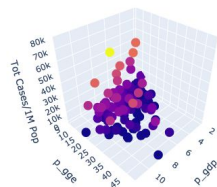
INSIGHT 4

	Correlation Coefficient	P-Value
AVG Health Expenditures as a Percent of GDP 2007- 2017 vs AVG GNI 2007 - 2017	-0.109255	0.240955
AVG Health Expenditures as a Percent of GGE 2007- 2017 vs AVG GNI 2007 - 2017	0.034730	0.710085
AVG Health GDP per Capita in USD vs AVG GNI 2007 - 2017	-0.034977	0.708114
AVG Health GGE per Capita in USD vs AVG GNI 2007 - 2017	-0.026061	0.780314
Change in Health Expenditure as a Percent of GDP 2007 - 2017 vs Change in GNI 2007 - 2017	0.173763	0.060982
Change in Health Expenditure as a Percent of GGE 2007 - 2017 vs Change in GNI 2007 - 2017	0.196766	0.033476

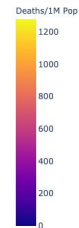
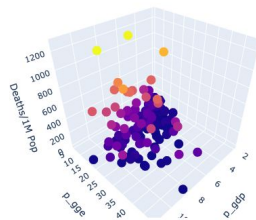
INSIGHT 5

	Correlation Coefficient	P-Value
AVG Health Expenditures as a Percent of GDP 2007- 2017 vs AVG GDP 2007 - 2017	0.209950	0.007148
AVG Health Expenditures as a Percent of GGE 2007- 2017 vs AVG GDP 2007 - 2017	-0.231217	0.002982

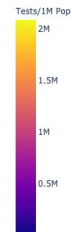
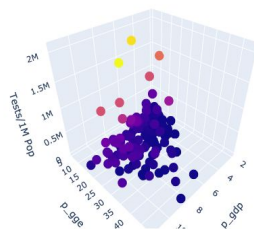
Health Expenditures vs COVID Total Cases / 1Million Population



Health Expenditures vs COVID Total Deaths / 1Million Population



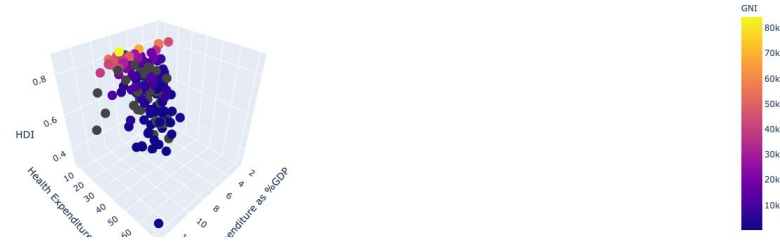
Health Expenditures vs COVID Total Tests / 1Million Population



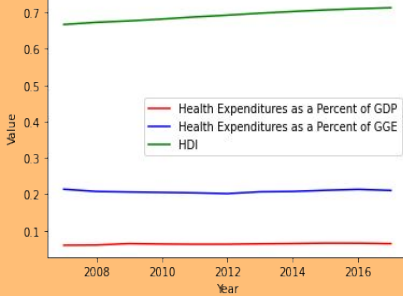
VISUAL 1

show on notebook when presenting

Health Expenditures as a Percent of GDP vs GGE vs HDI



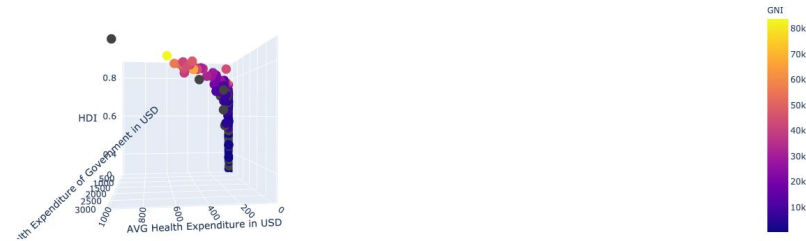
World Average Health Expenditures and HDI Over Time



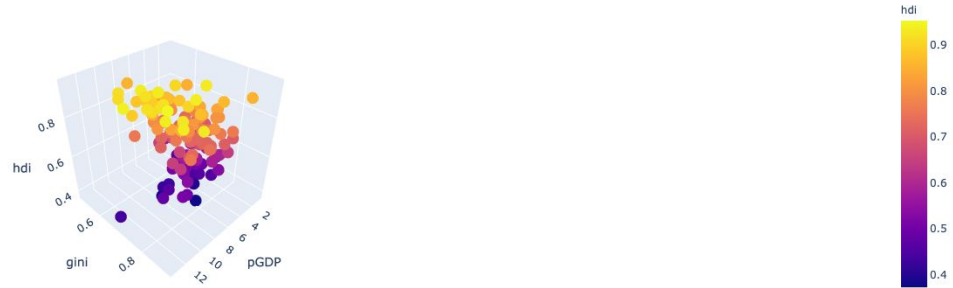
VISUAL 2

show on notebook when presenting

Health GDP per Capita vs Health GGE per Capita vs HDI



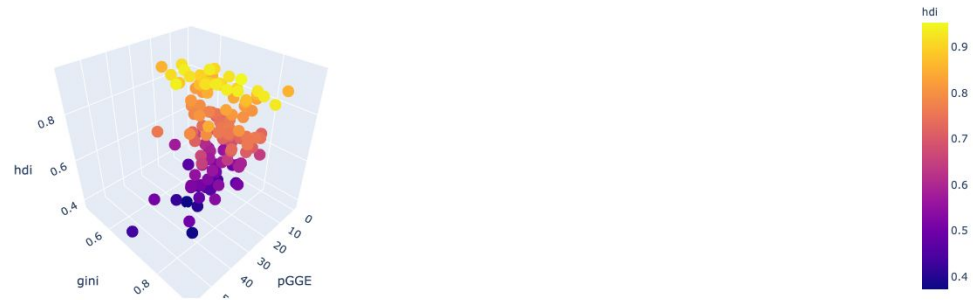
Health Expenditures as a Percent of GDP vs GINI vs HDI



VISUAL 3

show on notebook when presenting

Health Expenditures as a Percent of GGE vs GINI vs HDI



RESULTS

- Find out the correlation between average health expenditure for each country and the total number of COVID19 cases as a percentage of the population.
 - ◆ Health Expenditures vs COVID19 Deaths - negative
 - ◆ Health Expenditures vs COVID19 Cases and Tests - no correlation/data is too clustered

- Find how strongly different measures of health expenditure like as a percentage of total GDP correlate to standard measures of standard of living.
 - ◆ Health expenditure in percentage is a weak predictor
 - ◆ Health expenditure in USD is a strong predictor

- Compare measures of health expenditure to a standard measure of income inequality.
 - ◆ There is no correlation, however health expenditure used along with GINI can be a strong predictor of standard of living

NOTE

ZIP file does not contain all raw uncleaned files. One file was left out due to size which can be downloaded. We broke this file into 5 sub files which are each 100mbs.

DS1 Constant_2017_PPP_per_capita.csv:

https://drive.google.com/file/d/1jl_I_ZICmwU693yL2ivNarqQeB5FUiBI/view?usp=sharing

DS1 Constant_2017_US_per_capita.csv:

https://drive.google.com/file/d/15XR_TmvvTAG9IjlkKE_NpjiMH5_eAdK8/view?usp=sharing

DS1 Percentage_of_CHE.csv:

https://drive.google.com/file/d/1_L4JMy9nkXz7JxUZm38bqEhYQ88O3NqF/view?usp=sharing

DS1 Percentage_of_GDP.csv:

https://drive.google.com/file/d/11V8uYaSzIEoExeQcQtBZI_W_t9kapNlo/view?usp=sharing

DS1 Percentage_of_GGE.csv:

<https://drive.google.com/file/d/1yWIGNDZA8N1sil2RXMAh9cP3VTMH3hY-/view?usp=sharing>

The full dataset is available here:

https://drive.google.com/file/d/1rYIM8XFplzE_i2dunV2gHHM8NK3mbaHj/view?usp=sharing