Analysis of Life Expectancy

-Khushi Kashyap 20BCE1235
-Priyanka Gyanchandani 20BCE1722

Introduction

A lot of studies undertaken in the past on factors affecting life expectancy considering demographic variables, income composition and mortality rates. It was found that affect of immunization and human development index was not taken into account in the past. Important immunization like Hepatitis B, Polio and Diphtheria will also be considered. In a nutshell, this study will focus on immunization factors, mortality factors, economic factors, social factors and other health related factors as well. Since the observations this dataset are based on different countries, it will be easier for a country to determine the predicting factor which is contributing to lower value of life expectancy. This will help in suggesting a country which area should be given importance in order to efficiently improve the life expectancy of its population.

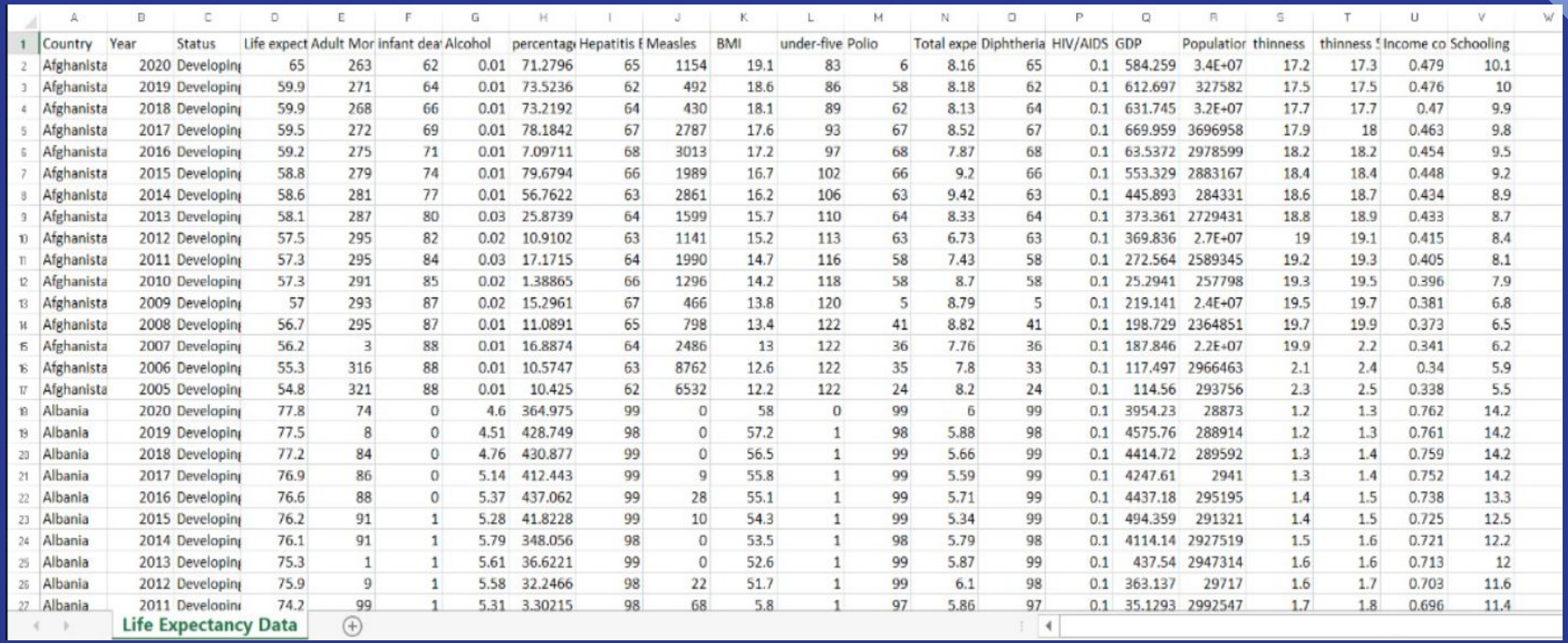
Objective

To identify and analyse how are the predicting factors such as immunization factors, mortality factors, economic factors, social factors and other health related factors actually affecting the life expectancy.

DATASET

The project relies on accuracy of data. The Global Health Observatory (GHO) data repository under World Health Organization (WHO) keeps track of the health status for all countries. The data-set related to life expectancy, health factors for 193 countries has been collected from the same WHO data repository website. Among all categories of health-related factors only those critical factors were chosen which are more representative. In the past 15 years , there has been a huge development in health sector resulting in improvement of human mortality rates especially in the developing nations in comparison to the past 30 years. Therefore, in this project we have considered data from year 2005-2020 for 193 countries for further analysis.

DATASET



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	Country	Year	Status	Life expect	Adult Mor	Infant dea	Alcohol	percentag	Hepatitis E	Measles	BMI	under-five	Polio	Total expe	Diphtheria	HIV/AIDS	GDP	Populatior	thinness	thinness S	Income co	Schooling	
2	Afghanista	2020	Developing	65	263	62	0.01	71.2796	65	1154	19.1	83	6	8.16	65	0.1	584.259	3.4E+07	17.2	17.3	0.479	10.1	
3	Afghanista	2019	Developing	59.9	271	64	0.01	73.5236	62	492	18.6	86	58	8.18	62	0.1	612.697	327582	17.5	17.5	0.476	10	
4	Afghanista	2018	Developing	59.9	268	66	0.01	73.2192	64	430	18.1	89	62	8.13	64	0.1	631.745	3.2E+07	17.7	17.7	0.47	9.9	
5	Afghanista	2017	Developing	59.5	272	69	0.01	78.1842	67	2787	17.6	93	67	8.52	67	0.1	669.959	3696958	17.9	18	0.463	9.8	
6	Afghanista	2016	Developing	59.2	275	71	0.01	7.09711	68	3013	17.2	97	68	7.87	68	0.1	63.5372	2978599	18.2	18.2	0.454	9.5	
7	Afghanista	2015	Developing	58.8	279	74	0.01	79.6794	66	1989	16.7	102	66	9.2	66	0.1	553.329	2883167	18.4	18.4	0.448	9.2	
8	Afghanista	2014	Developing	58.6	281	77	0.01	56.7622	63	2861	16.2	106	63	9.42	63	0.1	445.893	284331	18.6	18.7	0.434	8.9	
9	Afghanista	2013	Developing	58.1	287	80	0.03	25.8739	64	1599	15.7	110	64	8.33	64	0.1	373.361	2729431	18.8	18.9	0.433	8.7	
10	Afghanista	2012	Developing	57.5	295	82	0.02	10.9102	63	1141	15.2	113	63	6.73	63	0.1	369.836	2.7E+07	19	19.1	0.415	8.4	
11	Afghanista	2011	Developing	57.3	295	84	0.03	17.1715	64	1990	14.7	116	58	7.43	58	0.1	272.564	2589345	19.2	19.3	0.405	8.1	
12	Afghanista	2010	Developing	57.3	291	85	0.02	1.38865	66	1296	14.2	118	58	8.7	58	0.1	25.2941	257798	19.3	19.5	0.396	7.9	
13	Afghanista	2009	Developing	57	293	87	0.02	15.2961	67	466	13.8	120	5	8.79	5	0.1	219.141	2.4E+07	19.5	19.7	0.381	6.8	
14	Afghanista	2008	Developing	56.7	295	87	0.01	11.0891	65	798	13.4	122	41	8.82	41	0.1	198.729	2364851	19.7	19.9	0.373	6.5	
15	Afghanista	2007	Developing	56.2	3	88	0.01	16.8874	64	2486	13	122	36	7.76	36	0.1	187.846	2.2E+07	19.9	2.2	0.341	6.2	
16	Afghanista	2006	Developing	55.3	316	88	0.01	10.5747	63	8762	12.6	122	35	7.8	33	0.1	117.497	2966463	2.1	2.4	0.34	5.9	
17	Afghanista	2005	Developing	54.8	321	88	0.01	10.425	62	6532	12.2	122	24	8.2	24	0.1	114.56	293756	2.3	2.5	0.338	5.5	
18	Albania	2020	Developing	77.8	74	0	4.6	364.975	99	0	58	0	99	6	99	0.1	3954.23	28873	1.2	1.3	0.762	14.2	
19	Albania	2019	Developing	77.5	8	0	4.51	428.749	98	0	57.2	1	98	5.88	98	0.1	4575.76	288914	1.2	1.3	0.761	14.2	
20	Albania	2018	Developing	77.2	84	0	4.76	430.877	99	0	56.5	1	99	5.66	99	0.1	4414.72	289592	1.3	1.4	0.759	14.2	
21	Albania	2017	Developing	76.9	86	0	5.14	412.443	99	9	55.8	1	99	5.59	99	0.1	4247.61	2941	1.3	1.4	0.752	14.2	
22	Albania	2016	Developing	76.6	88	0	5.37	437.062	99	28	55.1	1	99	5.71	99	0.1	4437.18	295195	1.4	1.5	0.738	13.3	
23	Albania	2015	Developing	76.2	91	1	5.28	41.8228	99	10	54.3	1	99	5.34	99	0.1	494.359	291321	1.4	1.5	0.725	12.5	
24	Albania	2014	Developing	76.1	91	1	5.79	348.056	98	0	53.5	1	98	5.79	98	0.1	4114.14	2927519	1.5	1.6	0.721	12.2	
25	Albania	2013	Developing	75.3	1	1	5.61	36.6221	99	0	52.6	1	99	5.87	99	0.1	437.54	2947314	1.6	1.6	0.713	12	
26	Albania	2012	Developing	75.9	9	1	5.58	32.2466	98	22	51.7	1	99	6.1	98	0.1	363.137	29717	1.6	1.7	0.703	11.6	
27	Albania	2011	Developing	74.2	99	1	5.31	3.30215	98	68	5.8	1	97	5.86	97	0.1	35.1293	2992547	1.7	1.8	0.696	11.4	

Life Expectancy Data

Algorithms

Multiple Linear Regression

Decision Tree

KNN

NOVELTY

- To find the root cause and analyse how are various other factors affecting the life expectancy which will help government of a particular country to decide where to invest in a particular sector to raise life expectancy
- To find whether the various other factors such as eating habits, lifestyle, exercise, smoking, drinking alcohol has positive or negative correlation with Life Expectancy.
- Using the provided datasets, to determine whether nations with a high population density have shorter life expectancies or not?

Literature Review

Research Paper I:- Recent trends in life expectancy across high income countries: retrospective observational study
Author:- Jessica Y Ho, Arun S Hendi
Work Done:-To assess whether declines in life expectancy occurred across high income countries during 2014-16, to identify the causes of death contributing to these declines, and to examine the extent to which these declines were driven by shared or differing factors across countries.
Research Paper II:- Forecasting life expectancy, years of life lost, and all-cause and cause-specific mortality for 250 causes of death: reference and alternative scenarios for 2016–40 for 195 countries and territories
Author:-Kyle J Foreman,Neal Marquez, BAAndrew Dolgert
Work Done:- This research paper provides a novel approach to modelling life expectancy, all-cause mortality and cause of death forecasts and alternative future scenarios.
Research Paper III:- The Determinants of Life Expectancy: An Analysis of the OECD Health Data
Author:- James W Shaw, William C. Horrace
Work Done:- This study considers an aggregate life expectancy production function for a sample of developed countries.This research paper also present results for lifestyle inputs into the production of life expectancy.

Thank You