

Exploring Global Health Through Data: World Life Expectancy with MySQL

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Introduction:

- Life expectancy is one of the most widely used indicators to measure the overall health and development of populations across the globe.
- It reflects the average number of years a person is expected to live, based on current mortality patterns.
- The World Life Expectancy Project focuses on analyzing and comparing life expectancy trends across countries, regions, and demographics.
- It provides insights into public health outcomes, socio-economic disparities, and policy effectiveness.

Overview:

- The project collects and analyzes data from global organizations like WHO, UN, World Bank, and national health agencies.
- Factors studied include healthcare access, lifestyle choices, income levels, education, environmental conditions, and disease prevalence.
- It aims to highlight patterns, inequalities, and progress in life expectancy across nations.
- The project can be used by researchers, policymakers, NGOs, and governments to design interventions that improve population health and longevity.

Objectives:

- **Analyze Trends:** Study global, regional, and country-specific life expectancy patterns over time.
- **Identify Key Drivers:** Pinpoint factors influencing variations in life expectancy (e.g., healthcare, poverty, epidemics, lifestyle, climate change).
- **Compare & Benchmark:** Compare life expectancy across countries to identify high-performing nations vs. struggling ones.
- **Support Policy Decisions:** Provide evidence-based insights to governments and health organizations for better planning.
- **Promote Global Equity:** Highlight inequalities in life expectancy to encourage actions that reduce gaps between developed and developing regions.

Problem Statement:

- Despite advances in medicine, technology, and living standards, there are significant disparities in life expectancy worldwide.
- Some countries have an average life expectancy above 80 years, while others remain below 60 years, showing inequality.
- Contributing problems include:
 - Unequal access to healthcare and nutrition
 - High rates of infectious and chronic diseases
 - Poverty, war, and displacement
 - Environmental challenges (pollution, unsafe water, climate change)
 - Lifestyle risks (smoking, alcohol, poor diet, inactivity)
- The World Life Expectancy Project steps in to bridge this gap, providing insights that can guide targeted interventions for better global health outcomes.

Q1: How can we identify duplicate records in the world_life_expectancy table where the same country and year combination appears more than once?

	country	year	country_year	count_country
►	Ireland	2022	Ireland2022	2
	Senegal	2009	Senegal2009	2
	Zimbabwe	2019	Zimbabwe2019	2

Q2: How can we retrieve the list of countries along with their life expectancy values from the world_life_expectancy table?

	country	Life expectancy
►	Afghanistan	65
	Afghanistan	59.9
	Afghanistan	59.9
	Afghanistan	59.5
	Afghanistan	
	Afghanistan	58.8
	Afghanistan	58.6
	Afghanistan	58.1
	Afghanistan	57.5
	Afghanistan	57.3

Q3: For each country, what are the minimum and maximum life expectancy values recorded in the world_life_expectancy dataset?

	country	Min_LE	Max_LE
►	Afghanistan		65
	Albania		77.8
	Algeria	71.3	75.6
	Angola	45.3	56
	Antigua and Barbuda	73.6	76.4
	Argentina	74	76.3
	Armenia	72	74.8
	Australia	79.5	86
	Austria	78.1	88
	Azerbaijan	66.6	78
	Bahamas	72.6	76.1

Q4: Which countries have shown the greatest increase in life expectancy over time, and by how many years has life expectancy improved in each country?

	country	Min_LE	Max_LE	increase_in_life
►	Haiti	36.3	65	28.7
	Zimbabwe	44.3	67	22.7
	Eritrea	45.3	67	21.7
	Uganda	46.6	67	20.4
	Botswana	46	65.7	19.7
	Rwanda	48.3	68	19.7
	Zambia	43.8	63	19.2
	Niger	50	69	19
	United Republic of Tanzania	49.2	67	17.8
	Liberia	50	67	17
	Ethiopia	51.2	68	16.8

Q5: What is the average life expectancy across all countries for each year, and how has it changed over time?

	year	Life_expectations
►	2007	66.75
	2008	67.13
	2009	67.3
	2010	67.43
	2011	67.65
	2012	68.21
	2013	68.67
	2014	69.04
	2015	69.43
	2016	69.94
	2017	70.05

Q6: How can we retrieve the life expectancy values of country along with their corresponding GDP from the world_life_expectancy dataset?

	country	Life expectancy	GDP
►	Afghanistan	65	584
	Afghanistan	59.9	613
	Afghanistan	59.9	632
	Afghanistan	59.5	670
	Afghanistan		64
	Afghanistan	58.8	553
	Afghanistan	58.6	446
	Afghanistan	58.1	373
	Afghanistan	57.5	370
	Afghanistan	57.3	273

Q7: What is the average life expectancy and average GDP for each country, and how do countries rank when ordered by GDP in descending order?

	country	Life_expectations	GDP
►	Switzerland	82.33	57363.06
	Luxembourg	80.78	53257.13
	Qatar	77.03	40748.56
	Netherlands	81.13	34964.75
	Australia	81.81	34637.56
	Austria	81.48	33827.50
	Denmark	79.26	33067.63
	Singapore	81.48	32790.31
	Ireland	80.22	32237.00
	Kuwait	73.84	31914.44
	Iceland	82.44	30159.38

Q8: What is the average life expectancy for countries based on their development status (Developed vs. Developing)?

	status	status_LE
►	Developing	66.8
		67.4
	Developed	79.2

Q9: For each country, how has adult mortality accumulated year by year, and what is the rolling total across time?

	country	year	Adult Mortality	Rolling_Total
►	Afghanistan	2007	321	321
	Afghanistan	2008	316	637
	Afghanistan	2009	3	640
	Afghanistan	2010	295	935
	Afghanistan	2011	293	1228
	Afghanistan	2012	291	1519
	Afghanistan	2013	295	1814
	Afghanistan	2014	295	2109
	Afghanistan	2015	287	2396
	Afghanistan	2016	281	2677

Q10: For countries whose names begin with 'United', what are their yearly adult mortality values, and how does the rolling total of adult mortality change over time within each country?

	Country	Year	Adult Mortality	Rolling_Total
►	United Arab Emirates	2007	17	17
	United Arab Emirates	2008	14	31
	United Arab Emirates	2009	11	42
	United Arab Emirates	2010	98	140
	United Arab Emirates	2011	95	235
	United Arab Emirates	2012	92	327
	United Arab Emirates	2013	89	416
	United Arab Emirates	2014	87	503
	United Arab Emirates	2015	85	588
	United Arab Emirates	2016	84	672

Q11: For 'Pakistan', what are the yearly adult mortality values, and how does the rolling (cumulative) total of adult mortality progress over time?

	Country	Year	Adult Mortality	Rolling_Total
►	Pakistan	2007	19	19
	Pakistan	2008	189	208
	Pakistan	2009	187	395
	Pakistan	2010	185	580
	Pakistan	2011	183	763
	Pakistan	2012	2	765
	Pakistan	2013	179	944
	Pakistan	2014	178	1122
	Pakistan	2015	177	1299
	Pakistan	2016	175	1474

Q12: Which countries and years have the highest health percentage expenditure, and how does that relate to life expectancy?

	Country	Year	percentage expenditure	Life expectancy
►	Switzerland	2021	19479.9	83.2
	Switzerland	2020	19099	83
	Luxembourg	2015	18961.3	80
	Switzerland	2018	18822.9	82.6
	Switzerland	2019	18379.3	82.7
	Luxembourg	2018	17028.5	88
	Luxembourg	2021	16255.2	81.7
	Luxembourg	2020	15515.8	81.4
	Luxembourg	2013	15345.5	79.4
	Norway	2017	15268.1	81

Q13: Which countries and years have the highest health percentage expenditure, and how does that relate to life expectancy?

	Country	Year	percentage expenditure	Life expectancy
►	Switzerland	2021	19479.9	83.2
	Switzerland	2020	19099	83
	Luxembourg	2015	18961.3	80
	Switzerland	2018	18822.9	82.6
	Switzerland	2019	18379.3	82.7
	Luxembourg	2018	17028.5	88
	Luxembourg	2021	16255.2	81.7
	Luxembourg	2020	15515.8	81.4
	Luxembourg	2013	15345.5	79.4
	Norway	2017	15268.1	81

Q14: What are the values of BMI, life expectancy, adult mortality, and HIV/AIDS prevalence for each country and year in the world_life_expectancy dataset?

	Country	Year	BMI	Life expectancy	Adult Mortality	HIV/AIDS
►	Afghanistan	2022	19.1	65	263	0.1
	Afghanistan	2021	18.6	59.9	271	0.1
	Afghanistan	2020	18.1	59.9	268	0.1
	Afghanistan	2019	17.6	59.5	272	0.1
	Afghanistan	2018	17.2		275	0.1
	Afghanistan	2017	16.7	58.8	279	0.1
	Afghanistan	2016	16.2	58.6	281	0.1
	Afghanistan	2015	15.7	58.1	287	0.1
	Afghanistan	2014	15.2	57.5	295	0.1
	Afghanistan	2013	14.7	57.3	295	0.1

Q15: What are the Polio and Diphtheria immunization rates for each country and year, considering only records where both values are available?

	Country	Year	Polio	Diphtheria
►	Afghanistan	2022	6	65
	Afghanistan	2021	58	62
	Afghanistan	2020	62	64
	Afghanistan	2019	67	67
	Afghanistan	2018	68	68
	Afghanistan	2017	66	66
	Afghanistan	2016	63	63
	Afghanistan	2015	64	64
	Afghanistan	2014	63	63
	Afghanistan	2013	58	58
	Afghanistan	2012	58	58

Organized Data:

	Country	Year	Status	Life expectancy	Adult Mortality	infant deaths	percentage expenditure	Measles	BMI	under-five deaths	Polio	Diphtheria	HIV/AIDS	GDP	thinness 1-19 years	thinness 5-9 years	Schooling	Row_ID
▶	Afghanistan	2022	Developing	65	263	62	71.3	1154	19.1	83	6	65	0.1	584	17.2	17.3	10.1	1
	Afghanistan	2021	Developing	59.9	271	64	73.5	492	18.6	86	58	62	0.1	613	17.5	17.5	10	2
	Afghanistan	2020	Developing	59.9	268	66	73.2	430	18.1	89	62	64	0.1	632	17.7	17.7	9.9	3
	Afghanistan	2019	Developing	59.5	272	69	78.2	2787	17.6	93	67	67	0.1	670	17.9	18	9.8	4
	Afghanistan	2018	Developing		275	71	7.1	3013	17.2	97	68	68	0.1	64	18.2	18.2	9.5	5
	Afghanistan	2017	Developing	58.8	279	74	79.7	1989	16.7	102	66	66	0.1	553	18.4	18.4	9.2	6
	Afghanistan	2016	Developing	58.6	281	77	56.8	2861	16.2	106	63	63	0.1	446	18.6	18.7	8.9	7
	Afghanistan	2015	Developing	58.1	287	80	25.9	1599	15.7	110	64	64	0.1	373	18.8	18.9	8.7	8
	Afghanistan	2014		57.5	295	82	10.9	1141	15.2	113	63	63	0.1	370	19	19.1	8.4	9

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Final Takeaways:

- Global life expectancy has improved overall, but the gap between developed and developing nations remains significant.
- Economic strength matters → countries with higher GDP generally have higher life expectancy, though the relationship isn't perfectly linear.
- Health expenditure plays a role, but spending more doesn't always guarantee longer lives efficiency and access to healthcare matter too.
- Adult mortality and HIV/AIDS prevalence are critical negative drivers, pulling life expectancy down in many low-income countries.
- Immunization rates (Polio & Diphtheria) show a positive association with better life expectancy, emphasizing the importance of preventive healthcare.
- BMI and lifestyle indicators highlight growing risks in certain regions (obesity vs malnutrition), showing that both under- and over-nutrition are challenges.