

Supplementary Materials

Supplementary Table 1 Longitudinal age curves of CRC mortality caused by a diet high in red meat in China overall.

Age	Rate	CILo	CIHi
27.5	0.2187	0.1943	0.2461
32.5	0.455	0.4177	0.4956
37.5	0.7823	0.7309	0.8374
42.5	1.2074	1.1405	1.2782
47.5	1.7547	1.6698	1.844
52.5	2.7463	2.6354	2.8619
57.5	4.1329	3.9851	4.2862
62.5	5.7769	5.5873	5.9729
67.5	8.2346	7.9824	8.4948
72.5	12.628	12.257	13.0101
77.5	18.0621	17.5279	18.6126
82.5	23.6049	22.7265	24.5173
87.5	34.5867	33.0494	36.1955
92.5	40.8797	38.146	43.8093
97.5	36.368	31.0828	42.552

Supplementary Table 2 Period RR of CRC mortality caused by a diet high in red meat in China overall.

Period	Rate Ratio	CILo	CIHi
1994.5	1.0551	1.0218	1.0894
1999.5	1.0128	0.9827	1.0438
2004.5	1	1	1
2009.5	0.9659	0.9391	0.9934
2014.5	0.9487	0.9221	0.976
2019.5	0.9645	0.9368	0.9931

Supplementary Table 3 Cohort RR of CRC mortality caused by a diet high in red meat in China overall.

Cohort	Rate Ratio	CILo	CIHi
1897	1.2297	0.6165	2.4528
1902	1.147	0.9217	1.4273
1907	1.0203	0.9161	1.1363
1912	0.9676	0.9018	1.0382
1917	0.9762	0.9273	1.0278
1922	0.9906	0.9496	1.0333
1927	1.0247	0.9875	1.0634
1932	1.035	1.0005	1.0708
1937	1.0321	0.999	1.0662
1942	1	1	1

1947	0.9878	0.9548	1.0219
1952	0.946	0.9122	0.9811
1957	0.9099	0.8726	0.9488
1962	0.8418	0.8024	0.8832
1967	0.8454	0.8009	0.8923
1972	0.7945	0.7427	0.8498
1977	0.7856	0.7198	0.8574
1982	0.7897	0.7048	0.8848
1987	0.8113	0.7002	0.9402
1992	0.8221	0.6315	1.0704

Supplementary Table 4 Local drift of CRC mortality caused by a diet high in red meat in China overall.

Age	Percent per Year	CILo	CIHi
27.5	-0.0407	-0.852	0.7772
32.5	-0.2284	-0.7049	0.2503
37.5	-0.5574	-0.9245	-0.1889
42.5	-0.758	-1.043	-0.4722
47.5	-0.8557	-1.0823	-0.6286
52.5	-0.7733	-0.9653	-0.5809
57.5	-0.7657	-0.9396	-0.5915
62.5	-0.5231	-0.6809	-0.365
67.5	-0.3261	-0.4745	-0.1774
72.5	-0.0516	-0.2035	0.1006
77.5	0.1449	-0.0251	0.3151
82.5	0.3044	0.0849	0.5244
87.5	0.1478	-0.1837	0.4804
92.5	-0.367	-1.0198	0.2901
97.5	-0.9202	-2.8984	1.0984

Supplementary Table 5 Longitudinal age curves of CRC mortality caused by a diet high in red meat in China for males.

Age	Rate	CILo	CIHi
27.5	0.2013	0.1782	0.2275
32.5	0.4508	0.413	0.4921
37.5	0.8061	0.7517	0.8644
42.5	1.2898	1.2163	1.3678
47.5	2.0094	1.9101	2.1138
52.5	3.1211	2.9905	3.2574
57.5	4.8534	4.6735	5.0402
62.5	6.9941	6.7566	7.2398
67.5	10.2263	9.9021	10.5612
72.5	15.9592	15.4714	16.4624
77.5	23.9984	23.2556	24.765

82.5	32.8492	31.5412	34.2114
87.5	60.0572	57.1943	63.0635
92.5	85.8724	79.392	92.8818
97.5	61.1784	48.0313	77.9241

Supplementary Table 6 Period RR of CRC mortality caused by a diet high in red meat in China for males.

Period	Rate Ratio	CILo	CIHi
1994.5	0.9793	0.9447	1.0151
1999.5	0.9669	0.9358	0.999
2004.5	1	1	1
2009.5	1.0103	0.9804	1.0411
2014.5	1.0345	1.0023	1.0676
2019.5	1.0475	1.0119	1.0844

Supplementary Table 7 Cohort RR of CRC mortality caused by a diet high in red meat in China for males.

Cohort	Rate Ratio	CILo	CIHi
1897	0.7124	0.194	2.616
1902	0.9054	0.6868	1.1936
1907	0.8417	0.7407	0.9564
1912	0.8478	0.7817	0.9194
1917	0.8869	0.8375	0.9392
1922	0.9035	0.8629	0.946
1927	0.9497	0.913	0.988
1932	0.9806	0.9461	1.0162
1937	1.0041	0.9705	1.0388
1942	1	1	1
1947	1.026	0.9906	1.0627
1952	1.0181	0.9806	1.0571
1957	1.0136	0.971	1.058
1962	0.9816	0.9346	1.0309
1967	1.0365	0.9811	1.095
1972	1.0049	0.939	1.0753
1977	1.0496	0.9617	1.1455
1982	1.1109	0.9928	1.2431
1987	1.2	1.0378	1.3875
1992	1.2565	0.9695	1.6285

Supplementary Table 8 Local drift of CRC mortality caused by a diet high in red meat in China for males.

Age	Percent per Year	CILo	CIHi
27.5	0.8905	0.0846	1.703
32.5	0.7202	0.2457	1.1971

37.5	0.3598	-0.0074	0.7282
42.5	0.1032	-0.1845	0.3919
47.5	-0.0473	-0.2778	0.1838
52.5	0.0239	-0.1736	0.2219
57.5	-0.0459	-0.2263	0.1348
62.5	0.1332	-0.0321	0.2989
67.5	0.2745	0.1167	0.4325
72.5	0.4664	0.3018	0.6313
77.5	0.5436	0.3546	0.7329
82.5	0.6864	0.4332	0.9403
87.5	0.6437	0.2494	1.0397
92.5	0.2843	-0.5409	1.1163
97.5	0.6495	-3.0557	4.4965

Supplementary Table 9 Longitudinal age curves of CRC mortality caused by a diet high in red meat in China for females.

Age	Rate	CILo	CIHi
27.5	0.273	0.2374	0.314
32.5	0.4927	0.4447	0.5458
37.5	0.7857	0.7244	0.8523
42.5	1.136	1.0616	1.2156
47.5	1.4504	1.366	1.5401
52.5	2.3368	2.2264	2.4527
57.5	3.3399	3.2003	3.4856
62.5	4.4675	4.2956	4.6463
67.5	6.1861	5.9643	6.4162
72.5	9.3681	9.0487	9.6989
77.5	12.7529	12.3187	13.2023
82.5	16.423	15.7401	17.1355
87.5	20.2619	19.2613	21.3145
92.5	23.2545	21.6293	25.0018
97.5	26.6811	23.3019	30.5504

Supplementary Table 10 Period RR of CRC mortality caused by a diet high in red meat in China for females.

Period	Rate Ratio	CILo	CIHi
1994.5	1.1785	1.1376	1.2209
1999.5	1.0835	1.0477	1.1205
2004.5	1	1	1
2009.5	0.8982	0.8697	0.9276
2014.5	0.8195	0.7932	0.8466
2019.5	0.8406	0.8135	0.8685

Supplementary Table 11 Cohort RR of CRC mortality caused by a diet high in red meat in China

for females.

Cohort	Rate Ratio	CILo	CIHi
1897	1.6858	0.9705	2.9283
1902	1.5206	1.2363	1.8703
1907	1.3488	1.2111	1.5022
1912	1.2043	1.1199	1.2952
1917	1.1649	1.1025	1.2308
1922	1.1565	1.104	1.2114
1927	1.1594	1.112	1.2087
1932	1.1272	1.0842	1.1719
1937	1.0757	1.0359	1.1171
1942	1	1	1
1947	0.9359	0.8992	0.9742
1952	0.8519	0.816	0.8894
1957	0.7685	0.731	0.808
1962	0.6585	0.6214	0.6978
1967	0.6013	0.5628	0.6424
1972	0.5297	0.487	0.5761
1977	0.4739	0.4242	0.5294
1982	0.4279	0.3691	0.4962
1987	0.4002	0.3299	0.4856
1992	0.3778	0.2672	0.5341

Supplementary Table 12 Local drift of CRC mortality caused by a diet high in red meat in China for females.

Age	Percent per Year	CILo	CIHi
27.5	-1.8492	-2.8911	-0.7961
32.5	-2.048	-2.6591	-1.433
37.5	-2.283	-2.7494	-1.8144
42.5	-2.338	-2.692	-1.9827
47.5	-2.2855	-2.5628	-2.0074
52.5	-2.0927	-2.3228	-1.8621
57.5	-1.8892	-2.0942	-1.6839
62.5	-1.5203	-1.7032	-1.3371
67.5	-1.2333	-1.4016	-1.0647
72.5	-0.8809	-1.0486	-0.7129
77.5	-0.5746	-0.7561	-0.3927
82.5	-0.377	-0.6019	-0.1515
87.5	-0.5805	-0.9097	-0.2502
92.5	-1.0522	-1.6685	-0.432
97.5	-1.5856	-3.1743	0.0291

Supplementary Table 13 APC values of ASMR of China derived from Joinpoint regression overall.

Model	Segment	Segment.Start	Segment .End	val	lower	upper	Test.Statistic	P.Value
5	0	1990	1998	-0.6	-0.7	-0.5	-10.4	0
5	1	1998	2004	0.4	0.2	0.7	3.7	0.002
5	2	2004	2007	-2	-3.1	-0.9	-3.9	0.001
5	3	2007	2011	0.7	0.1	1.2	2.6	0.018
5	4	2011	2014	-1.4	-2.5	-0.3	-2.8	0.013
5	5	2014	2021	0.5	0.4	0.7	7.9	0

Supplementary Table 14 APC values of ASMR of China derived from Joinpoint regression for males.

Model	Segment	Segment.Start	Segment .End	val	lower	upper	Test.Statistic	P.Value
5	0	1990	1998	-0.2	-0.4	-0.1	-3.5	0.003
5	1	1998	2004	1.4	1.1	1.7	9.6	0
5	2	2004	2007	-1.5	-2.8	-0.1	-2.3	0.037
5	3	2007	2011	1.5	0.8	2.2	4.6	0
5	4	2011	2014	-0.7	-2	0.7	-1	0.31
5	5	2014	2021	0.4	0.2	0.6	4.1	0.001

Supplementary Table 15 APC values of ASMR of China derived from Joinpoint regression for females.

Model	Segment	Segment.Start	Segment .End	val	lower	upper	Test.Statistic	P.Value
4	0	1990	2004	-0.9	-1	-0.8	-26.8	0
4	1	2004	2007	-2.6	-4.1	-1.1	-3.7	0.002
4	2	2007	2011	-1	-1.7	-0.3	-2.8	0.011
4	3	2011	2014	-2.8	-4.2	-1.3	-4	0.001
4	4	2014	2021	0.9	0.6	1.1	8.8	0

Supplementary Table 16 APC values of ASDR of China derived from Joinpoint regression overall.

Model	Segment	Segment.Start	Segment .End	val	lower	upper	Test.Statistic	P.Value
5	0	1990	1998	-1	-1.1	-0.9	-19.5	0
5	1	1998	2004	0	-0.2	0.2	0.3	0.804
5	2	2004	2007	-1.9	-2.8	-1	-4.3	0.001
5	3	2007	2010	0.9	-0.1	1.8	1.9	0.073
5	4	2010	2015	-0.6	-0.9	-0.3	-4.2	0.001
5	5	2015	2021	0.8	0.7	1	11.1	0

Supplementary Table 17 APC values of ASDR of China derived from Joinpoint regression for males.

Model	Segment	Segment.Start	Segment .End	val	lower	upper	Test.Statistic	P.Value
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5	0	1990	1998	-0.7	-0.8	-0.5	-11.8	0
5	1	1998	2004	1	0.8	1.3	8.8	0
5	2	2004	2007	-1.2	-2.3	-0.2	-2.4	0.027
5	3	2007	2011	1.6	1.1	2.2	6.4	0
5	4	2011	2014	-0.4	-1.4	0.7	-0.7	0.49
5	5	2014	2021	0.6	0.5	0.8	9.3	0

Supplementary Table 18 APC values of ASMR of China derived from Joinpoint regression for females.

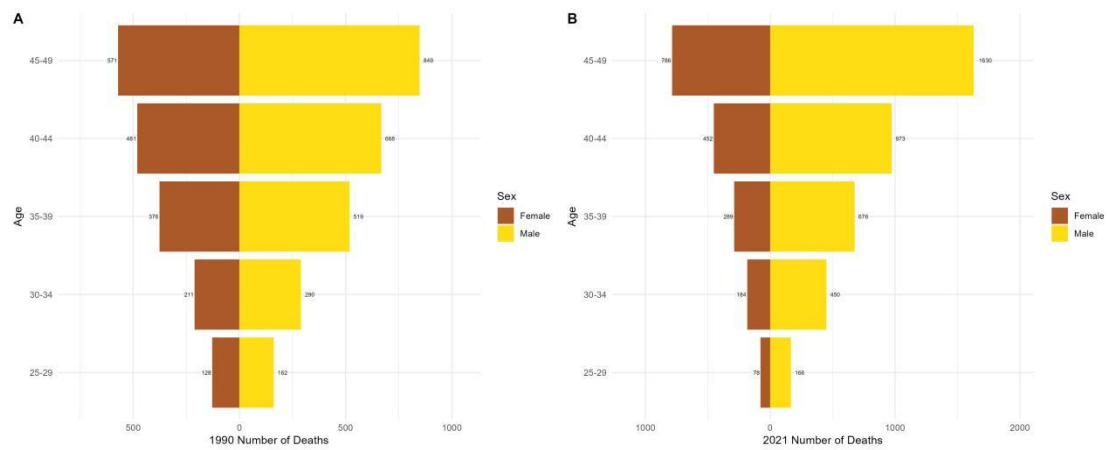
Model	Segment	Segment.Start	Segment .End	val	lower	upper	Test.Statistic	P.Value
4	0	1990	2004	-1.3	-1.4	-1.3	-42.6	0
4	1	2004	2007	-2.9	-4.3	-1.5	-4.4	0
4	2	2007	2011	-1.2	-1.8	-0.5	-3.5	0.003
4	3	2011	2014	-2.5	-3.9	-1.1	-3.8	0.001
4	4	2014	2021	0.9	0.7	1.1	9.7	0

Supplementary Table 19 AAPC values of ASMR derived from Joinpoint regression.

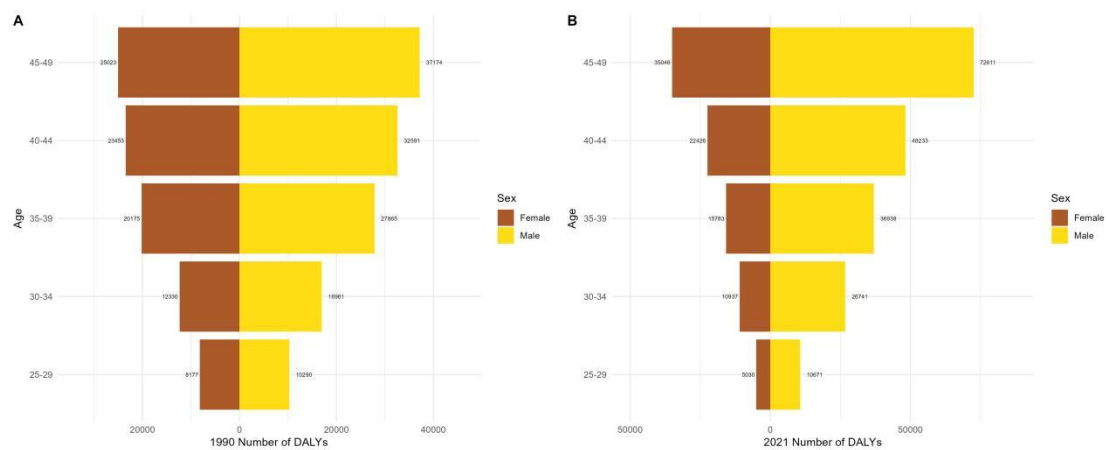
Sex	Joinp oint. Mode 1	AAPC.I ndex	Start. Obs	End. Obs	val	lower	upper	Statistically.S ignificant..0. No..1.Yes.	Test.Sta tistic	P.Va lue
Both	5	Full Range	1990	2021	-0.2	-0.4	0	1	-2.3	0.02 2
Female	4	Full Range	1990	2021	-0.9	-1.1	-0.7	1	-7.9	0
Male	5	Full Range	1990	2021	0.3	0.1	0.5	1	2.6	0.00 9

Supplementary Table 20 AAPC values of ASDR derived from Joinpoint regression.

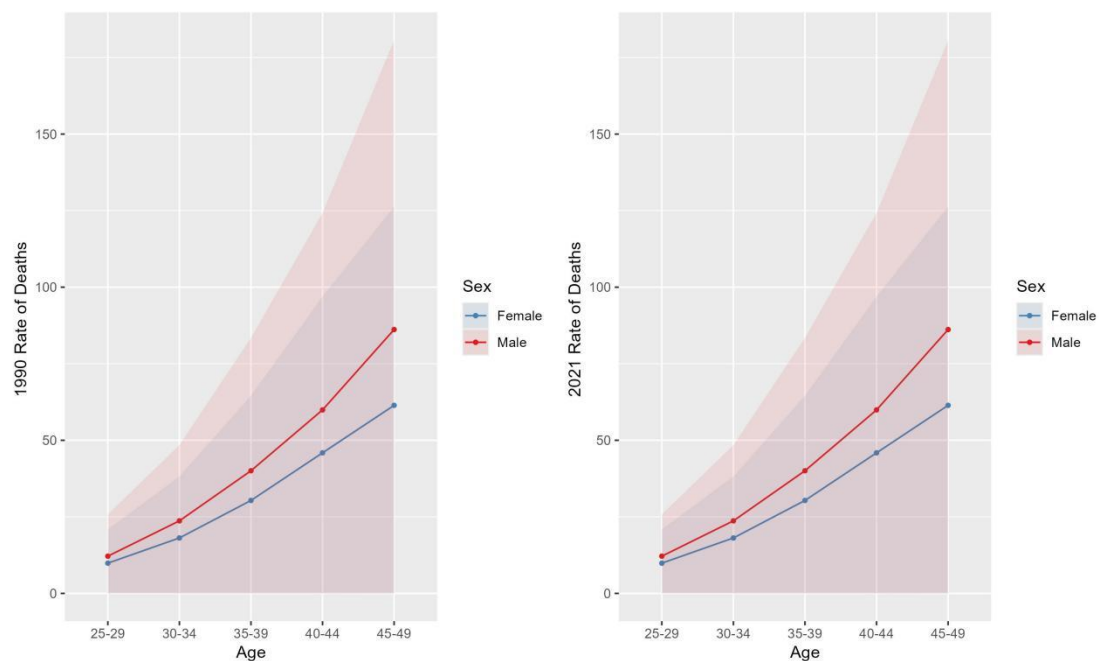
Sex	Joinp oint. Mode 1	AAPC.I ndex	Start. Obs	End. Obs	val	lower	upper	Statistically.S ignificant..0. No..1.Yes.	Test.Sta tistic	P.Va lue
Both	5	Full Range	1990	2021	-0.3	-0.4	-0.1	1	-3.9	0
Female	4	Full Range	1990	2021	-1.1	-1.3	-0.9	1	-10.5	0
Male	5	Full Range	1990	2021	0.2	0.1	0.4	1	2.8	0.00 6



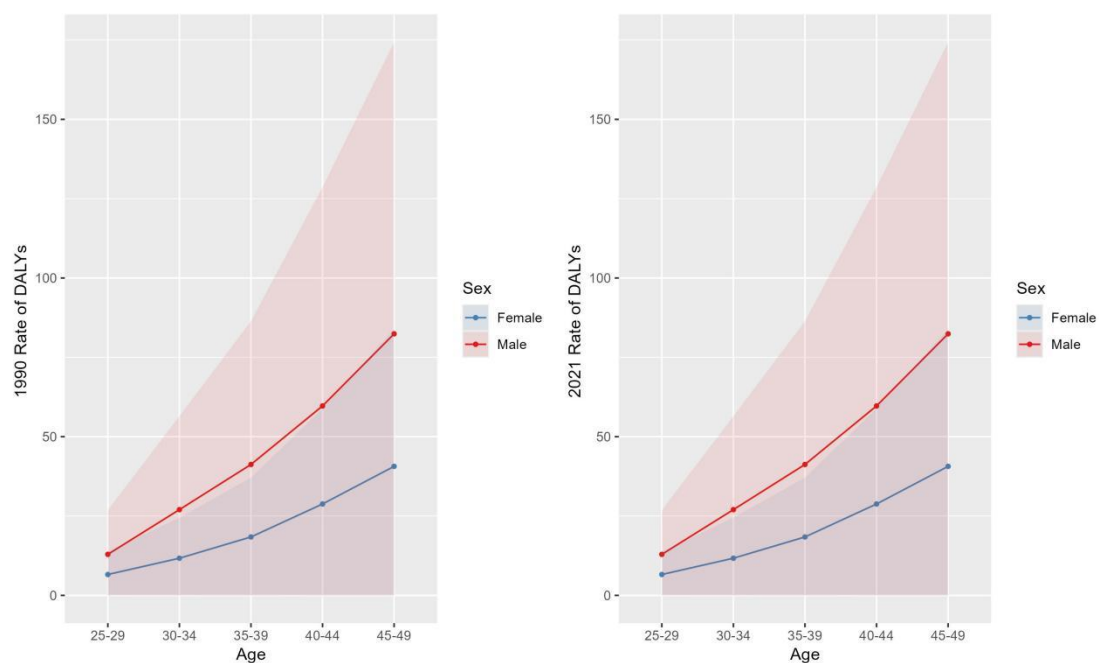
Supplementary Figure 1 Comparison of the Deaths of Early-onset CRC caused by a high red meat diet in different age groups and genders in Asia-Pacific region in 1990 and 2021.



Supplementary Figure 2 Comparison of the DALYs of Early-onset CRC caused by a high red meat diet in different age groups and genders in Asia-Pacific region in 1990 and 2021. DALYs, Disability-Adjusted Life Years.



Supplementary Figure 3 Analysis of the Deaths of Early-onset CRC caused by a high red meat diet in different age groups and genders in Asia-Pacific region in 1990 and 2021.



Supplementary Figure 4 Analysis of the DALYs of Early-onset CRC caused by a high red meat diet in different age groups and genders in Asia-Pacific region in 1990 and 2021. DALYs, Disability-Adjusted Life Years.

GBD methodology

Part I: Introduction to the Global Burden of Diseases (GBD 2021)

The 2021 Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) has investigated health trends worldwide. Leveraging 328,938 data sources, this study analyzed 371 diseases and injuries across 204 countries and regions, revealing health disparities across age, gender, location, and socio-economic groups. It emphasized the impact of the COVID-19 pandemic alongside other health challenges. The data sources were primarily sourced from a vast network of scientists, government officials, and medical professionals, facilitating accurate disease estimations. Specific data sources included vital registration and verbal autopsy, surveys, censuses, surveillance systems, and cancer registries. The GHDx, a data directory created and supported by the GBD organization, adheres to the recommendations of the Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER).

Part II: Glossary of Key Terms

1.Disability-Adjusted Life Years (DALYs): Healthy life years lost due to premature death and disability. DALYs are the sum of Years of Life Lost (YLLs) and Years Lived with Disability (YLDs).

2.Healthy Life Expectancy (HALE): The number of years a person at a specific age can expect to live in good health, considering both mortality and disability.

3.Life Expectancy: The number of years a person is expected to live based on their current age. For GBD, the life expectancy of an age group (e.g., 50-54 years) is determined from the first year of the age range.

4.Replacement Rate: The total fertility rate required for a population to replace itself in the absence of migration, or approximately 2.1 live births per woman.

5.Risk Factors: Risk factors that may be modifiable causes of diseases and injuries.

6.Socio-Demographic Index (SDI): A measure that determines the profile of a country or other geographical area within the spectrum of development. The SDI, ranging from 0 to 1, is the composite average of per capita income, average education level, and fertility rate rankings across all regions in the GBD study.

7.Super-Regions: Components of the seven world regions.

8.Country Grouping Based on Mortality Patterns: High-income Central and Eastern Europe and Central Asia; Latin America and the Caribbean; North Africa and Middle East; South Asia; Southeast Asia, East Asia, and Oceania; Sub-Saharan Africa.

9.Total Fertility Rate: The average number of live births a woman would have if she survived to the ages of childbearing (10 to 54 years), experiencing a specific age-specific fertility rate at each age of interest.

10.Under-5 Mortality Rate: The probability of a child dying before reaching age 5 per 1,000 live births.

11.Years Lived with Disability (YLDs): Life years with any short- or long-term health loss.

12.Years of Life Lost (YLLs): Life years lost due to premature death.

Part III : The Institute for Health Metrics and Evaluation (IHME) leads the Global

Burden of Diseases (GBD) study, serving as the central source for all primary and secondary data records and datasets within GBD. It maintains eight online GBD query tools and data visualizations, including the GBD Results Tool, GBD Compare, GBD Forecast, MortViz (Mortality Visualization), CoDViz (Cause of Death Visualization), EpiViz (Epidemiological Visualization), and Burden of Proof.

1.1 GBD Results Tool

The GBD Results Tool allows for the examination of:

All-Cause Mortality

Population

Fertility Rates

Life Tables

Deaths by Cause

Years of Life Lost (YLLs) due to Premature Death by Cause and Injury

Years Lived with Disability (YLDs)

Disability-Adjusted Life Years (DALYs)

Incidence Rates by Cause

Prevalence Rates by Cause and Injury

Maternal Mortality Rates

Probabilities of Death by Cause

Life Expectancy

Healthy Life Expectancy (HALE)

Population Attributable Fractions

Attributable Deaths, Life Years, Lost Life Years, Reduced Life Years, and DALYs due to Risk Factors and Causes

Summary of Exposure Values by Risk Factor

These tools provide comprehensive and detailed insights into the global health landscape, enabling researchers, policymakers, and stakeholders to make informed decisions and interventions to improve global health outcomes.

1.2 Visual Analysis in GBD Compare

Analyze how disease patterns have changed over time with the GBD's most comprehensive visualization.

1.3 GBD Foresight

Evaluate and analyze forecasts and alternative future scenarios from 2022 to 2050 for death, life expectancy, years of life lost (YLLs), years lived with disability (YLDs), and disability-adjusted life years (DALYs). Future scenarios of summary exposure values (SEV) by risk are also available through 2050.

1.4 Mortality Visualization (MortViz)

Walk through the estimation process for mortality trends for children and adults for 204 countries and territories using the Mortality visualization.

1.5 Causes of Death Visualization (CoDViz)

We can examine more than 250 causes in both adjusted and pre-adjusted numbers, rates, and percentages for 204 countries and territories. Data are available for download on the visualization.

1.6 Epi Visualization (EpiViz)

With this interactive tool, you can explore data inputs and epidemiological estimates from the

GBD 2021 study. Estimates of nonfatal health loss for the majority of diseases, and exposure estimates for many risk factors, were modeled using DisMod-MR 2.1, a Bayesian mixed-effects meta-regression modeling tool developed for GBD analyses. Initial estimates are made at the global level then sequentially revised down to the national and subnational levels using data that are progressively more detailed with respect to geography and time. Select any condition that was modeled using DisMod-MR 2.1, visualizing the pre- and post-adjusted incidence, prevalence, mortality, and remission data across hundreds of conditions in 204 countries and territories from 1990 to 2021.

1.7 Burden of Proof Visualization (BoPViz)

The Burden of Proof tool shows the strength of evidence between health risks and outcomes, indicating the likelihood of certain behaviors to have an impact on health. The tool uses a novel star-rating system to rank each pair from one to five, based on both the magnitude of risk shown by studies to date, as well as the consistency of findings between those studies

Part IV: Recent Advances in the GBD Database

1.First GBD Update to Examine the COVID-19 Pandemic: It provided disease burden data for the four years preceding the COVID-19 pandemic. During the pandemic, life expectancy declined in 84% of countries and regions. Locations severely impacted by COVID-19 included Mexico City, KwaZulu-Natal, and Limpopo in South Africa, Peru, and Bolivia. Encouragingly, child mortality continued to decline during the pandemic. Additionally, population growth rates declined in most countries.

2.Improvements and Refinements in Multiple Statistical Indicators: Multiple new data points were incorporated, including vital registration systems, sample vital registration systems, censuses, and surveys.

3.Linking Specific Causes of Death to Changes in Life Expectancy.

4.Addition of 12 New Causes of Death and More Detailed Age Groups: Notably, the first study comparing COVID-19 deaths with deaths from other global causes.

5.Update Analysis Using IHME's Innovative Burden of Proof Method: This method measures the strength of evidence linking risk factors to diseases and injuries, e.g., identifying nitrogen dioxide air pollution as a new risk factor associated with childhood asthma.

6.GBD Collaborators Conducted Predictions for All Key Indicators of the Study for the First Time: Including predictions for 359 diseases and injuries.

Data quality scoring framework

Below is a scoring system, breaking down the quality standards for each level of scoring across 0-5.

1.Scoring System

Dimension	0 (No Data)	1 (Very Low-Quality Data)	2 (Low-Quality Data)	3 (Moderate-Quality Data)	4 (Good-Quality Data)	5 (High-Quality Data)
Reliability of Data Source	No data exists, and assumptions are entirely based on modeling without any empirical validation.	Data is highly unreliable, derived from small-scale, non-representative studies with significant biases.	Data comes from localized or non-systematic studies with limited credibility.	Data is based on recognized sources, but coverage is limited to specific regions or subpopulations.	Data comes from robust, nationally recognized surveys or reports with partial national coverage.	Data is derived from comprehensive, national-level surveys or authoritative government databases with full national representation.
Coverage of Data	No geographic coverage, no data points for any regions or subpopulations.	Coverage is minimal, restricted to small regions or highly specific subgroups, not representative of the broader population.	Limited geographic coverage with significant gaps, some regions or groups are unrepresented.	Coverage includes major regions and key subgroups, though rural or hard-to-reach populations may be underrepresented.	Data covers the majority of the population, including both urban and some rural areas, but may lack full inclusion of marginalized populations.	Complete geographic coverage across all major regions and population subgroups, including both urban and rural areas, with national representation.

Temporal Continuity	No data points available for any time period.	Data is sparse, covering only a single or isolated year, making trend analysis impossible.	Data exists for only a few years, with significant time gaps that hinder continuous trend assessment.	Data is available for multiple years but may have inconsistencies or gaps in earlier years.	Data is available for multiple, consecutive years, allowing for trend analysis with few inconsistencies.	Data is available continuously across many years (decades), enabling robust trend analysis and forecasting.
Completeness of Data	Data is completely missing or unusable, with no information available for key variables.	Data is highly incomplete, with numerous missing values requiring extensive imputation.	Data is incomplete in several areas, necessitating significant adjustments or interpolation to fill gaps.	Data is mostly complete, with some missing values, but requires manageable adjustments or imputations.	Data is nearly complete with only minor gaps, requiring limited adjustment.	Data is complete and comprehensive with no significant missing values, requiring little to no adjustment.
Modeling and Uncertainty	Estimates are entirely based on assumptions with no validation, leading to extremely high uncertainty.	Modeling is heavily relied upon with no validation, resulting in substantial uncertainty in estimates.	Significant modeling is required, and validation is limited, leading to moderate uncertainty in results.	Some modeling is necessary but based on reasonably reliable data, with moderate validation and moderate uncertainty.	Modeling is limited to specific gaps, and estimates are validated by primary data, resulting in low uncertainty.	Minimal modeling is required, and estimates are thoroughly validated with empirical data, leading to very low uncertainty.

2. Explanation of the Revised Scoring System

- Reliability of Data Source:** This dimension evaluates how credible and robust the data sources are. A score of **5** reflects data derived from national surveys or comprehensive datasets that cover the entire population, while a score of **0**

represents the complete absence of data, relying entirely on modeling or assumptions.

- **Coverage of Data:** This dimension assesses how representative the data is across the country's geographic and population groups. A score of **5** indicates full national coverage, including urban and rural areas, while a score of **0** means no geographic or population data is available.
- **Temporal Continuity:** This dimension considers how many years of data are available for the analysis. A score of **5** reflects continuous data over many years, allowing for long-term trend analysis, whereas a score of **0** represents the absence of time-series data.
- **Completeness of Data:** This dimension measures the extent of missing values or gaps in the data. A score of **5** indicates that the dataset is complete with minimal or no missing values, while a score of **0** means that the data is essentially unusable due to a complete lack of information.
- **Modeling and Uncertainty:** This dimension evaluates the level of reliance on statistical modeling and the degree of uncertainty associated with the estimates. A score of **5** reflects minimal reliance on modeling, with strong validation of the data, whereas a score of **0** reflects a situation where estimates are entirely based on assumptions, resulting in high uncertainty.

3. References

This scoring system is constructed based on GBD methodologies, as outlined in the following references:

1. **GBD 2019 Methods:** Detailed description of the processes used for data collection, modeling, and quality assessment in the Global Burden of Disease Study.
 - *GBD 2019 Risk Factor Collaborators. (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. The Lancet.*
2. **IHME Data Sources:** Institute for Health Metrics and Evaluation's outline of the types of data used for GBD, including the sources and methods used for data quality validation.
 - *Institute for Health Metrics and Evaluation. (2018). Data Input Sources for GBD. Available at:*

3. **WHO Global Health Estimates:** Similar data quality assessments are used by WHO in generating global health estimates, providing a basis for the evaluation criteria used in GBD studies.

- *World Health Organization (WHO). (2020). Global Health Estimates Technical Paper.*

Supplementary table 21 The SDI of locations and countries

	Location	1990	2021
1	Global	0.525528856	0.665820975
2	Central Europe, eastern Europe, and central Asia	0.638316821	0.769466346
3	Central Asia	0.553361946	0.675163978
4	Armenia	0.544414535	0.701833194
5	Azerbaijan	0.595986033	0.694851274
6	Georgia	0.656136044	0.732473604
7	Kazakhstan	0.589435804	0.725144495
8	Kyrgyzstan	0.519407652	0.603979328
9	Mongolia	0.466550118	0.617621565
10	Tajikistan	0.466155413	0.541511187
11	Turkmenistan	0.563126887	0.682160776
12	Uzbekistan	0.500241735	0.662621694
13	Central Europe	0.637272174	0.796244448
14	Albania	0.5577733	0.706849791
15	Bosnia and Herzegovina	0.54113254	0.723077893
16	Bulgaria	0.633446498	0.768150939
17	Croatia	0.668906358	0.798341027
18	Czechia	0.681848021	0.828450433
19	Hungary	0.649419991	0.790754768
20	Montenegro	0.67422572	0.795800584
21	North Macedonia	0.609026094	0.750629703
22	Poland	0.627227888	0.812042809
23	Romania	0.619298862	0.768453864
24	Serbia	0.63051102	0.792416294
25	Slovakia	0.653853505	0.81061053
26	Slovenia	0.727463928	0.842430731
27	Eastern Europe	0.664250165	0.802851009
28	Belarus	0.622446576	0.784484711
29	Estonia	0.674967632	0.844917787
30	Latvia	0.680193638	0.830663516
31	Lithuania	0.668503938	0.856484049
32	Moldova	0.604251762	0.732214875
33	Russia	0.671600578	0.808536005

34	Ukraine	0.647461466	0.760773913
35	High income	0.751589646	0.85188481
36	Australasia	0.731234397	0.845514063
37	Australia	0.725982519	0.844252814
38	New Zealand	0.752321655	0.849442499
39	High-income Asia Pacific	0.767803786	0.876767
40	Brunei	0.666081917	0.810234367
41	Japan	0.790253516	0.871241813
42	Aichi	0.800854834	0.883048835
43	Akita	0.743856278	0.832249015
44	Aomori	0.734632276	0.828344206
45	Chiba	0.788716613	0.861292639
46	Ehime	0.756008354	0.843501706
47	Fukui	0.766481771	0.856142577
48	Fukuoka	0.781940943	0.858347709
49	Fukushima	0.749067309	0.840941474
50	Gifu	0.77061016	0.85334719
51	Gunma	0.772669278	0.861111359
52	Hiroshima	0.788739945	0.869908602
53	Hokkaidō	0.766618759	0.843743975
54	Hyōgo	0.793422254	0.868170156
55	Ibaraki	0.771923199	0.85980457
56	Ishikawa	0.772257224	0.859378938
57	Iwate	0.736184911	0.834979691
58	Kagawa	0.771183472	0.85781836
59	Kagoshima	0.743332441	0.832047307
60	Kanagawa	0.817021862	0.882654391
61	Kōchi	0.74200445	0.834906164
62	Kumamoto	0.753731159	0.834536592
63	Kyōto	0.799903927	0.87601835
64	Mie	0.763830036	0.860561189
65	Miyagi	0.77250193	0.859886569
66	Miyazaki	0.73910863	0.826589859
67	Nagano	0.776599842	0.858577839
68	Nagasaki	0.741965825	0.829213881
69	Nara	0.77849492	0.851652195
70	Niigata	0.755942624	0.845152095
71	Ōita	0.763945301	0.849282438
72	Okayama	0.777378183	0.862560219
73	Okinawa	0.735453216	0.821803051
74	Ōsaka	0.804615792	0.87640925
75	Saga	0.75102028	0.834925899
76	Saitama	0.782473382	0.85637105
77	Shiga	0.792940745	0.874323368

78	Shimane	0.739553491	0.838672262
79	Shizuoka	0.780199834	0.865450452
80	Tochigi	0.772234384	0.861186498
81	Tokushima	0.7538988	0.85748626
82	Tōkyō	0.866280939	0.928810109
83	Tottori	0.757802249	0.835956957
84	Toyama	0.776809557	0.865181131
85	Wakayama	0.753739111	0.847037481
86	Yamagata	0.746246131	0.837933155
87	Yamaguchi	0.770512746	0.856255885
88	Yamanashi	0.777354522	0.857782852
89	South Korea	0.692329307	0.886675267
90	Singapore	0.686404444	0.856097766
91	High-income North America	0.765659862	0.863465474
92	Canada	0.781977864	0.87317068
93	Greenland	0.732258252	0.826210336
94	USA	0.76364769	0.862448354
95	Alabama	0.723971524	0.825605142
96	Alaska	0.745456697	0.857524599
97	Arizona	0.736537113	0.846732871
98	Arkansas	0.702645719	0.81770902
99	California	0.75549857	0.87021505
100	Colorado	0.783966537	0.876654771
101	Connecticut	0.824312178	0.903107563
102	Delaware	0.783519768	0.866366234
103	Washington, DC	0.785119619	0.905964755
104	Florida	0.755299508	0.861979282
105	Georgia	0.739511622	0.84656427
106	Hawaii	0.765363789	0.869546917
107	Idaho	0.736462409	0.83651792
108	Illinois	0.769244886	0.879187797
109	Indiana	0.750328787	0.842859834
110	Iowa	0.77326663	0.86405652
111	Kansas	0.765782681	0.859383805
112	Kentucky	0.721698825	0.821325377
113	Louisiana	0.717356733	0.825346457
114	Maine	0.76873693	0.865754199
115	Maryland	0.796023679	0.889225569
116	Massachusetts	0.825701409	0.906621364
117	Michigan	0.766908044	0.863971128
118	Minnesota	0.799549491	0.887013945
119	Mississippi	0.697709614	0.810471681
120	Missouri	0.751221706	0.848169136
121	Montana	0.756650394	0.859107705

122	Nebraska	0.775521295	0.865128654
123	Nevada	0.744408991	0.847682783
124	New Hampshire	0.811328701	0.898263681
125	New Jersey	0.811232625	0.891922443
126	New Mexico	0.715668063	0.831716579
127	New York	0.79741955	0.885176868
128	North Carolina	0.743977619	0.844445313
129	North Dakota	0.771430284	0.873031775
130	Ohio	0.761347777	0.850513434
131	Oklahoma	0.733039141	0.828663242
132	Oregon	0.769007728	0.870177689
133	Pennsylvania	0.781295559	0.872416752
134	Rhode Island	0.795258398	0.883893485
135	South Carolina	0.731363176	0.83771865
136	South Dakota	0.751220476	0.855720868
137	Tennessee	0.73014798	0.833033239
138	Texas	0.728266043	0.834783278
139	Utah	0.744547789	0.854616788
140	Vermont	0.795613598	0.8899999
141	Virginia	0.785556276	0.880119901
142	Washington	0.781101794	0.877584845
143	West Virginia	0.725935457	0.817713511
144	Wisconsin	0.784207391	0.871726096
145	Wyoming	0.750880744	0.862148722
146	Southern Latin America	0.587308121	0.735984717
147	Argentina	0.587397284	0.723122973
148	Chile	0.5864951	0.771514716
149	Uruguay	0.581921855	0.719283445
150	Western Europe	0.746400479	0.848726316
151	Andorra	0.76146388	0.869444113
152	Austria	0.749853693	0.853837004
153	Belgium	0.737390656	0.853654016
154	Cyprus	0.648230872	0.835630545
155	Denmark	0.801154655	0.896424204
156	Finland	0.756221509	0.859831368
157	France	0.730747466	0.838364875
158	Germany	0.817077666	0.902957091
159	Greece	0.674186465	0.791854408
160	Iceland	0.764212517	0.87636168
161	Ireland	0.719891819	0.87375385
162	Israel	0.709178347	0.809011652
163	Italy	0.706255224	0.805773534
164	Abruzzo	0.714650756	0.816844362
165	Basilicata	0.666507396	0.784016427

166	Calabria	0.656864369	0.775713053
167	Campania	0.661702253	0.766943369
168	Emilia-Romagna	0.721948871	0.829724714
169	Friuli-Venezia Giulia	0.724866124	0.820302061
170	Lazio	0.737620712	0.827338854
171	Liguria	0.730184642	0.822133391
172	Lombardia	0.742347949	0.829429918
173	Marche	0.697071608	0.803473184
174	Molise	0.676593732	0.788350602
175	Piemonte	0.720360415	0.80703906
176	Provincia autonoma di Bolzano	0.732400638	0.839711339
177	Provincia autonoma di Trento	0.73819977	0.829384918
178	Puglia	0.657350626	0.76398208
179	Sardegna	0.679922875	0.772793427
180	Sicilia	0.657025838	0.76308681
181	Toscana	0.713229274	0.811654111
182	Umbria	0.706686715	0.799101322
183	Valle d'Aosta	0.726784665	0.812304291
184	Veneto	0.714979957	0.808534438
185	Luxembourg	0.781051609	0.884428955
186	Malta	0.656504584	0.801585034
187	Monaco	0.845495153	0.908262831
188	Netherlands	0.794612123	0.888464256
189	Norway	0.795887277	0.91613281
190	Agder	0.783912098	0.907489539
191	Innlandet	0.78002909	0.899754056
192	Møre og Romsdal	0.779159162	0.907426289
193	Nordland	0.764634665	0.896942278
194	Oslo	0.839440851	0.945691791
195	Rogaland	0.790232798	0.915083733
196	Troms og Finnmark	0.77581152	0.905163204
197	Trøndelag	0.784941155	0.915977587
198	Vestfold og Telemark	0.790051833	0.907307419
199	Vestland	0.789791575	0.917596286
200	Viken	0.811900165	0.914692607
201	Portugal	0.599777757	0.744151851
202	San Marino	0.813244888	0.888005474
203	Spain	0.636673166	0.769283698
204	Sweden	0.785535792	0.886880299
205	Stockholm	0.828649292	0.916622714
206	Sweden except Stockholm	0.774127452	0.87515115
207	Switzerland	0.862766844	0.933059111
208	UK	0.744334126	0.859000182
209	England	0.745220814	0.861437309

210	East Midlands	0.720595588	0.835856049
211	Derby	0.729286457	0.846010683
212	Derbyshire	0.713327582	0.824238096
213	Leicester	0.709100479	0.8290671
214	Leicestershire	0.749605138	0.851888947
215	Lincolnshire	0.713279193	0.821363757
216	Northamptonshire	0.731115469	0.839635363
217	Nottingham	0.739549358	0.85887136
218	Nottinghamshire	0.715311951	0.823007864
219	Rutland	0.766192523	0.852733752
220	East of England	0.741478228	0.856407925
221	Bedford	0.751540717	0.858093661
222	Cambridgeshire	0.779009799	0.888027582
223	Central Bedfordshire	0.749851975	0.852254516
224	Essex	0.732582426	0.845491449
225	Hertfordshire	0.781615003	0.887510721
226	Luton	0.720456369	0.839717125
227	Norfolk	0.722519771	0.837309678
228	Peterborough	0.720906113	0.837874469
229	Southend-on-Sea	0.710768644	0.825801394
230	Suffolk	0.728635207	0.841151028
231	Thurrock	0.714583085	0.819597724
232	Greater London	0.79481868	0.904864758
233	Barking and Dagenham	0.684001119	0.807324954
234	Barnet	0.781612853	0.88597606
235	Bexley	0.725753639	0.844547626
236	Brent	0.754591719	0.860164338
237	Bromley	0.768353433	0.869545327
238	Camden	0.866757584	0.936474834
239	Croydon	0.749157558	0.852066336
240	Ealing	0.776440874	0.88272888
241	Enfield	0.734015063	0.846461002
242	Greenwich	0.724794432	0.846080185
243	Hackney	0.772855945	0.892946278
244	Hammersmith and Fulham	0.84480445	0.935153171
245	Haringey	0.762031142	0.872084552
246	Harrow	0.76590342	0.860015269
247	Havering	0.718170603	0.834643869
248	Hillingdon	0.783602665	0.893138131
249	Hounslow	0.777744991	0.896994582
250	Islington	0.829730557	0.924740074
251	Kensington and Chelsea	0.87554948	0.946476699
252	Kingston upon Thames	0.811664993	0.908698276
253	Lambeth	0.787597726	0.916380817

254	Lewisham	0.741501455	0.857308935
255	Merton	0.774133503	0.887733957
256	Newham	0.701795321	0.841688128
257	Redbridge	0.741118203	0.850265079
258	Richmond upon Thames	0.837032814	0.932132548
259	Southwark	0.797907534	0.919509828
260	Sutton	0.745539692	0.858421577
261	Tower Hamlets	0.765109358	0.904488141
262	Waltham Forest	0.716668274	0.840509602
263	Wandsworth	0.820916201	0.924241493
264	Westminster	0.860957245	0.937198627
265	North East England	0.705613776	0.827273029
266	County Durham	0.698702667	0.812276525
267	Darlington	0.713740668	0.837204088
268	Gateshead	0.707597434	0.830244183
269	Hartlepool	0.676173399	0.798877773
270	Middlesbrough	0.686457603	0.801470999
271	Newcastle upon Tyne	0.751971871	0.872520663
272	North Tyneside	0.711450488	0.836400602
273	Northumberland	0.711789114	0.823317013
274	Redcar and Cleveland	0.683036341	0.798369621
275	South Tyneside	0.674543573	0.801073026
276	Stockton-on-Tees	0.716320949	0.83098489
277	Sunderland	0.693436907	0.819164125
278	North West England	0.723853024	0.844443823
279	Blackburn with Darwen	0.68238976	0.811503741
280	Blackpool	0.675252664	0.789925893
281	Bolton	0.701717327	0.814170764
282	Bury	0.717064481	0.830089162
283	Cheshire East	0.771674646	0.884754634
284	Cheshire West and Chester	0.759102313	0.871177933
285	Cumbria	0.723302241	0.843466901
286	Halton	0.704162024	0.836181349
287	Knowsley	0.68322195	0.813671711
288	Lancashire	0.727956978	0.841125535
289	Liverpool	0.725467323	0.848437635
290	Manchester	0.746647615	0.881429144
291	Oldham	0.680659819	0.798408293
292	Rochdale	0.682495148	0.802069322
293	Salford	0.707740126	0.838699172
294	Sefton	0.718750428	0.825841895
295	St Helens	0.694233681	0.8122146
296	Stockport	0.751620973	0.861719713
297	Tameside	0.690169822	0.800546694

298	Trafford	0.781976839	0.896753779
299	Warrington	0.757425219	0.878756212
300	Wigan	0.69385144	0.80685214
301	Wirral	0.706506429	0.819316291
302	South East England	0.772790602	0.876066596
303	Bracknell Forest	0.78835599	0.891002655
304	Brighton and Hove	0.792979183	0.898257203
305	Buckinghamshire	0.795667014	0.888785243
306	East Sussex	0.729563972	0.839594794
307	Hampshire	0.770575146	0.87285
308	Isle of Wight	0.708723981	0.826399628
309	Kent	0.737842246	0.845345393
310	Medway	0.712321819	0.820667842
311	Milton Keynes	0.77322075	0.88717934
312	Oxfordshire	0.797879483	0.899475931
313	Portsmouth	0.759838477	0.865875927
314	Reading	0.808190771	0.905873593
315	Slough	0.772614527	0.878557248
316	Southampton	0.759131491	0.861349084
317	Surrey	0.809241765	0.904859403
318	West Berkshire	0.805550058	0.897757011
319	West Sussex	0.762071928	0.864792147
320	Windsor and Maidenhead	0.818140871	0.91581805
321	Wokingham	0.82484241	0.911658755
322	South West England	0.747943254	0.861467015
323	Bath and North East Somerset	0.787410378	0.895435359
324	Bournemouth	0.755273408	0.870464766
325	Bristol, City of	0.784610852	0.897041874
326	Cornwall	0.723353527	0.839768559
327	Devon	0.744138186	0.855376103
328	Dorset	0.740994535	0.851615144
329	Gloucestershire	0.76125096	0.871806302
330	North Somerset	0.74308392	0.859017669
331	Plymouth	0.73401315	0.843307541
332	Poole	0.753452228	0.863494302
333	Somerset	0.729813379	0.843404311
334	South Gloucestershire	0.77431501	0.884984764
335	Swindon	0.763337469	0.867545906
336	Torbay	0.708212902	0.813038477
337	Wiltshire	0.751135505	0.859466242
338	West Midlands	0.712229751	0.835865141
339	Birmingham	0.711918055	0.838066899
340	Coventry	0.730835783	0.848618069
341	Dudley	0.698687632	0.804164522

342	Herefordshire, County of	0.722860527	0.846310474
343	Sandwell	0.674777822	0.795722297
344	Shropshire	0.72909223	0.843218762
345	Solihull	0.75697799	0.872079235
346	Staffordshire	0.723512602	0.829320238
347	Stoke-on-Trent	0.682717867	0.798242518
348	Telford and Wrekin	0.716348041	0.827341561
349	Walsall	0.67868011	0.792529439
350	Warwickshire	0.753085339	0.866672661
351	Wolverhampton	0.692133664	0.812389843
352	Worcestershire	0.731756994	0.843611304
353	Yorkshire and the Humber	0.71744891	0.837459877
354	Barnsley	0.674409277	0.789261821
355	Bradford	0.695777168	0.815985897
356	Calderdale	0.717583821	0.837863928
357	Doncaster	0.67510562	0.795614015
358	East Riding of Yorkshire	0.729479586	0.835731941
359	Kingston upon Hull, City of	0.681942142	0.79993173
360	Kirklees	0.710984285	0.824207653
361	Leeds	0.753340826	0.868761251
362	North East Lincolnshire	0.679517747	0.804837847
363	North Lincolnshire	0.721431975	0.825904867
364	North Yorkshire	0.746089107	0.85619466
365	Rotherham	0.684048953	0.804228811
366	Sheffield	0.740870442	0.854890971
367	Wakefield	0.692436467	0.806811491
368	York	0.787154023	0.888738932
369	Northern Ireland	0.722723259	0.838531942
370	Scotland	0.743972492	0.852061416
371	Wales	0.710140734	0.834278536
372	Latin America and Caribbean	0.497738092	0.646541285
373	Andean Latin America	0.50001149	0.651602456
374	Bolivia	0.423917961	0.599010799
375	Ecuador	0.518430614	0.661017053
376	Peru	0.510419852	0.662054037
377	Caribbean	0.518111381	0.642003055
378	Antigua and Barbuda	0.612104591	0.749886887
379	The Bahamas	0.693509268	0.805020668
380	Barbados	0.653582517	0.746748764
381	Belize	0.423726992	0.610229002
382	Bermuda	0.696451196	0.821365422
383	Cuba	0.558019071	0.668729864
384	Dominica	0.56360259	0.746967185
385	Dominican Republic	0.442654076	0.619388201

386	Grenada	0.436734419	0.668993028
387	Guyana	0.460430129	0.650812335
388	Haiti	0.31033463	0.448278285
389	Jamaica	0.534781234	0.683263064
390	Puerto Rico	0.658758146	0.825525847
391	Saint Kitts and Nevis	0.580685877	0.754987055
392	Saint Lucia	0.49629657	0.672509735
393	Saint Vincent and the Grenadines	0.475930186	0.637195963
394	Suriname	0.502054305	0.633665739
395	Trinidad and Tobago	0.62397015	0.768763254
396	Virgin Islands	0.655160856	0.821830853
397	Central Latin America	0.48578741	0.6406851
398	Colombia	0.480720054	0.655442913
399	Costa Rica	0.534125181	0.700340477
400	El Salvador	0.373057975	0.563775188
401	Guatemala	0.311792455	0.539972424
402	Honduras	0.332042889	0.513037248
403	Mexico	0.504996083	0.664575304
404	Aguascalientes	0.524645983	0.681159284
405	Baja California	0.557776897	0.704081972
406	Baja California Sur	0.547365468	0.709694281
407	Campeche	0.467809577	0.665363431
408	Chiapas	0.380122713	0.569940909
409	Chihuahua	0.526085567	0.673386571
410	Coahuila	0.524303567	0.677562875
411	Colima	0.541152933	0.699116771
412	Durango	0.471994856	0.639324841
413	Guanajuato	0.463111395	0.646374308
414	Guerrero	0.404457237	0.584850472
415	Hidalgo	0.433772282	0.633478453
416	Jalisco	0.519722519	0.675998373
417	México	0.530648662	0.681587605
418	Mexico City	0.618325598	0.759848414
419	Michoacán de Ocampo	0.454293326	0.613082024
420	Morelos	0.520991486	0.670074046
421	Nayarit	0.47346391	0.658178913
422	Nuevo León	0.581722309	0.710141817
423	Oaxaca	0.414302017	0.589041897
424	Puebla	0.449529952	0.622031827
425	Querétaro	0.507320191	0.682558115
426	Quintana Roo	0.491221072	0.681068671
427	San Luis Potosí	0.450145657	0.646651514
428	Sinaloa	0.51239837	0.677164972
429	Sonora	0.546866387	0.710679605

430	Tabasco	0.463410559	0.648728024
431	Tamaulipas	0.538947104	0.682086111
432	Tlaxcala	0.467929212	0.64782243
433	Veracruz de Ignacio de la Llave	0.457310627	0.628136965
434	Yucatán	0.469101155	0.653050809
435	Zacatecas	0.482045818	0.634773655
436	Nicaragua	0.346035235	0.523958472
437	Panama	0.546048123	0.708864828
438	Venezuela	0.516891218	0.596513059
439	Tropical Latin America	0.499587794	0.652442394
440	Brazil	0.500070509	0.653043887
441	Acre	0.372460174	0.565851526
442	Alagoas	0.375345821	0.535659976
443	Amapá	0.466489972	0.632179635
444	Amazonas	0.484414577	0.609484469
445	Bahia	0.41801382	0.577394253
446	Ceará	0.398353718	0.568665698
447	Distrito Federal	0.583730192	0.776016643
448	Espírito Santo	0.489800826	0.670192595
449	Goiás	0.453438148	0.640933873
450	Maranhão	0.313023543	0.49892987
451	Mato Grosso	0.457312691	0.651185759
452	Mato Grosso do Sul	0.480886355	0.64753332
453	Minas Gerais	0.494231041	0.652293253
454	Pará	0.433188565	0.582134405
455	Paraíba	0.396846309	0.563868152
456	Paraná	0.509650881	0.674856534
457	Pernambuco	0.425212065	0.586764224
458	Piauí	0.344034125	0.525243118
459	Rio de Janeiro	0.577165929	0.716093842
460	Rio Grande do Norte	0.41829153	0.589854818
461	Rio Grande do Sul	0.556901852	0.693337528
462	Rondônia	0.449843647	0.624854665
463	Roraima	0.47622098	0.621005567
464	Santa Catarina	0.547671627	0.701340701
465	São Paulo	0.564758448	0.713727597
466	Sergipe	0.444644766	0.595840177
467	Tocantins	0.385988031	0.608587676
468	Paraguay	0.469527785	0.635718099
469	North Africa and Middle East	0.437420668	0.658224715
470	North Africa and Middle East	0.437420668	0.658224715
471	Afghanistan	0.173832165	0.337199998
472	Algeria	0.460486906	0.659500924
473	Bahrain	0.584578852	0.753043204

474	Egypt	0.417182742	0.606787094
475	Iran	0.453799944	0.697207398
476	Alborz	0.540408689	0.748302022
477	Ardebil	0.360726369	0.658639771
478	Bushehr	0.453839596	0.708418708
479	Chahar Mahaal and Bakhtiari	0.396177428	0.677988602
480	East Azarbayejan	0.41107167	0.668193235
481	Fars	0.458096531	0.714830769
482	Gilan	0.487126643	0.712319447
483	Golestan	0.407352738	0.65607753
484	Hamadan	0.393037826	0.66673482
485	Hormozgan	0.380909867	0.670331366
486	Ilam	0.409636699	0.706194927
487	Isfahan	0.487959498	0.709716845
488	Kerman	0.430231243	0.668439265
489	Kermanshah	0.404063329	0.674466468
490	Khorasan-e-Razavi	0.40318232	0.669826641
491	Khuzestan	0.411717104	0.669587913
492	Kohgiluyeh and Boyer-Ahmad	0.385444625	0.693706198
493	Kurdistan	0.34632778	0.642261692
494	Lorestan	0.372692648	0.669118289
495	Markazi	0.431126436	0.682843822
496	Mazandaran	0.504227331	0.729929903
497	North Khorasan	0.347842053	0.651610197
498	Qazvin	0.413374606	0.6876536
499	Qom	0.452628907	0.694075907
500	Semnan	0.496089451	0.723926385
501	Sistan and Baluchistan	0.308840734	0.551305977
502	South Khorasan	0.350446131	0.653125383
503	Tehran	0.587612685	0.776032454
504	West Azarbayejan	0.37997815	0.627112463
505	Yazd	0.454227587	0.713344284
506	Zanjan	0.391316094	0.661729132
507	Iraq	0.412044173	0.662626231
508	Jordan	0.539147468	0.725307227
509	Kuwait	0.664517904	0.846651055
510	Lebanon	0.536718969	0.744746351
511	Libya	0.527998168	0.725771399
512	Morocco	0.35807287	0.562698301
513	Oman	0.429270949	0.773391602
514	Palestine	0.40179221	0.631011665
515	Qatar	0.651208376	0.846860584
516	Saudi Arabia	0.538954515	0.815143493
517	Sudan	0.292178643	0.541949735

518	Syria	0.430492643	0.623004075
519	Tunisia	0.471138521	0.682432216
520	Türkiye	0.461606984	0.712692673
521	United Arab Emirates	0.644412271	0.849317734
522	Yemen	0.215664586	0.450376375
523	South Asia	0.319796517	0.557864657
524	South Asia	0.319796517	0.557864657
525	Bangladesh	0.228548934	0.492420885
526	Bhutan	0.21503985	0.473062378
527	India	0.332593603	0.575401649
528	Nepal	0.199560654	0.433174635
529	Pakistan	0.310467621	0.504028689
530	Azad Jammu & Kashmir	0.325857101	0.54211877
531	Balochistan	0.248830294	0.417971505
532	Gilgit-Baltistan	0.222103674	0.397549987
533	Islamabad Capital Territory	0.487150872	0.696195374
534	Khyber Pakhtunkhwa	0.267901742	0.450581146
535	Punjab	0.316049943	0.520200488
536	Sindh	0.327061045	0.512574957
537	Southeast Asia, east Asia, and Oceania	0.471036942	0.698849901
538	East Asia	0.471179162	0.725704902
539	China	0.458668935	0.72162976
540	North Korea	0.497780128	0.569854634
541	Taiwan (province of China)	0.667633854	0.874747053
542	Oceania	0.391195082	0.467445126
543	American Samoa	0.613633924	0.723727533
544	Cook Islands	0.564514854	0.779109955
545	Fiji	0.534648908	0.675051631
546	Guam	0.676220305	0.803982203
547	Kiribati	0.410389821	0.527186583
548	Marshall Islands	0.430839288	0.574091128
549	Federated States of Micronesia	0.462511617	0.587534967
550	Nauru	0.539145981	0.625177834
551	Niue	0.587532984	0.72622205
552	Northern Mariana Islands	0.708593838	0.771535213
553	Palau	0.66290951	0.754046931
554	Papua New Guinea	0.310668629	0.417797443
555	Samoa	0.487491428	0.593392769
556	Solomon Islands	0.301217167	0.429360316
557	Tokelau	0.521942386	0.686425621
558	Tonga	0.49180684	0.626349936
559	Tuvalu	0.406247566	0.576620529
560	Vanuatu	0.353100252	0.473100706
561	Southeast Asia	0.46410364	0.649777295

562	Cambodia	0.289075059	0.473621491
563	Indonesia	0.457134954	0.656868336
564	Aceh	0.482673083	0.669551641
565	Bali	0.458655011	0.649585885
566	Bangka-Belitung Islands	0.452646767	0.64425964
567	Banten	0.450965928	0.640712993
568	Bengkulu	0.410618592	0.613670654
569	Gorontalo	0.389888128	0.569990208
570	Jakarta	0.603337382	0.799409443
571	Jambi	0.423986255	0.639563676
572	West Java	0.453362331	0.643676633
573	Central Java	0.418426869	0.613388815
574	East Java	0.439345376	0.645517381
575	West Kalimantan	0.392420939	0.586121672
576	South Kalimantan	0.4410948	0.623206076
577	Central Kalimantan	0.458816473	0.638993825
578	East Kalimantan	0.570464049	0.759293869
579	North Kalimantan	0.555308193	0.752986755
580	Riau Islands	0.573195374	0.747754306
581	Lampung	0.391631433	0.608871357
582	Maluku	0.476402589	0.580321875
583	North Maluku	0.372965609	0.562910873
584	West Nusa Tenggara	0.337279768	0.587034621
585	East Nusa Tenggara	0.365588037	0.54945119
586	Papua	0.462138557	0.645802883
587	West Papua	0.457306637	0.675125644
588	Riau	0.527812917	0.722784516
589	West Sulawesi	0.388169169	0.57565685
590	South Sulawesi	0.41327701	0.621135414
591	Central Sulawesi	0.411857501	0.616253843
592	Southeast Sulawesi	0.386931522	0.615325868
593	North Sulawesi	0.479692906	0.650468306
594	West Sumatra	0.465210234	0.665763664
595	South Sumatra	0.456248761	0.645536761
596	North Sumatra	0.469947965	0.667025647
597	Yogyakarta	0.463588443	0.675429917
598	Laos	0.264283164	0.489136091
599	Malaysia	0.545799405	0.742523828
600	Maldives	0.331601544	0.650886627
601	Mauritius	0.544586533	0.718260446
602	Myanmar	0.319219724	0.53390084
603	Philippines	0.510011796	0.651219329
604	Abra	0.493114157	0.646546912
605	Agusan Del Norte	0.488478852	0.609360621

606	Agusan Del Sur	0.394358429	0.542413674
607	Aklan	0.500143976	0.640074805
608	Albay	0.488673629	0.639863402
609	Antique	0.401776103	0.57433252
610	Apayao	0.435660953	0.611059719
611	Aurora	0.451738519	0.614506074
612	Basilan	0.350254265	0.546825716
613	Bataan	0.517309034	0.656901515
614	Batanes	0.528049634	0.682304862
615	Batangas	0.552429857	0.684411269
616	Benguet	0.584464349	0.713503653
617	Biliran	0.488957278	0.644053354
618	Bohol	0.443903869	0.603780595
619	Bukidnon	0.399380416	0.550516848
620	Bulacan	0.562840071	0.707522024
621	Cagayan	0.476523863	0.635068086
622	Camarines Norte	0.454389757	0.594286494
623	Camarines Sur	0.485164875	0.632554644
624	Camiguin	0.495305819	0.632437897
625	Capiz	0.42655316	0.568087958
626	Catanduanes	0.462551509	0.609478687
627	Cavite	0.610211825	0.726784372
628	Cebu	0.532735498	0.656076358
629	Cotabato (North Cotabato)	0.424363132	0.55377082
630	Davao de Oro	0.394188933	0.534417764
631	Davao Del Norte	0.47725283	0.638104952
632	Davao Del Sur	0.509118509	0.660001466
633	Davao Occidental	0.388923824	0.5814625
634	Davao Oriental	0.385245835	0.546673438
635	Dinagat Islands	0.45740369	0.620781361
636	Eastern Samar	0.358787376	0.495675232
637	Guimaras	0.448414677	0.609240673
638	Ifugao	0.442548221	0.597128222
639	Ilocos Norte	0.556207974	0.686921587
640	Ilocos Sur	0.524452639	0.672277756
641	Iloilo	0.527433705	0.672917821
642	Isabela	0.486994063	0.637319646
643	Kalinga	0.396586905	0.578198283
644	La Union	0.533148639	0.660963661
645	Laguna	0.583112351	0.700924655
646	Lanao Del Norte	0.46393371	0.58250552
647	Lanao Del Sur	0.393071715	0.530702771
648	Leyte	0.452754461	0.610942558
649	Maguindanao	0.338054564	0.51129551

650	Marinduque	0.415902044	0.55186124
651	Masbate	0.357228929	0.454108095
652	Misamis Occidental	0.479137772	0.585721104
653	Misamis Oriental	0.546148333	0.660208517
654	Mountain Province	0.384142978	0.52052229
655	National Capital Region	0.631604081	0.751742216
656	Negros Occidental	0.492135423	0.60317817
657	Negros Oriental	0.438173264	0.576084024
658	Northern Samar	0.377649131	0.522209106
659	Nueva Ecija	0.531381357	0.650166602
660	Nueva Vizcaya	0.482176184	0.616192946
661	Occidental Mindoro	0.339037642	0.466835042
662	Oriental Mindoro	0.438054195	0.603235742
663	Palawan	0.391125531	0.530005129
664	Pampanga	0.557746428	0.695999283
665	Pangasinan	0.535583582	0.66557535
666	Quezon	0.494755975	0.628562384
667	Quirino	0.417716701	0.571498837
668	Rizal	0.556537796	0.709407899
669	Romblon	0.373491683	0.532390648
670	Samar (Western Samar)	0.402122967	0.525508195
671	Sarangani	0.413238597	0.583869433
672	Siquijor	0.436579156	0.600739699
673	Sorsogon	0.451186555	0.600254568
674	South Cotabato	0.493304671	0.632081366
675	Southern Leyte	0.444659979	0.600211252
676	Sultan Kudarat	0.389772512	0.520676083
677	Sulu	0.291025666	0.483535851
678	Surigao Del Norte	0.468963284	0.627445196
679	Surigao Del Sur	0.44007541	0.588740715
680	Tarlac	0.516577193	0.650645532
681	Tawi-Tawi	0.362263287	0.535812038
682	Zambales	0.53965418	0.650840597
683	Zamboanga Del Norte	0.398464758	0.537184539
684	Zamboanga Del Sur	0.475176508	0.630908782
685	Zamboanga Sibugay	0.387055592	0.549696015
686	Seychelles	0.575526496	0.730150775
687	Sri Lanka	0.522622553	0.701534935
688	Thailand	0.506644861	0.682547933
689	Timor-Leste	0.262468083	0.444667619
690	Viet Nam	0.407630048	0.627933721
691	Sub-Saharan Africa	0.297147968	0.458587301
692	Central sub-Saharan Africa	0.302374953	0.472255651
693	Angola	0.270736935	0.453721949

694	Central African Republic	0.216825191	0.30916769
695	Congo (Brazzaville)	0.420654655	0.583075236
696	DR Congo	0.28984321	0.383179849
697	Equatorial Guinea	0.268783629	0.657857456
698	Gabon	0.455421187	0.634691393
699	Eastern sub-Saharan Africa	0.233622123	0.409720983
700	Burundi	0.20586736	0.289374365
701	Comoros	0.270048116	0.475978688
702	Djibouti	0.337781789	0.487958371
703	Eritrea	0.216028239	0.403863943
704	Ethiopia	0.148033885	0.358823295
705	Addis Ababa	0.487060041	0.694729596
706	Afar	0.102500069	0.28877341
707	Amhara	0.096349458	0.320453189
708	Benishangul-Gumuz	0.0929276	0.320228483
709	Dire Dawa	0.312205934	0.540668646
710	Gambella	0.168610253	0.458220084
711	Harari	0.322842077	0.538168759
712	Oromia	0.125544882	0.335815016
713	Somali	0.093590078	0.268253815
714	Southern Nations, Nationalities, and Peoples	0.132426296	0.355521531
715	Tigray	0.132771026	0.382183506
716	Kenya	0.333850293	0.523768077
717	Baringo	0.277332089	0.514883215
718	Bomet	0.281945483	0.529367852
719	Bungoma	0.289281609	0.49672518
720	Busia	0.229493355	0.477665024
721	Elgeyo Marakwet	0.272798674	0.526297038
722	Embu	0.372525502	0.547555396
723	Garissa	0.158613685	0.321068269
724	Homa Bay	0.231035423	0.493871805
725	Isiolo	0.233789194	0.433966834
726	Kajiado	0.299327765	0.506969707
727	Kakamega	0.309166492	0.509528998
728	Kericho	0.30207479	0.523573355
729	Kiambu	0.410469356	0.593110152
730	Kilifi	0.258065918	0.486009157
731	Kirinyaga	0.406480966	0.54301445
732	Kisii	0.325030301	0.544604844
733	Kisumu	0.306497721	0.544409324
734	Kitui	0.281505982	0.474749457
735	Kwale	0.27463023	0.475138205
736	Laikipia	0.375311824	0.575711773
737	Lamu	0.308688861	0.503786492

738	Machakos	0.36059665	0.548035791
739	Makueni	0.295311685	0.512568943
740	Mandera	0.112796963	0.238263833
741	Marsabit	0.204167587	0.40018158
742	Meru	0.313881707	0.508216146
743	Migori	0.199865536	0.472803008
744	Mombasa	0.407873141	0.596387778
745	Murang'a	0.367814565	0.550869493
746	Nairobi	0.522778723	0.683722442
747	Nakuru	0.355830725	0.570045398
748	Nandi	0.289951784	0.516279712
749	Narok	0.213001059	0.459103072
750	Nyamira	0.353838595	0.589267078
751	Nyandarua	0.374020323	0.576109863
752	Nyeri	0.409157218	0.578787484
753	Samburu	0.203841145	0.378312395
754	Siaya	0.229809712	0.476524395
755	Taita Taveta	0.343602499	0.540980982
756	Tana River	0.231789736	0.382845346
757	Tharaka Nithi	0.311294385	0.529680112
758	Trans Nzoia	0.326157148	0.54850455
759	Turkana	0.17963154	0.373434245
760	Uasin Gishu	0.351121368	0.567345589
761	Vihiga	0.292847673	0.523089788
762	Wajir	0.114632781	0.252050106
763	West Pokot	0.215643183	0.444120899
764	Madagascar	0.279889465	0.400246943
765	Malawi	0.204010245	0.384553634
766	Mozambique	0.173064715	0.326462614
767	Rwanda	0.27509719	0.435588706
768	Somalia	0.048848564	0.077688109
769	South Sudan	0.2066565	0.278371125
770	Uganda	0.187001096	0.423261181
771	Tanzania	0.259306074	0.446568273
772	Zambia	0.304008549	0.505948954
773	Southern sub-Saharan Africa	0.506946633	0.642200282
774	Botswana	0.418077748	0.642721629
775	Eswatini	0.399420955	0.585459713
776	Lesotho	0.339155125	0.510393066
777	Namibia	0.450040233	0.617564872
778	South Africa	0.541571435	0.679626598
779	Eastern Cape	0.487156629	0.617204696
780	Free State	0.547462374	0.677908602
781	Gauteng	0.634850535	0.735426628

782	KwaZulu-Natal	0.513597109	0.660483699
783	Limpopo	0.445061873	0.612287836
784	Mpumalanga	0.48855668	0.646057473
785	North West	0.511582018	0.652476432
786	Northern Cape	0.528126699	0.664140622
787	Western Cape	0.630621788	0.718532896
788	Zimbabwe	0.398559341	0.473819486
789	Western sub-Saharan Africa	0.273700004	0.446022979
790	Benin	0.218907154	0.373486574
791	Burkina Faso	0.129695615	0.285118402
792	Cabo Verde	0.276723367	0.533534539
793	Cameroon	0.303055334	0.479691223
794	Chad	0.114638829	0.240436019
795	Côte d'Ivoire	0.279320353	0.425941883
796	The Gambia	0.238714846	0.40971416
797	Ghana	0.373112005	0.56493039
798	Guinea	0.178295421	0.336401293
799	Guinea-Bissau	0.207614839	0.353109621
800	Liberia	0.235296847	0.352442452
801	Mali	0.126526428	0.268579941
802	Mauritania	0.335780942	0.4989451
803	Niger	0.08086848	0.168072774
804	Nigeria	0.305868047	0.503390833
805	São Tomé and Príncipe	0.309542852	0.505413747
806	Senegal	0.238047613	0.408054193
807	Sierra Leone	0.211569335	0.358665881
808	Togo	0.269692273	0.408533695
