SUPPLEMENTAL MATERIAL

Colorado Burden of Disease, Injuries and Risk Factors, 1990-2019: a sub-analysis of the Global Burden of Disease Study

Jen Roux MPH [a,b], David Rojas-Rueda PhD [a,b]

[a] Colorado School of Public Health, Colorado State University, Fort Collins, U.S.A.

[b] Department of Environmental and Radiological Health Sciences, Colorado State University, Fort Collins, U.S.A.

CONTENTS

Table S1. Main causes of death in Colorado in, both sexes, Level 4, by age group, in 2019 4

Table S2. All-cause mortality estimates for Colorado and the United States, in 1990, 2000, 2010, 2019 10

Figure S1. Arrow diagram of top ranked causes of death, in Colorado, in (A) both sexes (B) females and (C) males, Level 4, age standardized, 1990 - 2019 11

Figure S2. Heat map of top causes of death in Colorado, West States, and the United States, for both sexes, Level 4, age-standardized, in 1990. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 13

Figure S3. Heat map of top causes of death in Colorado, West States, and the United States, for (A) females and (B) males, Level 4, age-standardized, in 2019. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 14

Table S3. Colorado disability adjusted life years (DALYs), by age group and in all ages, in 2019 15

Table S4. Main causes of disability-adjusted life-years (DALYs) for Colorado in, females and males, all ages, in 2019 .16

Figure S4. Arrow diagram of top ranked causes of disability adjusted life years (DALYs), in Colorado, in (A) both sexes (B) females and (C) males, Level 4, age standardized, 1990 - 2019 20

Figure S5. Line graph of age-standardized rates of (A) death and (B) disability adjusted life years (DALYs), per 100,000 people, in Colorado, West States, and the United States, in both sexes, 1990-2019 22

Figure S6. Line graph of disability adjusted life years (DALYs), in Colorado, West States, and the United States by (A) females and (B) males, Level 4, age standardized, 1990 - 2019 23

Figure S7. Heat map of top ranked causes of disability-adjusted life years (DALYS) in Colorado, West States, and the United States for (A) females (B) males, Level 4, age standardized, in 2019.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 24

Figure S8. Heat map of top ranked causes of disability-adjusted life years (DALYS) in Colorado, West States, and the United States, for both sexes, Level 4, age standardized, in 1990.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 25

Figure S9. Pyramid of disability adjusted life years (DALYs) in Colorado and the United States, by sex and all ages in 2019 26

Figure S10. Pyramid of disability adjusted life years (DALYs) in Colorado, Earth and the United States, by sex and all ages in 2019 27

Figure S11. Heat map of top ranked years of life lost (YLL) in Colorado, West states, and the United States in (A) both sexes (B) females and (C) males, Level 4, age standardized, in 2019.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 28

Figure S12. Heat map of top ranked years of life lost (YLL) in Colorado, West States, and the United States, both sexes, Level 4, age standardized in 1990.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 30

Figure S13. Tree map of top causes of (A) years of healthy life lost due to disability (YLDs) and (B) years of life lost (YLLs) in Colorado, for both sexes, Level 4, all ages, in 2019.*Blue rectangles are non-communicable disease; red rectangles are communicable; and green rectangles are injuries. 31

Figure S14. Heat map of top ranked causes of years of healthy life lost due to disability (YLDs) per 100,000 people, in Colorado, West States, and the United States for (A) both sexes, (B) females and (C) males, Level 4, age-standardized,

in 2019. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 32

Figure S15. Heat of top ranked years lived with disability (YLD) in Colorado, West States, and the United States, both sexes, Level 4, age standardized in 1990. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.....34

Figure S16. Top ranked deaths per 100,000 people attributable to major risk factors in Colorado, both sexes, Level 4, age-standardized, in 2019.....35

Figure S17. Arrow diagram of top risk factors for (A) deaths and (B) disability-adjusted life years (DALYs) per 100,000 people in Colorado, both sexes, Level 4, age-standardized, 1990-2019 36

Figure S18. Arrow diagram of top ranked risk factors for deaths in Colorado, in (A) females and (B) males, Level 4, age-standardized, in 2019.....37

Figure S19. Arrow diagram of top ranked risk factors contributing to disability adjusted life years (DALYs) in Colorado, in (A) females and (B) males, Level 4, age-standardized, 2019.....38

Figure S20. Top ranked risk factors contributing to disability adjusted life years (DALYs) in percent in Colorado by (A) both sexes (B) female (C) males, Level 4, age-standardized, in 2019 39

Figure S21. Top ranked risk factors contributing to disability-adjusted life years (DALYs) per 100,000 people, attributable to major risk factors in Colorado in (A) females and (B) males, Level 4, age standardized, in 2019 41

Table S5. Colorado age-standardized summary exposure values (SEV), for both sexes, in 1990, 2000, 2010, 2019.....42

Figure S22. Heat map of top ranked risk factors in Colorado, West States, and the United States in (A) both sexes (B) females and (C) males, Level 4, age standardized, in 2019. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.....44

Figure S23. Heat map of top ranked risk factors in Colorado, West States, and the United States, both sexes, Level 4, age standardized, in 1990. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings. 46

Figure S24. Arrow diagram of top risk factors for years of life lived with disability (YLDs) per 100,000 people, in Colorado in (A) both, (B) females, (C) males, Level 4, 1990 - 2019.....47

Figure S25. Arrow diagram of top risk factors for years of life lost (YLLs) per 100,000 people in Colorado in (A) both sexes, (B) females, and (C) males, Level 4, 1990 – 2019 49

Table S6. Main causes of death and disability-adjusted life-years (DALYs), both sexes and all ages, Colorado, 2019...51

Table S7. GATHER checklist.....57

Table S8. Key Global Burden of Disease (GBD) papers and sources used as a reference in this analysis 58

Table S1. Main causes of death in Colorado in, both sexes, Level 4, by age group, in 2019

Cause	Deaths														
	Under 5			5-14 years			15-49 years			50-69 years			70+ years		
	Central Value	Lower Uncertainty Level	Upper Uncertainty Level	Central Value	Lower Uncertainty Level	Upper Uncertainty Level	Central Value	Lower Uncertainty Level	Upper Uncertainty Level	Central Value	Lower Uncertainty Level	Upper Uncertainty Level	Central Value	Lower Uncertainty Level	Upper Uncertainty Level
Acute hepatitis A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute hepatitis B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute hepatitis C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute hepatitis E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute lymphoid leukemia	1	1	1	2	2	3	8	6	10	8	6	11	10	7	13
Acute myeloid leukemia	1	1	1	1	1	2	16	12	21	64	49	81	122	93	154
Alcoholic cardiomyopathy	0	0	0	0	0	0	9	6	13	35	23	52	20	12	31
Amphetamine use disorders	0	0	0	0	0	0	48	37	62	17	12	25	1	0	1
Anorexia nervosa	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Asbestosis	0	0	0	0	0	0	0	0	0	1	1	2	10	6	13
Ascariasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bulimia nervosa	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Cellulitis	0	0	0	0	0	0	3	1	5	12	5	18	34	15	54
Chlamydial infection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chronic kidney disease	1	0	1	0	0	0	35	27	44	250	196	315	976	785	1160
Chronic kidney disease due to diabetes mellitus type 1	0	0	0	0	0	0	3	1	5	10	4	20	11	5	20
Chronic kidney disease due to diabetes mellitus type 2	0	0	0	0	0	0	5	2	8	78	47	113	258	176	358
Chronic kidney disease due to glomerulonephritis	0	0	0	0	0	0	12	8	17	39	22	62	77	48	118
Chronic kidney disease due to hypertension	0	0	0	0	0	0	6	4	9	76	52	107	462	346	594
Chronic kidney disease due to other and unspecified causes	0	0	1	0	0	0	9	6	14	47	26	73	169	108	240
Chronic lymphoid leukemia	0	0	0	0	0	0	1	1	1	19	13	26	69	52	90
Chronic myeloid leukemia	0	0	0	0	0	0	2	2	3	6	4	9	16	12	21

Cirrhosis and other chronic liver diseases due to alcohol use	0	0	0	0	0	0	41	29	56	191	135	260	79	58	104
Cirrhosis and other chronic liver diseases due to hepatitis B	0	0	0	0	0	0	6	4	8	16	11	22	8	6	11
Cirrhosis and other chronic liver diseases due to hepatitis C	0	0	0	0	0	0	99	77	127	305	226	404	138	105	173
Cirrhosis and other chronic liver diseases due to NAFLD	0	0	0	0	0	0	15	8	24	55	31	89	38	23	56
Cirrhosis and other chronic liver diseases due to other causes	0	0	0	0	0	0	25	16	38	91	56	138	82	53	116
Coal workers pneumoconiosis	0	0	0	0	0	0	0	0	0	1	0	1	3	2	5
Cocaine use disorders	0	0	0	0	0	0	83	65	106	37	26	51	2	1	2
Congenital heart anomalies	18	14	25	2	2	3	13	10	16	7	5	10	0	0	0
Congenital musculoskeletal and limb anomalies	3	2	4	0	0	0	1	0	1	1	0	1	0	0	0
Cyclist road injuries	0	0	0	2	1	2	8	6	10	8	6	11	2	2	3
Diabetes mellitus type 1	0	0	0	0	0	1	24	19	30	20	14	29	13	9	20
Diabetes mellitus type 2	0	0	0	0	0	0	32	24	41	265	212	326	544	446	640
Digestive congenital anomalies	5	3	7	0	0	0	0	0	1	0	0	1	0	0	0
Down syndrome	1	1	2	0	0	0	3	2	5	11	8	14	0	0	0
Drug-susceptible tuberculosis	0	0	0	0	0	0	1	1	2	4	3	5	7	5	8
Ectopic pregnancy				0	0	0	0	0	0	0	0	0	0	0	0
Endometriosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extensively drug-resistant tuberculosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foreign body in other body part	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
G6PD deficiency	0	0	0	0	0	0	3	2	4	2	1	3	1	0	1
Gastritis and duodenitis	0	0	0	0	0	0	1	1	2	3	2	4	7	5	9
Genital prolapse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gonococcal infection	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Hemolytic disease and other neonatal jaundice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HIV/AIDS - Drug-susceptible Tuberculosis	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0
HIV/AIDS - Extensively drug-resistant Tuberculosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HIV/AIDS - Multidrug-resistant Tuberculosis without extensive drug resistance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HIV/AIDS resulting in other diseases	0	0	0	0	0	0	29	27	31	26	24	28	2	2	2
Indirect maternal deaths	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0
Intracerebral hemorrhage	0	0	0	0	0	0	30	23	39	196	151	251	514	400	620
Ischemic stroke	0	0	0	0	0	0	6	5	8	80	60	103	1441	1113	1728
Late maternal deaths	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0
Liver cancer due to alcohol use	0	0	0	0	0	0	5	3	7	67	46	93	47	35	64
Liver cancer due to hepatitis B	0	0	0	0	0	0	4	3	6	23	16	33	14	10	19
Liver cancer due to hepatitis C	0	0	0	0	0	0	3	2	4	66	48	91	67	53	84
Liver cancer due to NASH	0	0	0	0	0	0	1	1	2	14	10	20	21	16	28
Liver cancer due to other causes	0	0	0	0	0	1	2	2	3	14	10	19	12	9	16
Maternal abortion and miscarriage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maternal deaths aggravated by HIV/AIDS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maternal hemorrhage	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Maternal hypertensive disorders	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
Maternal obstructed labor and uterine rupture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maternal sepsis and other maternal infections	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor vehicle road injuries	4	3	5	9	7	10	221	179	265	112	89	139	84	69	99
Motorcyclist road injuries	0	0	0	0	0	1	51	40	64	28	21	37	4	3	5

Multidrug-resistant tuberculosis without extensive drug resistance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Myelodysplastic, myeloproliferative, and other hematopoietic neoplasms	0	0	0	0	0	0	2	1	3	24	17	38	131	93	177
Myocarditis	1	1	1	0	0	1	6	4	9	4	2	7	5	2	8
Neonatal encephalopathy due to birth asphyxia and trauma	28	23	33	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal preterm birth	75	64	85	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal sepsis and other neonatal infections	9	7	11	0	0	0	0	0	0	0	0	0	0	0	0
Neural tube defects	8	6	11	0	0	0	1	1	2	0	0	0	0	0	0
Non-rheumatic calcific aortic valve disease	0	0	0	0	0	0	4	3	5	25	19	33	296	227	356
Non-rheumatic degenerative mitral valve disease	0	0	0	0	0	0	2	2	3	8	6	12	43	31	66
Non-rheumatic valvular heart disease	0	0	0	0	0	0	6	5	8	34	27	43	339	261	405
Non-venomous animal contact	0	0	0	0	0	0	1	1	1	1	1	2	1	1	1
Opioid use disorders	0	0	0	0	0	0	542	441	659	174	127	234	22	17	28
Orofacial clefts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other cardiomyopathy	1	1	2	1	0	1	24	17	36	71	50	119	200	154	272
Other chromosomal abnormalities	16	13	22	1	1	1	2	1	3	1	1	1	0	0	0
Other congenital birth defects	18	15	23	2	2	3	5	4	7	2	1	3	0	0	0
Other drug use disorders	0	0	0	0	0	0	57	45	72	18	13	25	6	4	7
Other exposure to mechanical forces	1	1	1	1	1	1	12	9	15	12	9	16	9	7	11
Other gynecological diseases	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Other hemoglobinopathies and hemolytic anemias	0	0	0	0	0	0	1	1	2	4	3	5	15	11	18
Other leukemia	0	0	0	1	0	1	6	4	7	23	17	30	75	57	97

Other malignant neoplasms	3	2	3	5	4	6	40	32	50	106	85	131	158	127	189
Other maternal disorders	0	0	0	0	0	0	3	2	5	0	0	0	0	0	0
Other neonatal disorders	30	23	38	0	0	0	0	0	0	0	0	0	0	0	0
Other non-rheumatic valve diseases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Other pneumoconiosis	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Other road injuries	0	0	0	0	0	0	2	1	2	1	1	2	1	1	1
Other sexually transmitted infections	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other urinary diseases	0	0	0	0	0	0	1	0	1	3	2	5	9	6	13
Paratyphoid fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian road injuries	2	2	3	3	3	4	39	31	47	33	25	42	23	18	27
Peptic ulcer disease	0	0	0	0	0	0	4	3	5	21	14	29	61	46	78
Physical violence by firearm	1	1	1	2	2	3	98	79	120	18	14	23	4	3	5
Physical violence by other means	6	5	7	2	1	2	18	15	22	10	8	12	4	3	5
Physical violence by sharp object	0	0	0	0	0	0	18	14	22	6	5	8	2	1	2
Poisoning by carbon monoxide	0	0	1	1	0	1	14	10	17	7	5	9	3	3	4
Poisoning by other means	1	0	1	1	0	1	4	3	5	3	2	4	2	1	2
Pulmonary aspiration and foreign body in airway	15	11	18	2	1	2	15	12	18	29	23	36	88	70	105
Pyoderma	0	0	0	0	0	0	1	1	3	8	4	14	25	13	48
Self-harm by firearm	0	0	0	4	2	6	269	212	351	204	153	276	102	80	130
Self-harm by other specified means	0	0	0	7	4	9	304	220	372	167	115	213	41	31	51
Sickle cell disorders	0	0	0	0	0	0	1	1	2	1	0	1	0	0	0
Silicosis	0	0	0	0	0	0	0	0	0	1	1	2	3	2	5
Subarachnoid hemorrhage	0	0	1	0	0	1	27	21	35	93	72	120	151	116	183
Syphilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Thalassemias	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Typhoid fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unintentional firearm injuries	0	0	0	1	0	1	5	4	7	2	1	3	1	1	1
Urinary tract infections and interstitial nephritis	0	0	0	0	0	0	5	4	7	35	27	43	247	195	306

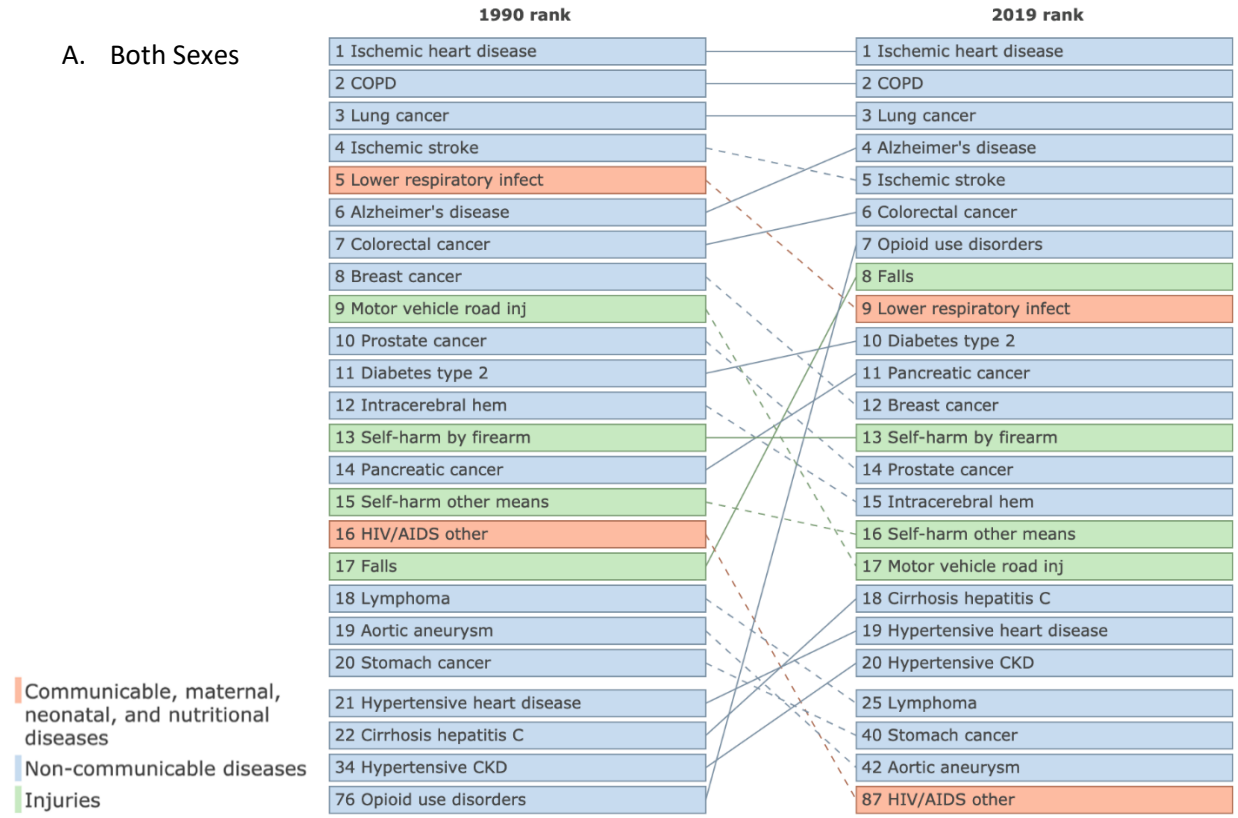
Urogenital congenital anomalies	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0
Urolithiasis	0	0	0	0	0	0	0	0	1	2	1	2	6	4	8
Uterine fibroids	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Venomous animal contact	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Visceral leishmaniasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communicable, maternal, neonatal, and nutritional diseases	156	140	173	4	4	5	102	88	118	259	210	317	1,080	863	1,279
Injuries	39	34	44	43	39	47	1,218	1,006	1,453	856	686	1,055	1,292	1,058	1,503
Non-communicable diseases	120	107	136	40	37	43	2,276	1,908	2,701	9,240	7,641	11,105	23,998	21,023	27,055
All causes	**315**	**288**	**343**	**88**	**83**	**93**	**3,595**	**3,022**	**4,247**	**10,356**	**8,569**	**12,455**	**26,370**	**23,129**	**29,697**

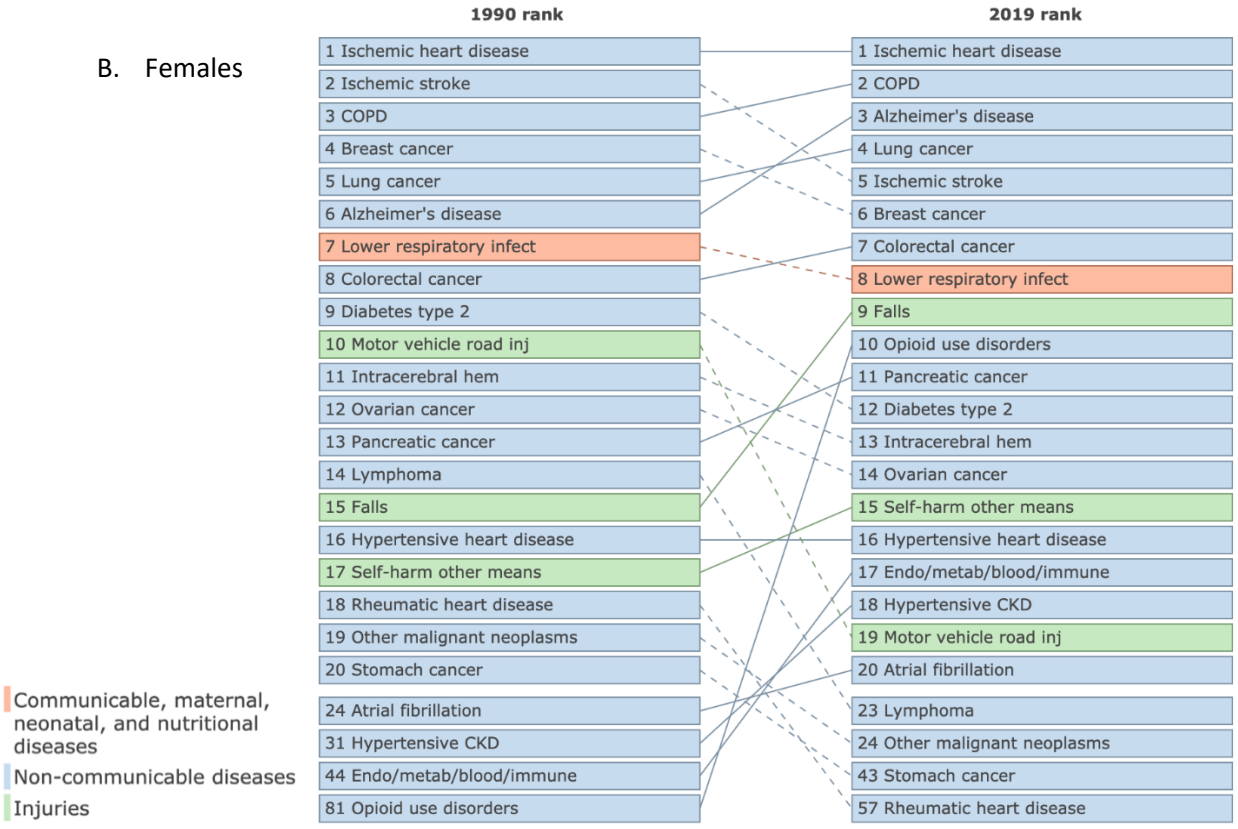
Table S2. All-cause mortality estimates for Colorado and the United States, in 1990, 2000, 2010, 2019

	Number of deaths	Mortality, per 100,000 people population	Age-standardized mortality, per 100,000 people
Colorado			
Year			
1990	21171 (20748 - 21603)	629.47 (642.3 - 616.88)	596.92 (608.99 - 585.08)
2000	26898 (26408 - 27388)	628.36 (639.8 - 616.9)	567.62 (577.87 - 557.17)
2010	30905 (30371 - 31480)	614.83 (626.27 - 604.21)	489.76 (498.6 - 481.4)
2019	40724 (35134 - 46743)	754 (865.45 - 650.5)	494.26 (567.25 - 426.48)
United States			
Year			
1990	2132451 (2128722 - 2136181)	840.85 (842.32 - 839.38)	668.88 (670.02 - 667.7)
2000	2388367 (2383994- 2392982)	850.92 (852.56 - 849.36)	618.62 (619.85 - 617.48)
2010	2474654 (2470219 - 2479225)	800.95 (802.43 - 799.52)	531.79 (532.83 - 530.83)
2019	2946456 (2924325 - 2968832)	898.37 (905.19 - 891.62)	528.24 (532.56 - 524.04)

Data are for all ages, unless otherwise specified, and data in parentheses are 95% uncertainty intervals

Figure S1. Arrow diagram of top ranked causes of death, in Colorado, in (A) both sexes (B) females and (C) males, Level 4, age standardized, 1990 - 2019





C. Males

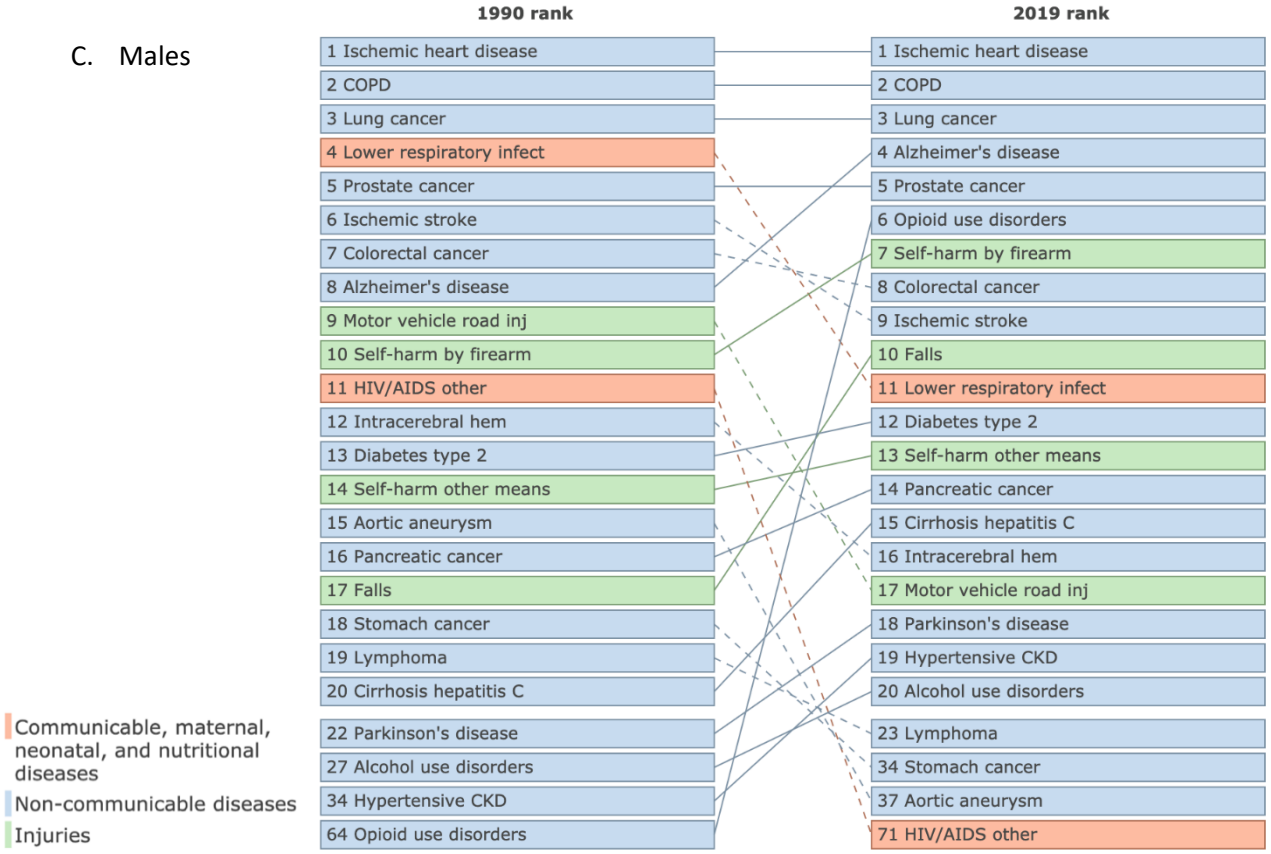

1990 rank
2019 rank
1 Ischemic heart disease
2 COPD
3 Lung cancer
4 Lower respiratory infect
5 Prostate cancer
6 Ischemic stroke
7 Colorectal cancer
8 Alzheimer's disease
9 Motor vehicle road inj
10 Self-harm by firearm
11 HIV/AIDS other
12 Intracerebral hem
13 Diabetes type 2
14 Self-harm other means
15 Aortic aneurysm
16 Pancreatic cancer
17 Falls
18 Stomach cancer
19 Lymphoma
20 Cirrhosis hepatitis C
22 Parkinson's disease
27 Alcohol use disorders
34 Hypertensive CKD
64 Opioid use disorders
1 Ischemic heart disease
2 COPD
3 Lung cancer
4 Alzheimer's disease
5 Prostate cancer
6 Opioid use disorders
7 Self-harm by firearm
8 Colorectal cancer
9 Ischemic stroke
10 Falls
11 Lower respiratory infect
12 Diabetes type 2
13 Self-harm other means
14 Pancreatic cancer
15 Cirrhosis hepatitis C
16 Intracerebral hem
17 Motor vehicle road inj
18 Parkinson's disease
19 Hypertensive CKD
20 Alcohol use disorders
23 Lymphoma
34 Stomach cancer
37 Aortic aneurysm
71 HIV/AIDS other
Communicable, maternal, neonatal, and nutritional diseases
Non-communicable diseases
Injuries

Figure S2. Heat map of top causes of death in Colorado, West States, and the United States, for both sexes, Level 4, age-standardized, in 1990. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
COPD	2	4	3	4	4	3	3	3	4	3	4	3
Lung cancer	3	2	2	2	2	2	2	2	2	5	2	2
Ischemic stroke	4	3	4	3	3	4	4	4	3	2	3	4
Lower respiratory infect	5	5	5	5	5	6	5	6	6	4	5	5
Alzheimer's disease	6	6	6	6	6	5	7	5	5	6	6	6
Colorectal cancer	7	7	7	7	8	8	6	9	7	8	7	8
Breast cancer	8	8	9	9	9	9	9	10	9	9	8	9
Motor vehicle road inj	9	10	8	10	7	7	11	7	8	10	9	7
Prostate cancer	10	12	12	13	11	11	13	12	11	11	12	12
Diabetes type 2	11	9	10	12	10	10	14	8	10	7	10	10
Intracerebral hem	12	11	13	11	13	13	12	13	12	12	11	13
Self-harm by firearm	13	16	11	18	12	12	10	11	13	13	14	11
Pancreatic cancer	14	14	14	14	14	14	15	14	14	15	13	14
Self-harm other means	15	22	17	22	19	16	17	16	16	14	15	19
HIV/AIDS other	16	13	16	8	63	70	21	28	21	44	17	76
Falls	17	25	21	34	18	17	27	17	20	17	23	17
Lymphoma	18	17	15	19	15	15	18	22	15	18	16	15
Aortic aneurysm	19	23	26	24	16	18	23	27	18	23	21	16
Stomach cancer	20	21	19	20	17	19	22	19	19	19	20	18
Hypertensive heart disease	21	15	25	15	20	22	8	20	22	16	18	21
Cirrhosis hepatitis C	22	24	18	21	29	24	19	15	28	28	27	20
Other cardiomyopathy	23	19	20	17	22	20	16	25	25	20	22	22
Ovarian cancer	24	26	28	25	23	23	33	32	23	25	24	24
Neonatal preterm birth	25	20	22	23	25	30	41	24	34	42	33	28

Figure S3. Heat map of top causes of death in Colorado, West States, and the United States, for (A) females and (B) males, Level 4, age-standardized, in 2019. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

A. Females

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
COPD	2	3	2	3	2	2	2	2	3	2	3	2
Alzheimer's disease	3	4	4	4	4	4	5	3	4	5	4	4
Lung cancer	4	2	3	2	3	3	3	4	2	6	2	3
Ischemic stroke	5	6	6	6	5	5	4	6	5	3	5	6
Breast cancer	6	5	5	5	6	6	6	5	6	4	6	5
Colorectal cancer	7	7	7	7	8	7	8	8	7	9	7	8
Lower respiratory infect	8	8	9	8	7	8	7	10	11	7	9	7
Falls	9	16	13	25	12	12	17	11	12	12	13	14
Opioid use disorders	10	12	10	14	14	14	11	9	15	13	11	10
Pancreatic cancer	11	11	11	10	11	11	12	12	9	11	10	12
Diabetes type 2	12	9	8	9	9	9	13	7	8	8	8	9
Intracerebral hem	13	10	14	11	10	13	10	14	10	10	12	13
Ovarian cancer	14	14	15	13	13	15	14	16	13	15	14	15
Self-harm other means	15	25	19	23	21	16	16	19	20	14	20	23
Hypertensive heart disease	16	13	12	12	16	18	9	18	18	16	15	18
Endo/metab/blood/immune	17	15	16	16	17	17	22	17	16	17	16	16
Hypertensive CKD	18	17	20	15	20	20	15	20	19	18	19	17
Motor vehicle road inj	19	18	17	21	15	10	21	13	21	22	25	11
Atrial fibrillation	20	20	21	17	19	19	19	26	17	19	18	19
Cirrhosis hepatitis C	21	27	18	19	26	22	18	15	23	29	23	20
Other cardiovascular	22	28	28	34	28	31	30	30	30	25	29	22
Lymphoma	23	21	23	22	22	23	25	25	22	23	21	21
Other malignant neoplasms	24	22	24	20	27	24	28	24	24	26	22	26
Parkinson's disease	25	30	25	27	25	27	29	27	27	27	27	28

B. Males

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
COPD	2	3	2	3	2	2	2	2	3	2	3	2
Lung cancer	3	2	3	2	3	3	3	3	2	3	2	3
Alzheimer's disease	4	6	6	5	6	5	9	6	5	11	6	8
Prostate cancer	5	5	5	4	4	4	4	7	4	4	4	6
Opioid use disorders	6	4	4	10	11	10	6	4	7	5	5	5
Self-harm by firearm	7	14	9	20	7	6	11	10	10	9	13	4
Colorectal cancer	8	7	8	6	8	8	7	8	9	10	9	10
Ischemic stroke	9	9	10	9	5	9	10	13	6	7	7	11
Falls	10	16	13	22	15	13	18	15	13	13	10	13
Lower respiratory infect	11	8	11	7	10	12	5	11	14	8	11	9
Diabetes type 2	12	10	7	8	9	11	14	5	8	6	8	12
Self-harm other means	13	19	18	15	17	15	16	17	16	12	15	15
Pancreatic cancer	14	12	12	11	13	14	13	16	11	15	12	14
Cirrhosis hepatitis C	15	18	14	14	18	17	15	9	15	20	17	16
Intracerebral hem	16	11	17	12	14	16	12	18	12	14	14	17
Motor vehicle road inj	17	15	15	18	12	7	20	14	17	19	21	7
Parkinson's disease	18	20	19	16	16	18	19	20	19	16	16	19
Hypertensive CKD	19	17	22	17	19	20	17	23	22	17	22	20
Alcohol use disorders	20	32	20	33	31	19	23	12	21	25	33	18
Hypertensive heart disease	21	13	16	13	25	26	8	22	31	22	19	23
Esophageal cancer	22	22	24	27	23	23	22	25	23	29	20	21
Lymphoma	23	24	27	24	21	24	25	27	24	21	24	26
Atrial fibrillation	24	28	28	25	22	25	28	31	26	23	26	25
Endo/metab/blood/immune	25	21	21	21	20	21	30	21	18	18	18	22

Table S3. Colorado disability adjusted life years (DALYs), by age group and in all ages, in 2019

	DALYs 2019	
	Count	Age-standardized rate (per 100,000 people)
0 – 9 years	48,694 (42,940 – 55,550)	3,804 (3,354.5 – 4,340.5)
10 – 24 years	141,830 (11,4279 – 17,2473)	13,127 (10,577.3 – 15,964.5)
25 – 49 years	424,962 (350,912 – 511,536)	23,281 (19,224.6 – 28,024.3)
50 – 74 years	725,882 (608,019 – 845,493)	25,150 (21,066.4 – 29,294.3)
≥ 75 years	335,123 (297,650 – 374,010)	68,854 (61,154.3 – 7,6843.3)
All ages	1,676,491 (1,427,654 – 1,953,173)	31,040 (26,432.8 – 36,162.7)

DALY = disability-adjusted life-year

Table S4. Main causes of disability-adjusted life-years (DALYs) for Colorado in, females and males, all ages, in 2019

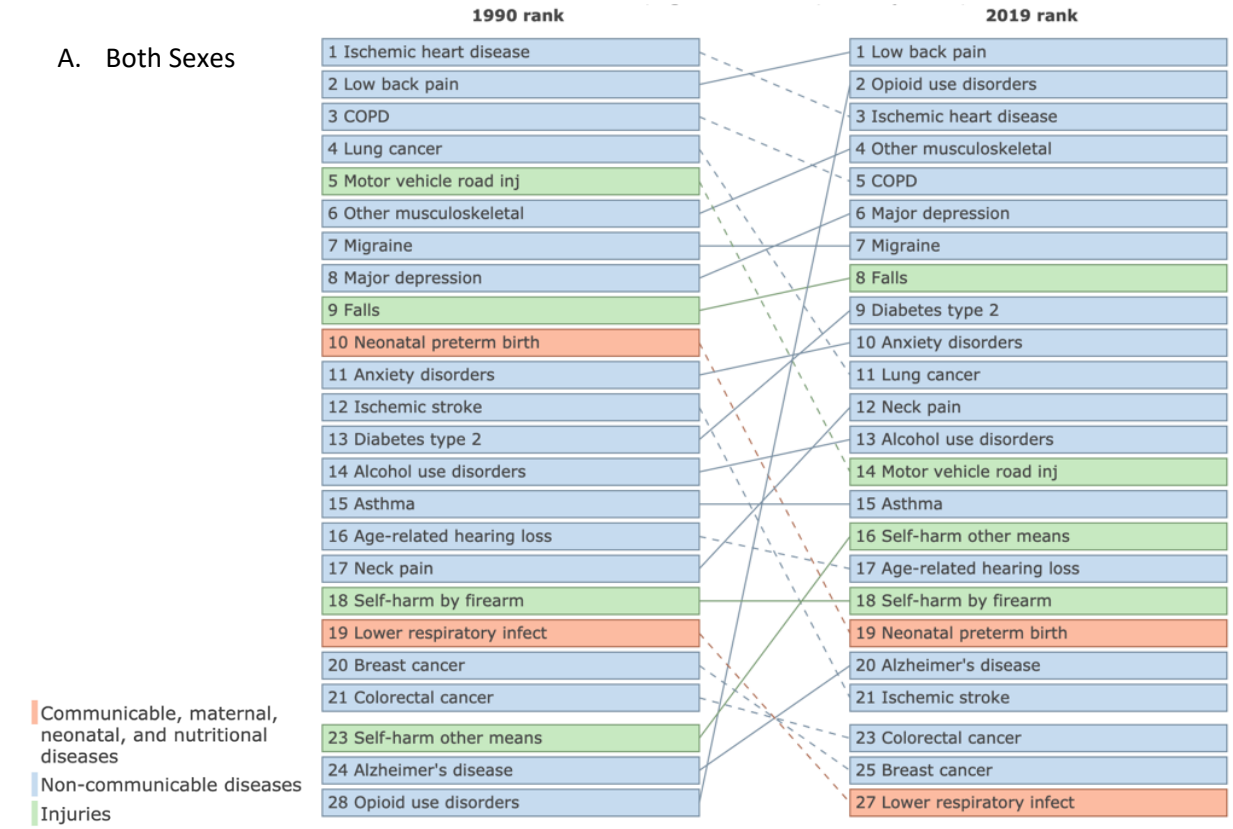
Cause	Disability adjusted life years (DALYs)					
	Females			Males		
	Central Value	Lower Uncertainty Level	Upper Uncertainty Level	Central Value	Lower Uncertainty Level	Upper Uncertainty Level
Acute hepatitis A	68	45	100	76	50	109
Acute hepatitis B	10	7	15	19	13	28
Acute hepatitis C	5	3	8	9	5	15
Acute hepatitis E	6	4	9	7	4	10
Acute lymphoid leukemia	415	320	545	661	482	849
Acute myeloid leukemia	1,847	1,407	2,385	2,670	1,950	3,498
Alcoholic cardiomyopathy	239	172	382	1,692	1,143	2,462
Amphetamine use disorders	1,367	969	1,813	2,560	1,969	3,251
Anorexia nervosa	1,072	644	1,661	246	137	395
Asbestosis	10	6	14	169	122	228
Ascariasis	0	0	0	0	0	0
Bulimia nervosa	2,383	1,383	3,776	1,001	567	1,596
Cellulitis	599	333	810	629	296	1,033
Chlamydial infection	28	19	41	5	3	9
Chronic kidney disease	12,595	10,226	15,179	14,622	11,935	17,720
Chronic kidney disease due to diabetes mellitus type 1	391	252	579	531	330	815
Chronic kidney disease due to diabetes mellitus type 2	3,557	2,691	4,604	3,717	2,678	4,991
Chronic kidney disease due to glomerulonephritis	1,595	1,191	2,088	2,022	1,474	2,719
Chronic kidney disease due to hypertension	3,920	3,017	4,962	5,034	3,841	6,404
Chronic kidney disease due to other and unspecified causes	3,130	2,368	3,968	3,319	2,476	4,215
Chronic lymphoid leukemia	491	360	648	1,127	811	1,553
Chronic myeloid leukemia	204	151	274	336	239	456
Cirrhosis and other chronic liver diseases due to alcohol use	2,522	1,787	3,438	6,256	4,467	8,489
Cirrhosis and other chronic liver diseases due to hepatitis B	257	184	349	622	448	841
Cirrhosis and other chronic liver diseases due to hepatitis C	4,761	3,552	6,289	11,093	8,230	14,853
Cirrhosis and other chronic liver diseases due to NAFLD	1,488	933	2,245	1,341	823	2,065
Cirrhosis and other chronic liver diseases due to other causes	2,723	1,829	3,906	2,355	1,504	3,499
Coal workers pneumoconiosis	3	2	5	63	43	91
Cocaine use disorders	3,048	2,246	3,972	6,144	4,823	7,804
Congenital heart anomalies	1,290	1,011	1,814	1,751	1,339	2,219
Congenital musculoskeletal and limb anomalies	1,159	795	1,595	930	636	1,281
Cyclist road injuries	511	392	650	1,574	1,256	1,944
Diabetes mellitus type 1	2,100	1,531	2,786	3,046	2,233	4,035

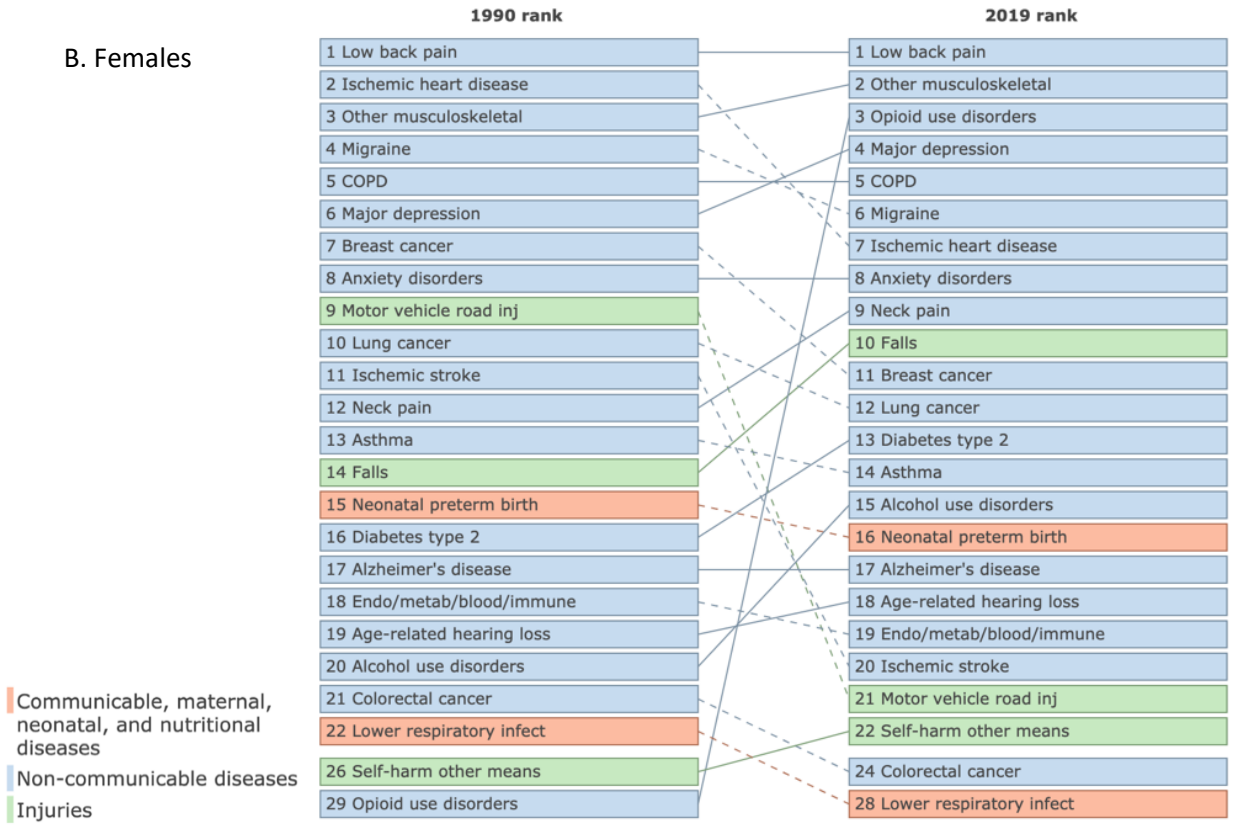
Diabetes mellitus type 2	20,503	15,612	26,109	27,358	21,089	34,658
Digestive congenital anomalies	277	192	432	366	245	487
Down syndrome	326	244	418	477	363	622
Drug-susceptible tuberculosis	127	97	159	172	129	219
Ectopic pregnancy	15	10	21	0	0	0
Endometriosis	903	550	1,414	0	0	0
Extensively drug-resistant tuberculosis	1	0	4	1	0	5
Foreign body in other body part	455	329	605	470	338	638
G6PD deficiency	92	62	135	172	126	226
Gastritis and duodenitis	485	338	674	400	289	533
Genital prolapse	318	155	592	0	0	0
Gonococcal infection	32	25	40	5	4	8
Hemolytic disease and other neonatal jaundice	53	40	68	57	44	73
HIV/AIDS - Drug-susceptible Tuberculosis	10	6	15	42	26	66
HIV/AIDS - Extensively drug-resistant Tuberculosis	0	0	0	0	0	2
HIV/AIDS - Multidrug-resistant Tuberculosis without extensive drug resistance	0	0	1	2	0	6
HIV/AIDS resulting in other diseases	641	515	799	2,809	2,261	3,550
Indirect maternal deaths	86	58	120	0	0	0
Intracerebral hemorrhage	6,707	5,402	8,354	7,682	5,797	9,945
Ischemic stroke	16,370	13,447	19,280	11,254	9,088	13,460
Late maternal deaths	115	65	187	0	0	0
Liver cancer due to alcohol use	328	236	446	2,538	1,775	3,470
Liver cancer due to hepatitis B	247	182	331	859	588	1,222
Liver cancer due to hepatitis C	1,138	858	1,478	1,819	1,257	2,560
Liver cancer due to NASH	290	215	389	467	319	662
Liver cancer due to other causes	301	229	387	457	317	630
Maternal abortion and miscarriage	15	10	21	0	0	0
Maternal deaths aggravated by HIV/AIDS	0	0	1	0	0	0
Maternal hemorrhage	108	68	168	0	0	0
Maternal hypertensive disorders	149	102	211	0	0	0
Maternal obstructed labor and uterine rupture	34	15	59	0	0	0
Maternal sepsis and other maternal infections	63	32	112	0	0	0
Motor vehicle road injuries	8,991	7,325	10,895	15,458	12,365	18,881
Motorcyclist road injuries	829	657	1,006	4,872	3,962	5,930
Multidrug-resistant tuberculosis without extensive drug resistance	4	0	15	5	0	19
Myelodysplastic, myeloproliferative, and other hematopoietic neoplasms	1,080	845	1,361	1,618	1,111	2,557
Myocarditis	321	202	442	408	242	561
Neonatal encephalopathy due to birth asphyxia and trauma	1,890	1,569	2,244	2,130	1,701	2,654
Neonatal preterm birth	6,701	5,689	7,861	7,520	6,385	8,876
Neonatal sepsis and other neonatal infections	479	381	582	574	453	703
Neural tube defects	463	332	620	392	267	536
Non-rheumatic calcific aortic valve disease	1,914	1,484	2,410	1,981	1,553	2,507

Non-rheumatic degenerative mitral valve disease	730	541	1,058	548	402	767
Non-rheumatic valvular heart disease	2,657	2,111	3,305	2,540	2,020	3,199
Non-venomous animal contact	294	185	463	322	215	496
Opioid use disorders	28,514	21,487	36,370	43,372	34,325	53,513
Orofacial clefts	30	19	44	32	20	48
Other cardiomyopathy	2,648	2,049	3,639	3,802	2,739	6,185
Other chromosomal abnormalities	1,004	758	1,439	999	756	1,326
Other congenital birth defects	1,095	822	1,477	1,417	1,090	1,855
Other drug use disorders	2,994	2,206	3,898	4,033	3,083	5,191
Other exposure to mechanical forces	2,734	1,857	3,947	5,704	3,974	8,183
Other gynecological diseases	6,416	4,298	8,944	0	0	0
Other hemoglobinopathies and hemolytic anemias	375	273	510	217	164	289
Other leukemia	757	574	992	1,257	918	1,664
Other malignant neoplasms	4,065	3,234	5,079	4,426	3,464	5,543
Other maternal disorders	239	175	313	0	0	0
Other neonatal disorders	1,238	945	1,577	1,679	1,316	2,097
Other non-rheumatic valve diseases	13	8	20	11	7	16
Other pneumoconiosis	7	5	11	30	17	42
Other road injuries	277	210	359	172	137	212
Other sexually transmitted infections	123	78	186	7	5	11
Other urinary diseases	115	85	154	223	126	311
Paratyphoid fever	1	0	1	0	0	1
Pedestrian road injuries	1,434	1,184	1,717	3,702	3,016	4,501
Peptic ulcer disease	786	629	973	963	713	1,290
Physical violence by firearm	1,524	1,196	1,919	5,867	4,606	7,288
Physical violence by other means	1,435	1,192	1,716	2,418	1,938	3,004
Physical violence by sharp object	440	348	551	1,250	1,000	1,530
Poisoning by carbon monoxide	319	248	407	816	616	1,053
Poisoning by other means	513	380	670	540	417	694
Pulmonary aspiration and foreign body in airway	1,533	1,287	1,834	2,557	2,136	3,029
Pyoderma	287	147	508	306	100	699
Self-harm by firearm	2,912	2,157	3,745	20,097	15,187	26,984
Self-harm by other specified means	8,178	6,240	10,383	16,029	10,224	20,888
Sickle cell disorders	59	39	90	42	30	57
Silicosis	7	4	10	95	68	132
Subarachnoid hemorrhage	4,548	3,701	5,505	3,199	2,461	4,090
Syphilis	17	12	23	48	36	61
Thalassemias	58	42	81	33	25	42
Thyroid cancer	472	365	591	528	375	677
Unintentional firearm injuries	150	115	197	520	390	683
Urinary tract infections and interstitial nephritis	2,518	1,980	3,179	1,509	1,134	2,002
Urogenital congenital anomalies	152	105	231	270	175	395
Urolithiasis	155	118	198	140	102	185
Uterine fibroids	821	395	1,585	0	0	0

Venomous animal contact	134	91	186	145	103	197
Visceral leishmaniasis	0	0	0	0	0	0
Communicable, maternal, neonatal, and nutritional diseases	32,970	28,077	38,789	34,868	30,262	39,992
Injuries	65,411	53,186	79,692	117,894	96,840	142,776
Non-communicable diseases	706,486	581,790	833,644	718,861	591,060	855,254
All causes	**804,867**	**666,040**	**950,057**	**871,624**	**719,839**	**1,037,227**

Figure S4. Arrow diagram of top ranked causes of disability adjusted life years (DALYs), in Colorado, in (A) both sexes (B) females and (C) males, Level 4, age standardized, 1990 - 2019





C. Males

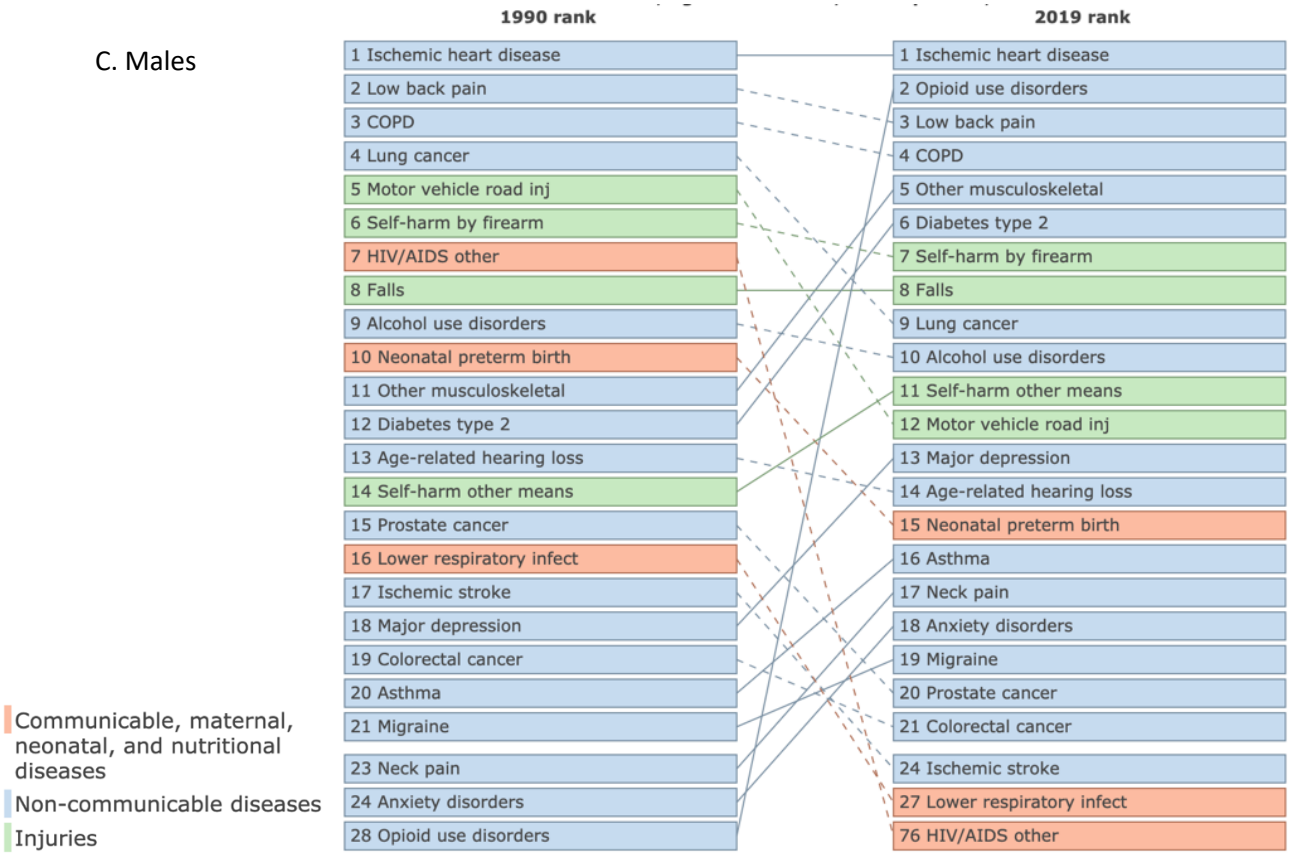
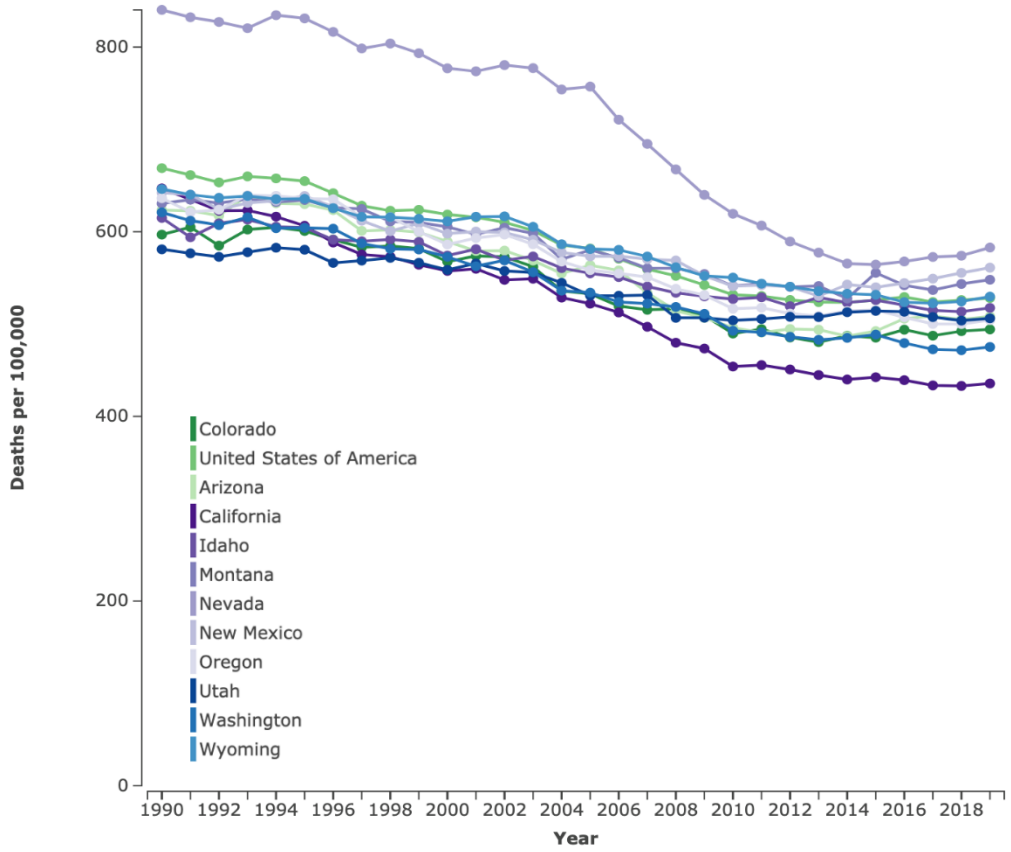

1990 rank
2019 rank
1 Ischemic heart disease
2 Low back pain
3 COPD
4 Lung cancer
5 Motor vehicle road inj
6 Self-harm by firearm
7 HIV/AIDS other
8 Falls
9 Alcohol use disorders
10 Neonatal preterm birth
11 Other musculoskeletal
12 Diabetes type 2
13 Age-related hearing loss
14 Self-harm other means
15 Prostate cancer
16 Lower respiratory infect
17 Ischemic stroke
18 Major depression
19 Colorectal cancer
20 Asthma
21 Migraine
23 Neck pain
24 Anxiety disorders
28 Opioid use disorders
1 Ischemic heart disease
2 Opioid use disorders
3 Low back pain
4 COPD
5 Other musculoskeletal
6 Diabetes type 2
7 Self-harm by firearm
8 Falls
9 Lung cancer
10 Alcohol use disorders
11 Self-harm other means
12 Motor vehicle road inj
13 Major depression
14 Age-related hearing loss
15 Neonatal preterm birth
16 Asthma
17 Neck pain
18 Anxiety disorders
19 Migraine
20 Prostate cancer
21 Colorectal cancer
24 Ischemic stroke
27 Lower respiratory infect
76 HIV/AIDS other
Communicable, maternal, neonatal, and nutritional diseases
Non-communicable diseases
Injuries

Figure S5. Line graph of age-standardized rates of (A) death and (B) disability adjusted life years (DALYs), per 100,000 people, in Colorado, West States, and the United States, in both sexes, 1990-2019



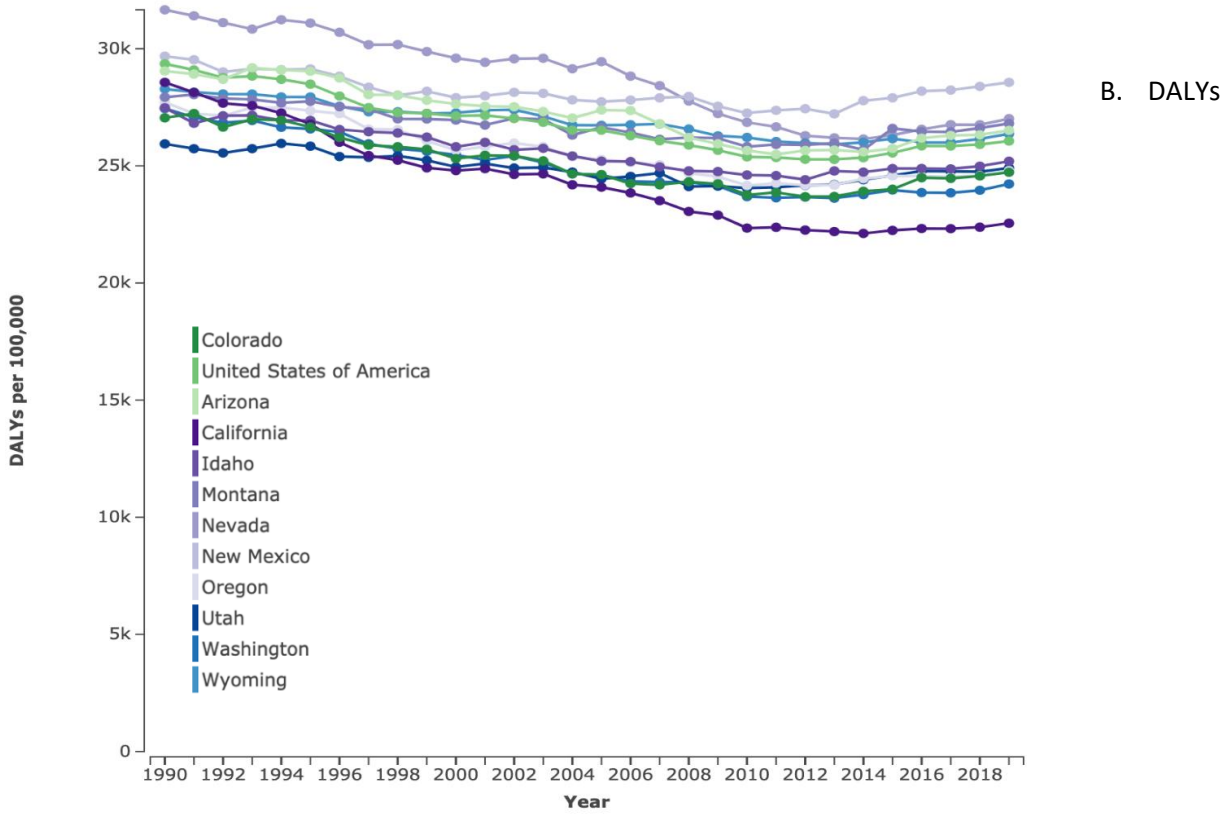
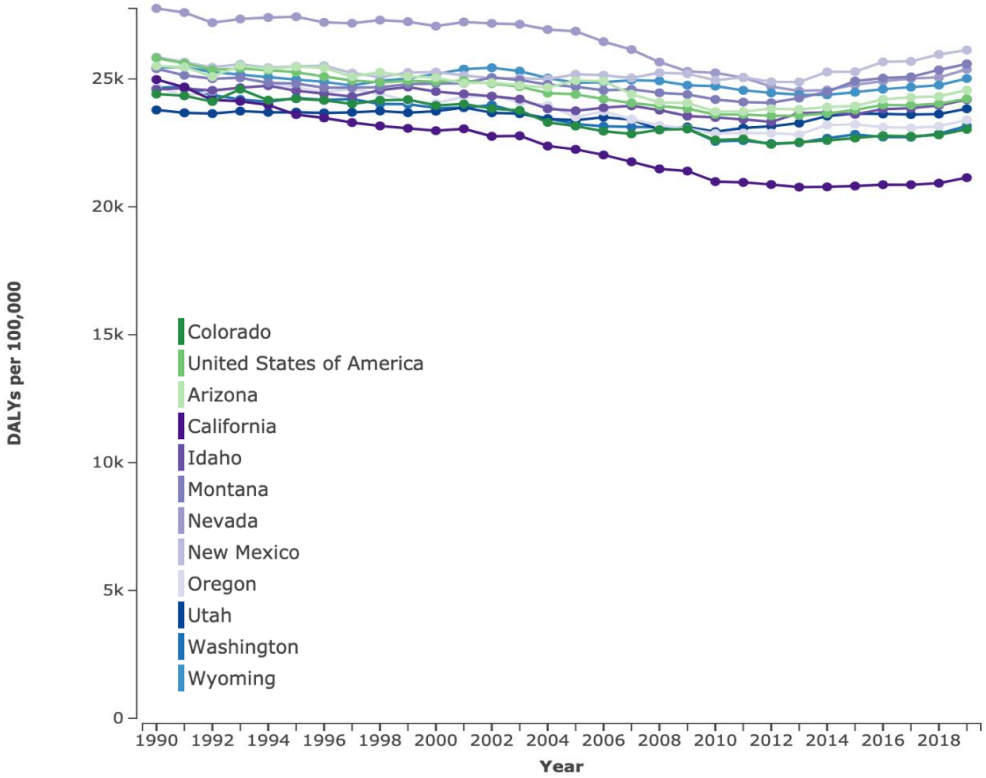
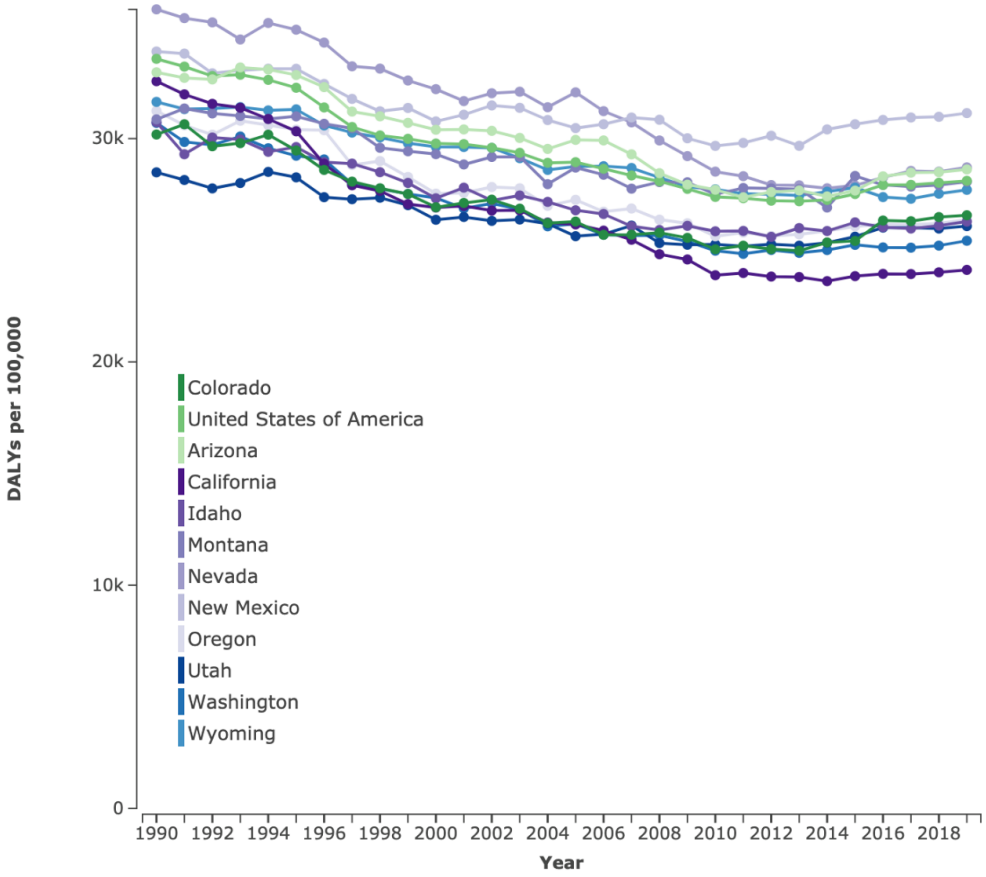


Figure S6. Line graph of disability adjusted life years (DALYs), in Colorado, West States, and the United States by (A) females and (B) males, Level 4, age standardized, 1990 - 2019



A. Females



B. Males

Figure S7. Heat map of top ranked causes of disability-adjusted life years (DALYS) in Colorado, West States, and the United States for (A) females (B) males, Level 4, age standardized, in 2019.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

A. Females

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Low back pain	1	1	1	1	1	1	1	1	1	1	1	1
Other musculoskeletal	2	2	3	2	2	2	4	3	2	4	2	2
Opioid use disorders	3	3	2	5	3	3	2	2	3	2	3	3
Major depression	4	5	4	6	4	5	6	4	4	3	4	5
COPD	5	6	6	8	5	4	5	6	6	8	6	4
Migraine	6	7	7	3	7	7	7	7	5	5	5	7
Ischemic heart disease	7	4	5	4	6	6	3	5	7	6	8	6
Anxiety disorders	8	8	8	7	9	9	9	9	11	9	9	8
Neck pain	9	11	10	9	8	10	10	10	9	10	7	15
Falls	10	14	14	14	13	14	14	11	13	11	12	13
Breast cancer	11	12	13	11	12	13	12	12	12	12	13	12
Lung cancer	12	10	12	13	11	8	8	15	8	18	10	9
Diabetes type 2	13	9	9	10	10	12	11	8	10	7	11	10
Asthma	14	13	11	12	17	15	13	14	14	14	14	14
Alcohol use disorders	15	23	20	22	22	21	20	17	21	26	23	18
Neonatal preterm birth	16	15	16	18	19	18	16	18	20	19	19	21
Alzheimer's disease	17	20	21	19	20	20	22	20	18	22	18	20
Age-related hearing loss	18	18	18	15	18	19	18	19	17	16	17	19
Endo/metab/blood/immune	19	16	15	16	15	17	17	16	15	15	16	16
Ischemic stroke	20	17	19	17	16	16	15	21	16	13	15	17
Motor vehicle road inj	21	19	17	21	14	11	19	13	19	20	22	11
Self-harm other means	22	28	24	29	24	22	25	22	25	17	26	26
Schizophrenia	23	22	22	20	21	24	26	25	22	21	21	24
Colorectal cancer	24	21	23	23	23	23	21	23	23	24	24	22
Osteoarthritis hand	25	24	26	25	25	25	28	24	24	25	20	23

B. Males

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	2	2	2	1	1
Opioid use disorders	2	2	2	3	2	2	2	1	1	1	2	2
Low back pain	3	3	3	2	3	3	3	3	3	3	3	3
COPD	4	4	5	5	4	4	4	5	4	5	6	4
Other musculoskeletal	5	7	6	6	5	7	7	7	6	6	4	6
Diabetes type 2	6	5	4	4	6	8	6	4	5	4	5	8
Self-harm by firearm	7	14	9	28	7	6	8	9	9	7	13	7
Falls	8	11	13	14	12	11	16	12	10	12	8	11
Lung cancer	9	6	7	7	8	9	5	10	7	11	7	9
Alcohol use disorders	10	13	8	9	14	10	9	6	8	13	14	10
Self-harm other means	11	18	15	18	15	13	13	14	14	9	12	14
Motor vehicle road inj	12	8	10	10	9	5	12	8	13	15	16	5
Major depression	13	12	11	12	10	12	10	11	11	8	9	12
Age-related hearing loss	14	9	12	8	11	14	11	15	12	10	11	13
Neonatal preterm birth	15	10	19	19	18	18	20	16	15	14	18	15
Asthma	16	19	14	15	23	20	18	18	20	22	20	21
Neck pain	17	16	16	13	13	26	17	26	17	25	10	23
Anxiety disorders	18	20	18	16	16	15	19	20	26	16	15	16
Migraine	19	21	20	17	17	16	22	21	16	17	17	17
Prostate cancer	20	22	24	21	19	19	23	23	18	18	19	19
Colorectal cancer	21	17	21	20	21	17	15	17	21	20	21	18
Alzheimer's disease	22	25	26	26	25	23	29	27	24	29	25	28
Cirrhosis hepatitis C	23	30	23	23	27	24	25	13	23	31	26	25
Ischemic stroke	24	23	25	22	20	21	26	24	19	19	22	20
Schizophrenia	25	27	27	24	24	25	28	30	25	23	24	26

Figure S8. Heat map of top ranked causes of disability-adjusted life years (DALYS) in Colorado, West States, and the United States, for both sexes, Level 4, age standardized, in 1990.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
Low back pain	2	2	2	2	2	2	2	2	2	2	2	2
COPD	3	4	4	4	4	4	4	4	4	3	4	4
Lung cancer	4	3	3	3	5	5	3	5	3	10	3	5
Motor vehicle road inj	5	5	5	6	3	3	5	3	5	4	5	3
Other musculoskeletal	6	7	6	7	6	6	7	7	6	6	6	6
Migraine	7	8	7	8	7	7	9	9	7	8	7	7
Major depression	8	12	8	21	8	8	10	10	9	7	8	9
Falls	9	16	16	19	15	14	20	13	11	12	12	14
Neonatal preterm birth	10	6	9	9	13	17	15	11	16	18	15	15
Anxiety disorders	11	13	13	12	14	12	14	15	19	11	13	12
Ischemic stroke	12	10	14	10	9	9	8	14	8	9	9	10
Diabetes type 2	13	9	10	11	10	10	11	6	10	5	10	11
Alcohol use disorders	14	22	11	18	19	13	13	8	12	21	19	13
Asthma	15	19	15	16	17	16	18	16	15	16	16	18
Age-related hearing loss	16	17	17	15	16	15	17	17	14	14	14	17
Neck pain	17	18	18	20	12	19	21	21	13	20	11	25
Self-harm by firearm	18	25	12	26	11	11	6	12	17	13	20	8
Lower respiratory infect	19	20	19	14	20	21	12	19	21	15	21	16
Breast cancer	20	14	20	17	18	18	19	20	18	19	17	19
Colorectal cancer	21	15	21	23	21	20	16	23	20	23	18	20
HIV/AIDS other	22	11	25	5	68	75	27	31	28	40	25	85
Self-harm other means	23	29	28	29	27	23	22	22	26	17	22	27
Alzheimer's disease	24	23	24	24	23	22	29	25	22	24	23	22
SIDS	25	30	27	28	25	24	25	29	23	26	24	21

Figure S9. Pyramid of disability adjusted life years (DALYs) in Colorado and the United States, by sex and all ages in 2019

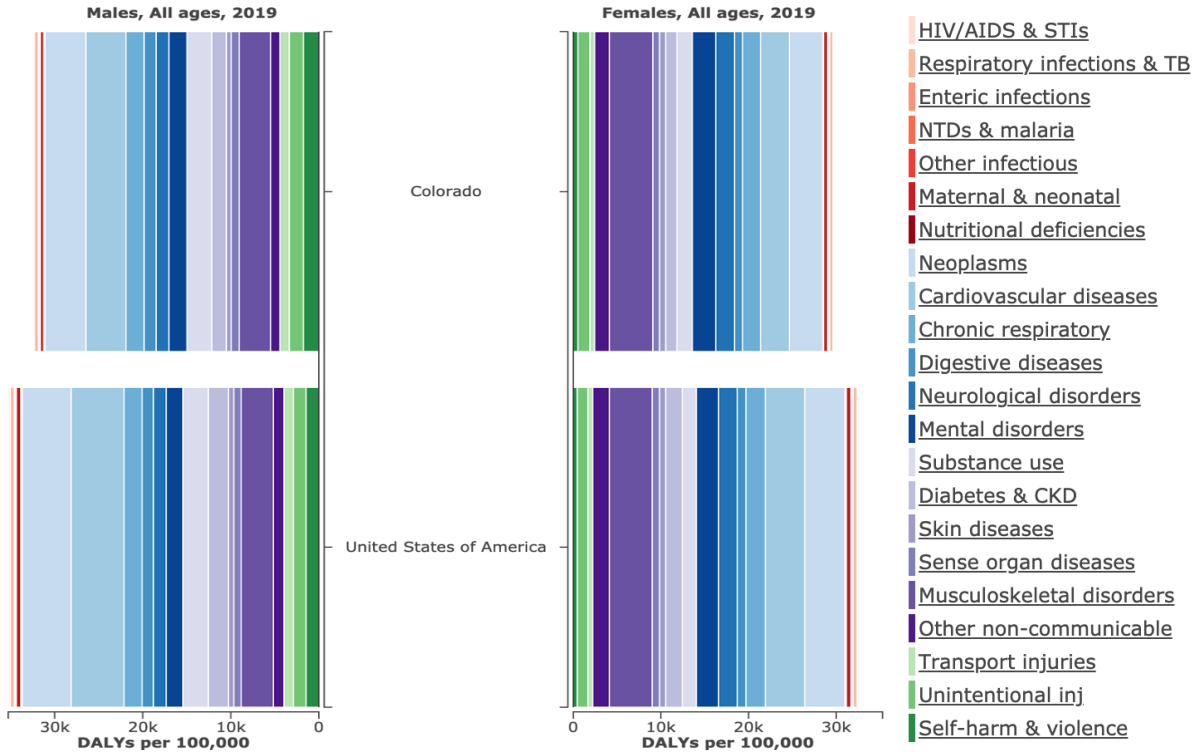


Figure S10. Pyramid of disability adjusted life years (DALYs) in Colorado, Earth and the United States, by sex and all ages in 2019

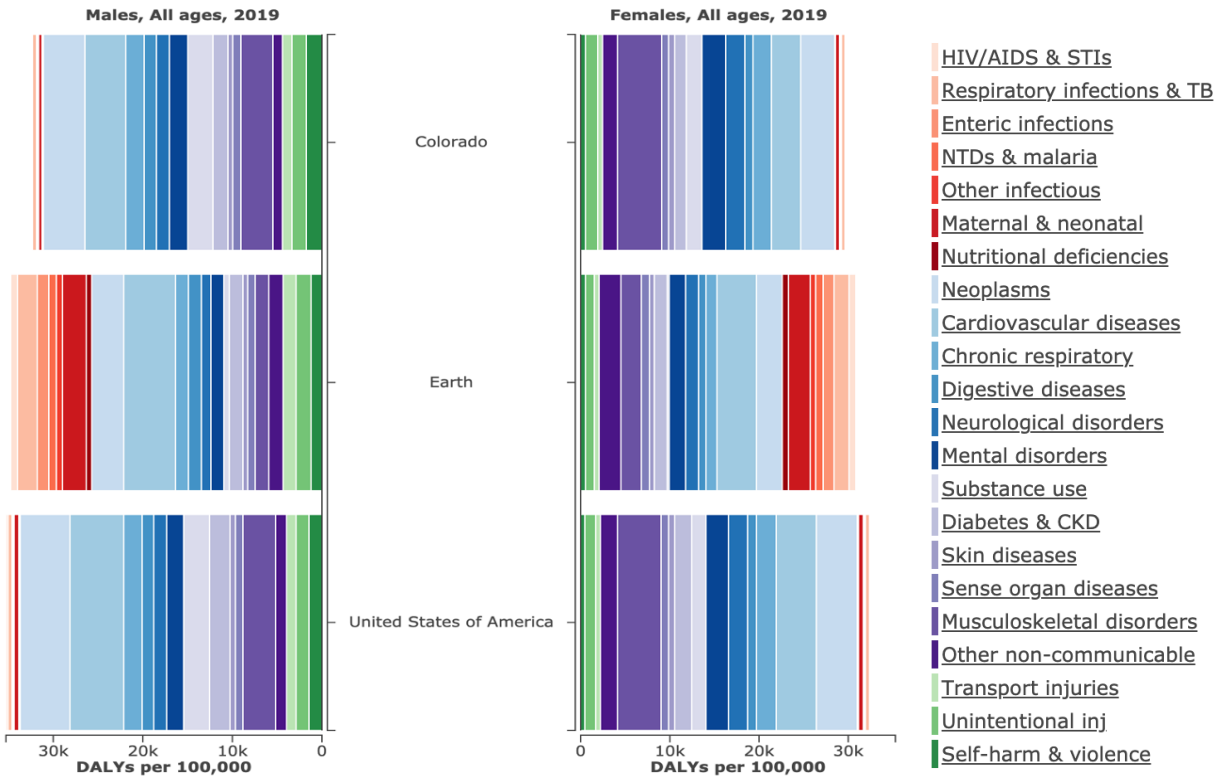


Figure S11. Heat map of top ranked years of life lost (YLL) in Colorado, West states, and the United States in (A) both sexes (B) females and (C) males, Level 4, age standardized, in 2019.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

A. Both Sexes

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
Opioid use disorders	2	3	2	3	4	5	3	2	3	2	3	3
COPD	3	4	4	4	2	4	4	3	4	3	4	2
Lung cancer	4	2	3	2	3	2	2	4	2	6	2	5
Self-harm other means	5	8	7	6	7	7	6	7	5	4	5	7
Self-harm by firearm	6	10	6	20	6	6	5	6	6	5	7	6
Motor vehicle road inj	7	5	5	5	5	3	9	5	7	8	8	4
Colorectal cancer	8	6	8	7	8	8	7	10	8	9	6	8
Neonatal preterm birth	9	7	12	13	11	12	14	12	11	11	12	10
Alzheimer's disease	10	16	17	14	14	13	18	17	15	17	11	15
Cirrhosis hepatitis C	11	19	11	12	17	14	12	9	13	19	16	14
Breast cancer	12	11	13	9	10	9	11	15	10	12	10	11
Lower respiratory infect	13	13	14	11	13	11	10	13	19	10	17	9
Alcohol use disorders	14	25	15	24	23	17	20	8	17	20	24	12
Falls	15	22	22	32	19	19	26	19	20	18	19	20
Pancreatic cancer	16	15	16	15	15	15	16	18	14	14	13	16
Ischemic stroke	17	17	20	17	12	16	17	21	12	13	15	17
Diabetes type 2	18	9	9	10	9	10	19	11	9	7	9	13
Intracerebral hem	19	14	21	16	18	20	15	22	18	16	18	19
Endo/metab/blood/immune	20	20	18	19	16	18	21	16	16	15	14	18
Violence firearm	21	12	10	8	43	29	13	14	26	45	25	31
Brain cancer	22	21	25	21	20	21	25	27	21	21	20	21
Hypertensive heart disease	23	18	19	18	25	26	8	25	36	26	21	25
Prostate cancer	24	24	26	23	21	22	22	28	22	22	23	22
Other malignant neoplasms	25	23	27	22	22	23	27	26	23	23	22	23

B. Females

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
COPD	2	3	3	4	2	3	3	3	3	3	3	2
Lung cancer	3	2	2	2	3	2	2	4	2	6	2	3
Breast cancer	4	4	4	3	4	5	4	5	4	2	4	4
Opioid use disorders	5	5	5	6	6	6	5	2	5	4	5	6
Self-harm other means	6	13	7	11	8	7	8	7	8	5	8	12
Alzheimer's disease	7	9	11	7	10	9	13	11	9	14	7	9
Motor vehicle road inj	8	7	6	8	5	4	10	6	6	10	10	5
Colorectal cancer	9	8	8	5	7	8	6	8	7	11	6	7
Neonatal preterm birth	10	6	9	10	11	10	12	10	13	12	12	10
Ischemic stroke	11	12	13	12	9	13	11	16	10	9	9	11
Lower respiratory infect	12	10	12	9	13	11	7	13	17	8	16	8
Pancreatic cancer	13	14	14	14	14	14	15	17	14	15	14	14
Ovarian cancer	14	17	17	15	16	16	16	18	15	16	15	17
Diabetes type 2	15	11	10	13	12	12	18	9	11	7	11	13
Endo/metab/blood/immune	16	16	15	17	15	15	20	15	12	13	13	15
Intracerebral hem	17	15	18	16	17	18	14	19	16	17	17	16
Falls	18	28	21	43	22	20	35	20	20	18	21	24
Alcohol use disorders	19	39	23	35	31	21	21	14	22	28	26	20
Cirrhosis hepatitis C	20	20	16	19	19	19	17	12	18	24	18	19
Other malignant neoplasms	21	19	22	20	20	22	22	23	19	21	19	22
Brain cancer	22	21	24	22	21	23	26	27	21	23	20	21
Self-harm by firearm	23	33	20	52	18	17	19	21	23	19	27	18
Other cardiovascular	24	25	31	30	25	29	29	31	28	25	24	23
Hypertensive heart disease	25	18	19	18	23	28	9	25	33	22	22	28

C. Males

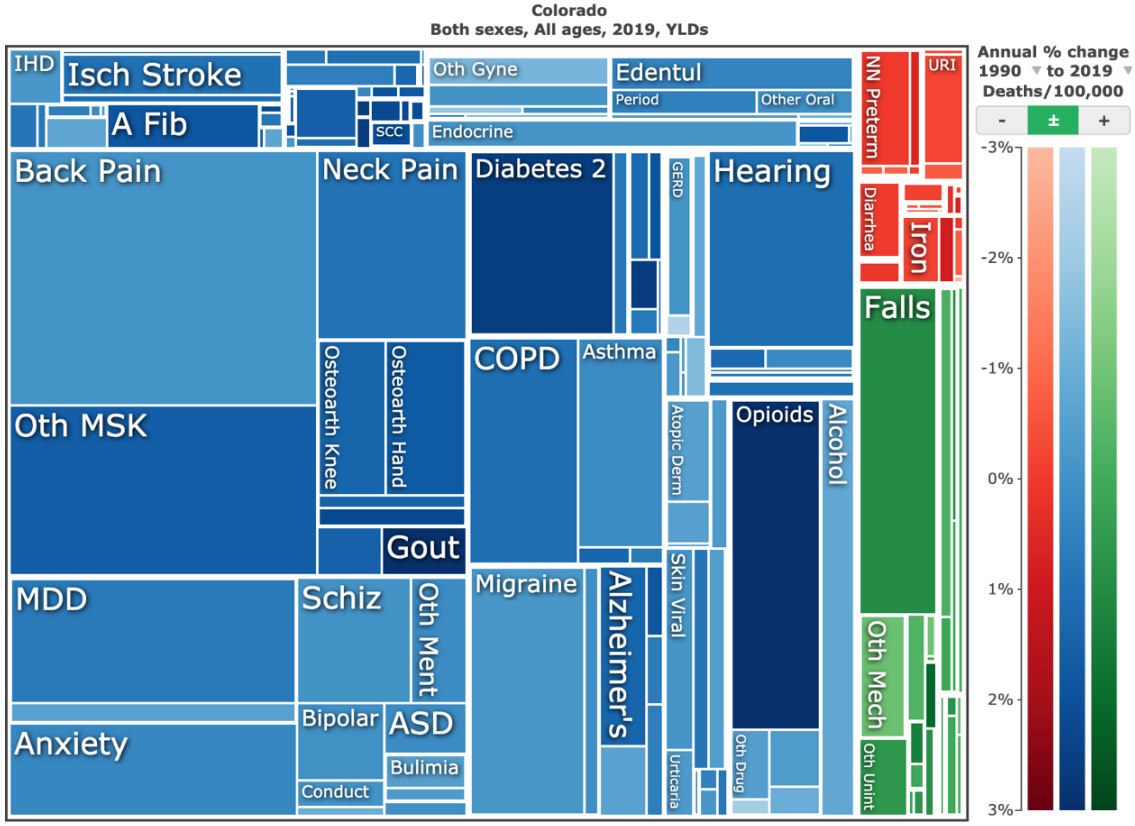
	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
Opioid use disorders	2	2	2	3	5	4	2	2	2	2	2	2
COPD	3	4	4	4	4	6	4	5	4	4	4	5
Self-harm by firearm	4	6	5	12	2	2	5	3	5	3	5	3
Lung cancer	5	3	3	2	3	5	3	6	3	6	3	6
Self-harm other means	6	8	7	6	7	7	6	9	6	5	6	7
Motor vehicle road inj	7	5	6	7	6	3	9	4	7	8	7	4
Colorectal cancer	8	9	11	8	8	8	8	10	9	9	8	8
Cirrhosis hepatitis C	9	14	10	9	12	11	12	8	10	17	11	11
Alcohol use disorders	10	21	12	20	21	12	16	7	12	14	22	9
Prostate cancer	11	13	13	11	9	10	13	16	11	10	10	13
Neonatal preterm birth	12	10	14	15	11	16	17	13	13	12	13	10
Falls	13	22	19	27	19	14	23	17	18	19	16	16
Diabetes type 2	14	11	9	10	10	9	18	11	8	7	9	14
Lower respiratory infect	15	12	15	13	14	13	11	14	20	11	17	12
Pancreatic cancer	16	16	16	17	13	15	15	18	14	13	12	15
Violence firearm	17	7	8	5	35	30	10	12	25	34	21	28
Alzheimer's disease	18	20	23	19	18	18	20	23	19	22	19	20
Intracerebral hem	19	15	20	14	17	20	14	22	16	18	15	18
Ischemic stroke	20	19	24	21	15	19	19	25	17	16	18	19
Endo/metab/blood/immune	21	18	17	18	16	17	22	19	15	15	14	17
Cirrhosis alcohol	22	26	21	22	25	24	21	15	21	32	25	23
Hypertensive heart disease	23	17	18	16	27	29	7	24	40	27	24	27
Brain cancer	24	23	26	23	20	21	26	28	22	20	20	21
Esophageal cancer	25	24	27	30	23	23	24	29	23	30	23	22

Figure S12. Heat map of top ranked years of life lost (YLL) in Colorado, West States, and the United States, both sexes, Level 4, age standardized in 1990.*Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Ischemic heart disease	1	1	1	1	1	1	1	1	1	1	1	1
Lung cancer	2	2	2	2	3	3	2	3	2	3	2	3
Motor vehicle road inj	3	3	3	4	2	2	4	2	3	2	3	2
COPD	4	5	4	5	4	4	3	4	4	5	4	4
Self-harm by firearm	5	12	5	12	5	5	5	5	6	4	7	5
Lower respiratory infect	6	9	7	8	8	8	6	7	9	6	9	6
Neonatal preterm birth	7	4	6	7	7	10	13	6	11	13	12	8
Self-harm other means	8	15	14	14	12	12	10	8	12	8	10	12
Colorectal cancer	9	7	9	11	10	7	8	11	7	11	8	9
HIV/AIDS other	10	6	11	3	44	47	15	20	13	23	13	52
Breast cancer	11	8	8	10	9	9	9	12	8	10	6	11
Ischemic stroke	12	10	10	9	6	6	7	10	5	7	5	7
SIDS	13	16	12	13	11	11	12	15	10	12	11	10
Alzheimer's disease	14	17	18	18	14	14	22	18	15	15	15	14
Diabetes type 2	15	13	16	17	13	13	17	9	14	9	14	13
Congenital heart	16	18	17	16	15	17	24	19	19	16	17	16
Intracerebral hem	17	14	19	15	16	15	16	21	16	14	16	15
Prostate cancer	18	20	22	23	17	16	21	23	18	17	20	17
Pancreatic cancer	19	19	21	21	19	18	20	22	17	19	18	18
Violence firearm	20	11	13	6	37	23	11	14	25	37	19	26
Lymphoma	21	21	23	24	20	19	25	31	20	20	22	23
Brain cancer	22	25	26	28	21	20	29	34	21	21	21	22
Neonatal encephalopathy	23	29	31	34	25	24	39	35	26	34	30	19
Cirrhosis hepatitis C	24	24	20	19	32	26	18	17	27	24	24	21
Other malignant neoplasms	25	27	27	29	23	21	30	29	23	22	23	24

Figure S13. Tree map of top causes of (A) years of healthy life lost due to disability (YLDs) and (B) years of life lost (YLLs) in Colorado, for both sexes, Level 4, all ages, in 2019.*Blue rectangles are non-communicable disease; red rectangles are communicable; and green rectangles are injuries.

A. YLDs



A. YLLs

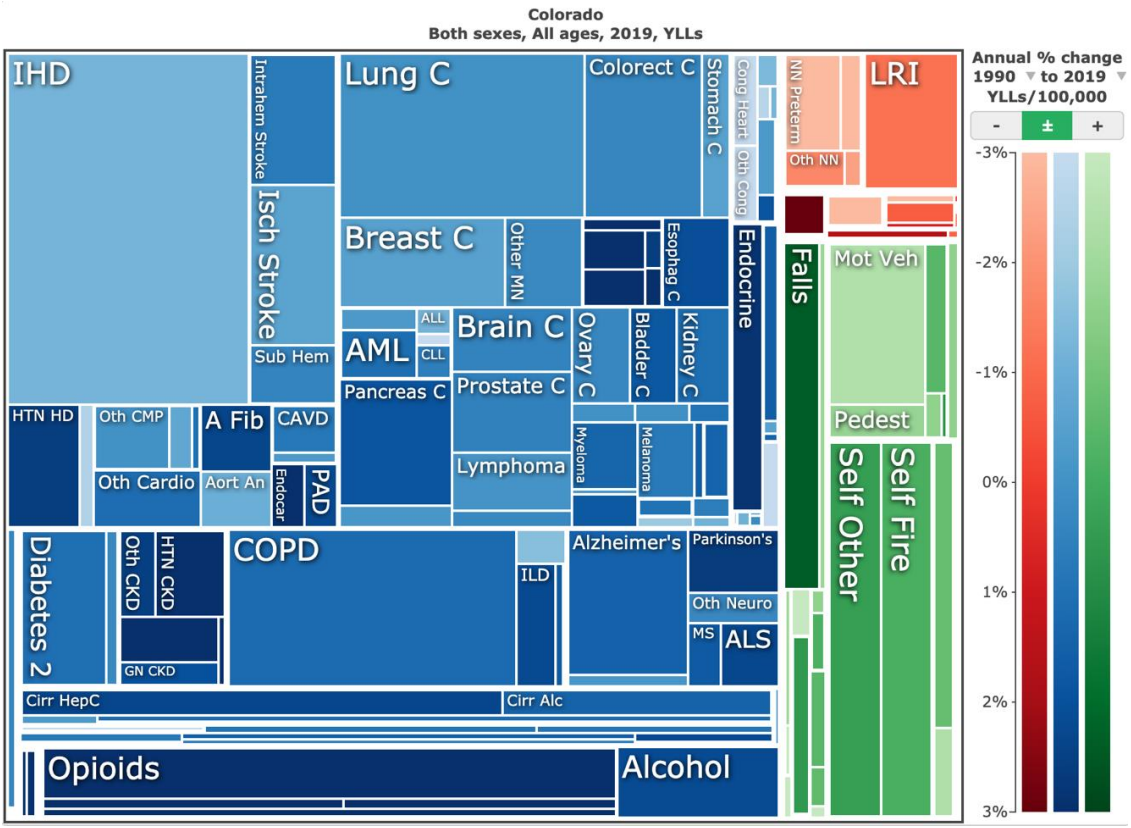


Figure S14. Heat map of top ranked causes of years of healthy life lost due to disability (YLDs) per 100,000 people, in Colorado, West States, and the United States for (A) both sexes, (B) females and (C) males, Level 4, age-standardized, in 2019. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

B. Both Sexes

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Low back pain	1	1	1	1	1	1	1	1	1	1	1	1
Other musculoskeletal	2	2	2	2	2	2	3	3	2	3	2	2
Major depression	3	4	4	5	4	4	4	4	4	2	4	4
Opioid use disorders	4	3	3	4	3	3	2	2	3	4	3	3
Migraine	5	5	5	3	5	5	5	5	5	5	6	5
Anxiety disorders	6	7	7	6	7	6	6	7	9	6	7	6
Neck pain	7	8	6	7	6	7	7	8	6	9	5	11
Age-related hearing loss	8	9	10	9	9	9	9	9	8	8	9	7
Falls	9	12	12	11	10	10	12	11	10	10	10	10
Asthma	10	10	9	10	12	12	10	10	11	11	11	12
Diabetes type 2	11	6	8	8	8	8	8	6	7	7	8	8
COPD	12	11	11	12	11	11	11	12	12	12	12	9
Alcohol use disorders	13	14	13	14	14	13	13	13	14	14	14	13
Schizophrenia	14	13	14	13	13	14	14	14	13	13	13	14
Osteoarthritis hand	15	15	16	15	16	15	16	15	15	15	15	15
Endo/metab/blood/immune	16	16	15	17	15	17	15	16	17	16	17	16
Neonatal preterm birth	17	18	17	20	21	19	17	18	19	21	19	22
Osteoarthritis knee	18	19	20	19	22	22	20	19	21	19	20	21
Ischemic stroke	19	17	18	18	18	16	18	17	16	17	16	17
Bipolar disorder	20	24	21	24	17	18	27	22	24	20	23	26
Viral skin diseases	21	23	28	22	19	23	32	29	20	18	22	27
Other mental disorders	22	22	22	21	23	21	21	21	22	23	21	20
Atopic derm	23	20	19	16	25	31	19	23	18	25	18	25
Edentulism	24	21	23	23	20	20	22	20	23	24	24	18
Alzheimer's disease	25	28	30	29	28	27	30	28	28	32	29	29

B. Females

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Low back pain	1	1	1	1	1	1	1	1	1	1	1	1
Other musculoskeletal	2	2	2	2	2	2	3	2	2	3	2	2
Major depression	3	3	3	4	3	3	4	3	3	2	3	3
Migraine	4	4	5	3	5	5	5	5	4	5	4	4
Opioid use disorders	5	5	4	7	4	4	2	4	5	4	5	5
Anxiety disorders	6	6	6	5	7	6	6	6	7	6	7	6
Neck pain	7	7	7	6	6	7	7	7	6	7	6	7
Asthma	8	9	8	8	11	10	8	9	9	10	10	11
Falls	9	10	10	11	9	8	12	10	10	9	9	9
Age-related hearing loss	10	11	12	10	10	12	11	11	11	11	11	12
COPD	11	12	11	12	12	11	10	12	12	12	12	8
Diabetes type 2	12	8	9	9	8	9	9	8	8	8	8	10
Schizophrenia	13	13	13	13	13	13	13	15	13	13	14	14
Alcohol use disorders	14	20	17	18	17	15	17	16	15	21	19	15
Osteoarthritis hand	15	14	16	15	15	14	16	13	14	14	13	13
Endo/metab/blood/immune	16	15	14	16	14	16	14	14	16	15	16	16
Other gynecological	17	16	15	14	16	19	15	17	17	16	15	18
Premenstrual syndrome	18	17	18	17	18	17	18	18	18	17	17	17
Osteoarthritis knee	19	19	21	20	21	21	22	19	21	19	21	21
Neonatal preterm birth	20	21	22	23	25	23	20	22	23	23	22	25
Ischemic stroke	21	18	20	21	20	18	19	20	19	18	18	19
Viral skin diseases	22	25	27	25	23	25	29	29	22	20	26	27
Atopic derm	23	22	19	19	26	29	21	24	20	26	20	24
Bipolar disorder	24	26	23	27	19	20	26	25	26	22	25	23
Dysthymia	25	24	24	22	24	24	24	23	24	24	23	22

C. Males

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Low back pain	1	1	1	1	1	1	1	1	1	1	1	1
Other musculoskeletal	2	3	3	2	2	2	3	3	3	3	2	2
Opioid use disorders	3	2	2	3	3	3	2	2	2	2	3	3
Major depression	4	6	5	6	4	4	5	5	5	4	5	4
Age-related hearing loss	5	5	6	5	6	6	6	6	6	6	7	5
Diabetes type 2	6	4	4	4	5	5	4	4	4	5	4	6
Neck pain	7	7	7	7	7	14	7	13	8	13	6	12
Anxiety disorders	8	8	9	8	8	7	8	8	14	7	8	7
Falls	9	12	13	14	11	11	13	11	9	9	10	10
Migraine	10	9	11	9	9	8	9	9	7	8	9	9
Asthma	11	10	8	10	12	12	11	10	11	11	11	14
COPD	12	11	12	12	10	10	10	12	12	10	12	8
Alcohol use disorders	13	13	10	11	14	9	12	7	10	14	14	11
Schizophrenia	14	14	14	13	13	13	14	14	13	12	13	13
Other mental disorders	15	15	16	15	16	16	15	15	15	16	15	17
Autism spectrum	16	17	15	16	18	18	17	17	16	15	16	18
Neonatal preterm birth	17	16	17	20	19	19	16	18	20	19	19	21
Other mechanical forces	18	19	23	18	15	15	18	19	18	18	17	15
Bipolar disorder	19	22	18	23	17	20	30	24	24	21	24	30
Viral skin diseases	20	20	26	21	22	24	28	30	22	17	23	28
Osteoarthritis hand	21	24	24	25	21	17	25	16	19	22	21	16
Osteoarthritis knee	22	25	25	24	26	25	26	23	26	23	25	22
Ischemic stroke	23	18	19	19	20	21	19	20	17	20	18	19
Atrial fibrillation	24	21	22	22	23	22	23	28	23	26	22	24
Atopic derm	25	23	20	17	28	32	21	26	21	28	20	26

Figure S15. Heat of top ranked years lived with disability (YLD) in Colorado, West States, and the United States, both sexes, Level 4, age standardized in 1990. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Low back pain	1	1	1	1	1	1	1	1	1	1	1	1
Other musculoskeletal	2	2	2	3	2	2	3	4	2	4	2	2
Migraine	3	3	3	2	3	3	2	2	3	3	3	3
Major depression	4	4	4	7	4	4	4	3	4	2	4	4
Anxiety disorders	5	5	5	4	6	5	5	5	7	5	6	5
Age-related hearing loss	6	6	6	5	7	6	6	6	6	6	7	6
Neck pain	7	7	7	6	5	7	7	11	5	8	5	12
Falls	8	11	11	10	10	11	12	9	10	9	8	8
Asthma	9	8	8	8	9	9	9	8	8	10	10	9
COPD	10	9	10	9	8	8	8	12	9	11	9	7
Alcohol use disorders	11	12	9	11	12	10	10	7	11	13	12	10
Schizophrenia	12	13	13	13	13	13	13	14	13	12	13	13
Diabetes type 2	13	10	12	12	11	12	11	10	12	7	11	11
Endo/metab/blood/immune	14	14	15	15	14	14	15	15	15	14	16	14
Osteoarthritis hand	15	17	16	21	17	15	17	16	16	16	15	15
Opioid use disorders	16	15	14	14	15	17	14	13	14	15	14	19
Other mechanical forces	17	19	21	17	16	16	19	18	17	21	18	16
Edentulism	18	18	18	19	20	19	18	17	19	19	19	18
Osteoarthritis knee	19	22	22	22	23	23	23	21	23	20	22	21
Other gynecological	20	21	17	20	21	21	20	19	21	23	21	20
Ischemic stroke	21	16	20	18	19	18	16	20	18	17	17	17
Neonatal preterm birth	22	20	24	25	30	29	22	23	27	27	29	30
Bipolar disorder	23	27	23	27	18	20	29	26	26	22	26	28
Viral skin diseases	24	25	29	26	22	25	30	30	22	18	24	27
Atopic derm	25	23	19	16	26	30	21	25	20	26	20	25

Figure S16. Top ranked deaths per 100,000 people attributable to major risk factors in Colorado, both sexes, Level 4, age-standardized, in 2019

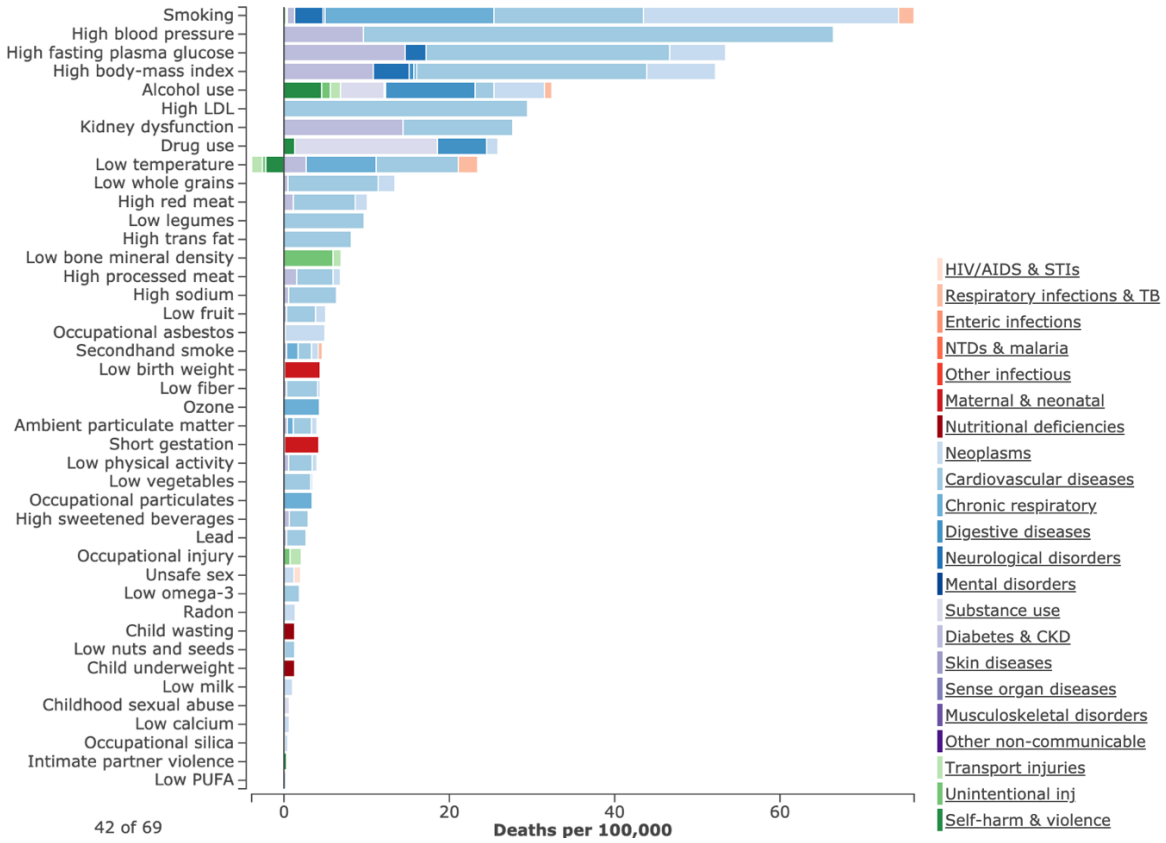


Figure S17. Arrow diagram of top risk factors for (A) deaths and (B) disability-adjusted life years (DALYs) per 100,000 people in Colorado, both sexes, Level 4, age-standardized, 1990-2019



Figure S18. Arrow diagram of top ranked risk factors for deaths in Colorado, in (A) females and (B) males, Level 4, age-standardized, in 2019



Figure S19. Arrow diagram of top ranked risk factors contributing to disability adjusted life years (DALYs) in Colorado, in (A) females and (B) males, Level 4, age-standardized, 2019

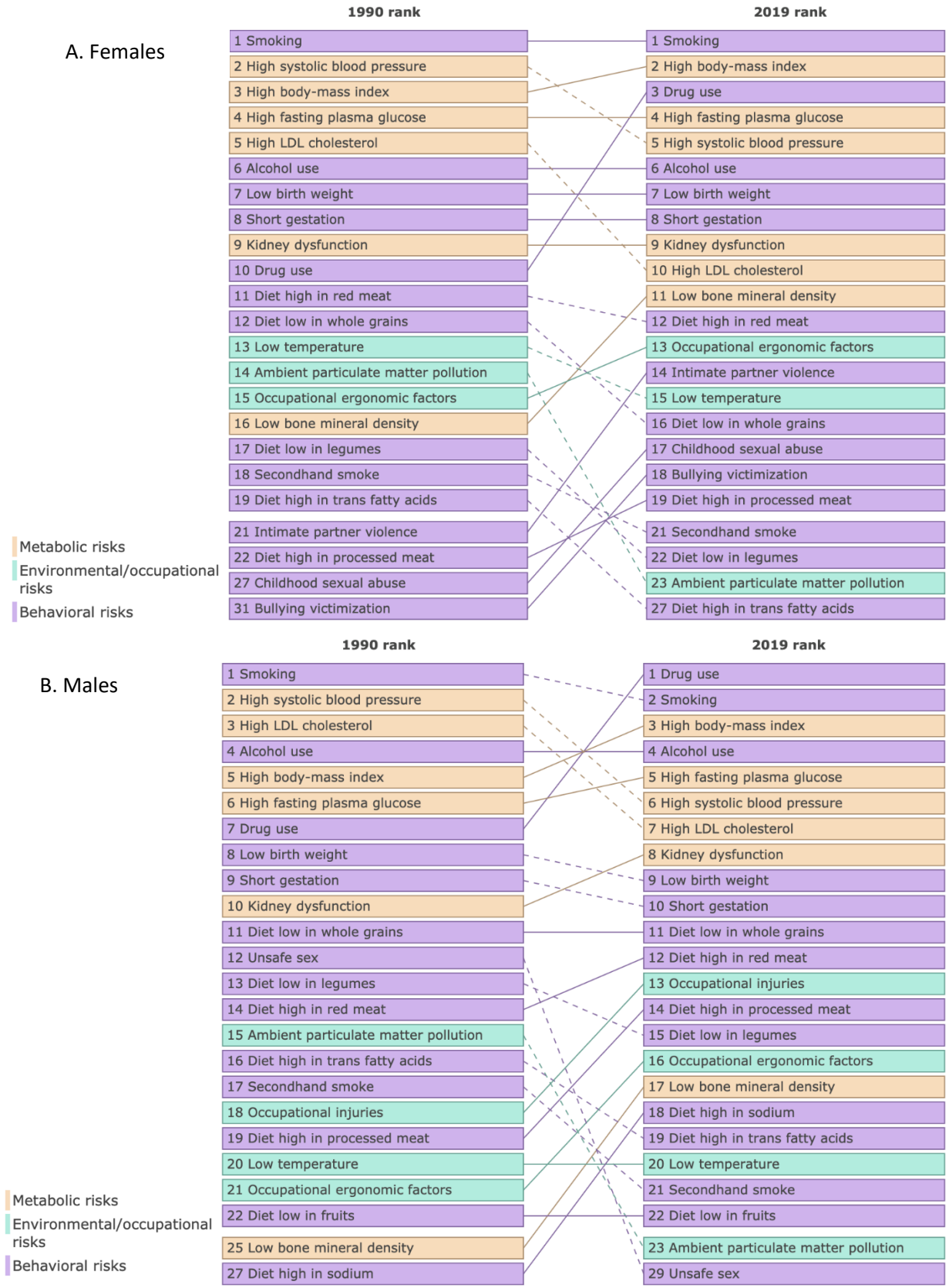
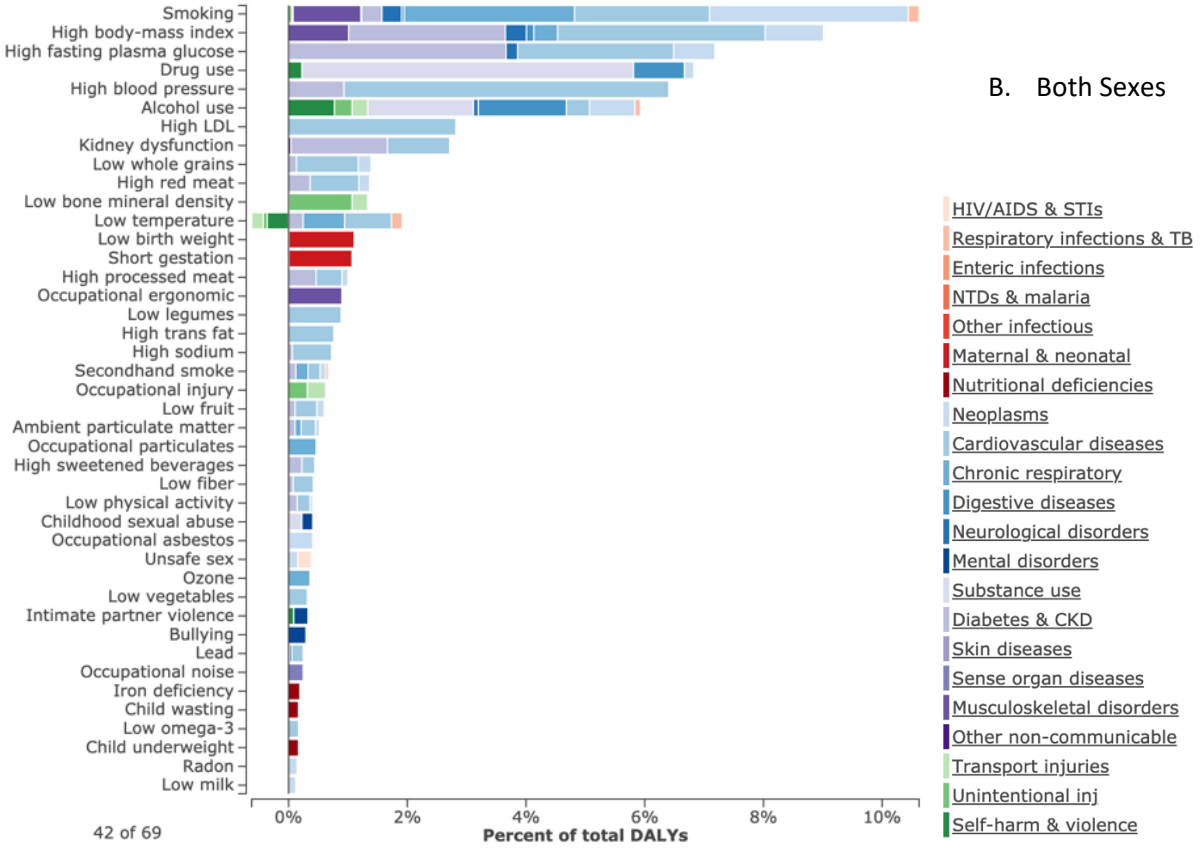
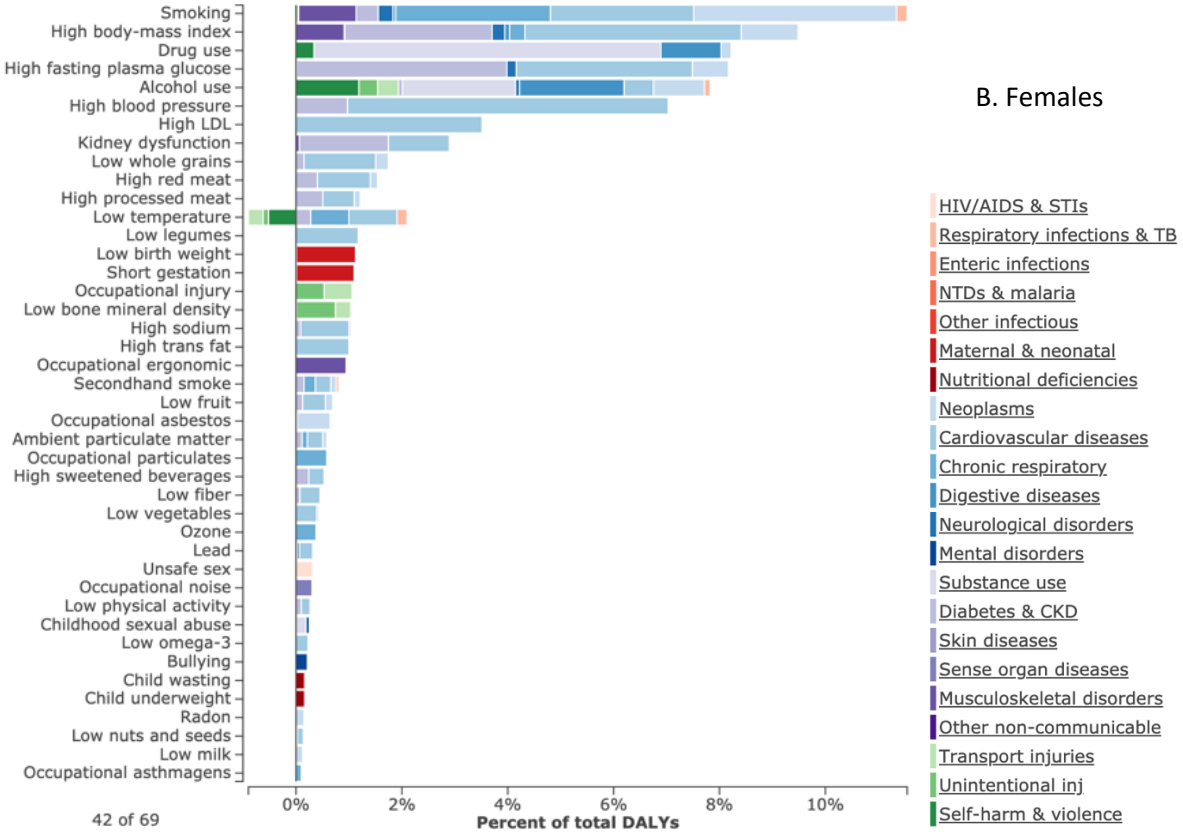


Figure S20. Top ranked risk factors contributing to disability adjusted life years (DALYs) in percent in Colorado by (A) both sexes (B) female (C) males, Level 4, age-standardized, in 2019





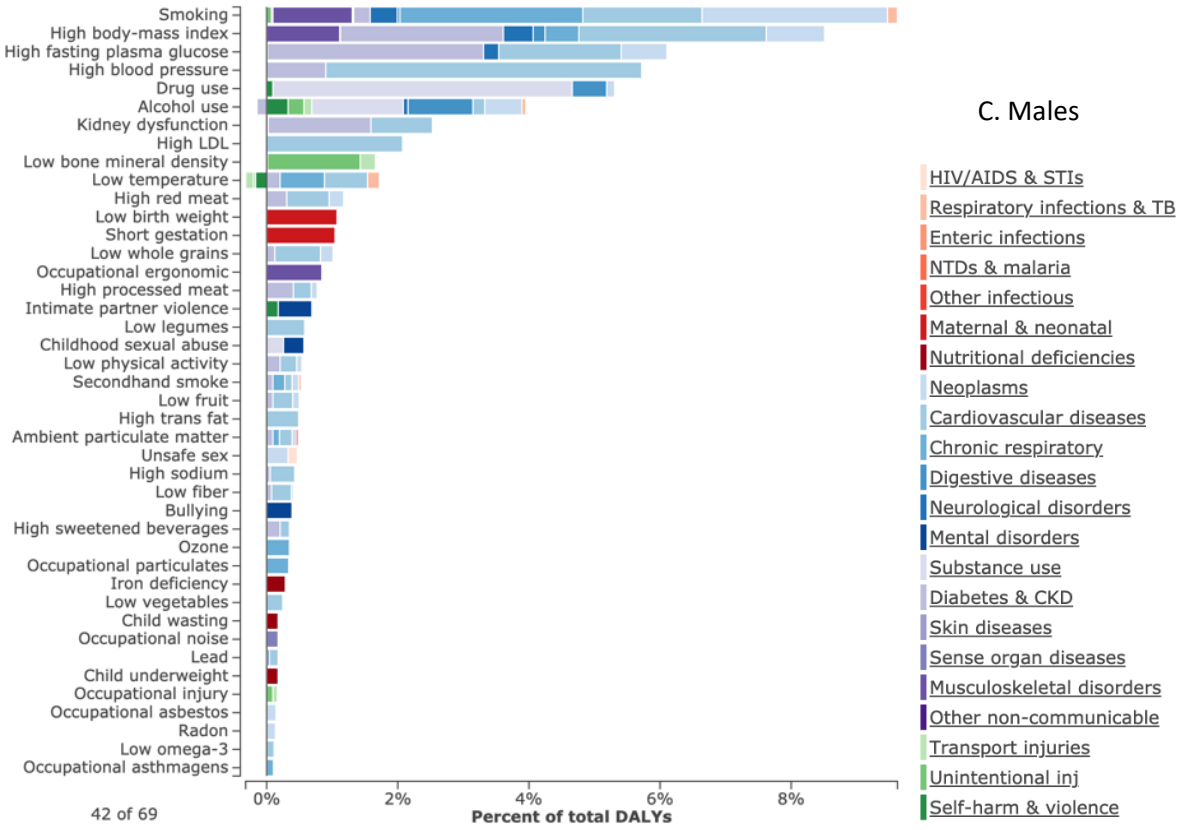
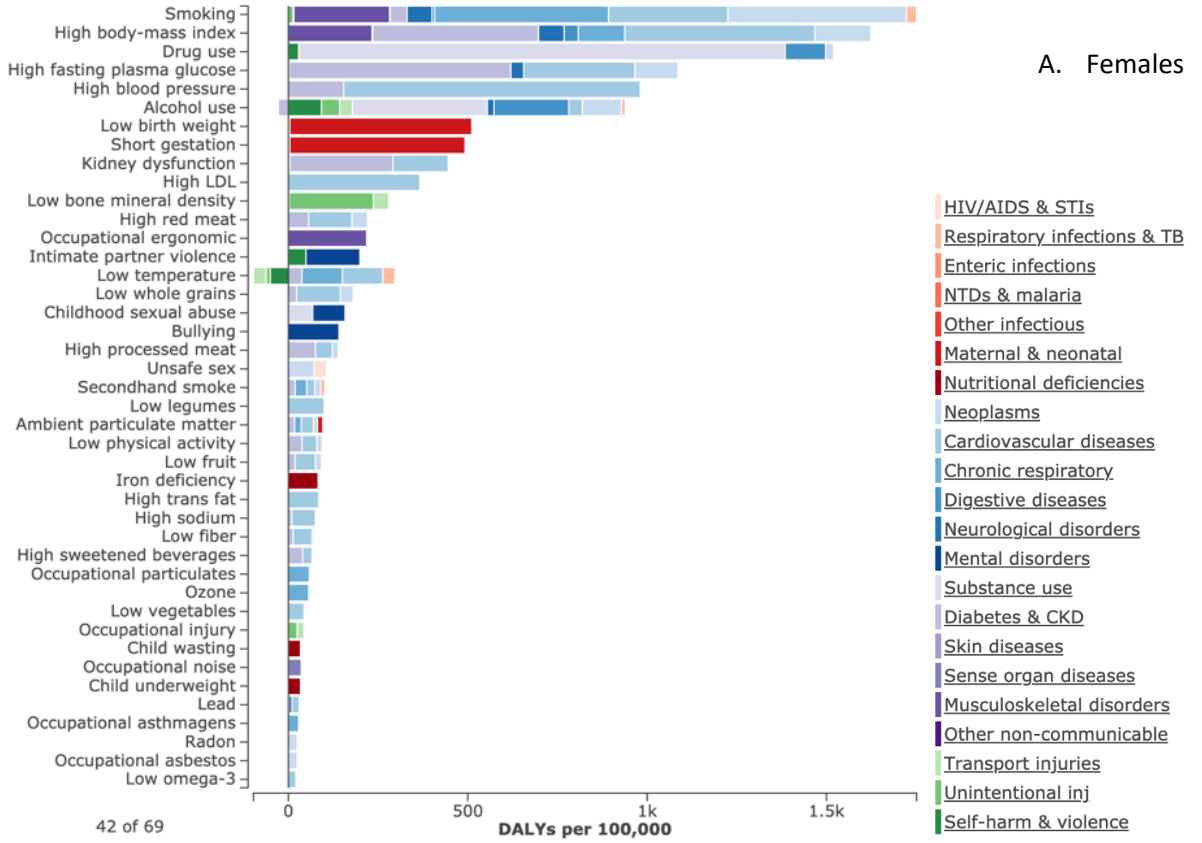

Smoking
High body-mass index
High fasting plasma glucose
High blood pressure
Drug use
Alcohol use
Kidney dysfunction
High LDL
Low bone mineral density
Low temperature
High red meat
Low birth weight
Short gestation
Low whole grains
Occupational ergonomic
High processed meat
Intimate partner violence
Low legumes
Childhood sexual abuse
Low physical activity
Secondhand smoke
Low fruit
High trans fat
Ambient particulate matter
Unsafe sex
High sodium
Low fiber
Bullying
High sweetened beverages
Ozone
Occupational particulates
Iron deficiency
Low vegetables
Child wasting
Occupational noise
Lead
Child underweight
Occupational injury
Occupational asbestos
Radon
Low omega-3
Occupational asthmagens
0%
2%
4%
6%
8%
Percent of total DALYs
42 of 69
C. Males
HIV/AIDS & STIs
Respiratory infections & TB
Enteric infections
NTDs & malaria
Other infectious
Maternal & neonatal
Nutritional deficiencies
Neoplasms
Cardiovascular diseases
Chronic respiratory
Digestive diseases
Neurological disorders
Mental disorders
Substance use
Diabetes & CKD
Skin diseases
Sense organ diseases
Musculoskeletal disorders
Other non-communicable
Transport injuries
Unintentional inj
Self-harm & violence

Figure S21. Top ranked risk factors contributing to disability-adjusted life years (DALYs) per 100,000 people, attributable to major risk factors in Colorado in (A) females and (B) males, Level 4, age standardized, in 2019



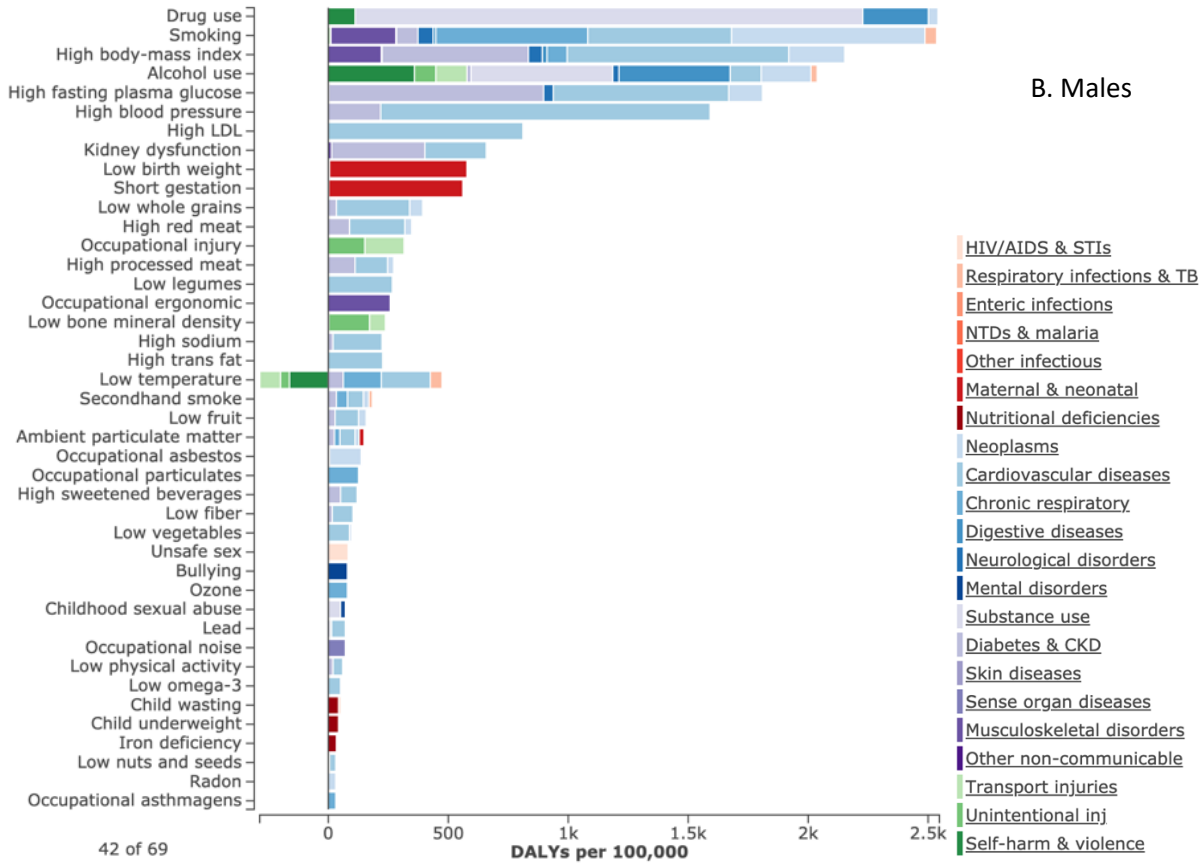


Table S5. Colorado age-standardized summary exposure values (SEV), for both sexes, in 1990, 2000, 2010, 2019

	SEV 1990	SEV 2000	SEV 2010	SEV 2019
All risk factors	20.29 (16.94 – 23.63)	20.20 (16.83 – 23.48)	20.37 (16.65 – 24.00)	20.91 (17.12 – 24.58)
Environmental/occupational risks	30.65 (24.55 – 36.87)	26.64 (21.72 – 31.85)	23.89 (19.51 – 28.73)	22.22 (18.34 – 26.69)
Unsafe water, sanitation, and handwashing	15.83 (8.61 – 27.05)	10.52 (6.74 – 15.98)	7.57 (4.87 – 11.27)	6.51 (4.44 – 10.03)
Unsafe water source	1.30 (0.72 – 2.19)	1.23 (0.67 – 2.16)	0.37 (0.22 – 0.60)	0.31 (0.19 – 0.48)
Unsafe sanitation	5.43 (2.51 – 9.81)	4.40 (1.86 – 8.63)	3.01 (1.27 – 5.73)	2.33 (1.05 – 4.74)
No access to handwashing facility	3.31 (3.06 – 3.58)	3.28 (3.03 – 3.55)	3.09 (2.85 – 3.35)	3.05 (2.82 – 3.31)
Air pollution	4.80 (0.91 – 10.87)	4.18 (0.96 – 8.45)	2.80 (1.13 – 4.96)	2.29 (0.72 – 4.37)
Particulate matter pollution	4.56 (0.75 – 10.55)	3.91 (0.75 – 8.07)	2.52 (0.89 – 4.61)	2.03 (0.52 – 4.05)
Ambient particulate matter pollution	6.63 (1.08 – 15.82)	5.67 (1.08 – 11.70)	3.64 (1.35 – 6.35)	2.94 (0.80 – 5.59)
Household air pollution from solid fuels	0.02 (0.003 – 0.06)	0.02 (0.003 – 0.06)	0.01 (0.002 – 0.04)	0.01 (0.001 – 0.03)
Ambient ozone pollution	66.34 (30.84 – 96.76)	71.28 (33.77 – 97.80)	75.28 (39.81 – 98.46)	72.99 (36.29 – 98.40)
Non-optimal temperature	35.46 (31.60 – 40.41)	--	34.80 (31.40 – 39.46)	35.82 (32.48 – 40.33)
High temperature	27.05 (17.89 – 37.63)	--	25.20 (16.06 – 36.35)	25.90 (16.63 – 37.03)
Low temperature	35.95 (31.98 – 40.96)	--	35.49 (31.91 – 40.04)	36.52 (33.01 – 40.94)
Other environmental risks	41.72 (20.47 – 63. 35)	33.55 (14.41 – 55.20)	26.84 (9.85 – 47.54)	20.85 (6.55 – 39.70)
Residential radon	23.51 (4.20 – 63.71)	23.51 (4.20 – 63.71)	23.51 (4.20 – 63.71)	23.51 (4.20 – 63.71)
Lead exposure	51.40 (23.60 – 74.48)	38.78 (17.64 – 62.02)	28.51 (9.19 – 50.81)	19.30 (4.87 – 38.45)
Occupational risks	2.88 (2.34 – 3.77)	2.97 (2.42 – 3.92)	2.83 (2.30 – 3.83)	2.86 (2.28 – 3.85)
Behavioral risks	18.78 (15.34 – 22.62)	17.96 (14.58 – 21.74)	17.42 (13.64 – 21.59)	17.25 (13.19 – 21.62)
Child and maternal malnutrition	9.90 (8.26 – 11.62)	9.84 (8.26 – 11.51)	10.14 (8.42 – 11.82)	10.28 (8.43 – 12.12)
Suboptimal breastfeeding	31.88 (31.07 – 32.73)	31.10 (30.49 – 31.79)	30.60 (29.75 – 31.48)	30.39 (29.53 – 31.27)
Non-exclusive breastfeeding	26.19 (21.44 – 30.93)	28.26 (23.99 – 32.62)	25.00 (21.42 – 29.15)	24.96 (20.65 – 29.60)
Discontinued breastfeeding	26.93 (25.99 – 27.88)	25.91 (24.60 – 27.04)	25.24 (23.95 – 26.57)	25.19 (23.93 – 26.38)
Child growth failure	0.39 (0.26 – 0.54)	0.39 (0.25 – 0.53)	0.38 (0.25 – 0.52)	0.38 (0.24 – 0.52)
Child underweight	0.87 (0.49 – 1.30)	0.88 (0.49 – 1.32)	0.89 (0.49 – 1.33)	0.89 (0.49 – 1.33)
Child wasting	0.76 (0.50 – 1.03)	0.75 (0.49 – 1.02)	0.74 (0.49 – 1.00)	0.74 (0.49 – 1.01)
Child stunting	2.12 (1.1 – 3.09)	2.03 (1.05 – 2.99)	1.89 (0.98 – 2.77)	1.86 (0.97 – 2.77)
Low birth weight and short gestation	13.87 (11.93 – 16.16)	15.11 (13.35 – 17.19)	15.59 (13.33 – 18.17)	14.89 (12.70 – 17.44)
Short gestation	20.75 (18.02 – 23.82)	22.03 (19.87 – 24.45)	22.39 (19.51 – 25.77)	20.76 (17.76 – 24.19)
Low birth weight	11 (9.57 – 12.50)	11.74 (10.81 – 12.80)	12.03 (10.70 – 13.68)	11.56 (10.17 – 13.29)
Iron deficiency	11.35 (9.43 – 13.36)	11.28 (9.48 – 13.23)	11.62 (9.63 – 13.52)	11.79 (9.70 – 13.95)
Vitamin A deficiency	1.11 (0.48 – 2.02)	1.61 (0.73 – 2.97)	1.25 (0.56 – 2.39)	0.96 (0.43 – 1.91)
Zinc deficiency	2.11 (0 – 6.79)	1.21 (0 – 3.85)	1.21 (0 – 3.54)	1.11 (0 – 3.53)
Tobacco	36.88 (34.72 – 39.36)	29.98 (28.73 – 31.25)	23.19 (22.14 – 24.30)	21.99 (20.47 – 23.68)
Smoking	22.96 (20.64 – 25.40)	19.61 (17.79 – 21.52)	16.00 (14.45 – 17.71)	13.47 (12.01 – 14.99)
Chewing tobacco	2.14 (1.63 – 2.75)	2.17 (1.68 – 2.81)	2.11 (1.59 – 2.83)	2.05 (1.48 – 2.81)
Secondhand smoke	37.50 (35.65 – 39.52)	29.77 (28.61 – 30.86)	22.63 (21.69 – 23.69)	22.76 (21.13 – 24.42)
Alcohol use	12.94 (8.12 – 18.65)	12.73 (7.52 – 18.61)	13.89 (7.99 – 20.61)	14.52 (8.43 – 21.55)
Drug use	0.48 (0.26 – 0.92)	0.57 (0.36 – 0.90)	0.80 (0.55 – 1.18)	1.10 (0.79 – 1.52)
Dietary risks	33.61 (24.07 – 47.59)	38.28 (26.43 – 52.21)	40.13 (26.64 – 54.50)	39.55 (25.95 – 54.40)
Diet low in fruits	52.60 (41.24 – 65.47)	48.77 (38.37 – 59.59)	46.53 (34.95 – 59.15)	45.21 (34.00 – 58.11)
Diet low in vegetables	23.72 (11.08 – 43.48)	35.01 (20.98 – 54.91)	38.81 (21.31 – 60.70)	35.88 (19.62 – 55.86)

Diet low in legumes	72.63 (34.45 – 98.89)	74.78 (40.67 – 99.26)	75.68 (42.22 – 99.56)	75.53 (43.49 – 99.43)
Diet low in whole grains	77.93 (68.32 – 87.40)	79.74 (71.23 – 88.12)	80.43 (71.68 – 88.50)	80.18 (71.31 – 88.29)
Diet low in nuts and seeds	24.12 (7.14 – 54.38)	24.40 (8.19 – 55.06)	23.76 (7.87 – 55.02)	19.01 (6.30 – 53.18)
Diet low in milk	46.87 (24.12 – 66.65)	43.91 (21.85 – 63.51)	41.48 (18.49 – 61.94)	39.67 (17.70 – 59.80)
Diet high in red meat	85.70 (77.67 – 92.17)	83.59 (76.11 – 89.70)	82.38 (72.73 – 89.51)	82.08 (72.20 – 89.81)
Diet high in processed meat	78.04 (54.74 – 97.57)	84.20 (66.55 – 98.61)	86.65 (70.08 – 99.63)	86.13 (67.76 – 99.61)
Diet high in sugar-sweetened beverages	49.44 (34.32 – 65.76)	61.46 (48.25 – 74.79)	66.95 (52.29 – 80.41)	67.29 (53.27 – 81.05)
Diet low in fiber	38.77 (24.65 – 52.44)	31.06 (19.31 – 43.36)	29.03 (17.94 – 41.02)	24.95 (14.22 – 36.54)
Diet low in calcium	12.35 (5.63 – 22.53)	8.78 (4.06 – 15.70)	10.99 (5.21 – 19.66)	10.00 (4.63 – 18.22)
Diet low in seafood omega-3 fatty acids	81.00 (64.90 – 99.12)	78.57 (63.53 – 97.49)	77.04 (60.53 – 96.71)	76.32 (59.92 – 97.46)
Diet low in polyunsaturated fatty acids	12.90 (4.07 – 33.33)	8.94 (2.83 – 26.80)	6.31 (2.03 – 22.10)	5.85 (1.93 – 21.43)
Diet high in trans fatty acids	87.84 (82.05 – 92.91)	88.62 (83.41 – 93.29)	86.23 (79.76 – 92.69)	85.71 (78.72 – 92.20)
Diet high in sodium	18.53 (4.45 – 41.94)	33.68 (9.37 – 57.44)	40.09 (10.42 – 64.35)	39.49 (10.34 – 64.21)
Intimate partner violence	29.03 (16.04 – 37.84)	28.01 (16.20 – 36.75)	27.43 (15.23 – 36.06)	28.41 (15.26 – 37.49)
Childhood sexual abuse and bullying	7.70 (5.14 – 11.44)	10.13 (6.71 – 15.16)	11.16 (7.20 – 17.00)	11.13 (7.17 – 17.19)
Childhood sexual abuse	9.79 (7.68 – 12.66)	11.47 (8.95 – 14.90)	12.11 (9.47 – 15.73)	12.28 (9.57 – 16.00)
Bullying victimization	5.08 (2.09 – 10.50)	7.35 (3.18 – 14.28)	8.43 (3.36 – 16.75)	8.31 (3.14 – 17.12)
Unsafe sex	--	--	--	--
Low physical activity	3.47 (1.64 – 6.90)	3.00 (1.59 – 5.46)	3.07 (1.51 – 5.75)	3.11 (1.47 – 6.04)
Metabolic risks	25.82 (20.53 – 31.73)	30.10 (24.95 – 35.89)	33.27 (27.31 – 39.41)	35.89 (29.72 – 42.26)
High fasting plasma glucose	9.44 (8.20 – 10.78)	8.28 (7.20 – 9.38)	11.58 (10.38 – 12.86)	13.19 (11.83 – 14.80)
High LDL cholesterol	66.61 (63.36 – 69.93)	39.72 (36.62 – 42.94)	34.36 (31.06 – 37.65)	31.36 (27.95 – 34.99)
High systolic blood pressure	23.43 (19.27 – 28.06)	15.96 (14.33 – 17.60)	13.83 (12.26 – 15.54)	18.27 (14.75 – 22.34)
High body-mass index	25.33 (18.46 – 33.67)	31.71 (24.19 – 40.40)	36.71 (28.76 – 45.55)	39.03 (30.53 – 47.94)
Low bone mineral density	14.74 (9.72 – 21.42)	13.22 (8.40 – 19.55)	13.49 (8.76 – 19.82)	15.76 (10.42 – 22.70)
Kidney dysfunction	19.98 (14.15 – 26.97)	20.28 (14.37 – 27.33)	20.49 (14.51 – 27.67)	20.95 (14.96 – 28.16)

Data in parenthesis are 95% uncertainty intervals. SEVs measured 0 to 100 scale, in which 100 is when the entire population is exposed to maximum risk and 0 is when the entire population is at minimum risk. SEVs are shown for all levels of the risk factor hierarchy. SEV = summary exposure values

Figure S22. Heat map of top ranked risk factors in Colorado, West States, and the United States in (A) both sexes (B) females and (C) males, Level 4, age standardized, in 2019. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

A. Both Sexes

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Smoking	1	1	2	2	1	1	1	2	1	4	1	1
Drug use	2	3	1	4	3	2	2	1	2	1	2	2
High body-mass index	3	2	3	1	2	3	3	3	3	2	3	3
Alcohol use	4	6	6	6	6	5	6	5	5	6	6	5
High fasting plasma glucose	5	4	4	3	4	4	4	4	4	3	4	4
High blood pressure	6	5	5	5	5	6	5	6	6	5	5	6
High LDL	7	7	7	7	7	7	7	7	7	8	7	7
Low birth weight	8	9	9	9	9	9	9	9	9	9	9	9
Kidney dysfunction	9	8	8	8	8	8	8	8	8	7	8	8
Short gestation	10	10	10	10	10	10	10	10	10	10	10	10
Low whole grains	11	11	11	11	11	12	11	11	11	11	11	11
High red meat	12	12	12	12	12	11	13	12	12	12	12	13
Low bone mineral density	13	19	16	19	14	14	21	15	13	15	15	15
Occupational ergonomic	14	17	14	16	13	13	16	16	14	14	13	12
High processed meat	15	14	13	14	15	15	15	13	16	16	14	14
Low temperature	16	13	15	15	17	26	12	14	15	13	16	22
Occupational injury	17	23	22	18	18	21	22	21	18	18	17	19
Low legumes	18	15	17	17	16	16	14	17	17	19	18	16
High trans fat	19	18	18	20	20	17	18	18	21	21	19	17
High sodium	20	21	21	21	23	19	19	20	22	20	20	20
Secondhand smoke	21	20	19	22	22	18	17	19	19	23	22	18
Low fruit	22	22	23	24	19	20	23	22	23	22	21	21
Ambient particulate matter	23	16	20	13	21	22	20	30	20	17	23	35
Childhood sexual abuse	24	33	27	28	28	24	29	23	25	28	25	26
Bullying	25	29	30	27	26	27	32	28	29	25	26	28

B. Females

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Smoking	1	2	1	2	1	1	1	3	1	4	1	1
High body-mass index	2	1	2	1	2	2	2	2	2	1	2	2
Drug use	3	4	3	4	3	3	3	1	3	2	3	3
High fasting plasma glucose	4	3	4	3	4	4	4	4	4	3	4	4
High blood pressure	5	5	5	5	5	5	5	5	5	5	5	5
Alcohol use	6	6	6	6	6	6	6	6	6	6	6	6
Low birth weight	7	8	8	8	8	8	9	8	8	8	8	9
Short gestation	8	9	9	9	9	9	10	9	9	9	9	10
Kidney dysfunction	9	7	7	7	7	7	7	7	7	7	7	7
High LDL	10	10	10	10	10	10	8	10	10	10	10	8
Low bone mineral density	11	14	11	15	12	12	16	11	11	11	11	12
High red meat	12	11	13	11	11	11	13	12	13	13	12	13
Occupational ergonomic	13	15	15	16	14	13	15	16	14	15	15	11
Intimate partner violence	14	18	14	23	16	15	14	15	15	14	14	14
Low temperature	15	13	16	14	13	16	11	13	12	12	13	16
Low whole grains	16	12	12	13	15	14	12	14	16	16	16	15
Childhood sexual abuse	17	26	18	21	20	18	21	18	18	19	17	18
Bullying	18	25	22	20	21	20	26	20	19	20	19	20
High processed meat	19	16	17	17	17	17	17	17	17	17	18	17
Unsafe sex	20	19	24	18	24	24	23	19	22	24	24	23
Secondhand smoke	21	22	23	22	22	19	18	23	21	26	22	19
Low legumes	22	20	20	19	23	22	20	22	25	23	25	21
Ambient particulate matter	23	17	19	12	19	23	19	30	20	18	23	33
Low physical activity	24	21	21	25	25	25	22	21	24	21	21	24
Low fruit	25	23	25	26	18	21	24	24	23	22	20	22

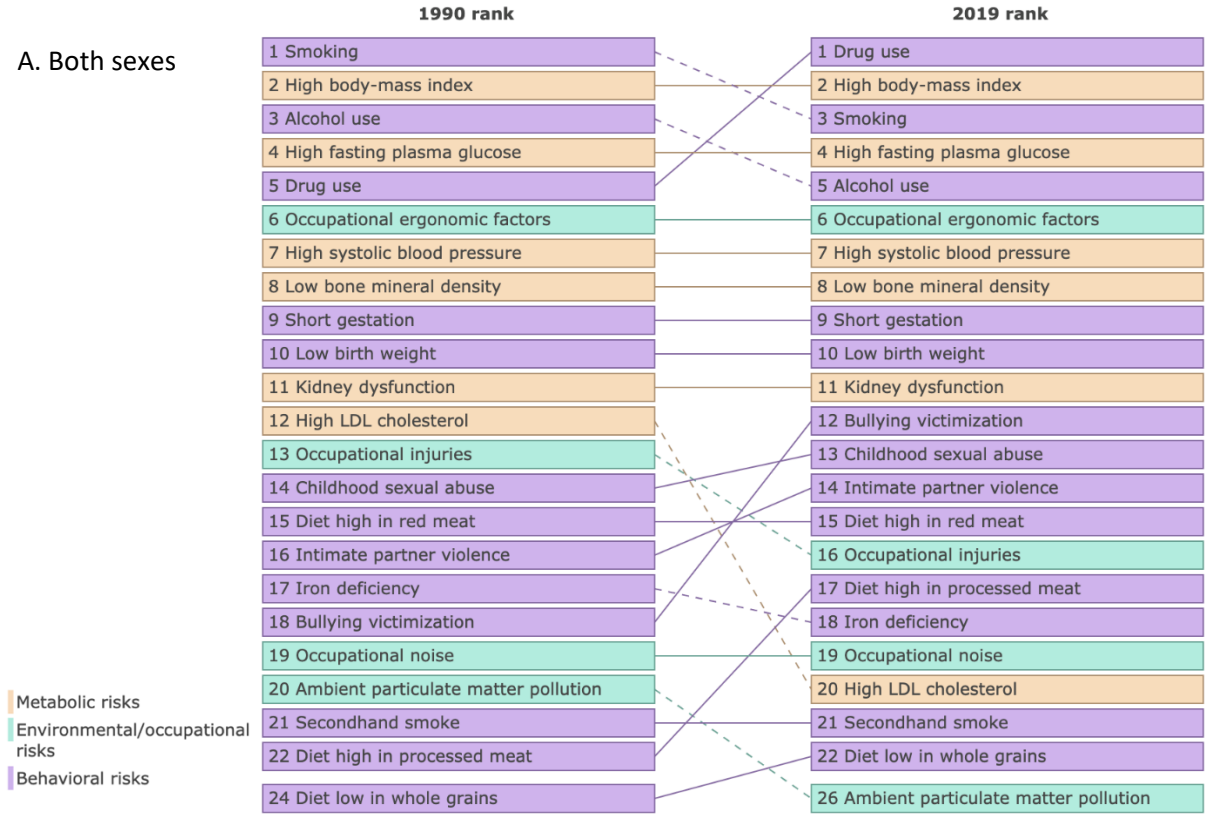
C. Males

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Drug use	1	3	1	4	3	2	2	1	2	1	1	2
Smoking	2	1	2	2	1	1	1	2	1	4	2	1
High body-mass index	3	2	3	1	2	3	3	4	3	2	3	3
Alcohol use	4	6	5	5	6	4	6	3	5	6	5	4
High fasting plasma glucose	5	4	4	3	4	5	5	5	4	3	4	5
High blood pressure	6	5	6	6	5	6	4	6	6	5	6	6
High LDL	7	7	7	7	7	7	7	7	7	7	7	7
Kidney dysfunction	8	8	8	8	8	8	8	8	8	8	8	8
Low birth weight	9	9	9	9	9	9	10	9	9	9	9	9
Short gestation	10	10	10	10	10	10	11	10	10	10	10	10
Low whole grains	11	11	11	11	11	11	9	11	11	11	11	11
High red meat	12	12	12	12	12	12	14	12	12	13	13	13
Occupational injury	13	16	15	14	13	15	17	16	13	12	12	15
High processed meat	14	14	14	15	15	14	15	13	14	15	14	16
Low legumes	15	13	13	16	14	13	13	14	15	18	15	14
Occupational ergonomic	16	20	17	19	16	16	20	18	16	14	16	12
Low bone mineral density	17	24	22	22	20	19	24	20	21	21	21	20
High sodium	18	17	19	18	18	18	16	19	18	19	19	18
High trans fat	19	18	16	20	17	17	18	17	19	20	18	17
Low temperature	20	15	18	17	25	33	12	15	17	16	17	27
Secondhand smoke	21	21	20	21	21	20	19	21	22	23	22	19
Low fruit	22	22	23	24	19	21	22	22	24	22	23	22
Ambient particulate matter	23	19	21	13	22	23	21	27	23	17	24	30
Occupational asbestos	24	23	24	26	24	22	23	24	20	25	20	21
Occupational particulates	25	29	28	29	27	26	29	28	27	27	28	23

Figure S23. Heat map of top ranked risk factors in Colorado, West States, and the United States, both sexes, Level 4, age standardized, in 1990. *Numbers are rankings, with colors indicating the scale from low (blue: below 17th) to high (red: first and second) rankings.

	Colorado	United States of America	Arizona	California	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
Smoking	1	1	1	1	1	1	1	1	1	1	1	1
High blood pressure	2	2	2	2	2	2	2	2	2	2	2	2
High body-mass index	3	3	3	3	3	3	3	4	3	3	3	3
High LDL	4	4	4	4	4	4	4	6	4	5	4	4
High fasting plasma glucose	5	5	5	5	5	5	5	3	5	4	5	5
Alcohol use	6	6	6	6	6	6	6	5	6	6	6	6
Low birth weight	7	7	8	9	7	8	10	8	9	10	9	7
Short gestation	8	8	9	10	8	10	12	9	10	11	10	9
Drug use	9	11	7	7	10	9	8	7	7	8	7	11
Kidney dysfunction	10	9	11	12	9	7	7	10	8	7	8	8
Low whole grains	11	12	12	13	11	11	9	11	11	9	11	10
High red meat	12	13	14	14	12	12	16	12	13	13	12	12
Ambient particulate matter	13	10	10	8	17	14	11	17	16	12	16	22
Low legumes	14	14	13	15	13	13	14	13	12	14	13	13
Unsafe sex	15	15	17	11	27	27	19	22	22	27	18	30
Secondhand smoke	16	17	15	18	15	15	13	14	15	20	15	15
High trans fat	17	16	16	17	14	16	17	16	14	16	14	14
Occupational ergonomic	18	22	19	20	16	17	22	18	20	17	21	16
Low temperature	19	18	18	16	22	26	15	15	17	15	17	24
High processed meat	20	19	20	19	19	18	18	19	18	18	19	17
Low fruit	21	20	22	21	18	20	21	21	19	22	20	19
Low bone mineral density	22	26	23	26	21	21	28	23	24	23	24	20
Low fiber	23	21	21	22	20	19	20	20	21	19	22	18
Occupational injury	24	24	24	23	23	22	26	24	25	21	26	21
Low physical activity	25	23	25	27	24	24	23	25	26	24	25	25

Figure S24. Arrow diagram of top risk factors for years of life lived with disability (YLDs) per 100,000 people, in Colorado in (A) both, (B) females, (C) males, Level 4, 1990 - 2019





C. Males

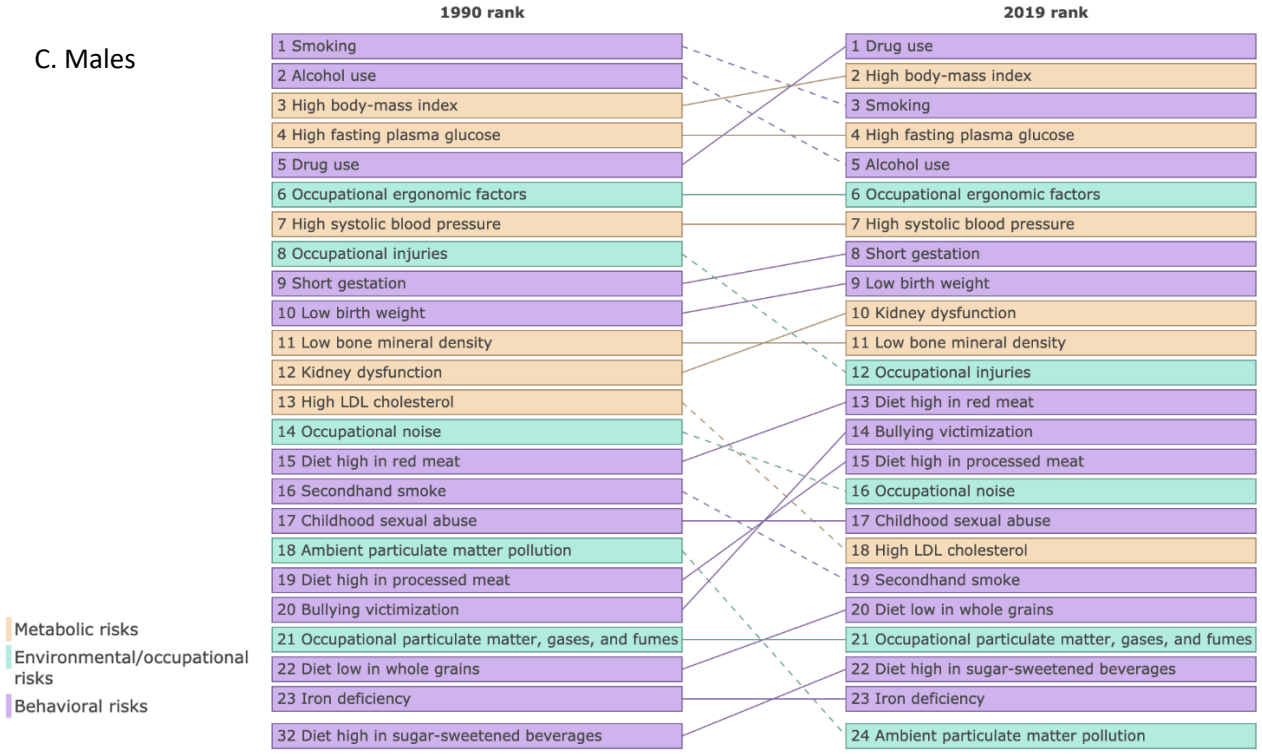
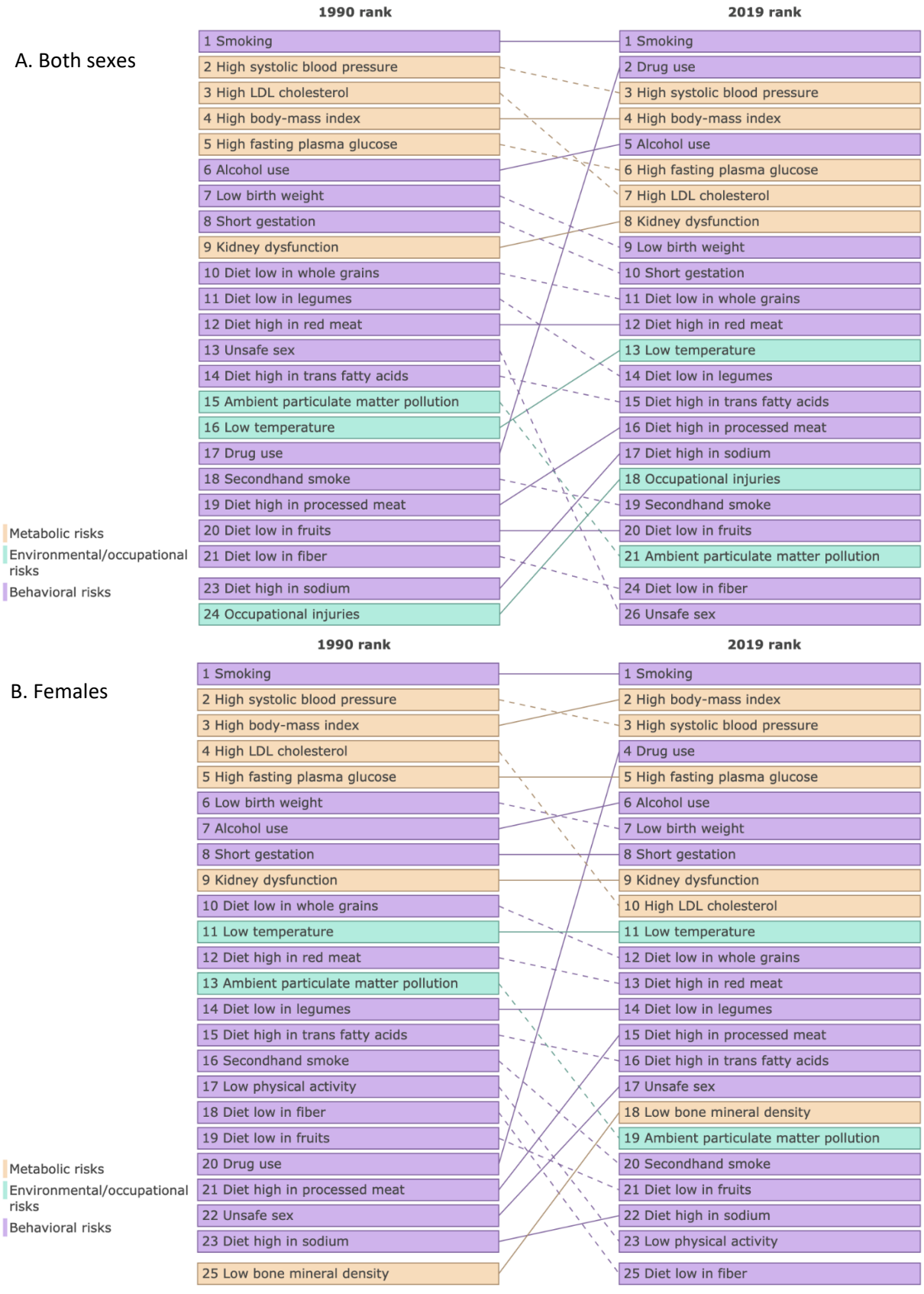

1990 rank
2019 rank
1 Smoking
2 Alcohol use
3 High body-mass index
4 High fasting plasma glucose
5 Drug use
6 Occupational ergonomic factors
7 High systolic blood pressure
8 Occupational injuries
9 Short gestation
10 Low birth weight
11 Low bone mineral density
12 Kidney dysfunction
13 High LDL cholesterol
14 Occupational noise
15 Diet high in red meat
16 Secondhand smoke
17 Childhood sexual abuse
18 Ambient particulate matter pollution
19 Diet high in processed meat
20 Bullying victimization
21 Occupational particulate matter, gases, and fumes
22 Diet low in whole grains
23 Iron deficiency
32 Diet high in sugar-sweetened beverages
1 Drug use
2 High body-mass index
3 Smoking
4 High fasting plasma glucose
5 Alcohol use
6 Occupational ergonomic factors
7 High systolic blood pressure
8 Short gestation
9 Low birth weight
10 Kidney dysfunction
11 Low bone mineral density
12 Occupational injuries
13 Diet high in red meat
14 Bullying victimization
15 Diet high in processed meat
16 Occupational noise
17 Childhood sexual abuse
18 High LDL cholesterol
19 Secondhand smoke
20 Diet low in whole grains
21 Occupational particulate matter, gases, and fumes
22 Diet high in sugar-sweetened beverages
23 Iron deficiency
24 Ambient particulate matter pollution
Metabolic risks
Environmental/occupational risks
Behavioral risks

Figure S25. Arrow diagram of top risk factors for years of life lost (YLLs) per 100,000 people in Colorado in (A) both sexes, (B) females, and (C) males, Level 4, 1990 – 2019



C. Males


1990 rank
2019 rank
1 Smoking
2 High systolic blood pressure
3 High LDL cholesterol
4 Alcohol use
5 High body-mass index
6 High fasting plasma glucose
7 Diet low in whole grains
8 Low birth weight
9 Short gestation
10 Kidney dysfunction
11 Unsafe sex
12 Diet low in legumes
13 Diet high in trans fatty acids
14 Diet high in red meat
15 Ambient particulate matter pollution
16 Drug use
17 Secondhand smoke
18 Low temperature
19 Diet high in processed meat
20 Diet low in fruits
21 Diet low in fiber
22 Occupational exposure to asbestos
23 Occupational injuries
24 Diet high in sodium
1 Smoking
2 Drug use
3 Alcohol use
4 High systolic blood pressure
5 High body-mass index
6 High fasting plasma glucose
7 High LDL cholesterol
8 Kidney dysfunction
9 Low birth weight
10 Short gestation
11 Diet low in whole grains
12 Diet high in red meat
13 Diet low in legumes
14 Diet high in trans fatty acids
15 Diet high in sodium
16 Diet high in processed meat
17 Occupational injuries
18 Low temperature
19 Secondhand smoke
20 Occupational exposure to asbestos
21 Diet low in fruits
22 Ambient particulate matter pollution
25 Diet low in fiber
30 Unsafe sex
Metabolic risks
Environmental/occupational risks
Behavioral risks

Table S6. Main causes of death and disability-adjusted life-years (DALYs), both sexes and all ages, Colorado, 2019.

Cause	Deaths			DALYs		
	Central Value	Lower Uncertainty Level	Upper Uncertainty Level	Central Value	Lower Uncertainty Level	Upper Uncertainty Level
Acute hepatitis A	1	0	1	144	98	206
Acute hepatitis B	1	0	1	29	21	40
Acute hepatitis C	0	0	1	14	9	22
Acute hepatitis E	0	0	0	13	9	19
Acute lymphoid leukemia	28	23	35	1,076	884	1,305
Acute myeloid leukemia	204	163	250	4,517	3,660	5,479
Alcoholic cardiomyopathy	64	42	95	1,931	1,372	2,757
Amphetamine use disorders	66	51	83	3,927	3,086	4,847
Anorexia nervosa	1	0	1	1,318	792	2,043
Asbestosis	11	7	15	179	131	240
Ascariasis	0	0	0	0	0	0
Bulimia nervosa	0	0	1	3,383	2,000	5,246
Cellulitis	49	22	78	1,228	706	1,690
Chlamydial infection	0	0	0	33	22	48
Chronic kidney disease	1262	1037	1499	27,217	22,997	31,429
Chronic kidney disease due to diabetes mellitus type 1	24	14	40	922	593	1,378
Chronic kidney disease due to diabetes mellitus type 2	341	244	460	7,274	5,446	9,202
Chronic kidney disease due to glomerulonephritis	128	88	182	3,617	2,773	4,647
Chronic kidney disease due to hypertension	545	418	685	8,954	7,209	10,900

Chronic kidney disease due to other and unspecified causes	226	154	312	6,449	5,016	7,996
Chronic lymphoid leukemia	89	68	116	1,618	1,259	2,090
Chronic myeloid leukemia	24	19	32	540	425	685
Cirrhosis and other chronic liver diseases due to alcohol use	311	236	401	8,778	6,595	11,404
Cirrhosis and other chronic liver diseases due to hepatitis B	30	23	39	879	664	1,140
Cirrhosis and other chronic liver diseases due to hepatitis C	542	427	686	15,854	12,355	20,105
Cirrhosis and other chronic liver diseases due to NAFLD	107	73	153	2,830	1,856	4,118
Cirrhosis and other chronic liver diseases due to other causes	199	142	267	5,078	3,633	6,883
Coal workers pneumoconiosis	4	2	6	67	45	94
Cocaine use disorders	121	96	151	9,192	7,370	11,389
Congenital heart anomalies	41	33	50	3,041	2,501	3,712
Congenital musculoskeletal and limb anomalies	4	3	5	2,089	1,469	2,850
Cyclist road injuries	20	15	25	2,085	1,669	2,577
Diabetes mellitus type 1	57	43	78	5,147	3,901	6,640
Diabetes mellitus type 2	841	696	992	47,861	37,370	60,056
Digestive congenital anomalies	6	4	8	643	460	831
Down syndrome	16	12	20	803	646	975
Drug-susceptible tuberculosis	12	9	14	299	238	357
Ectopic pregnancy	0	0	0	15	10	21
Endometriosis	0	0	0	903	550	1,414
Extensively drug-resistant tuberculosis	0	0	0	2	0	9
Foreign body in other body part	1	1	2	925	668	1,238

G6PD deficiency	6	4	7	264	203	332
Gastritis and duodenitis	11	8	14	885	643	1,201
Genital prolapse	0	0	1	318	155	592
Gonococcal infection	1	1	1	37	29	47
Hemolytic disease and other neonatal jaundice	0	0	0	110	84	139
HIV/AIDS - Drug-susceptible Tuberculosis	1	1	2	52	32	81
HIV/AIDS - Extensively drug-resistant Tuberculosis	0	0	0	0	0	2
HIV/AIDS - Multidrug-resistant Tuberculosis without extensive drug resistance	0	0	0	2	0	8
HIV/AIDS resulting in other diseases	57	54	60	3,450	2,788	4,327
Indirect maternal deaths	2	1	2	86	58	120
Intracerebral hemorrhage	740	603	883	14,389	11,895	17,210
Ischemic stroke	1528	1193	1829	27,624	23,056	32,013
Late maternal deaths	2	1	3	115	65	187
Liver cancer due to alcohol use	119	88	157	2,866	2,081	3,830
Liver cancer due to hepatitis B	41	31	56	1,106	809	1,488
Liver cancer due to hepatitis C	136	107	172	2,957	2,303	3,843
Liver cancer due to NASH	36	28	47	757	577	984
Liver cancer due to other causes	29	22	37	758	594	949
Maternal abortion and miscarriage	0	0	0	15	10	21
Maternal deaths aggravated by HIV/AIDS	0	0	0	0	0	1
Maternal hemorrhage	0	0	1	108	68	168
Maternal hypertensive disorders	1	1	1	149	102	211

Maternal obstructed labor and uterine rupture	0	0	0	34	15	59
Maternal sepsis and other maternal infections	0	0	0	63	32	112
Motor vehicle road injuries	429	356	512	24,449	20,578	28,670
Motorcyclist road injuries	84	66	104	5,702	4,696	6,827
Multidrug-resistant tuberculosis without extensive drug resistance	0	0	1	9	1	34
Myelodysplastic, myeloproliferative, and other hematopoietic neoplasms	157	113	216	2,698	2,059	3,776
Myocarditis	17	10	23	729	469	966
Neonatal encephalopathy due to birth asphyxia and trauma	28	23	33	4,020	3,393	4,771
Neonatal preterm birth	75	64	85	14,220	12,122	16,618
Neonatal sepsis and other neonatal infections	9	7	11	1,053	834	1,276
Neural tube defects	10	7	12	855	642	1,078
Non-rheumatic calcific aortic valve disease	325	253	390	3,895	3,184	4,696
Non-rheumatic degenerative mitral valve disease	54	40	79	1,279	979	1,715
Non-rheumatic valvular heart disease	380	297	453	5,197	4,350	6,300
Non-venomous animal contact	3	3	4	616	405	951
Opioid use disorders	738	608	891	71,887	57,703	88,062
Orofacial clefts	0	0	0	62	39	90
Other cardiomyopathy	297	228	423	6,450	5,035	9,230
Other chromosomal abnormalities	20	16	27	2,002	1,639	2,518
Other congenital birth defects	28	23	35	2,512	2,036	3,159

Other drug use disorders	82	64	101	7,027	5,595	8,834
Other exposure to mechanical forces	34	27	42	8,438	5,835	12,050
Other gynecological diseases	2	1	2	6,416	4,298	8,944
Other hemoglobinopathies and hemolytic anemias	20	16	25	592	461	769
Other leukemia	105	83	132	2,014	1,591	2,504
Other malignant neoplasms	311	257	371	8,491	7,147	10,016
Other maternal disorders	3	2	5	239	175	313
Other neonatal disorders	30	23	38	2,917	2,290	3,646
Other non-rheumatic valve diseases	1	0	1	23	15	35
Other pneumoconiosis	1	0	2	38	25	51
Other road injuries	4	3	5	450	358	560
Other sexually transmitted infections	0	0	1	130	83	197
Other urinary diseases	13	8	19	338	244	435
Paratyphoid fever	0	0	0	1	0	1
Pedestrian road injuries	100	82	120	5,136	4,319	6,030
Peptic ulcer disease	86	66	107	1,749	1,404	2,158
Physical violence by firearm	123	99	148	7,392	6,047	8,896
Physical violence by other means	39	33	45	3,853	3,202	4,688
Physical violence by sharp object	26	21	31	1,690	1,398	2,005
Poisoning by carbon monoxide	24	20	30	1,135	915	1,399
Poisoning by other means	10	8	12	1,053	805	1,345
Pulmonary aspiration and foreign body in airway	149	126	173	4,090	3,537	4,648

Pyoderma	34	18	63	593	327	1,051
Self-harm by firearm	579	452	740	23,009	18,000	29,923
Self-harm by other specified means	519	374	636	24,207	17,701	29,322
Sickle cell disorders	2	1	3	101	74	137
Silicosis	4	3	6	103	75	139
Subarachnoid hemorrhage	272	223	327	7,747	6,486	9,115
Syphilis	1	0	1	65	50	82
Thalassemias	1	1	2	91	70	118
Typhoid fever	0	0	0	1,000	800	1,197
Unintentional firearm injuries	9	7	12	670	526	863
Urinary tract infections and interstitial nephritis	287	231	355	4,028	3,306	4,906
Urogenital congenital anomalies	4	2	5	422	307	581
Urolithiasis	8	6	11	295	229	371
Uterine fibroids	0	0	0	821	395	1,585
Venomous animal contact	1	1	1	280	194	381
Visceral leishmaniasis	0	0	0	0	0	0
Communicable, maternal, neonatal, and nutritional diseases	1,602	1,352	1,849	67,838	59,095	77,936
Injuries	3,448	2,891	4,044	183,306	155,487	215,592
Non-communicable diseases	35,675	30,805	40,965	1,425,347	1,206,503	1,664,944
All causes	**40,724**	**35,134**	**46,743**	**1,676,491**	**1,427,654**	**1,953,173**

Table S7. GATHER checklist



Checklist of information that should be included in new reports of global health estimates

Item #	Checklist item	Reported on point #
Objectives and funding		
1	Define the indicator(s), populations (including age, sex, and geographic entities), and time period(s) for which estimates were made.	2
2	List the funding sources for the work.	Financial disclosure
Data Inputs		
For all data inputs from multiple sources that are synthesized as part of the study:		
3	Describe how the data were identified and how the data were accessed.	2
4	Specify the inclusion and exclusion criteria. Identify all ad-hoc exclusions.	2
5	Provide information on all included data sources and their main characteristics. For each data source used, report reference information or contact name/institution, population represented, data collection method, year(s) of data collection, sex and age range, diagnostic criteria or measurement method, and sample size, as relevant.	2
6	Identify and describe any categories of input data that have potentially important biases (e.g., based on characteristics listed in item 5).	2, 4
For data inputs that contribute to the analysis but were not synthesized as part of the study:		
7	Describe and give sources for any other data inputs.	-
For all data inputs:		
8	Provide all data inputs in a file format from which data can be efficiently extracted (e.g., a spreadsheet rather than a PDF), including all relevant meta-data listed in item 5. For any data inputs that cannot be shared because of ethical or legal reasons, such as third-party ownership, provide a contact name or the name of the institution that retains the right to the data.	2, figures 1-3
Data analysis		
9	Provide a conceptual overview of the data analysis method. A diagram may be helpful.	2
10	Provide a detailed description of all steps of the analysis, including mathematical formulae. This description should cover, as relevant, data cleaning, data pre-processing, data adjustments and weighting of data sources, and mathematical or statistical model(s).	2
11	Describe how candidate models were evaluated and how the final model(s) were selected.	2
12	Provide the results of an evaluation of model performance, if done, as well as the results of any relevant sensitivity analysis.	2
13	Describe methods for calculating uncertainty of the estimates. State which sources of uncertainty were, and were not, accounted for in the uncertainty analysis.	4
14	State how analytic or statistical source code used to generate estimates can be accessed.	2, 4
Results and Discussion		
15	Provide published estimates in a file format from which data can be efficiently extracted.	2, figures 1-3
16	Report a quantitative measure of the uncertainty of the estimates (e.g. uncertainty intervals).	Table 1

17	Interpret results in light of existing evidence. If updating a previous set of estimates, describe the reasons for changes in estimates.	4
18	Discuss limitations of the estimates. Include a discussion of any modelling assumptions or data limitations that affect interpretation of the estimates.	4

This checklist should be used in conjunction with the GATHER statement and Explanation and Elaboration document, found on gather-statement.org

Table S8. Key Global Burden of Disease (GBD) papers and sources used as a reference in this analysis

Vos T, Lim SS, Abbafati C, et al. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*. 2020;396(10258):1204-1222. doi:10.1016/S0140-6736(20)30925-9
Murray CJL, Aravkin AY, Zheng P, et al. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*. 2020;396(10258):1223-1249. doi:10.1016/S0140-6736(20)30752-2
http://vizhub.healthdata.org/gbd-compare