

Health Benefits from Oregonian's Outdoor Recreation Participation



2019-2023 Oregon SCORP
2019 Sustainable Tourism and Recreation Conference
October 8-11, 2019

Benefits of Outdoor Recreation

- Benefits = value of outdoor recreation
 - Health valuation (Cost of Illness savings metric)
 - Access valuation (Net economic value metric)
- Both measured in a monetary metric (\$)
- For use in:
 - Planning
 - Assessment
 - Grant applications
 - Legislative budget allocations

Health Benefits Estimates for Oregonians from Their Outdoor Recreation Participation in Oregon

Oregon Outdoor Recreation Metrics: Health, Physical Activity, and Value

2019-2023 Oregon Statewide Comprehensive Outdoor Recreation Plan
Supporting Documentation

Randall S. Rosenberger & Tara Dunn

What is SCORP?

- Qualifies state for LWCF funding
- Updated every 5 years
- Provides guidance for other OPRD-administered grant programs
- Provides guidance & information for federal, state, & local units of government & the private sector
- Accepted by the NPS on April 23, 2019



Important Demographic & Social Changes Addressed

- An aging population
- An increasingly diverse population
- Lack of youth engagement in outdoor recreation
- An underserved low-income population
- **Health, physical activity, value**



Statewide Resident Outdoor Recreation Survey

An Oregon population survey: (Conducted by OPRD with technical assistance from Kreg Lindberg - OSU)

- 3,069 completed surveys (20% response rate)
- 74% online survey / 26% paper survey
- Supplemented with 481 Qualtrics online sample
- 94% participants / 6% non-participants
- 56 individual outdoor recreation activities

Outdoor Recreation in Oregon

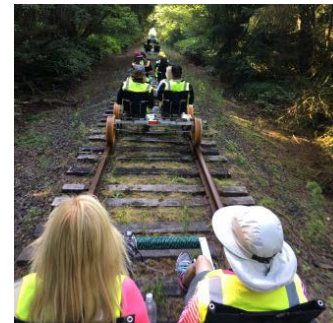


A Study Conducted by:



Oregon Parks and Recreation Department

Health Benefits Conceptual Model



“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”

Environment

- New trail system



Behavior

- Increased walking / biking on trails



Exposure

- Reduces relative risks of diseases



Health Outcome

- Decrease in health care expenditures

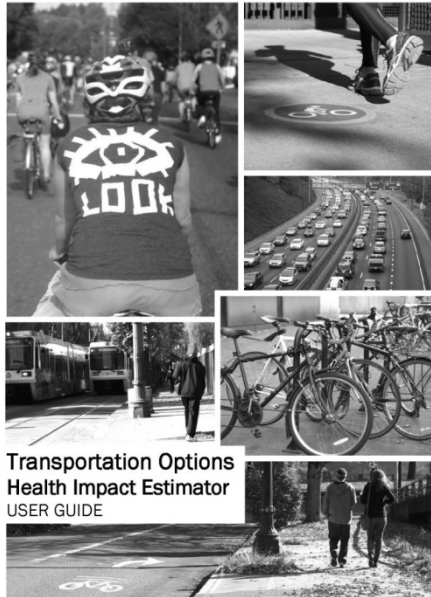


Health Benefits Estimation



ITHIM: Integrated Transport & Health Impact Modeling

Neil Maizlish, PhD, MPH, Epidemiologist
Berkeley, California (neil3971@comcast.net)



Transportation Options
Health Impact Estimator
USER GUIDE

A Tool for Estimating the Health Benefits from Outdoor Recreation in Oregon

by
Tara Dunn

A THESIS

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www.healthoregon.org/hia

ITHIM Health Pathways, Diseases, and Injuries

■ Physical Activity

- Ischemic Heart Disease
- Hypertensive Heart Disease
- Stroke
- Diabetes
- Dementia (Alzheimer's Disease)
- Depression
- Colon Cancer
- Breast cancer

Women **younger than 50**, who get **2.5 hours** of recreational physical activity a week may have a **25 percent lower risk** of heart disease.

HEART DISEASE
25%

Activity **does not** have to **be strenuous**; brisk walking may also be associated with lower risk.

Source: Chomistek, et al. Frequency, Type, and Volume of Leisure-time Physical Activity and Risk of Coronary Heart Disease in Young Women; Circulation, Journal of the American Heart Association July 25, 2016

American Heart Association

ITHIM Health Measures

- Disability Adjusted Life Years (DALYs)
 - ✓ Years Living with Disability + Years of Life Lost
 - ✓ Expresses deaths and illness for different diseases/injuries on a common scale
- Costs

DALY

Disability Adjusted Life Year is a measure of overall disease burden, expressed as the cumulative number of years lost due to ill-health, disability or early death

$$= \text{YLD} + \text{YLL}$$

Years Lived with Disability + Years of Life Lost

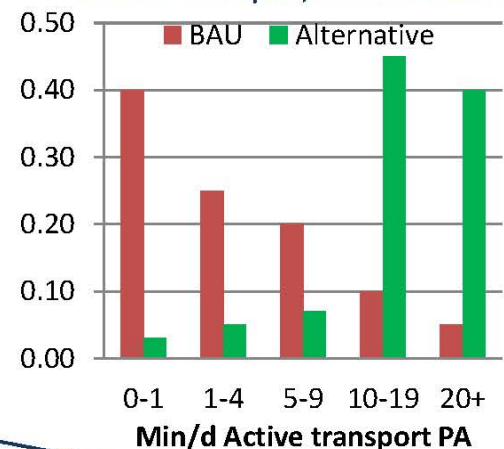


Physical Activity: Simplified Example of How ITHIM Works

- Physical Activity (PA) and Ischemic Heart Disease

PA Level (min/d)	Disease Rate (x 10 ⁻³)	RR	Exposure Distribution	
			BAU	Alternative
0-1	15*	1.00	0.40	0.03
1-4	9	0.60	0.25	0.05
5-9	7	0.47	0.20	0.07
10-19	4	0.27	0.10	0.45
20+	2	0.13	0.05	0.40
Approximate min/d/person PA			5	20
Exposure-weighted disease rate [†] x 10 ⁻³			10.15	3.99
Exposure-weighted RR [#]			0.677	0.266

Population Proportions of Daily Minutes of Active Transport, BAU and Scenario



* Reference rate for denominator of RR

† BAU (15*0.4 + 9*0.25 + 7*0.2 ...) Alt:(15*0.03 + 9*0.05 + 7*0.07...)

BAU (1.0*0.4 + 0.6*0.25 + 0.47*0.2...) Alt:(1.0*0.03 + 0.6*0.05 + 0.47*0.07...)

$$PAF = \frac{\int_{x_{min}}^{x_{max}} RR(x)P(x)dx - \int_{x_{min}}^{x_{max}} RR(x)Q(x)dx}{\int_{x_{min}}^{x_{max}} RR(x)P(x)dx}$$

- Existing burden of heart disease = 31,854 DALYs

$$PAF = \frac{0.677_{baseline} - 0.266_{alternative}}{0.677_{baseline}} = \frac{10.15_{baseline} - 3.99_{alternative}}{10.15_{baseline}} = 0.607$$

- In ITHIM context, sign of PAF is negative

- Δ BD = BD × PAF = 31,854 DALYs × -0.607 = -19,332 DALYs

- Burden of Disease reduced (-19,332 DALYs)

- In practice, RRs come from a meta-analysis of the scientific literature

SCORP Activities Included

CDC recommended physical activity levels for health benefits:

- MET (metabolic equivalent task) = energy expended relative to a resting metabolic rate (MET = 1)
- 150 weekly minutes of moderately-intense activity (3.0-5.9 METs); or / or a mix of
- 75 weekly minutes of vigorously-intense activity (≥ 6.0 METS); or
- MET < 1.5 considered 'sedentary'
- **30 SCORP activities** with MET ≥ 3.0



OR Estimator Inputs / Outputs

	A	B	C	D	E	F	G
1	Inputs				Annual physical activity benefit per 30920 participants		
2	Instructions: Fill in yellow cells on this worksheet (blue cells will be automatically filled)				More in depth outputs can be found on the Outputs page		
3	County (select)	Small Rural			Deaths	-2.838346183	
4	County Type	Rural			YLL	-18.17	
5	Current % of Total Population Participating	77%			YLD	-16.38	
6	County Population	40,000.00			DALYs	-34.55	
7	Current # Users	30,920.00			Value	-\$1,555,341.28	
8	Activity (select)	Walking on local streets or sidewalks					
9	MET Values For Activity	3.5					
10	Minutes of Moderate Activity/Week	100.6849315					
11	Desired Weekly Participation (weekly minutes per participant)	150					
12							

Recreation Calibration Worksheet

Weekly minutes spent participating in each activity (Median Participant)														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Weekly minutes spent participating in each activity (Median Participant)													
2		Walking on local streets or sidewalks	Walking on local trails or paths	day hiking on non-local trails or path	Long-distance hiking (back packing)	Jogging or running on streets or sidewalks	Jogging or running on trails or paths		Bicycling on unpaved trails	Bicycling on paved trails	Bicycling on roads, streets or sidewalks	All-terrain vehicle riding (3 & 4 wheel ATVs,	Class III – Off-road motorcycle	Riding UTVs or side-by-side ATVs (non-
4	METS	3.5	3.5	3.5	7.0	7	7	3.8	5.8	3.5	3.5	4.0	4.0	4.
5		Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week	Minutes of Vigorous Activity/W week	Minutes of Vigorous Activity/W week	Minutes of Vigorous Activity/W week	Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week	Minutes of Moderate Activity/W week
6	Rural	100.6849	34.52055	27.61644	27.61644	46.0274	23.0137	46.0274	23.0137	23.0137	34.52055	25.31507	46.0274	48.3287
7	Urban	161.6712	35.67123	24.16438	24.16438	57.53425	28.76712	9.205479	23.0137	23.0137	43.15068	20.71233	43.72603	16.1095
8														
9														
10	Lookup Matrix for % Participating													
11		Walking on local streets or sidewalks	Walking on local trails or paths	Walking / day hiking on non-local trails or	Long-distance hiking (back packing)	Jogging or running on streets or sidewalks	Jogging or running on trails or paths		Bicycling on unpaved trails	Bicycling on paved trails	Bicycling on roads, streets or sidewalks	Class I – All-terrain vehicle riding (3 & 4 wheel	Class III – Off-road motorcycle	Class IV – Riding UTVs or side-by-side ATVs
13	Rural	0.773	0.68	0.519	0.105	0.16	0.116	0.083	0.126	0.193	0.262	0.166	0.046	0.08
14	Urban	0.8495	0.7545	0.559	0.1435	0.3	0.242	0.0275	0.1565	0.3365	0.424	0.0615	0.03	0.026

OR Estimator Outputs

Recreation Health Impact Estimator Outputs Page

Annual physical activity benefit per 30920 participants

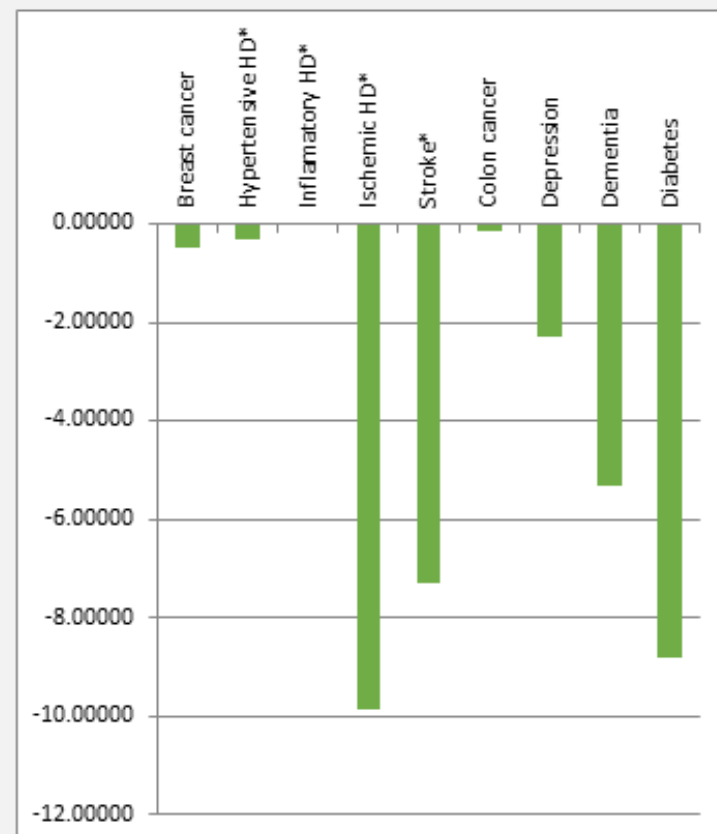
	YLL	YLD	DALYs (YLL+YLD)	Value	Deaths
Physical Activity	-18.17	-16.38	-34.55	-\$1,555,341.28	-2.8383

Health Outcomes by Disease

	YLL	YLD	DALYs (YLL+YLD)	Value	Deaths
Breast cancer	-0.36700	-0.13704	-0.50404	-\$64,948.74	0
Hypertensive HD*	-0.25359	-0.05753	-0.31112	-\$520,947.81	0
Inflammatory HD*	0.00000	0.00000	0.00000		0
Ischemic HD*	-7.99766	-1.87671	-9.87437		-1
Stroke*	-3.82166	-3.46318	-7.28484	-\$127,064.61	-1
Colon cancer	-0.13373	-0.02152	-0.15525	-\$18,552.85	0
Depression	-0.01318	-2.28350	-2.29667	-\$76,889.91	0
Dementia	-2.32781	-2.99158	-5.31939	-\$265,186.38	-1
Diabetes	-3.25357	-5.55067	-8.80424	-\$481,750.98	0
TOTAL	-18.16820	-16.38172	-34.54992	-\$1,555,341.28	-3

*Cardiovascular diseases

DALYs



Health Metrics

503 billion kcal / year

= 144 million pounds of body fat = 29.5 Olympic swimming pools)

Total kcal = MET * Annual Median Hours * Mean Body Weight (kg) * Annual User Occasions

– Data sources: Ainsworth Compendium; 2017 SCORP Statewide Survey

\$1.42 billion year in Cost of Illness Savings

= 17% of the estimated \$8.1 billion spent on chronic illnesses, or 4% of total health care expenditures in Oregon

\$COI Savings = Δ Burden of Disease* \$Cost of Illness

– Δ BD = BD * Δ RR

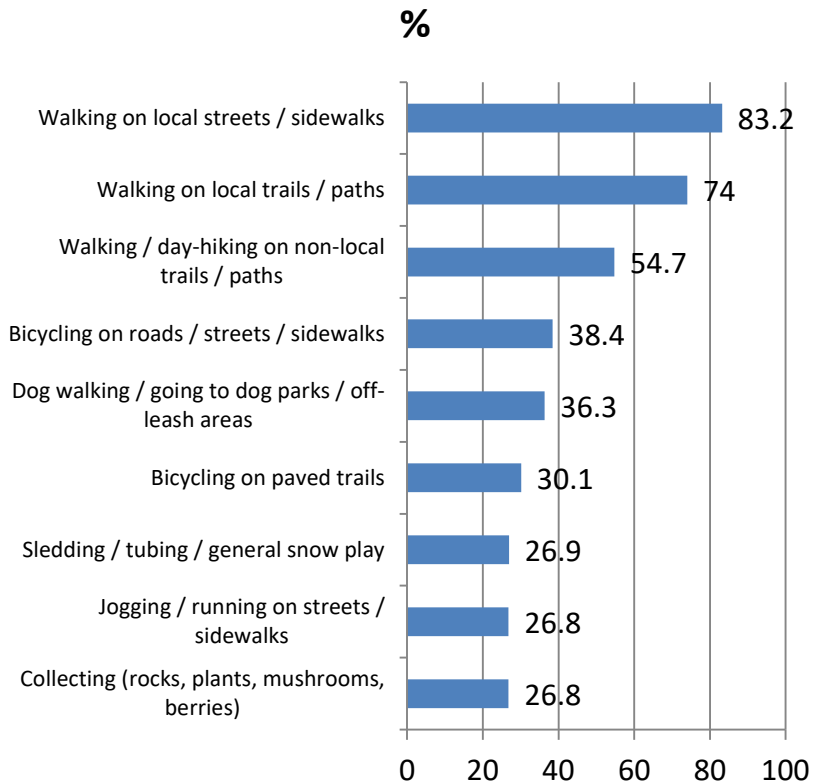
– BD = DALY (Disability Adjusted Life Years)

– Δ RR = change in relative risk

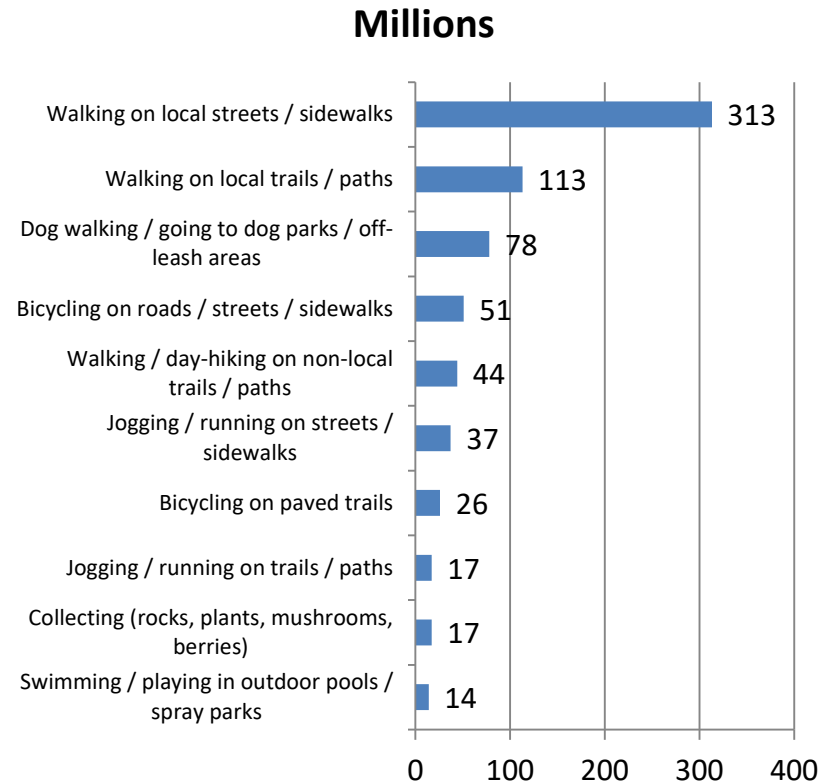
– \$COI = direct medical treatment costs + lost worker productivity

Top Ten Results

% OR Population Participating



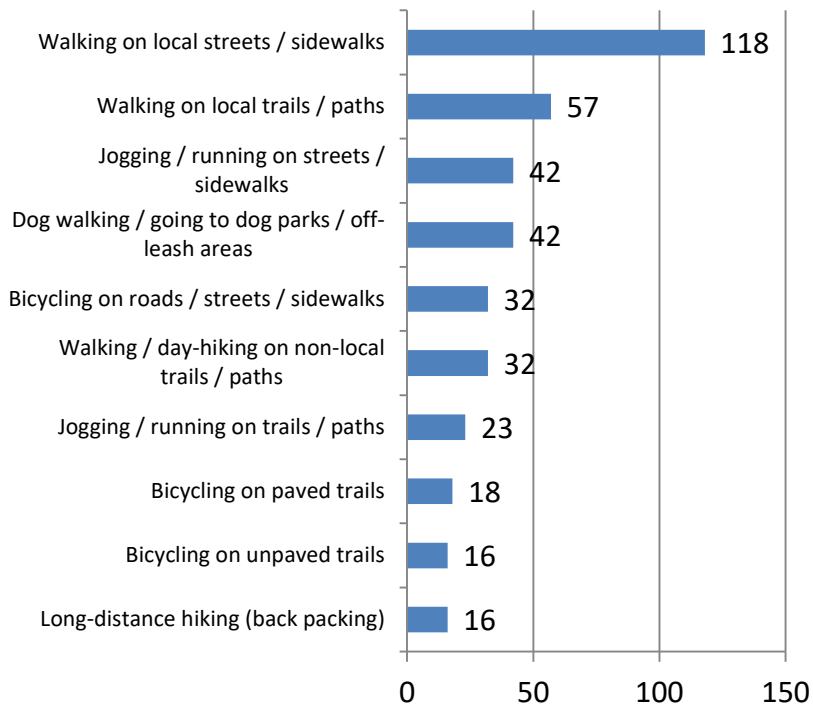
Annual User Occasions



Top Ten Results

Annual Energy Expended

Billions of kCals



Annual Cost of Illness Savings

\$ Millions

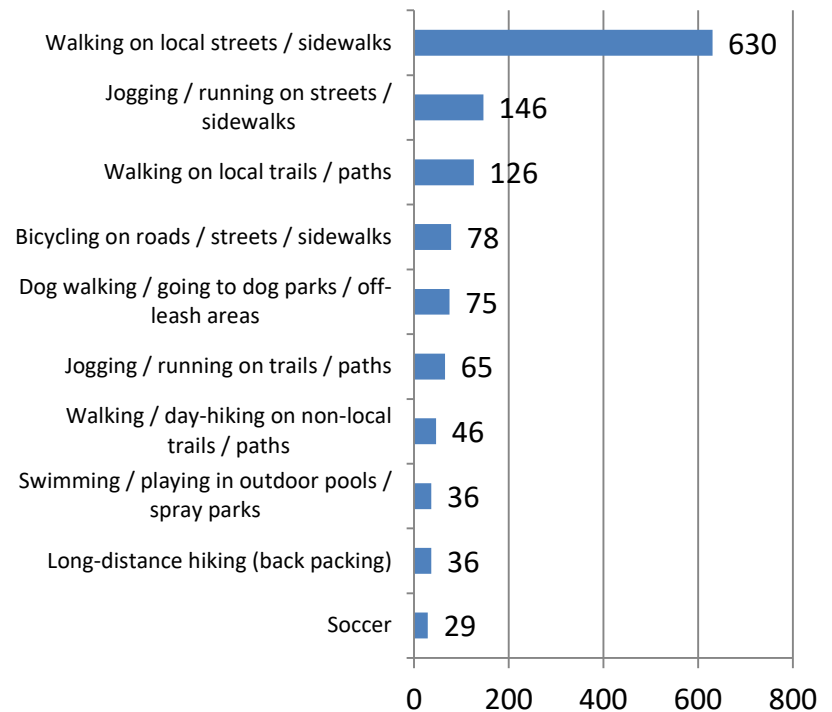


Table 3. Average Weekly Minutes of Outdoor Recreation Physical Activity by SCORP Survey Respondent Characteristics

	Average Weekly Minutes	No. Respondents		Average Weekly Minutes	No. Respondents
Age Category			Sex		
18-34	↓ 509	714	Female	↓ 407	1,894
35-59	↓ 478	1,559	Male	↓ 420	1,617
60-74	↓ 334	716	Community Type		
75-84	↓ 185	460	Rural	↑ 413	1,115
85 or older	↓ 92	32	Suburban	↑ 392	1,339
Income Category			Urban	↓ 428	776
<\$25k	↑ 456	420			
\$25K-\$75K	↑ 387	1,255	Workplace Activity		
\$75K or more	↓ 438	1,267	Mostly sitting or standing	↓ 429	1,330
Education Level			Mostly walking	↓ 502	428
Did Not Complete High School	↑ 247	105	Mostly heavy labor or physically demanding work	↓ 539	245
High School Diploma (or equivalent)	↑ 405	438	BMI		
Some College, But No Degree	↑ 441	760	Normal Weight (18.5-24.9)	↓ 460	1,212
Associate Degree	↑ 410	349	Overweight (25-29.9)	↓ 415	1,036
Bachelor Degree	↑ 428	818	Obese (30-45)	↓ 335	680
Graduate or Professional Degree	↓ 393	707			

Questions



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