




Social & Physical Determinants of Alaskan Health: a meta-analysis

Presented by

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 UNIVERSITY of ALASKA ANCHORAGE



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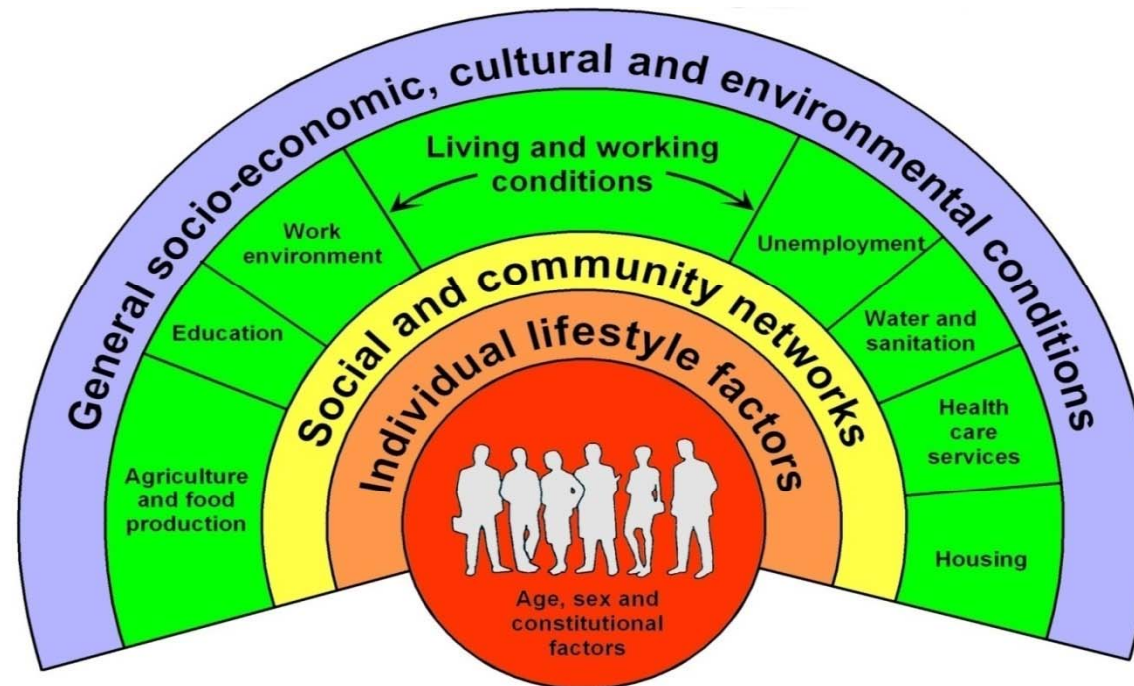
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Overview of Presentation

- What are determinants of health?
- What is population health promotion
- What are the primary determinants of Alaskan health?
- What are the implications for population health promotion in Alaska and the circumpolar north?

Social and Physical Determinants of Health

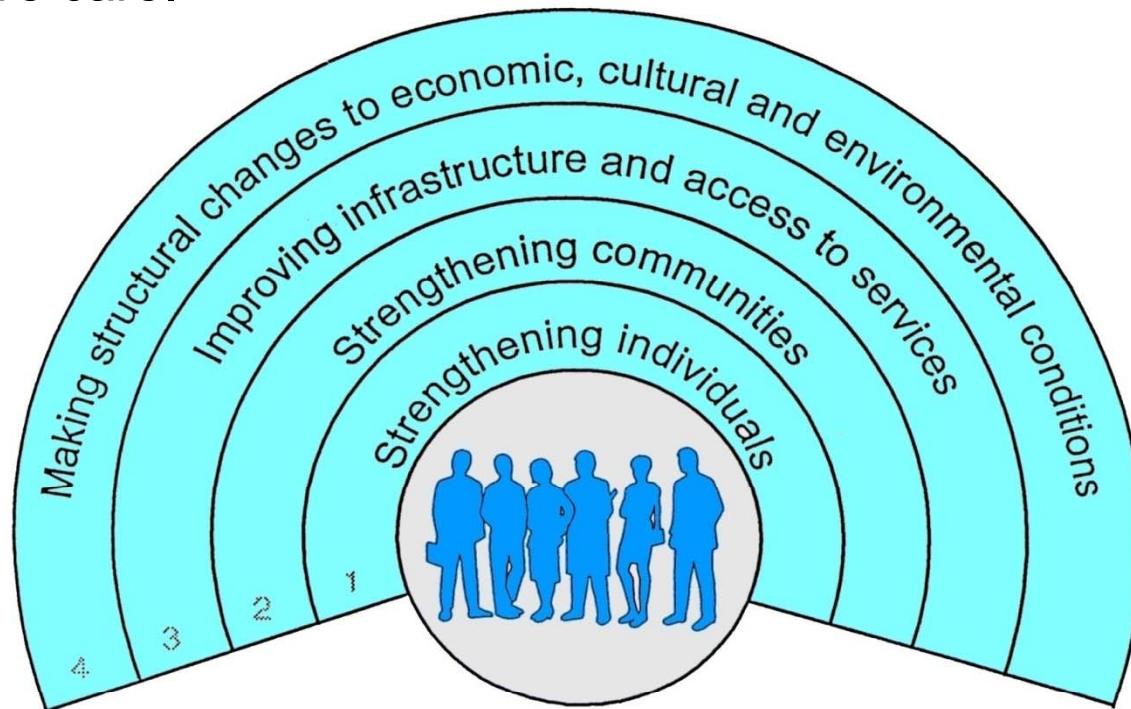
Social determinants of health determine whether individuals stay healthy or become ill (Raphael, 1984).



Source: Dahlgren and Whitehead, 1991

Structure of Health Promotion: *The Ottawa Charter*

- Population health promotion is educational, organizational, economic, and environmental supports to reorient health services beyond clinical and curative care.



Strategic Prevention Framework

- Ottawa Charter
 - Cross-silo health promotion planning
- Healthy People 2020
 - “Over the coming year and throughout the decade, the US Department of Health and Human Services intends to develop objectives for the social determinants and methods to ensure their integration across all Healthy People 2020 objectives.”

Meta-analysis Introduction

- A structured assessment of research into associations between health determinants and outcomes in Alaska and populations in the Arctic and sub-Arctic (i.e. circumpolar populations).
- The results of this review will inform the development of an ICHS health promotion research agenda tailored to populations living in the circumpolar north.
- Two objectives directed our analysis:
 1. to identify associations between the proximate determinants of population health and the outcomes
 2. to characterize key features of the research methodologies currently employed by researchers focusing on the circumpolar north.

Leading Causes of Death (Alaska)

Rank	Causes of Death	# of Deaths
1	Malignant Neoplasms	7375
2	Diseases of the Heart	6154
3	Unintentional Injuries	3278
4	Cerebrovascular Diseases	1689
5	Chronic Lower Respiratory Diseases	1499
6	Intentional Self-harm	1317
7	Diabetes	913
8	Alzheimer's Disease	534
9	Chronic Liver Disease and Cirrhosis	526
10	Influenza and Pneumonia	385

Source: Alaska Bureau of Vital Statistics, 2008 data is provisional. Last Updated: 11/25/2009

Meta-analysis Methods

- English language articles were identified by a search of the PubMed and ISI Web of Knowledge (WoK) databases from 1999 to present.
- The leading causes of death were used as search terms. Variants of these terms were also used. For example, in addition to chronic liver disease we included cirrhosis.
- To identify publications focused on the circumpolar north we used AND to combine the outcomes listed above with the phrase Alaska OR Arctic (e.g., cirrhosis AND Alaska OR Arctic).
- We also conducted a MeSH search in PubMed using Health AND Alaska OR Arctic Regions.

Meta-analysis Methods (cont.)

■ Inclusion criteria:

1. The study was reported in English
2. No earlier than 1999
3. In a peer-reviewed journal
4. Represents original and region-specific research (*i.e.*, studies that combined American Indian and Alaska Native health data were not included)
5. Structured assessment of association between at least one prospective health determinant and health outcome (*i.e.*, qualitative or quantitative assessment).

Meta-analysis Methods: *Circumpolar Region*

- The **Arctic region** includes the Arctic Ocean and the lands in it and adjacent to it. It includes northern Alaska, most of the Franklin District in Canada, two thirds of Greenland, Svalbard, Franz Josef Land, Lapland, Novaya Zemlya, and Northern Siberia.
- The **Subarctic** is a region in the Northern Hemisphere immediately south of the true Arctic and covering much of Alaska, Canada, the north of Scandinavia, and Siberia. Generally, subarctic regions fall between 50°N and 70°N latitude, depending on local climates.

Source: Webster's New Geographical Dictionary, 1988

Meta-analysis Methods: *Circumpolar Region*

■ Circumpolar States

- Sweden
- Norway
- Finland
- Russia
- Canada
- Iceland
- Denmark
- Greenland
- Alaska



Initial Review

- All studies identified in literature search were assessed using the inclusion criteria
- Independent assessment of studies purported to meet the criteria
- Review team to determination of differences
 - Structured assessment of association?
- Secondary analysis of studies selected to identify the determinants and outcomes assessed and study design; descriptive, cross-sectional, case-control, or cohort.

Results

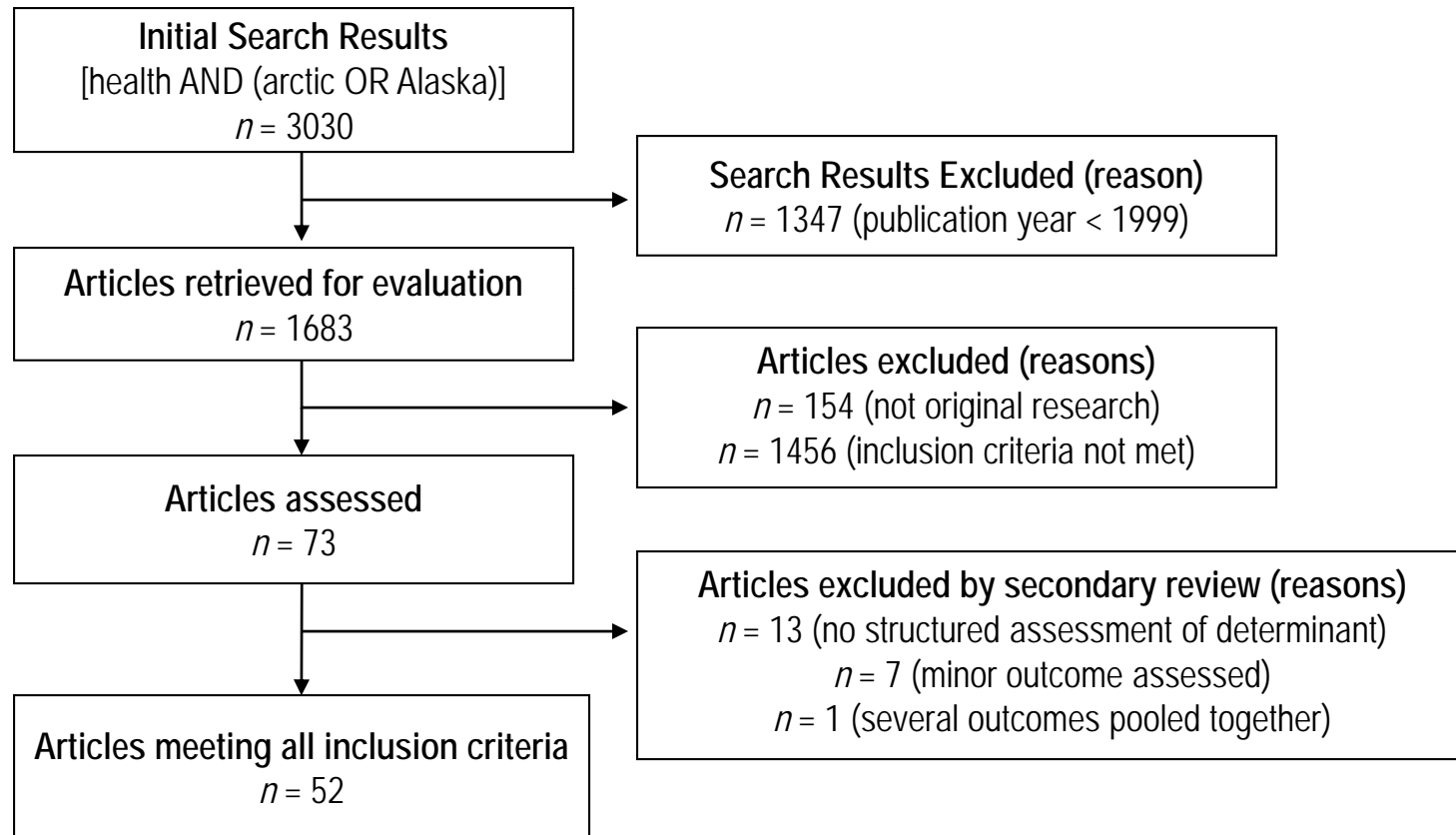


Figure 1. Search results and article selection procedure

Secondary Review

- Listed the operational definitions of the social and physical factors investigated in each study
- These factors were separated into social and physical factors
- Social and physical factors aggregated into prospective population health determinants
- Operational definitions of Alaskan and circumpolar health determinants developed

Meta-analysis Results: *Determinants of Circumpolar Health*

Determinant	Definition
Addiction	confluence of psychological, social and biological forces that combine to promote and support compulsive substance use
Social isolation	social situations characterized by anxiety, depression, shame, conflict, and a lack of gainful employment
Environmental exposures	presence of environmental hazards that adversely affect health or the ecological balances essential to human health
Diet / Nutrition	procurement and consumption of nutrients necessary to maintain life and health
Global climate change	adverse environmental factors induced by rapid changes in the earth's climate
Access to clean water	processes, quantity and quality of water obtained for hygiene and consumption
Access to quality health care	effective health care service utilization

Meta-analysis Results: *Defining “Social Isolation”*

Social Isolation variables	Study
Self-reported anxiety/depression was a strong and significant correlate to both self-mutilation/suicide attempts and suicidal thoughts in both populations.	Kvernmo and Rosenvinge (2009)
Of the cases of completed suicides 59% were reportedly experiencing an event that caused a great deal of shame.	Perkins et al. (2009)
Factors such as family problems (16 %), relationships (15 %), stress (15%), sadness/depression (13 %), no love (12 %), and boredom (11 %) identified as warning signs for suicide.	Wexler and Goodwin (2006)
Lifetime diagnosis of depression, personality disorder in completed suicides.	Boothroyd et al. (2001)
Anxiety, depression, eating behavior problems identified as risk factors associated with suicide.	Silviken and Kvernmo (2007)
<u>Social isolation</u> social situations characterized by anxiety, depression, shame, conflict, and a lack of gainful employment	

Meta-analysis Results: *Defining “Addiction”*

Addiction variables	Study
Maternal tobacco use identified as a risk factor associated with infant deaths.	Blabey and Gessner (2009)
An overdose independently predicted lifetime attempted suicide.	Monirzzaman et al. (2009)
Smoking in pregnancy was associated with an increased risk of admission for LRTI.	Banerji et al. (2009)
Case subjects were significantly more likely to have had a history of solvent sniffing.	Boothroyd et al. (2001)
Significant risk factors for diabetes included high alcohol consumption.	Jorgensen et al. (2002)
Current smokers and those who had quit <5 years ago were more likely than non-smokers to have carotid plaque.	Kaufman et al. (2008)
Bronchitis was associated with tobacco consumption.	Backer et al. (2004)
Current smoking was significantly related to the presence of atherosclerosis	Cutchins et al. (2008)
Risk factors with the highest population attributable risks included maternal prenatal substance use.	Gessner et al. (2004)
Substance abuse history significantly associated with fatal suicides.	Wexler et al. (2008)
<u>Addiction</u> confluence of psychological, social and biological forces that combine to promote and support compulsive substance use	

Meta-analysis Results: *Determinant-Outcome Associations*

		Outcomes										Totals
		1	2	3	4	5	6	7	8	9	10	
Leading Causes of Death in Alaska		Cancer	Heart Disease	Unintentional Injuries	Cerebro-vascular Disease	COPD	Suicide	Diabetes	Alzheimer's Disease	Chronic Liver Disease	Influenza and Pneumonia	
Determinants	Addiction	2	2	3	3	4	6	1		3	1	25
	Environmental Exposures	3	2	3		8						16
	Diet/ Nutrition	3	4		3			2				12
	Social Isolation					1	5					6
	Access to Clean Water					2					1	3
	Global Climate Change	1		1								2
	Access to Quality Health Care						1					1
	Totals	9	8	7	6	15	12	3	0	3	2	*

**Note: several studies assessed multiple determinant-outcome associations.*

Meta-analysis Results: *Study Design*

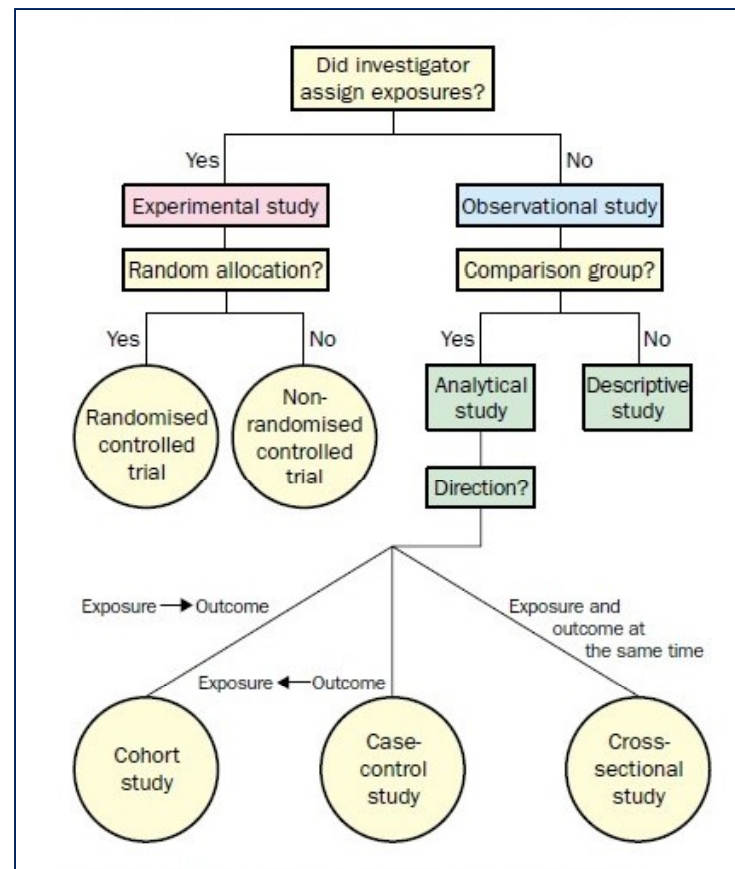


Figure 2. From Grimes and Schulz (2002): Algorithm for classification of clinical research.

Meta-analysis Results: *Study Design*

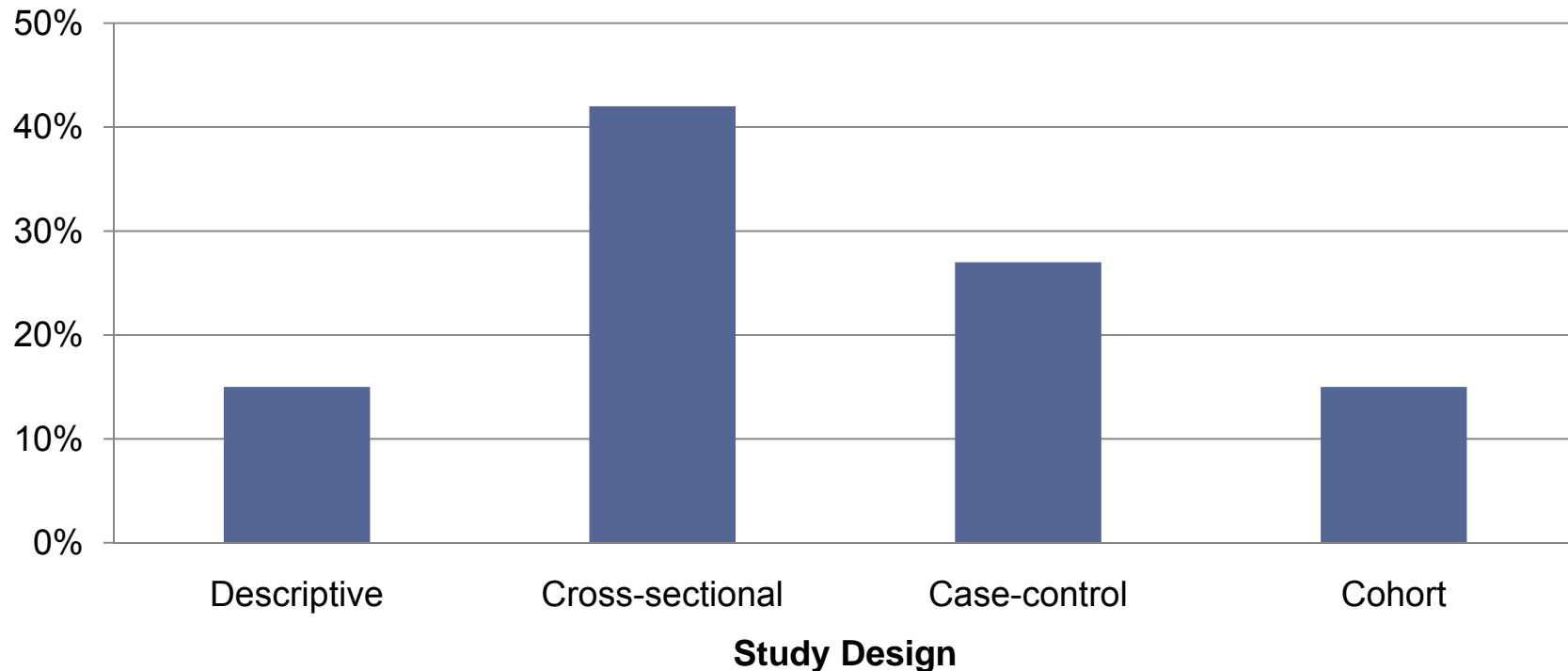


Figure 3. Percentages of experimental designs identified in the reviewed literature. Results are displayed left to right according to the methodological hierarchy proposed by Grimes and Schulz (2002).

Conclusions

- This study provides an evidence-based set of operational definitions for seven determinants of circumpolar health:
 1. Addiction
 2. Environmental exposures
 3. Diet / Nutrition
 4. Social isolation
 5. Access to clean water
 6. Global climate change
 7. Access to quality health care

Conclusions

- Data exist for population health promotion interventions in addiction, diet / nutrition, and environmental exposures
- There is a need for further study of additional determinants of Alaskan and circumpolar health
- There is a need for non-descriptive experimental study designs to assess the strength and direction of associations between determinants and health outcomes in Alaska and the circumpolar north
 - Cohort and case-control studies
 - Quasi-experimental (time-series) studies?

Conclusions

- Questions Remain:
 - Search parameters –
 - ◆ Morbidities as well as mortalities?
 - ◆ If so, which ones?
 - Determinants –
 - ◆ Additional?
 - ◆ Which ones?
 - Next Steps? –