

Loneliness and Longevity:

Meta-analytic data examining the influence of social connections on mortality risk

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Social Connections

May be protective to both mental and physical health

*"Loneliness is the first thing which God's
eye named, not good"*

John Milton (English Poet & Scholar)

"Loneliness is the most terrible poverty"

Mother Teresa of Calcutta

"One is the loneliest number"

Three Dog Night

Loneliness, or the lack of social connectedness, may be detrimental

Early studies by Durkheim
(1897/1951) link
loneliness to mortality.

Is there evidence that social connections influences longevity?

If so, is it a strong enough influence to take seriously for one's health?

Most major health organizations do not acknowledge the importance of social connections for health

Theoretical Models of the Protective role of Social Connections

The buffering hypothesis (Stress regulation)

social relationships may provide resources (informational, emotional, or tangible) that promote adaptive behavioral or neuroendocrine responses to acute or chronic stressors (e.g., illness, life events, life transitions).

The main effects model

social relationships may be associated with protective health effects through more direct means, such as cognitive, emotional, behavioral, and biological influences that are not explicitly intended as help or support.

Industrialized societies may be decreasing

Trends reveal

- reduced intergenerational living, greater social mobility,
- delayed marriage,
- dual-career families,
- Increased single-residence households,
- increased age-related disabilities

Meta-Analysis of Social Relationships and Mortality

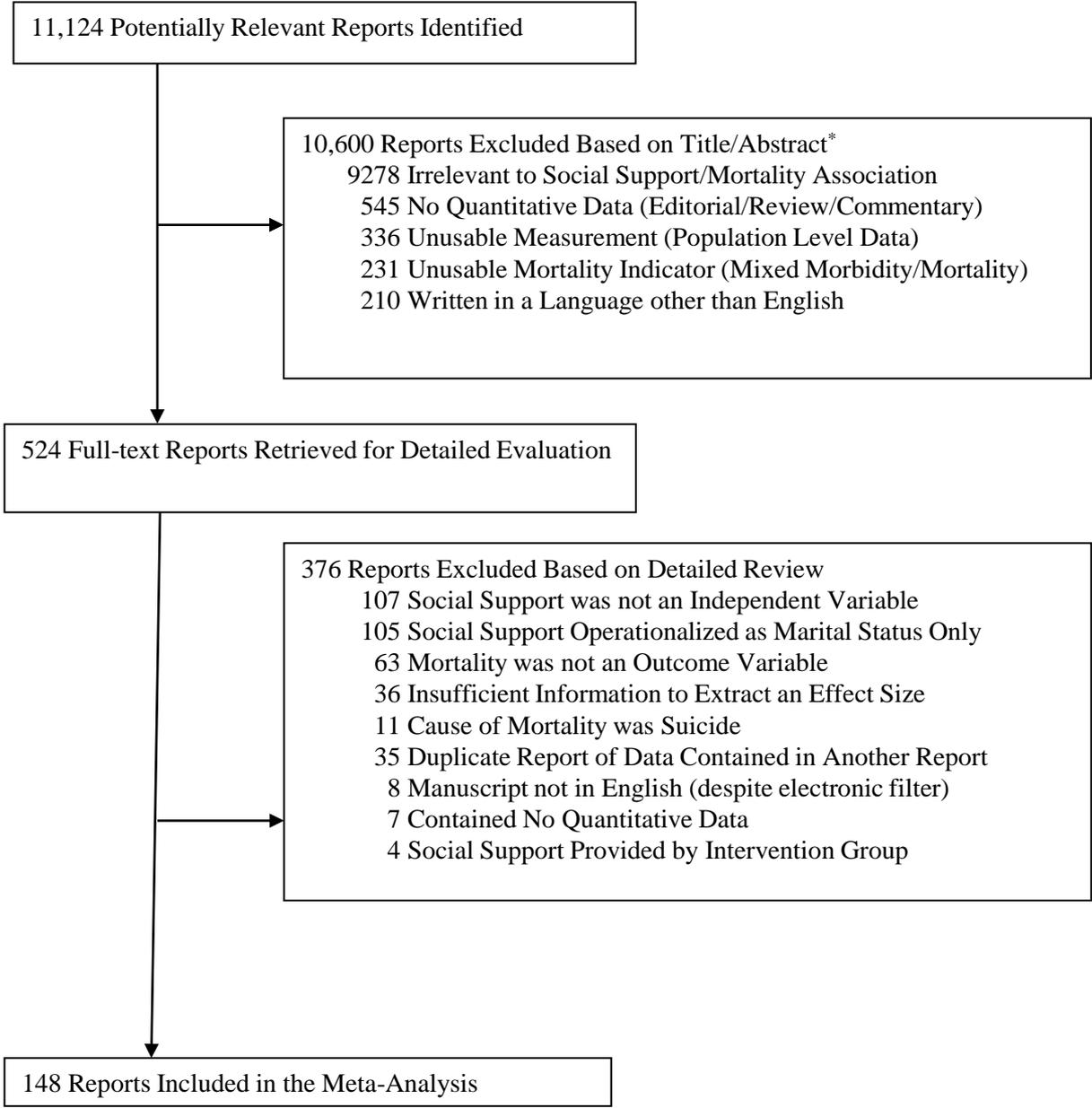
Primary Aims:

1. Overall magnitude of social relationships influence on risk for mortality?
2. Which factors may moderate the risk?
3. Which aspects of social relationships are most highly predictive?

Meta-Analysis: combines results across multiple studies, providing a weighted effect size.

- Generally thought to be a more powerful estimate of effect than any single study.

Holt-Lunstad, Smith, & Layton; *PLoS Medicine*, 2010

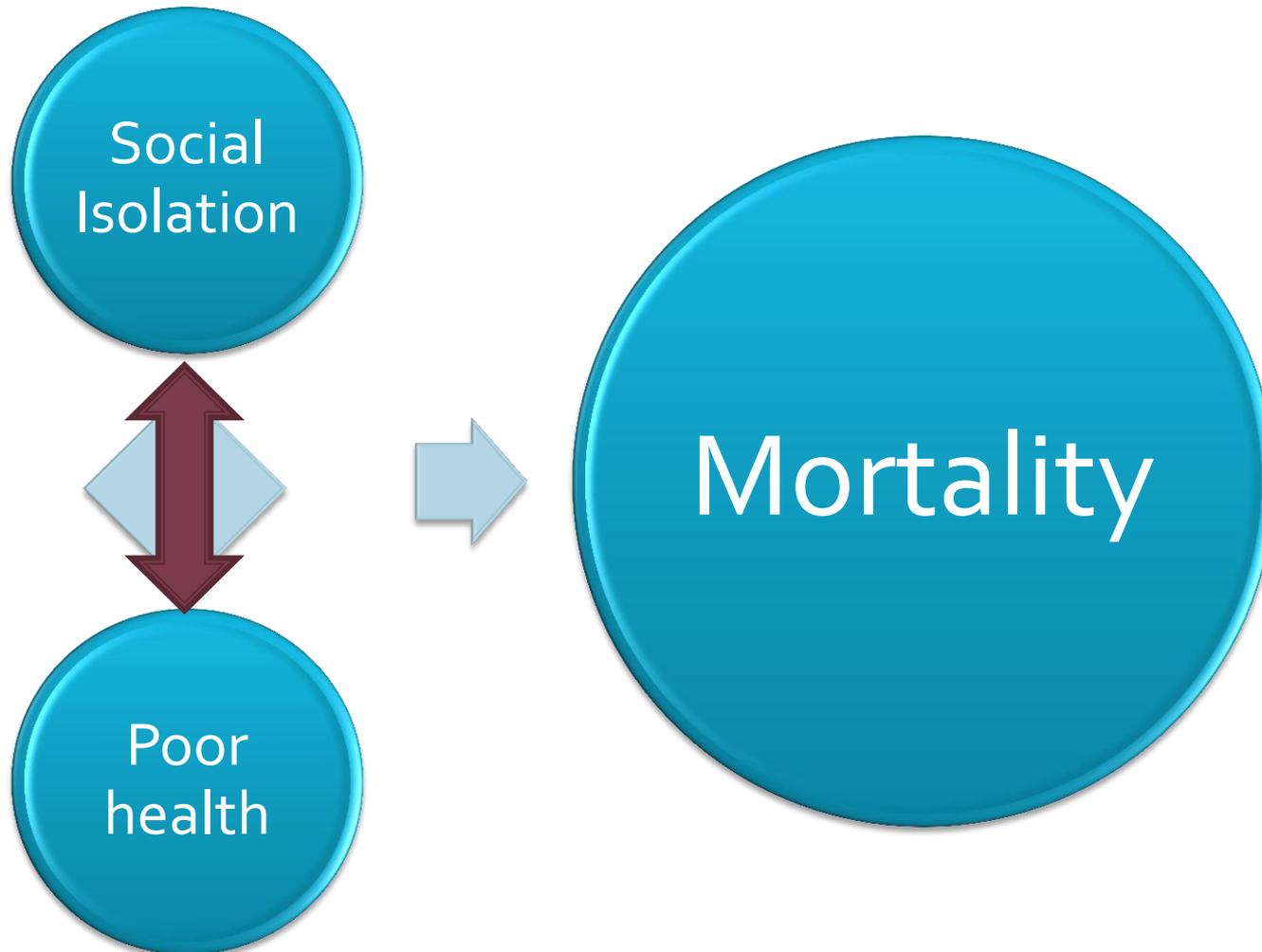


Results of Meta-analysis

- Meta-Analysis of 148 studies (308,849 participants)
 - Average follow-up time 7.5 years
- OR = 1.50 (95% CI 1.42 to 1.59)

Overall finding: a 50% increased likelihood of survival for participants with stronger social connections

Evidence of a directional effect of social connections on mortality.



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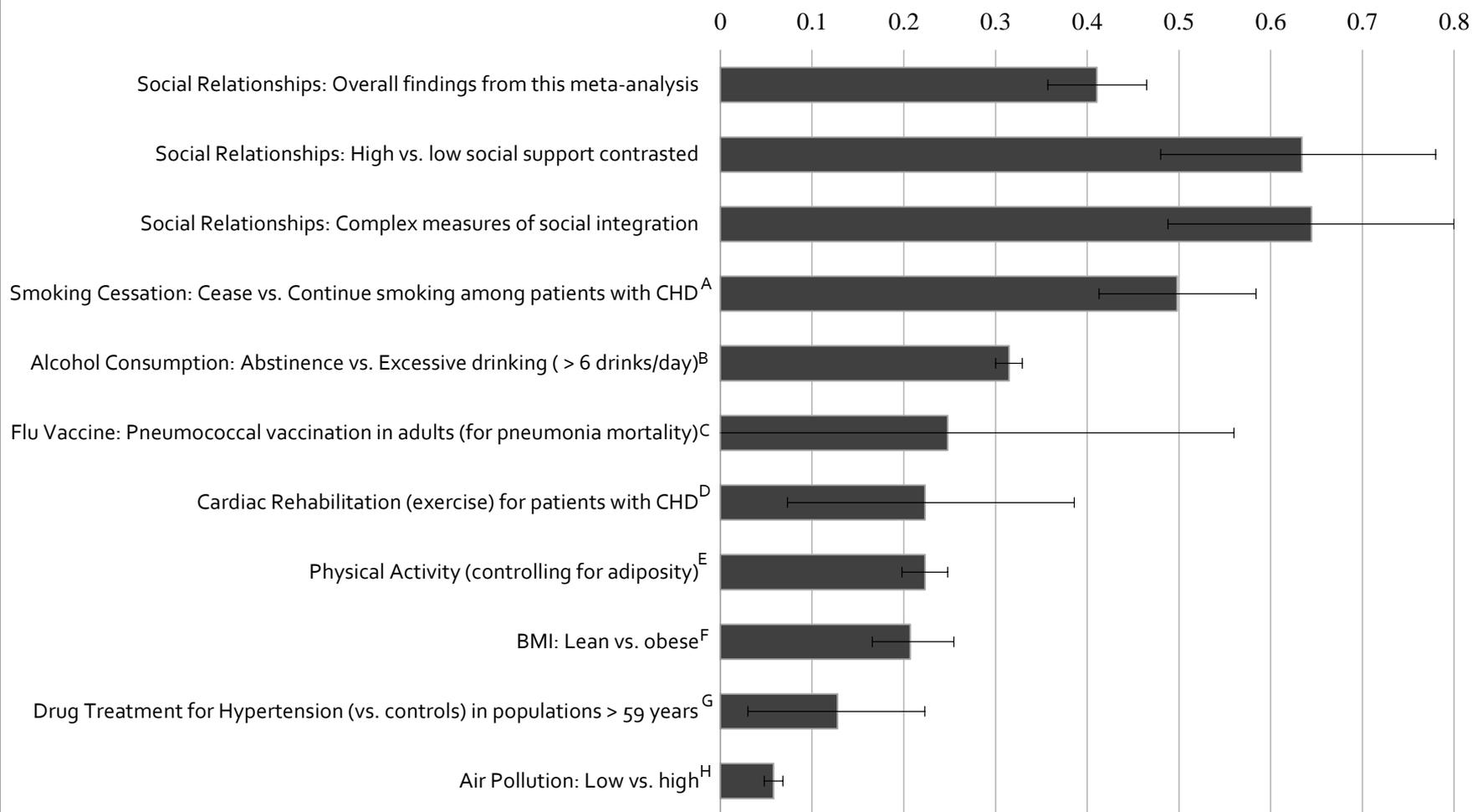
- Majority of studies epidemiological studies that tracked initially healthy participants
 - Initially healthy subjects who had greater social connections lived longer
- Among those who were ill, the effect also held.

Regardless of initial health status, those with great social connections lived longer.

What is the significance of the magnitude of effect?

Can we benchmark the effect relative to well-established risk factors for mortality?

Comparison of Odds (lnOR) of Decreased Mortality across Several Conditions Associated with Mortality



Note. Effect size of zero indicates no effect. The effect sizes were estimated from meta analyses: ; A = Critchley and Capewell (2003); B = Holman, English, Milne, and Winter (1996); C = Fine, Smith, Carson, Meffe, Sankey, Weissfeld, Detsky, and Kapoor (1994); D = Taylor, Brown, Ebrahim, Jolliffe, Noorani, Rees et al. (2004); E, F = Katzmarzyk, Janssen, and Ardern (2003); G = Insua, Sacks, Lau, Lau, Reitman, Pagano, and Chalmers (1994); H = Schwartz (1994).

Who is at greatest risk?

Participant and Study Characteristics

- Age (at study initiation)
- Sex
- Initial health status
- Cause of death
- Follow-up period
- Country of origin

Results consistent across these factors.

**What aspects of social connections
are the strongest predictors?**

How to define and measure social connections?

- Structural Measures
 - The existence and interconnections among differing social ties and roles
 - Examples: Size of social network (Social isolation/integration), marital status, living alone
- Functional Measure
 - Functions provided or perceived to be available by social relationships
 - Examples: Received support, Perceived support, Perceived Loneliness
- Multi-component Measures
 - Assessment of both structural and functional measures

**Significant differences were found
across the type of social
measurement evaluated ($p < 0.001$)**

**Strongest for complex measures of social integration
(OR = 1.91; 95% CI 1.63 to 2.23)**

Weighted Average Effect Sizes across Different Measures of Social Relationships

Type of Measure	k	OR	95 % CI
Functional			
Received Social Support	9	1.22	[0.91, 1.63]
Perceptions of Social Support	73	1.35	[1.22, 1.49]
Loneliness (inversed)	8	1.45	[1.08, 1.94]
Structural			
Living Alone (inversed)	17	1.19	[0.99, 1.44]
Marital Status (married vs. other)	62	1.33	[1.20, 1.48]
Social Isolation (inversed)	8	1.40	[1.06, 1.86]
Social Networks	71	1.45	[1.32, 1.59]
Social Integration	45	1.52	[1.36, 1.69]
Complex Measures of Social Integration	30	1.91	[1.63, 2.23]
Combined Structural and Functional			
Multi-faceted Measurement	67	1.47	[1.34, 1.60]

Note. These analyses shifted the units of analysis, with distinct effect size estimates within studies used within different categories of measurement, such that many studies contributed more than one effect size but not more than one per category of measurement. OR = odds ratio, transformed from random effects weighted lnOR.

Marriage: Until death do we part

Marriage is a central relationship for most adults

- Spouse may be only confidant (McPherson, Smith-Lovin, & Brashears, 2006)
- Marriage, offspring, and siblings are associated with lower loneliness (Distel, Rebollo-Mesa, Abdellaoui, Derom, Willemsen, Cacioppo, Boomsma, 2010).
- Spouse: health problem, infrequent emotional support, infrequent conversations, disagreement, associated with greater loneliness (Gierveld, van Groenou, Hoogendoorn, Smith, 2009).

Marriage and Mortality

Preliminary analyses (unpublished) from Meta-analysis of 240 studies

- 95,485,667 participants across those studies; most Western/Northern European and North American data
 - Average length of follow-up = 8.2 years
- Average effect size = 1.36
 - 36% increased survival of married compared to non-married (combination divorced, single, widowed, etc.), (or inverses, $OR=.74 = 26\%$ reduced likelihood of mortality)
- Across 146 studies controlling for age, the results were 1.32
- No significant gender differences

Summary

Taken together the data suggest that social relationships have a significant influence on survival-- comparable to many well-established risk factors.

What we know and what we don't know . . .

From converging evidence to gaps in the literature

What we know and what we don't know . . .

- How many friends do you need for a health benefit?
 - Evidence points to a gradient rather than a threshold effect
 - Interventions need not be limited to those deemed “high risk”, rather individuals across the risk trajectory may benefit.

What we know and what we don't know . . .

Social relationships make me healthier?? Well you haven't met my family!

The issue of relationship quality.

Not all relationships are entirely positive!

What we know and what we don't know . . .

Relationship Quality

- Few studies of mortality examine Relationship Quality.
- Effect on mortality may be conservative estimate

What we know and what we don't know . . .

- Are some relationships better than others?
 - Family vs. Friends?
 - Marriage a significant predictor of mortality
 - Complex measures (which would include a diversity of relationship types) was strongest predictor of mortality.
 - Online relationships / social networks?

Online Social Networks

DO THEY OFFER A HEALTH BENEFIT?

- Mortality data unclear
- What functions can they serve that may be pathways to health?
- What can't they provide?
- Might there be detrimental consequences?

How might we intervene?

Can social contact reduce risk?

Implications for interventions

- Data from meta-analysis based on naturally occurring relationships—
 - Support groups? Or Support Staff?
- Relationship quality
 - Potentially increase effect by focusing on positive relationships
- Focus on Loneliness
 - Lowest end of spectrum at greatest risk
 - Loneliness as a continuum not a category

Implications for interventions

- Focus on Older Adults?
 - Effect of social connections on Mortality independent of age
 - Similar to other lifestyle or behavioral factors, they are important at any age but effect become evident over time
 - Age may still be a salient factor to consider
 - Social disruptions with age that may increase loneliness
 - Retirement
 - Children leaving home (becoming empty nester)
 - Widowhood

Conclusion

Several decades ago high mortality rates observed among infants in custodial care (orphanages), even when controlling for pre-existing health conditions and medical treatment. This finding changed policy . . .

Might adults similarly benefit from social contact?

Acknowledge

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*A faithful friend is the medicine of
life.*

~Ecclesiasticus 6.16

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