

Reduction in saturated fat intake for cardiovascular disease: Evidence and implications for public health

Review on which this evidence summary is based:

Hooper, L., Martin, N., Abdelhamid, A., & Smith, G.D. (2015). **Reduction in saturated fat intake for cardiovascular disease.** *Cochrane Database of Systematic Reviews, Issue 6*, Art. No.: CD011737. DOI: 10.1002/14651858.CD011737.

Review Focus

- P** Adults (18 years or older) with or without cardiovascular disease
- I** Dietary advice, supplementation of fats, oils, modified or low-fat foods, or a provided diet
- C** Usual diet, placebo, or a controlled diet
- O** *Primary Outcomes:* All-cause mortality, cardiovascular mortality, combined cardiovascular disease (CVD) events
Secondary Outcomes: Additional health events, blood measures, adverse effects reported by study authors

Review Quality Rating:

10 (strong) *Details on the methodological quality are available [here](#).*

Considerations for Public Health Practice

Conclusions from Health EvidenceTM

This systematic review and meta-analysis includes 15 randomized controlled trials (RCTs) and 17 comparisons with a total of 59,000 participants. There is moderate quality evidence for all primary and secondary outcomes, except for the secondary outcome coronary heart disease events, which is a synthesis of low-quality evidence.

Primary Outcomes

- Long-term trials found that reducing dietary saturated fat is associated with a small but important reduction in **cardiovascular risk, 17% (4%-28%)**
- Reducing saturated fat has **no effect on all-cause mortality or cardiovascular mortality** compared to usual diet

Secondary Outcomes

- Reducing saturated fat has no significant effect on lowering risk of myocardial infarctions, non-fatal myocardial infarctions, stroke, or coronary heart disease
- Replacing saturated fat with **polyunsaturated fat** (and not monounsaturated fat, carbohydrates or protein) reduces the risk of cardiovascular events by **27%**

General Implications

Public Health *should* focus on interventions aiming to reduce saturated fat intake for durations of up to 52 months to lower the risk of cardiovascular events in adults with or without CVD.

Public Health *should be aware and consider* that interventions to reduce saturated fat intake are not effective in reducing all-cause mortality, cardiovascular mortality, risk of myocardial infarction, stroke, or coronary heart disease mortality and events.

Public Health *should* consider implementing interventions that promote polyunsaturated fats in place of saturated fats to reduce the risk of cardiovascular events.

Evidence and Implications

What's the evidence?	Implications for practice and policy
<p>1. Primary Outcome: Cardiovascular Events (11 RCTs [13 comparisons], 53,300 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat intake reduces cardiovascular events by 17% (RR 0.83; 95% CI 0.72 to 0.96; 13 trials; 53,300 participants; moderate quality evidence) 	<p>1. Primary Outcome: Cardiovascular Events</p> <ul style="list-style-type: none"> To reduce the risk of combined cardiovascular events, Public Health should promote interventions to reduce and/or modify dietary saturated fat intake. Intervention durations up to 52 months are effective, compared to no intervention/usual saturated fat intake.
<p>2. Primary Outcome: All-cause Mortality (11 RCTs [12 comparisons], 55,858 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat has no effect on all-cause mortality (RR 0.97; 95% CI 0.90 to 1.05; 3,276 deaths; moderate quality evidence) 	<p>2. Primary Outcome: All-cause Mortality</p> <ul style="list-style-type: none"> Public Health should be aware that interventions to reduce saturated fat intake are not effective in reducing all-cause mortality among people identified at risk of CVD.
<p>3. Primary Outcome: Cardiovascular Mortality (10 RCTs [12 comparisons], 53,421 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat has no effect on cardiovascular mortality (RR 0.95; 95% CI 0.80 to 1.12; 12 trials; 53,421 participants; moderate quality evidence) 	<p>3. Primary Outcome: Cardiovascular Mortality</p> <ul style="list-style-type: none"> Public Health should be aware that interventions to reduce saturated fat intake are not effective in reducing cardiovascular mortality.
<p>4. Secondary Outcomes:</p> <p>Myocardial Infarctions (MI) (10 RCTs [11 comparisons], 53,167 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat intake has no effect on myocardial infarction (RR 0.90; 95% CI 0.80 to 1.01; 11 trials; 53,167 participants; moderate quality evidence) <p>Non-fatal MI (7 RCTs [9 comparisons], 52,834 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat has no effect on reducing the risk of non-fatal myocardial infarctions (RR 0.95, 95% CI 0.80 to 1.13; 9 trials; 52,834 participants; moderate quality evidence) <p>Stroke (7 RCTs [8 comparisons], 50,952 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat has no effect on risk of stroke (RR 1.00; 95% CI 0.89 to 1.12; 8 trials; 50,952 participants; moderate quality evidence) <p>Coronary Heart Disease (CHD) Mortality (8 RCTs [10 comparisons], 53,159 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat intake has no effect on CHD mortality risk (RR 0.98; 95% CI 0.84 to 1.15; 10 trials; 53,159 participants; moderate quality evidence) <p>CHD Events (12 RCTs [12 comparisons], 53,199 participants)</p> <ul style="list-style-type: none"> Reducing saturated fat has no effect on CHD events (RR 0.87; 95% CI 0.74 to 1.03; 12 trials; 53,199 participants; low quality evidence) 	<p>4. Secondary Outcomes</p> <ul style="list-style-type: none"> Public Health should note that reducing saturated fat is not effective for reducing the risk of myocardial infarctions, stroke, or coronary heart disease mortality and events.

5. Subgroup Analysis: Replacing saturated fat with polyunsaturated fat, carbohydrates, protein, or monounsaturated fats

- Replacing saturated fat with **polyunsaturated fat** reduces the risk of cardiovascular events (RR 0.73; 95% CI 0.58 to 0.92; 7 trials; **moderate** quality evidence)
- Replacing saturated fat with **monounsaturated fat** has **no effect** on the risk of cardiovascular events (RR 1.0; 95% CI 0.53 to 1.89; 1 trial; **very low** quality evidence)
- Replacing saturated fat with **carbohydrates** has **no effect** on the risk of cardiovascular events (RR 0.93; 95% CI 0.79 to 1.08; 6 trials; **low** quality evidence)
- Replacing saturated fat with **protein** has **no effect** on the risk of cardiovascular events (RR 0.98; 95% CI 0.90 to 1.06; 5 trials; **moderate** quality evidence)

5. Subgroup Analysis: Replacing saturated fat with polyunsaturated fat, carbohydrates, protein, or monounsaturated fats

- For interventions aiming to reduce CVD events, Public Health should promote replacing saturated fat with polyunsaturated fat.
- Public Health should use caution in suggesting or promoting saturated fat replacements (i.e., monounsaturated fat, carbohydrates, protein) for reducing the risk of CVD events as evidence suggests this is not effective and/or evidence is limited.

Legend: P – Population; I – Intervention; C – Comparison group; O – Outcomes; CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk; MD – Mean Difference

**For definitions see the [healthevidence.org](http://www.healthevidence.org/glossary.aspx) glossary at <http://www.healthevidence.org/glossary.aspx>

Why this issue is of interest to public health:

Cardiovascular disease (CVD) is a leading cause of death among Canadians, attributable to approximately 32% of deaths.¹ Nearly \$22.2 billion is spent treating and managing CVD annually, with disease expenditures expected to rise.² The World Health Organization states that CVD risk factors can be reduced through stress management, healthy eating, regular physical activity, and maintaining a healthy weight.³ Increased fruit and vegetable intake and decreased fat intake are recommended for preventing CVD. The recommended daily fat intake for adults is between 20% and 35% of total caloric intake, however 25% of males and 23% of females have fat intakes above the acceptable macronutrient distribution range.⁴ High intake of saturated fat elevates low density lipoprotein cholesterol levels in the blood and increases risk of cardiovascular disease and cardiovascular events.⁵ Due to the sizeable health concerns related to the consumption of saturated fats, it is important for public health to consider effective interventions to modify dietary fat intake in adults.

1. Statistics Canada (2015). *Leading causes of death, by sex (Both sexes)*. Retrieved from <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/hlth36a-eng.htm>
2. Public Health Agency of Canada (2009). Tracking heart disease & stroke in Canada. Retrieved from <http://www.phac-aspc.gc.ca/publicat/2009/cvd-avc/pdf/cvd-avs-2009-eng.pdf>
3. World Health Organization (2007). Cardiovascular diseases (CVDs). Retrieved from <http://www.who.int/mediacentre/factsheets/fs317/en/>
4. Health Canada (2012). *Do Canadian Adults Meet Their Nutrient Requirements Through Food Intake Alone?* Retrieved from <http://www.hc-sc.gc.ca/fn-an/surveill/nutrition/commun/art-nutr-adult-eng.php#a1>
5. Heart and Stroke Foundation (2015). *Saturated Fat heart Disease and Stroke*. Retrieved from http://www.heartandstroke.com/site/c.iklQLcMWJtE/b.9314923/k.E0FA/Saturated_fat_heart_disease_and_stroke.htm

Other quality reviews on this topic are available on www.healthevidence.org.

Suggested citation:

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This evidence summary was written to condense the work of the authors of the review referenced on page one. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

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