

Sodium Working Group

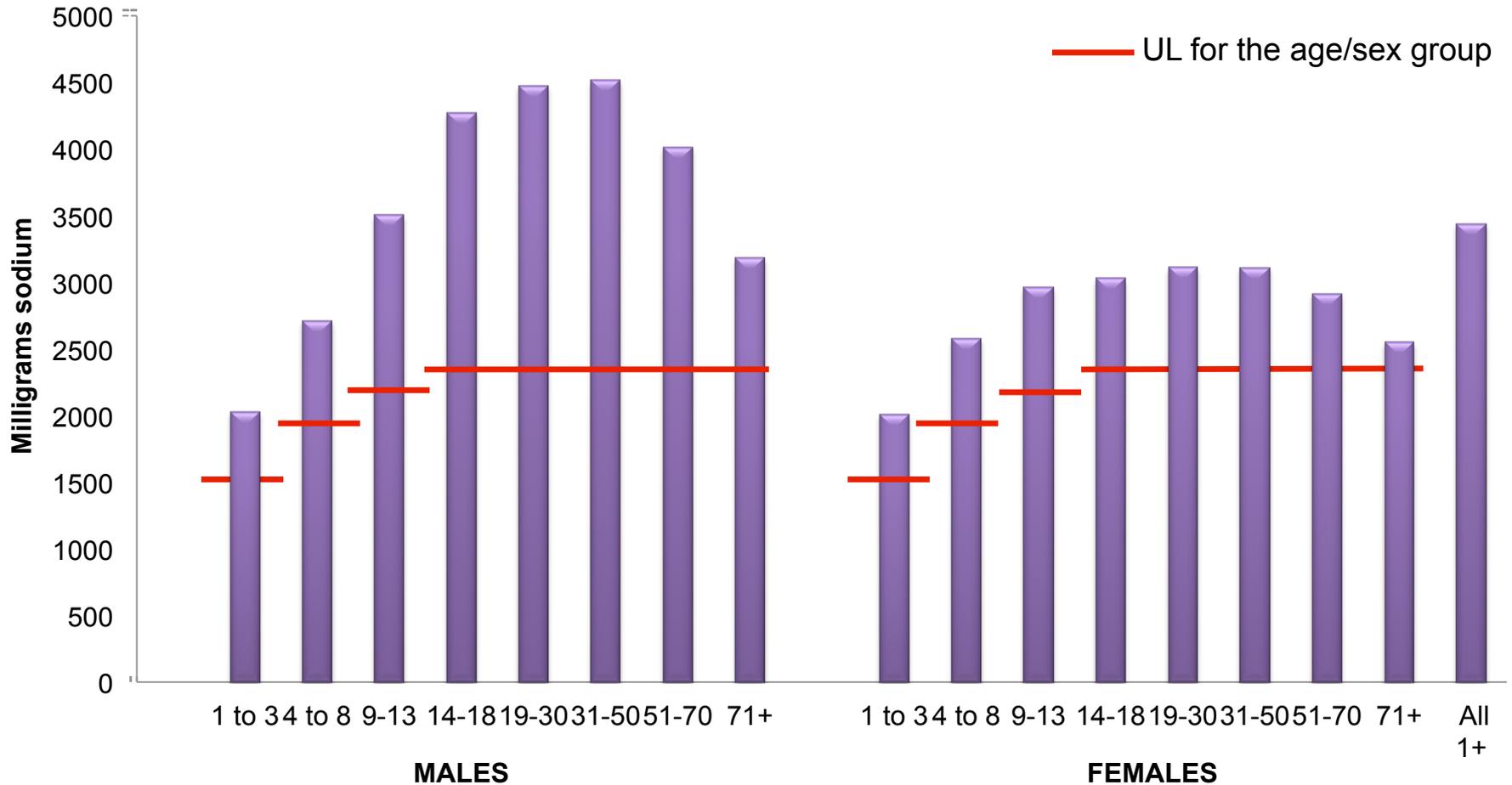
Cheryl Anderson
Wayne Campbell
Steven Clinton
Alice H. Lichtenstein

Scope

To describe:

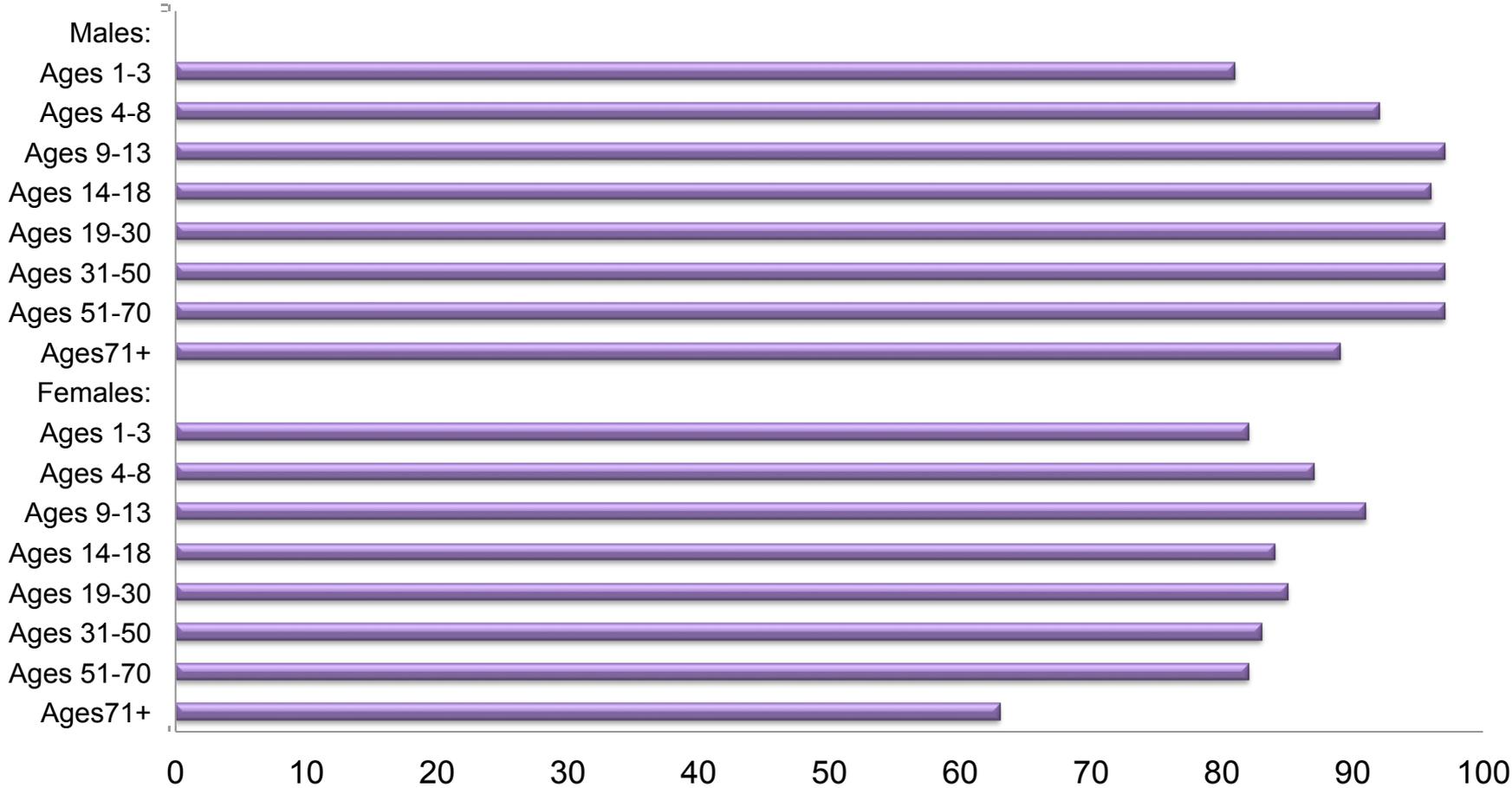
- the relationship between sodium intake, blood pressure, and cardiovascular disease
- strategies that can be used by individuals to promote recommended intake of sodium
- policies and environmental strategies to promote recommended intake of sodium
- how sodium recommendations may be influenced by the interaction of sodium and potassium

Mean Daily Sodium Intake by Age/Sex Group



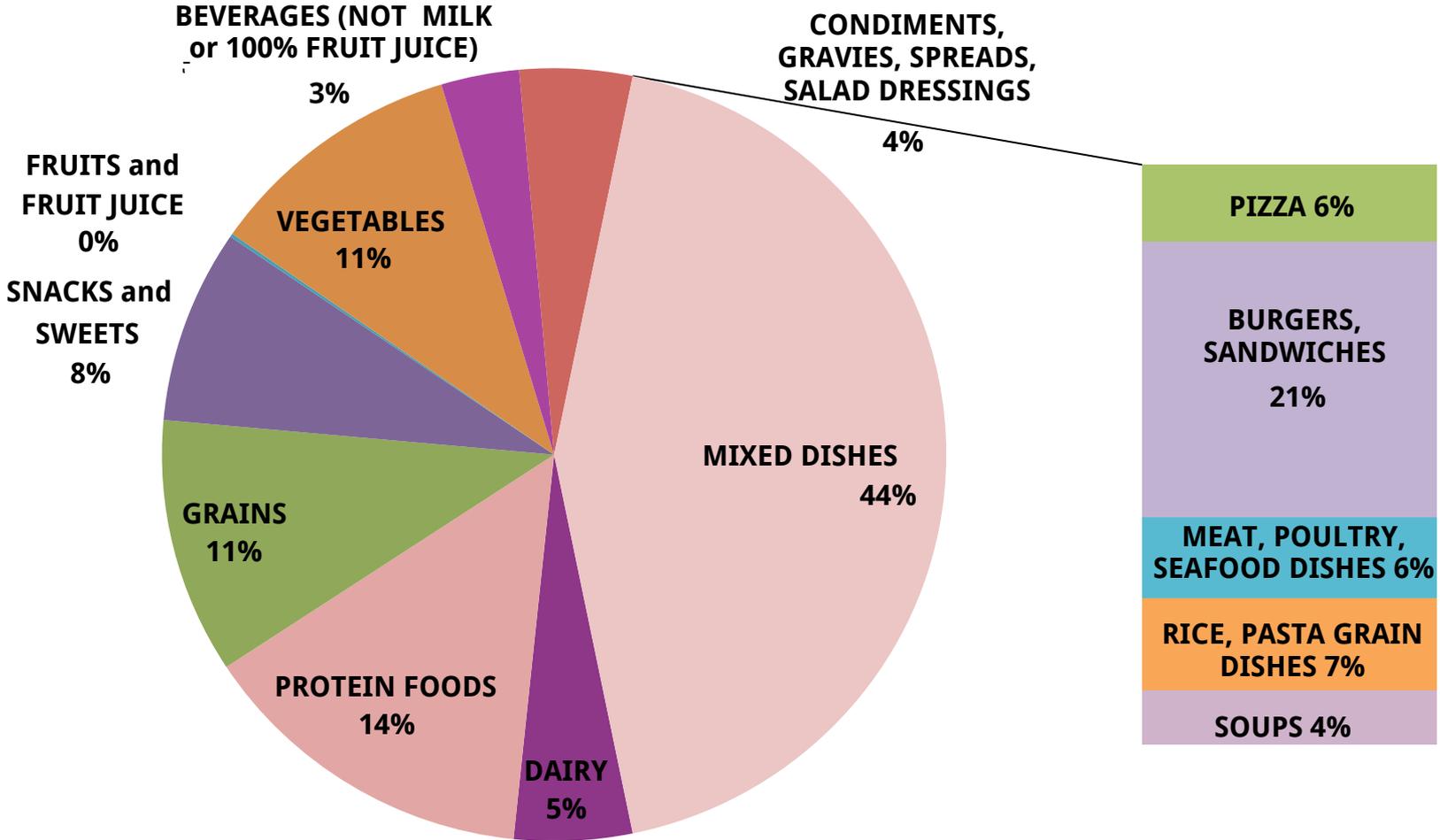
What We Eat in America, NHANES 2007-10

Sodium: Percent of age/sex group with usual intakes above the UL



What We Eat in America, NHANES 2007-10

Food sources of sodium



What We Eat in America, NHANES 2009-10

Invited Experts and Consultants

Invited Experts

Individuals invited by the SC, usually on a one time basis, to provide their expertise to inform the SC's work. Invited experts do not participate in decisions at the SC level.

Consultant SC Members

Individuals sought by the SC to participate in SC discussions and decisions on an ongoing basis but are not members of the full DGAC. Like DGAC members, consultants complete training and have been reviewed and cleared through a formal process within the Federal government.

Experts & Consultants

Invited Experts (July to Sept 2014)

None

Consultant SC Members

None

Questions Addressed Today

- What is the relationship between sodium intake and blood pressure in adults?
- What is the relationship between sodium intake and blood pressure in children?

Sodium and Blood Pressure in Adults

What is the relationship between sodium intake and blood pressure in adults?

Existing Reports

Presenter: Cheryl Anderson

Sodium and Blood Pressure in Adults

- Sources of evidence
 - 2013 American Heart Association/American College of Cardiology Guideline on Lifestyle Management to Reduce Cardiovascular Risk
 - 2005 Institute of Medicine's (IOM) Dietary Reference Intakes (DRI) for Water, Potassium, Sodium, Chloride, and Sulfate

Sodium and Blood Pressure in Adults

Draft Conclusion Statement

The committee concurs with the 2013 AHA/ACC Lifestyle report which advises adults who would benefit from blood pressure lowering to:

- “Lower sodium intake”

AHA/ACC Grade: Strong

The committee concurs with the 2013 AHA/ACC Lifestyle report which advises adults who would benefit from blood pressure lowering to:

- “Consume no more than 2,400 mg/day of sodium; and aim for further reduction of sodium intake to 1,500 mg/day for even greater reduction in blood pressure; and
- Even without achieving the two aforementioned goals, reducing sodium intake by at least 1,000 mg/day lowers blood pressure.”

AHA/ACC Grade: Moderate

The committee concurs with the 2013 AHA/ACC Lifestyle report which advises adults who would benefit from blood pressure lowering to:

- “Combine the DASH dietary pattern with lower sodium intake.”

AHA/ACC Grade: Strong

Sodium and Blood Pressure in Children

What is the relationship between sodium intake and blood pressure in children from 2 to 18 years of age?

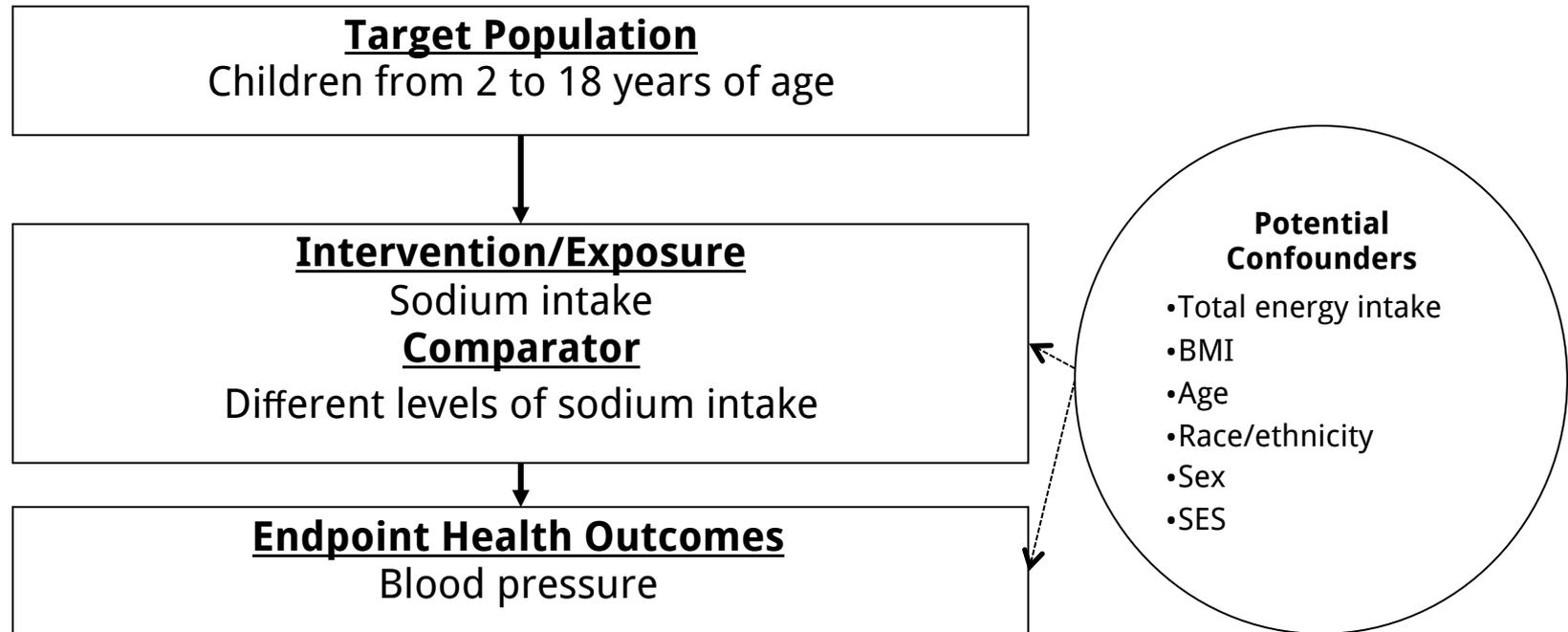
NEL Systematic Review
(2010 DGAC + update)

Presenter: Cheryl Anderson

Sodium and Blood Pressure in Children

- The 2010 DGAC conducted a systematic review on the relationship between sodium intake and blood pressure in children from birth to age 18 years, examining studies published from January 1970 to May 2009.
- The 2015 DGAC updated the systematic review done by the 2010 DGAC, and determined whether changes to the 2010 DGAC conclusion statement/grade were warranted.

Analytical Framework: Sodium and Blood Pressure in Children



Systematic Review Questions:

- What is the relationship between sodium intake and blood pressure in children from 2 to 18 years of age?

Sodium and Blood Pressure in Children Literature Search: Inclusion/Exclusion Criteria

Date Range:

- Published between January 2009 and June 2014 (in English in a peer-reviewed journal)

Study Design:

- Randomized or non-randomized controlled trial, or prospective cohort study

Study Subjects:

- Children and adolescents from 2-18 years of age
- From countries with high or very high human development (per the 2012 Human Development Index)
- Healthy or at elevated chronic disease risk

Intervention/Exposure:

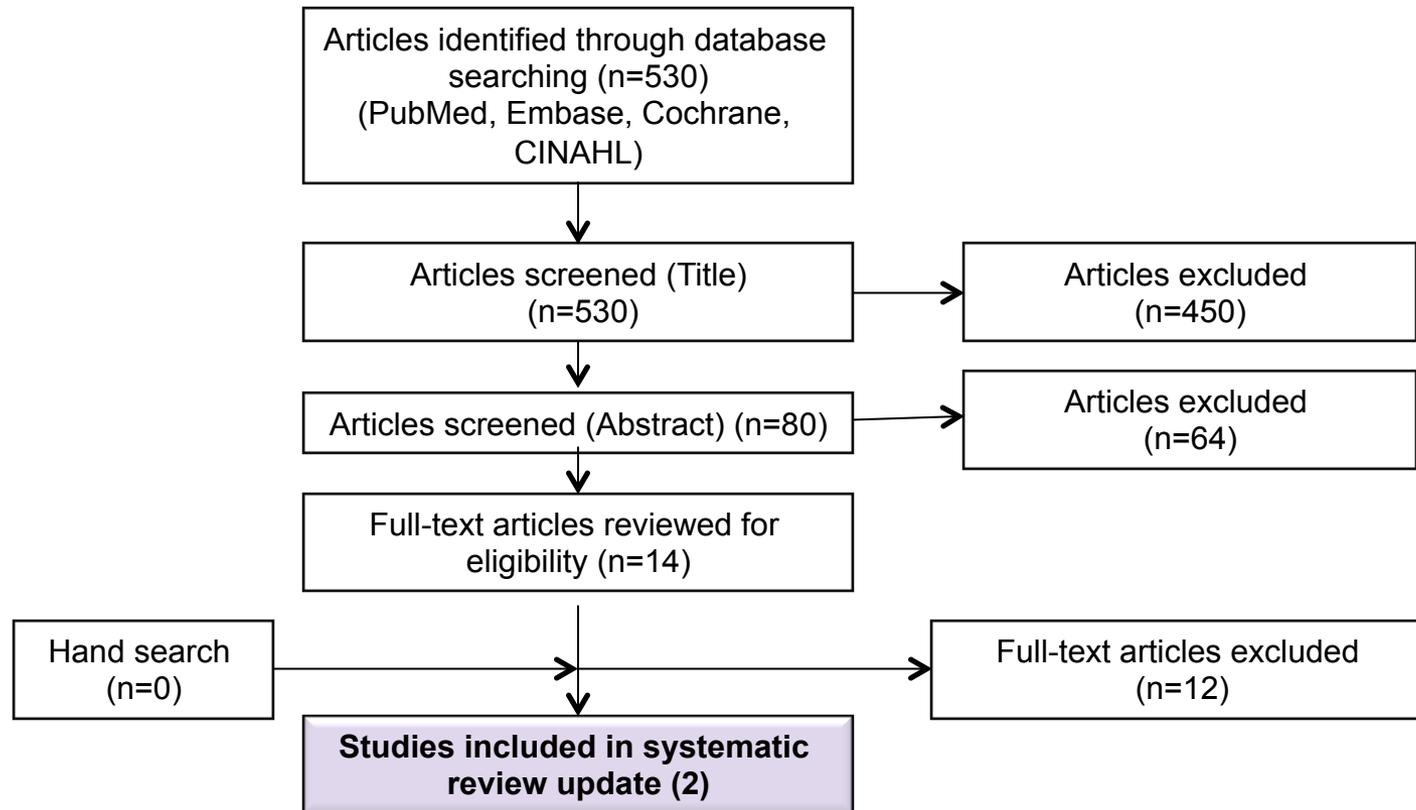
- Sodium intake, compared to different levels of sodium intake

Outcome:

- Blood pressure

Sodium and Blood Pressure in Children

Literature Search Results



Sodium and Blood Pressure in Children

Description of Evidence

- The 2010 DGAC reviewed 19 articles (15 intervention studies, 4 prospective cohort studies) published from January 1970 to May 2009
- The 2015 DGAC updated the systematic review done by the 2010 DGAC, and identified 2 additional studies:
 - Cotter, 2013:
 - 127 boys and girls from Portugal, (~11y old)
 - RCT to examine the effects of 6-month educational interventions on salt intake and blood pressure
 - 24-h urine samples used to estimate salt intake
 - Shi, 2014:
 - 432 boys and girls from Germany (~6 y old)
 - Prospective cohort study to examine the relationship between salt intake and blood pressure over 10 y of follow-up
 - 24-h urine samples used to estimate salt intake

Sodium and Blood Pressure in Children

Description of Evidence

- The 2015 DGAC determined that, based on the 2 new studies identified in the updated search, changes were not warranted to the 2010 DGAC conclusion statement or grade.
 - The data reviewed by the 2010 DGAC indicated that sodium reduction modestly lowers BP in infants and children.
 - Neither of the two studies identified in the update found a relationship between dietary sodium intake and blood pressure in healthy, normotensive children.

Sodium and Blood Pressure in Children

Draft Conclusion Statement

A moderate body of evidence has documented that as sodium intake decreases, so does blood pressure in children, birth to 18 years of age.

DGAC Grade: Moderate

Next Steps

1. Continue reviewing the evidence on the relationship between sodium intake and the risk of CVD outcomes (existing reports with NEL update)
2. Highlight individual strategies to promote recommended intake of sodium (existing report)
3. Describe policies and environmental strategies to promote recommended intake of sodium (existing report)
4. Examine sodium and potassium inter-relationship (existing report)

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NEL Grading Rubric

Elements	Grade I: Strong	Grade II: Moderate	Grade III: Limited	Grade IV: Grade Not Assignable
Quality (as determined using the NEL BAT) <ul style="list-style-type: none"> Scientific rigor and validity Consider study design and execution 	Studies of strong design Free from design flaws, bias, and execution problems	Studies of strong design with minor methodological concerns OR only studies of weaker study design for question	Studies of weak design for answering the question OR inconclusive findings due to design flaws, bias, or execution problems	Serious design flaws, bias, or execution problems across the body of evidence
Quantity <ul style="list-style-type: none"> Number of studies Number of subjects in studies 	Several good quality studies Large number of subjects studied Studies have sufficiently large sample size for adequate statistical power	Several studies by independent investigators Doubts about adequacy of sample size to avoid Type I and Type II error	Limited number of studies Low number of subjects studied and/or inadequate sample size within studies	Available studies do not directly answer the question OR no studies available
Consistency of findings across studies	Findings generally consistent in direction and size of effect or degree of association, and statistical significance with very minor exceptions	Some inconsistency in results across studies in direction and size of effect, degree of association, or statistical significance	Unexplained inconsistency among results from different studies	Independent variables and/or outcomes are too disparate to synthesize OR single small study unconfirmed by other studies
Impact <ul style="list-style-type: none"> Directness of studied outcomes Magnitude of effect 	Studied outcome relates directly to the question Size of effect is clinically meaningful	Some study outcomes relate to the question indirectly Some doubt about the clinical significance of the effect	Most studied outcomes relate to the question indirectly Size of effect is small or lacks clinical significance	Studied outcomes relate to the question indirectly Size of effect cannot be determined
Generalizability to the U.S. population of interest	Studied population, intervention and outcomes are free from serious doubts about generalizability	Minor doubts about generalizability	Serious doubts about generalizability due to narrow or different study population, intervention or outcomes studied	Highly unlikely that the studied population, intervention AND/OR outcomes are generalizable to the population of interest