

Subcommittee 4:

Food and Physical Activity Environments

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Scope

Food Environments

Physical environment

- Key settings – neighborhood and community food access, early care and education, schools, worksites
- Understand and assess the role of food environment in promoting or hindering healthy eating in various settings.
- Identify the most effective evidence-based diet-related programs, practices, environmental and policy approaches (“what works”) to improve health and reduce disparities.

Key Topic Areas Discussed Today

- Food Access (Mim Nelson)
- Early Care and Education (Mary Story)
- Schools (Wayne Campbell)
- Worksites (Lucile Adams-Campbell)

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

Food Access Questions

What is the relationship between neighborhood and community access to food retail settings and:

1. Individuals' dietary intake and quality?
2. Weight status?

Approach:

NEL (Nutrition Evidence Library) systematic review

Food Access

Description of the Evidence: Dietary Intake & Quality

- Includes 18 studies published between 2007 and 2013
- **Study Design:** 2 non-RCT, 1 longitudinal, 5 cross-sectional
- **Location:** US
- **Subjects:** generally healthy population aged ~8-70y
 - Children/Adolescents: 5 studies
 - Adults: 13 studies
- **Sample Size:** 116 to 15,634
- **Risk of Bias:** relatively low, 0-8 points out of 26 or 28

Food Access

Draft Conclusion Statement: Dietary Intake & Quality

Emerging evidence suggests that the relationship between access to farmers' markets/produce stands and dietary intake and quality is favorable.

Grade: Insufficient evidence to grade

The body of evidence on access to other food outlets, such as supermarkets, grocery stores and convenience/corner stores, and dietary intake and quality is limited and inconsistent.

Grade: Insufficient evidence to grade

Food Access

Draft Conclusion Statement: Weight Status

Limited but consistent evidence suggests that the relationship between access to convenience/corner stores and weight status is unfavorable, with closer proximity and greater access being associated with significantly higher BMI and/or increased odds of overweight/obesity.

Grade: Limited

The body of evidence on access to other food outlets, such as supermarkets, grocery stores and farmers' markets/produce stands, and weight status is limited and inconsistent.

Grade: Insufficient evidence to grade

Food Access

Draft Implications

For people to improve their diets and health, they need to have convenient access to nutritious, high quality, and affordable healthy foods in environments where they live, work, learn, and play. Limited access to affordable and healthy food is a challenge, particularly for families living in rural areas and low-income urban communities.

Innovative approaches to bring healthy food retail into communities have proliferated, especially in underserved neighborhoods. These include creating financing programs to incentivize grocery store development; improving availability of healthy food at corner stores and bodegas, farmers markets and mobile markets, community gardens and youth-focused gardens; creating new forms of wholesale distribution through food hubs; and improving transportation and public safety options. However, most of these approaches lack adequate evaluation.

These and other promising equity-oriented efforts need to continue and be evaluated and then successfully scaled up to other communities.

Food Access

Draft Implications (cont.)

To ensure healthy food access to everyone in America, action is needed across all levels Federal, state, and local, to create private-public partnerships and business models, with the highest priority on those places with highest need to ensure healthy food access for everyone in America.

Although efforts are needed to increase access to healthy foods, similar efforts are needed to reduce access to and consumption of, calorie-dense nutrient poor foods and sugar sweetened beverages in community settings.

These efforts need to be seamlessly integrated with Federal nutrition assistance programs, such as WIC, SNAP and as well as elder nutrition.

Food Access

Discussion

Early Care and Education Questions

What is the impact of obesity prevention approaches in early care and education (ECE) programs on the weight status of children two to five years of age?

Approach:

- Existing systematic review *plus*
- NEL systematic review to update the literature

Early Care and Education

Description of the Evidence

- Includes 1 existing systematic review including studies published between 2000 and 2012 and a *de novo* NEL systematic review including studies published between 2012 and 2014
- **Study Design**
 - Zhou *et al.*, 2013: 15 controlled trials
 - NEL review: 5 cluster randomized trials, 1 before-and-after study, 1 non-controlled trial
- **Location**
 - 9 studies in the United States
 - 3 studies each in Israel and in Germany
 - 1 study each: France, Scotland, Australia, Switzerland, China, Colombia, Belgium
- **Subjects:** generally healthy children aged 2-5y
- **Outcomes:** BMI and BMI z-score
- **Risk of Bias**
 - AMSTAR score of 9/11 for Zhou *et al.* review
 - 6/26 to 16/26 for NEL review
- **Sample Size for Studies in NEL Review:** 112 to 1,102

Early Care and Education

Draft Conclusion Statement

Moderate evidence indicates that multi-component obesity prevention approaches implemented in child care settings improve adiposity-related outcomes in preschoolers. A combination of dietary and physical activity interventions is effective for preventing or slowing excess weight gain and reducing the proportion of young children aged 2-5 years who are overweight or obese.

Grade: Moderate

Early Care and Education

Draft Implications

Existing evidence indicates that multi-component interventions that incorporate both nutrition and physical activity are effective in reducing obesity risk in preschool children.

Successful strategies include: curricular enhancements to classroom education for children for both nutrition education and physical activity, outreach engagement to reach parents about making positive changes in the home, improvements in the healthfulness of meals and snacks and mealtime environment, modifying food service practices, increasing physical activity play, reducing sedentary behaviors, and improving outdoor playground environments.

Early Care and Education

Draft Implications (cont.)

Evidenced-based healthy eating and physical activity practices should be implemented in child care settings with training and technical assistance for staff. Policies at the Federal, state, and local levels for nutrition and physical activity standards and guidelines in child care settings need to be strengthened.

It also is important that child care facilities provide meals and snacks that are consistent with the meal patterns in the federal Child and Adult Care Food Program (CACFP) to ensure that young children have access to healthy meals and snacks and age-appropriate portions. Drinking water also needs to be readily available and accessible to children. Government agencies should ensure access to affordable nutritious foods through CACFP and maximize participation in the program.

Early Care and Education

Discussion

Schools

Questions

1. What is the impact of school-based approaches on the dietary intake, quality, behaviors and/or preferences of school-aged children?
2. What is the impact of school-based policies on the dietary intake, quality, behaviors and/or preferences of school-aged children?
3. What is the impact of school-based approaches on the weight status of school-aged children?
4. What is the impact of school-based policies on the weight status of school-aged children?

Approach: Existing Systematic Reviews

Schools (Q1)

Description of the Evidence: School-based Approaches & Dietary Intakes

- Includes 3 systematic reviews/meta-analyses
 - Published between 2011 and 2012
 - Risk of Bias: AMSTAR scores were high, ranging from 8/11 to 11/11
 - Total of 75 studies published between 1985-2011
 - No overlap of studies between reviews
- **Study Designs:** RCT, non-RCT, cross-sectional, modeling
- **Location**
 - 49 studies in the United States
 - 26 studies in other highly developed countries (HDI)
- **Subjects:** generally healthy children aged 5-18y
- **Sample Sizes**
 - N = 29,361 for meta-analysis
 - N = 24 to 3,382 for 75 studies included in the reviews
- **Outcomes:** diet intake/quality (proxy = daily fruit and vegetable intake)

Schools (Q1)

Key Findings: School-based Approaches & Dietary Intakes

- School-based interventions moderately increase total daily fruit and vegetable intakes, and fruit (w/ and w/out fruit juice) intake alone, but not vegetable (excluding potato) intake alone.
- Multi-component programs targeting both children and families are more effective than single-component programs.
- School-based economic incentive programs can increase fruit and vegetable intakes and reduce consumption of low-nutrient-dense foods.
- Nutrition education programs that include gardening effectively increase the preference for and consumption of vegetables in school-aged children, along with small, but significant increases in fruit consumption.

Schools (Q1)

Draft Conclusion Statement: School-based Approaches & Dietary Intakes

Moderate evidence indicates that multi-component school-based approaches can increase daily fruit and vegetable consumption in children grades kindergarten through 8th. A paucity of school-based studies preclude conclusions with youth in grades 9-12. Fruit and vegetable consumption individually, as well as in combination, can be targeted with specific school-based approaches.

Grade: Moderate

Schools (Q2)

Description of the Evidence: School-based Policies & Dietary Intakes

- Includes 2 systematic reviews/meta-analyses
 - Published between 2011 and 2013
 - Risk of Bias: AMSTAR scores were high, ranging from 8/11 to 11/11
 - Total of 52 studies published between 1990-2013
 - No overlap of studies between reviews
- **Study Designs:** RCT, non-RCT, cross-sectional, pre/post, and price simulation
- **Location**
 - 41 studies in the United States
 - 11 studies in other highly developed countries (HDI)
- **Subjects:** generally healthy children in grades K-12 (~5-18y)
- **Sample Size:** ranged from 3 high schools to 130,353 subjects, and a varying number of districts
- **Outcomes:** diet intake/quality (proxy = accessibility, availability, and consumption of competitive foods and beverages)

Schools (Q2)

Key Findings: School-based Policies & Dietary Intakes

- Implementation of school policies to change competitive foods and beverage availability/accessibility is associated with:
 - Reduced availability/accessibility and consumption of SSB, candy, unhealthy snacks, and dessert foods
 - Replacement of regular soda with diet soda and water and healthier options in vending machines and at snack bars
- Strong and consistent enforcement of comprehensive policies was associated with greater changes in-school consumption, intake and/or purchasing.
- District or combined district and state policies restricting the use of food as a reward for academic performance or as a fundraiser was associated with a reduction in use of foods and beverages for these purposes.

Schools (Q2)

Draft Conclusion Statement: School-based Policies & Dietary Intakes

Moderate evidence indicates that implementation of school policies for nutrition standards to change the availability, accessibility, and consumption of foods and beverages sold outside the school meal programs (competitive foods and beverages) are associated with higher quality purchasing behavior and dietary intake while at school.

Grade: Moderate

Schools (Q3)

Description of the Evidence: School-based Approaches & Weight Status

- Includes 2 systematic reviews/meta-analyses
 - Published between 2011 and 2013
 - Risk of Bias: AMSTAR scores were high, both scoring 11/11
 - Total of 116 studies published between 1985-2012
 - Overlap of studies: 13 between reviews
 - Studies included in meta-analysis: 37 studies
- **Study Designs:** RCT, non-RCT
- **Location**
 - 49 studies in the United States
 - 67 studies in other highly developed countries (HDI)
- **Subjects:** generally healthy children aged 5-18y
- **Sample Size:**
 - N = 30 to 1807
 - Meta-analysis N = 27,946
- **Outcomes:** indices of weight status

Schools (Q3)

Key Findings: School-based Approaches & Weight Status

- Both short (3-6 mo) and longer-term (>6 mo) school-based interventions may have modest benefits related to childhood obesity prevention, especially among 6-12 year olds.
 - Yet, sustainability of effects on child adiposity and obesity-related behaviors is greater following long-term interventions.
- The evidence for school-based multi-component interventions that combine diet and physical activity with a home or community component is strong.
- There is no evidence that school-based obesity prevention programs are harmful or have any adverse effects among children.

Schools (Q3)

Draft Conclusion Statement: School-based Approaches & Weight Status

Moderate and generally consistent evidence indicates that multi-component school-based approaches have beneficial effects on weight status in children ages 6-12 years. An insufficient number of school-based studies have been conducted with adolescents.

Grade: Moderate

Schools (Q4)

Description of the Evidence: School-based Policies & Weight Status

- Includes 2 systematic reviews
 - Published in 2013
 - Risk of Bias: AMSTAR scores were high, ranging from 9/11 to 11/11
 - Total of 45 studies published between 2003-2013
 - No overlap of studies between reviews
- **Study Designs:** RCT, non-RCT, cohort, cross-sectional and pre/post-policy
- **Location**
 - 40 studies in the United States
 - 5 studies in other highly developed countries (HDI)
- **Subjects:** generally healthy children aged 4-18y
- **Sample Size:** ranged from 3 high schools to 130,353 subjects, and a varying number of districts
- **Outcomes:** indices of weight status

Schools (Q4)

Key Findings: School-based Policies & Weight Status

- Limited research exists to systematically review and quantitatively evaluate the effect of school-based dietary policies on the weight status of school-aged children. In addition, high heterogeneity among studies makes it difficult to draw conclusions.
- Although studies produced mixed results, students in states with laws on competitive foods and beverages had a reduced risk of being overweight as they progressed from 5th to 8th grade.
- Participation in the School Breakfast Program, but not National School Lunch Program, was associated with lower BMI among students.
 - Note: This evaluation was conducted before the change in school nutrition standards.
- School-based policies did not have a negative impact on the prevalence of underweight, with some reporting a reduced prevalence of underweight with a policy.
- At the present time, insufficient research exists to evaluate that effects of diet and physical activity policies on weight-related outcomes.

Schools (Q4)

Draft Conclusion Statement: School-based Policies & Weight Status

Limited evidence suggests that school policies targeting nutrition, alone and in combination with physical activity, may beneficially affect weight-related outcomes.

Grade: Limited

Schools

Draft Implications

Existing evidence indicates that school-based programs designed to improve the food environment and support healthy behaviors may effectively promote improved dietary intake and weight status of school-aged children.

Programs that emphasize multi-component, multidimensional approaches (including increased physical activity) are important to changing behavior and need to be reinforced within the home environment, as well as the community, including the neighborhood food retail outlets that surround schools.

School policies should strive to support effective programs that increase availability, accessibility, and consumption of healthy foods and beverages, while reducing less healthy competitive foods and beverages.

Schools

Draft Implications (cont.)

The combination of economic incentives along with specific policies can increase the likelihood that specific approaches will be effective.

The recently updated USDA nutrition standards for school meals and snacks and beverages sold in schools will ensure that students throughout the U.S. will have healthier school meals and snack and beverage options, but schools need support and active engagement from students, parents, community members, and their districts and states to successfully implement and sustain them.

Schools

Discussion

Worksite Questions

1. What is the impact of worksite-based approaches on the dietary intake, quality, behavior of employees?
2. What is the impact of worksite-based approaches on the weight status of employees?
3. What is the impact of worksite-based policies on the dietary intake, quality and behavior of employees?
4. What is the impact of worksite-based policies on the weight status of employees?

Approach: Existing Systematic Reviews

Analytical Framework: Worksite

Target Population
Workers

Intervention/Exposure
Workplace environment interventions

Comparator
Different levels of intervention; no intervention/control

Intermediate Health Outcomes

- Nutrient intake
- Macronutrient composition of diet
- Foods/food groups
- Diet quality
- Intervention-specific outcomes
- Body weight
- BMI
- Adiposity
- Blood lipids
- Blood pressure
- Glucose

Endpoint Health Outcomes
Prevalence/incidence of healthy weight, overweight and obesity

Key Definitions
Dietary quality

Potential Confounders

- Sex
- Age
- SES
- Ethnicity/race
- Fitness facility at work
- BMI
- Diet
- Physical activity



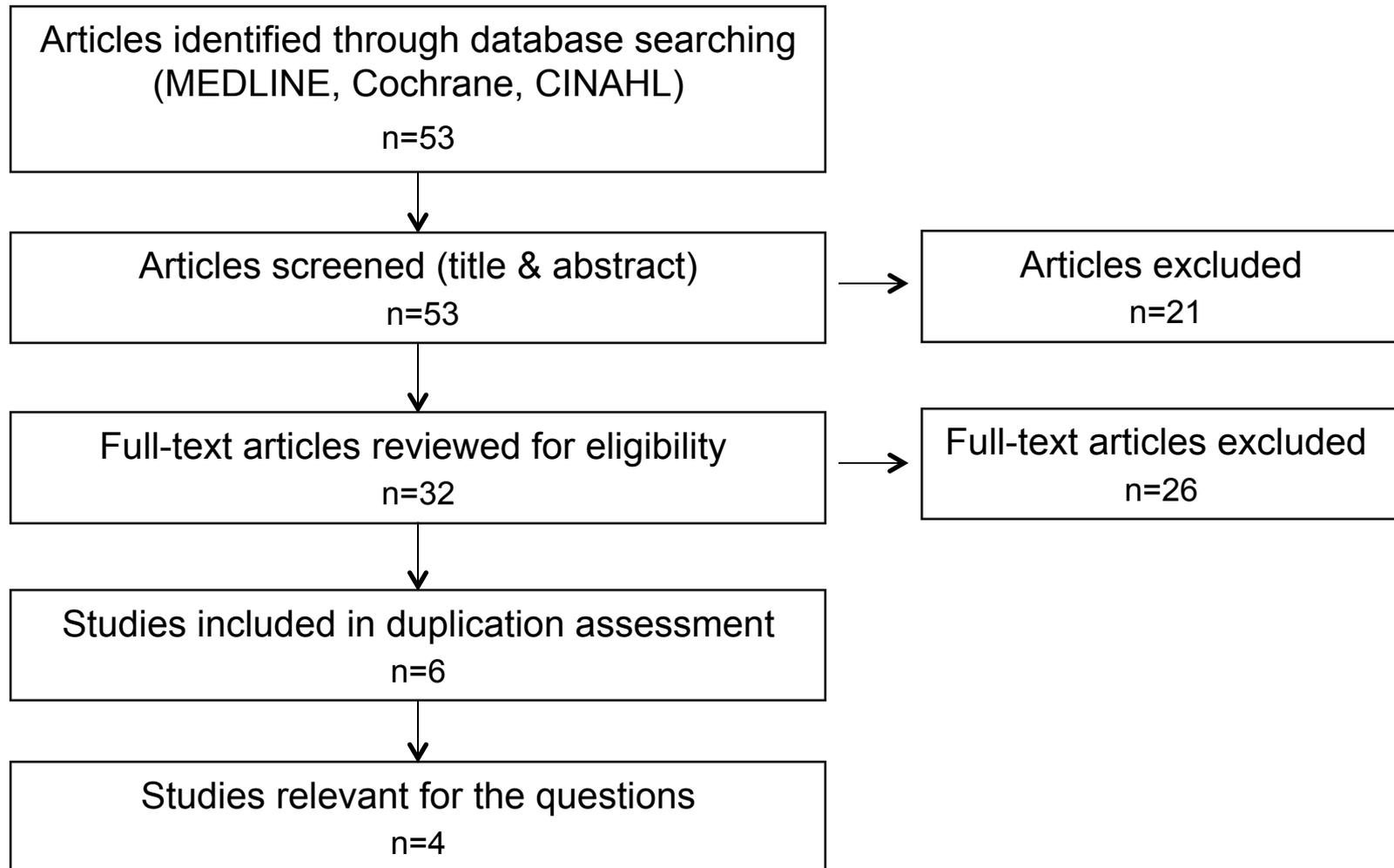
Worksite

Literature Search: Inclusion/Exclusion Criteria

- Systematic reviews that include RCTs, non-RCTs, prospective cohort
- Published in English in peer-reviewed journals between 2010 and present
- Exposure: different programs, policies and practices in workplace settings
- Subjects: workers
- Dietary outcomes: dietary intake, quality, behaviors and preferences
- Weight outcomes: body weight, BMI, BMI z-score, waist circumference, weight change, % body fat mass

Worksite

Literature Search Results for Duplication Assessment



Worksite (Q1)

Description of the Evidence: Worksite-based Approaches & Dietary Intakes

- Includes 2 systematic reviews/meta-analyses
 - Published between 2013 and 2014
 - Risk of Bias: AMSTAR scores were high, ranging from 8/11 to 9/11
 - Total of 35 studies published prior to Nov 2012
 - No overlap of studies between reviews
- **Study Designs:** RCT, non-randomized controlled trials, pre/post studies
- **Subjects:** workers
- **Sample Size:** 65 to 4254
- **Outcomes**
 - Primary: dietary intake
 - Secondary: weight and various health outcomes

Worksite (Q2)

Description of the Evidence: Worksite-based Approaches & Weight Status

- Includes 2 systematic reviews/meta-analyses
 - Published between 2011 and 2014
 - Risk of Bias: AMSTAR scores were high, ranging from 9/11 to 10/11
 - Total of 70 studies published prior to Nov 2012
 - Overlap of studies: 2
- **Study Designs:** RCT (n=59), pre/post studies (n=11)
- **Subjects:** workers
- **Sample Size:** 33 to 10,282
- **Outcomes:** indices of weight status

Worksite (Q3)

Description of the Evidence: Worksite-based Policies & Dietary Intake

- Includes 1 systematic review
 - Published in 2012
 - Risk of Bias: AMSTAR scores was high, 8/11
 - Total of 27 studies published prior to Nov 2012
- **Study Designs:** RCT, quasi-experimental, without experimental design
- **Subjects:** workers
- **Sample Size:** 145 to 26,806
- **Outcomes:** dietary behaviors, indices of weight status, and various health outcomes

Worksite (Q4)

Description of the Evidence: Worksite-based Policies & Weight Status

- Includes 1 systematic review
 - Published in 2012
 - Risk of Bias: AMSTAR scores was high, 8/11
 - Total of 27 studies published prior to Nov 2012
- **Study Designs:** RCT, quasi-experimental, without experimental design
- **Subjects:** workers
- **Sample Size:** 145 to 26,806
- **Outcomes:** dietary behaviors, indices of weight status, and various health outcomes

Worksite

Discussion

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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