



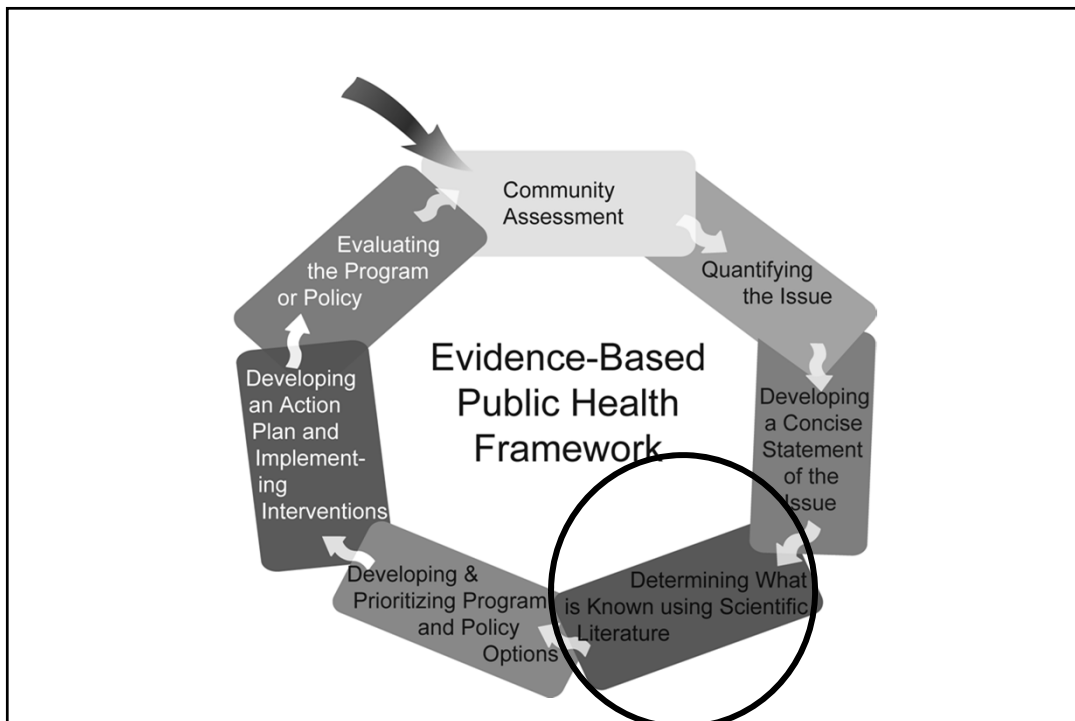
Department of Health

## Evidence-Based Public Health to Support the New York State Prevention Agenda

### MODULE 5: SEARCHING & SUMMARIZING SCIENTIFIC LITERATURE

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## Learning Objectives

1. To understand the process used in systematic reviews and identify a key source (the Community Guide)
2. To use recommended guidelines for searching the scientific literature

## Systematic Reviews

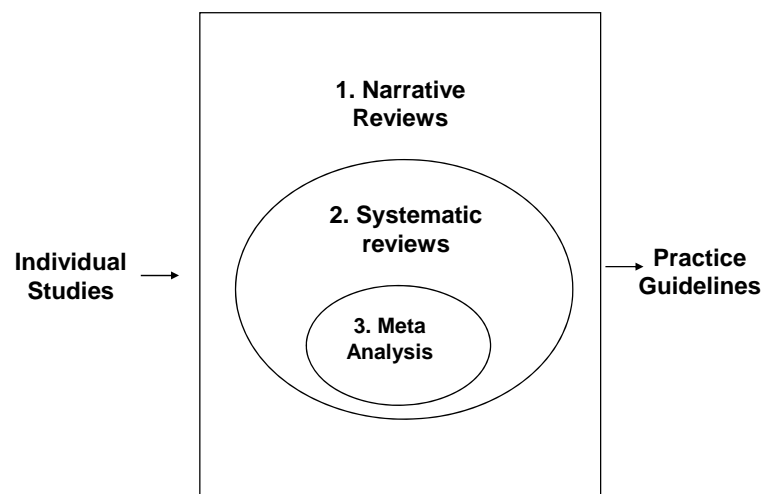
- Reports that identify, combine, and assess the results of the published literature in a specific area
- Purpose is to ....
  - Inform public health practice and policy
  - Help select proven interventions
  - Provide direction for innovations into unknown frontiers of knowledge

# Systematic Reviews

Definition (Last 2000)

“the application of strategies that limit bias in the assembly, critical appraisal, and synthesis of all relevant studies on a specific topic”

## Relationship of review types



# Systematic Reviews

## Historical background

- Formal methods began in mid 1900s
- Meta-analysis introduced by Glass in 1976
- Large growth in methods and uses in past few decades
  - 1992, the UK Cochrane Centre
  - The Campbell Collaboration in the social sciences
- Most reviews focus on medical treatments and clinical preventive services

## Systematic Reviews Are Not:

- Limited to randomized controlled trials
- Limited to healthcare interventions
- Restricted to a “biomedical model” of health

- Petticrew, 2001

## Common Steps in Systematic Reviews

1. Selecting topics
2. Convening a systematic review team
3. Developing a conceptual model for each topic and intervention
4. Defining and selecting interventions for review
5. Conducting a search for relevant scientific information
6. Evaluating the quality of, and abstracting data from, included studies
7. Summarizing information on:
  - a. effectiveness,
  - b. applicability of the effectiveness results,
  - c. other effects (side benefits and harms),
  - d. cost and cost effectiveness, and
  - e. barriers to implementation.

One important effort for public health practitioners:

*The Guide to Community Preventive Services*

*(The Community Guide)*

## *Community Guide* “Basics”

- Recommendations based on systematic reviews
- DHHS initiative
- CDC coordination
- Independent, non-federal oversight
- Follows systematic approach for review of evidence

[www.thecommunityguide.org](http://www.thecommunityguide.org)

## What Distinguishes *Community Guide* from Clinical Guide Reviews?

- The Community Guide may potentially address interventions that
  - Occur outside of clinical settings to impact community health -or-
  - Are delivered to groups rather than individuals -or-
  - Are delivered by persons other than healthcare providers

## Assess quality hierarchy of study designs



## What factors determine quality of execution?

- Description of intervention and study population
- Sampling procedures
- Exposure and outcome measurements
- Approach to data analysis
- Interpretation of results
  - Follow-up
  - Confounding
  - Other bias
- Other issues

## Recommendation outcomes

Four possible recommendation categories

1. Recommended, strong evidence
2. Recommended, sufficient evidence
3. Insufficient evidence
4. Recommended against due to lack of effect, cost, harms

Chronic disease topics

- Diabetes, tobacco, physical activity, obesity, cancer screening, nutrition (underway), socio-cultural factors

Example:

What are effective interventions for promoting physical activity?



## The problem...

## The Burden of Physical Inactivity

**The Economist**  
DECEMBER 13TH-19TH 2003 www.economist.com

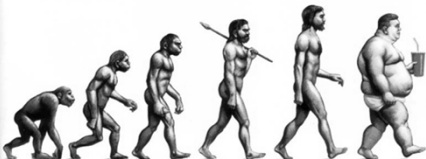
Gore anoints Dean  
PAGES 52 AND 73

America's Taiwan test  
PAGES 52 AND 59

The future of flight  
PAGES 79-81

A SURVEY OF FOOD  
AFTER PAGE 52

**The shape of things to come**



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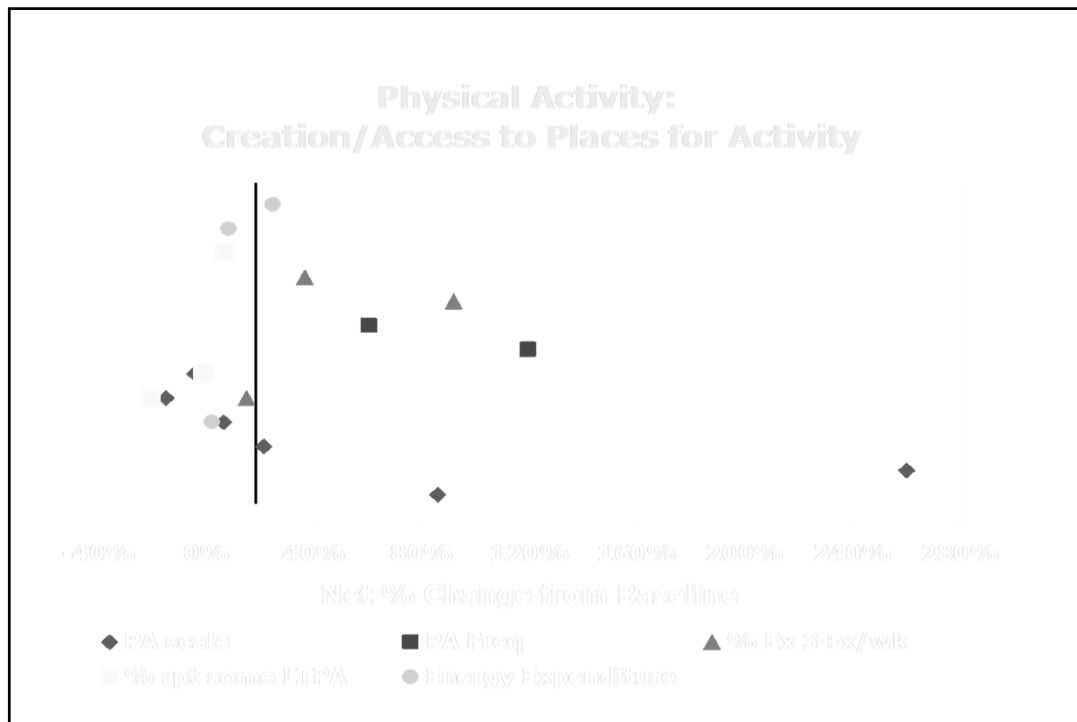
- The Problem
  - 23% of adults are completely sedentary
  - 51% do not achieve recommendation
- The Outcome
  - Obesity, CVD, cancer, diabetes
  - Physical inactivity is a primary factor in over 200,000 deaths annually
  - 2 mil deaths worldwide
- Small increases could affect 30K to 35K deaths/yr
- Medical costs exceed \$76 billion annually
  - Comparable to tobacco costs

**Example:**  
**Creation and/or enhanced access to  
places for physical activity**

- Built environment - trails and/or facilities access
- Reducing barriers - safety, affordability
- Training & incentives
- Site-specific programs

**Creation of or enhanced access to  
places for PA  
Strongly Recommended**





## Strongly recommended

- Modified physical education
- Individualized behavioral change
- Non-family social support
- Community-wide education
- Create or enhance access

## Recommended

- Point-of-decision prompts
- Urban design policies and practices at the street and community scale

## What are the limitations of the *Community Guide* in your state/local area?

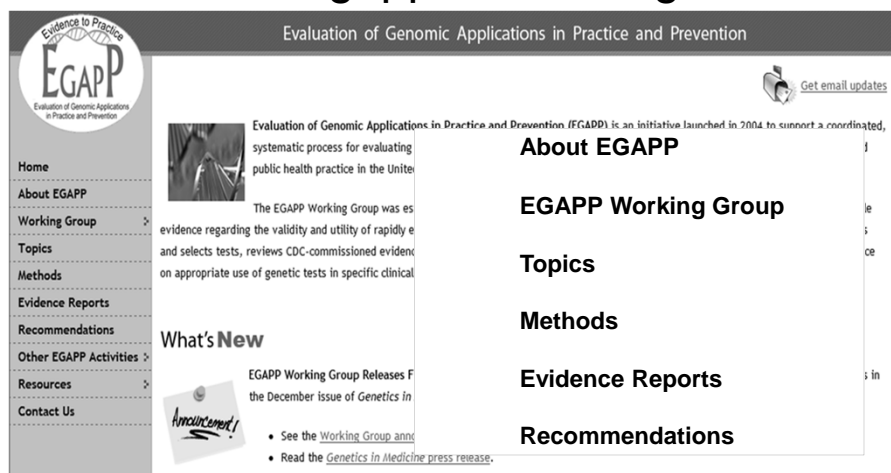
- Do the specific intervention categories within these broad headings also apply?
- Which important interventions might be left out?
- Could we build case studies (stories)?
- Is the context and/or populations for intervention different and how might this affect the reach of interventions?

Other guidelines and sources

## Other systematic reviews

- Cochrane Public Health Group  
<http://www.ph.cochrane.org/>
- Center for Reviews and Dissemination  
<http://www.york.ac.uk/inst/crd/index.htm>
- Campbell Collaboration  
<http://www.campbellcollaboration.org/>
- Guide to Clinical Preventive Services  
<http://www.ahrq.gov/clinic/prevenix.htm>

## Information [www.egappreviews.org](http://www.egappreviews.org)



The screenshot shows the homepage of the Evaluation of Genomic Applications in Practice and Prevention (EGAPP) website. The header includes the EGAPP logo and the text "Evaluation of Genomic Applications in Practice and Prevention". A navigation menu on the left lists: Home, About EGAPP, Working Group, Topics, Methods, Evidence Reports, Recommendations, Other EGAPP Activities, Resources, and Contact Us. The main content area features a "What's New" section with a sub-heading "EGAPP Working Group Releases F" and a bullet point: "Read the *Genetics in Medicine* press release." To the right, a sidebar contains a "Get email updates" button and a list of links: About EGAPP, EGAPP Working Group, Topics, Methods, Evidence Reports, and Recommendations.

## Scientific Literature Review

### Background

- Success of evidence-based public health rests largely on the ability to find credible, high quality evidence.
- Modern information technologies exist for finding valuable evidence quickly and efficiently.

## Scientific Literature Review

### Background

- This evidence is often obtained from searching the scientific literature.
- It is essential to follow a systematic approach when searching the scientific literature.

## Scientific Literature Review

### **Sources for scientific information**

- books
- journals
- Internet
- government reports
- scientific meetings

## Scientific Literature Review

### Types of publications in the scientific literature

- original research articles
- review articles with summaries
- review articles with quantitative synthesis
- guidelines

## Scientific Literature Review

### **Organizing a search of the scientific literature**

1. Define purpose of search
2. Select bibliographic database
3. Identify key words
4. Conduct search

## Scientific Literature Review

### **Organizing a search of the scientific literature**

5. Select and organize documents for review
6. Abstract pertinent information from each document
7. Summarize scientific literature review



# Scientific Literature Review

## Define purpose of search

- What community-based interventions have been conducted?
- What evidence exists for effective and non-effective community-based interventions?

# Scientific Literature Review

## Select bibliographic database

| Database                                      | Dates          | Subjects covered  |
|---|----------------|---|
| CancerLit                                     | 1983 – present | cancer research including abstracts from scientific meetings                      |
| Current Contents                              | period varies  | multidisciplinary   |
| Dissertation Abstracts                        | 1861 – present | abstracts of masters and doctoral dissertations from North American universities  |
| ERIC (Education Resources Information Center) | 1966 – present | Digital library of education research and information, includes “grey” literature |

## Scientific Literature Review

### Select bibliographic database

| Database                            | Dates           | Subjects covered  |
|-------------------------------------|-----------------|---|
| Health and Psychosocial Instruments | 1985 – present  | measurement instruments in health-related and behavioral sciences       |
| MEDLINE/PUBMED                      | 1966 – present  | health sciences   |
| REPORTER                            | 1986 – present  | federally funded biomedical research projects                           |
| PsychINFO                           | 1800s – present | abstracting and indexing database on psychology and behavioral sciences |

## Scientific Literature Review

### Select bibliographic database

- MEDLINE
  - most widely used database for searching health sciences literature
  - maintained by National Library of Medicine
  - free to users
  - updated frequently
  - relatively “user friendly”

## Scientific Literature Review

### Select bibliographic database

- MEDLINE /PUBMED
  - provides title, authors, publication source, abstract, key words, and other “tags”
  - full text sometimes available by linking to journal website

## Scientific Literature Review

### Select search engine

- |  |  |
|--|--|
| PubMed   | - free access to Medline                         |
| Ovid   | - subscriber access to Medline & other databases |
| <a href="http://scholar.google.com">scholar.google.com</a> | - free access to Medline & other databases       |

## Scientific Literature Review

### Identify key words

- terms that describe the characteristics of the subject being reviewed
- most bibliographic databases require standardized key words from a list of Medical Subject Heading (MeSH) terms
  - <http://www.ncbi.nlm.nih.gov/mesh>

## Scientific Literature Review

### Identify key words

- useful sources
  - find key words on two relevant scientific articles (one more recent and one less recent)
  - use non-standardized key words (if allowed)
    - ⇒ will provide less precise literature search

## Scientific Literature Review

### Conduct search

- Population = *population, adult*
- Intervention = *exercise, leisure activities, physical fitness*
- Outcome = *cardiovascular diseases*

## Scientific Literature Review

### Conduct search

| Search | Query   | Result    |
|--------|---|-----------|
| 1      | population AND adult                                  | 266,302   |
| 2      | exercise OR leisure activities<br>OR physical fitness | 206,629   |
| 3      | cardiovascular diseases                               | 1,306,719 |
| 4      | #1 AND #2 AND #3                                      | 2,540     |

## Scientific Literature Review

### Conduct search

- may include many irrelevant articles
- can narrow the scope of literature searches
  - focus initial search on review articles to identify original research articles
  - exclude specific publication types, e.g., editorial, letter, comment

## Scientific Literature Review

### Conduct search

| Search | Query                | Result |
|--------|----------------------|--------|
| 4      | #1 AND #2 AND #3     | 2,540  |
| 5      | #4 AND (review [pt]) | 195    |

## Scientific Literature Review

### Select and organize documents for review

- organize by publication type, e.g., original research, review articles, guidelines
- enter document information into reference management database, e.g., EndNote or ProCite
- store articles alphabetically by author's name

## Example

### Abstract information from each document

|                                       |      | Methodological Characteristics   |   |   |
|---------------------------------------|------|--|---|---|
| Lead author, journal citation         | Year | Study Design   | Study Population  | Sample Size   |
| Luepker<br>AJPH 1994;84:<br>1383-1393 | 1994 | quasi-exp<br>(pre-test /<br>post-test<br>design with<br>control group) | six communities<br>matched on size,<br>type & within 250<br>miles to<br>Minneapolis | 18,062 adults (25-74<br>yrs) from x-sectional<br>sample completed<br>survey center protocol<br><br>4,762 from above<br>followed for 6-7 years |

## Example

### Abstract information from each document

| Methodology  | Content-specific Characteristics   |
|--|--|
| Intervention   | Results  |
| mass media<br>community organization<br>direct education | <ul style="list-style-type: none"> <li>■ % reporting regular physical activity only higher for intervention (vs. control) group at 7 yrs follow-up</li> <li>■ small increase in kilocalories / day for intervention group in early years, but less during later yrs</li> <li>■ more heavier-intensity activities for intervention group, but slight decrease at 7 yrs follow-up</li> </ul> |

## Example

### Abstract information from each document

| Content-specific Characteristics   |   |
|--|---|
| Conclusions  | Comments  |
| <p>observed differences between intervention &amp; control groups were less than postulated</p> <ul style="list-style-type: none"> <li>■ net improvements in health promotion activities &amp; individual risk factors were modest, of limited duration, &amp; within chance levels</li> <li>■ strong, favorable secular trends of increasing health promotion activities &amp; declining risk factors for CHD in all study communities</li> </ul> | <p><u>Other outcomes measured:</u><br/>blood cholesterol, smoking, systolic/ diastolic blood pressure, BMI, &amp; coronary heart disease risk</p> |



## Scientific Literature Review

Summarize the scientific literature review

- Information can be used for various purposes
  - to support new or existing health policies
  - to support new budget item presented to administrators
  - to prepare grant application for external support of new or existing program

## Access

- Does your agency or organization have a subscription service?
- Can you access information services through a local academic institution, medical school, or library?
- Open source journals
- Contact authors or journals