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Rural vs. Urban Ambulatory Health Care

A Systematic Review of the Evidence

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Disclosure

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VA Evidence-based Synthesis (ESP) Program Overview

- Sponsored by VA Office of R&D and HSR&D.
- Established to provide timely and accurate syntheses/reviews of healthcare topics identified by VA clinicians, managers and policy-makers, as they work to improve the health and healthcare of Veterans.
- Builds on staff and expertise already in place at the Evidence-based Practice Centers (EPC) designated by AHRQ. Four of these EPCs are also ESP Centers:
  - Durham VA Medical Center; VA Greater Los Angeles Health Care System; Portland VA Medical Center; and Minneapolis VA Medical Center.

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- Provides evidence syntheses on important clinical practice topics relevant to Veterans, and these reports help:
    - Develop clinical policies informed by evidence.
    - The implementation of effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures.
    - Guide the direction for future research to address gaps in clinical knowledge.
- Broad topic nomination process – e.g. VACO, VISNs, field – facilitated by ESP Coordinating Center (Portland) through online process:

http://www.hsrd.research.va.gov/publications/esp/TopicNomination.cfm

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- Steering Committee representing research and operations (PCS, OQP, ONS, and VISN) provides oversight and guides program direction.
- Technical Advisory Panel (TAP)
    - Recruited for each topic to provide content expertise.
    - Guides topic development; refines the key questions.
    - Reviews data/draft report.
- External Peer Reviewers & Policy Partners
    - Reviews and comments on draft report
- Final reports posted on VA HSR&D website and disseminated widely through the VA.

http://www.hsrd.research.va.gov/publications/esp/reports.cfm

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Rural vs. Urban Ambulatory Health Care: A Systematic Review

2011

Full-length report available on ESP website:

http://www.hsrd.research.va.gov/publications/esp/reports.cfm

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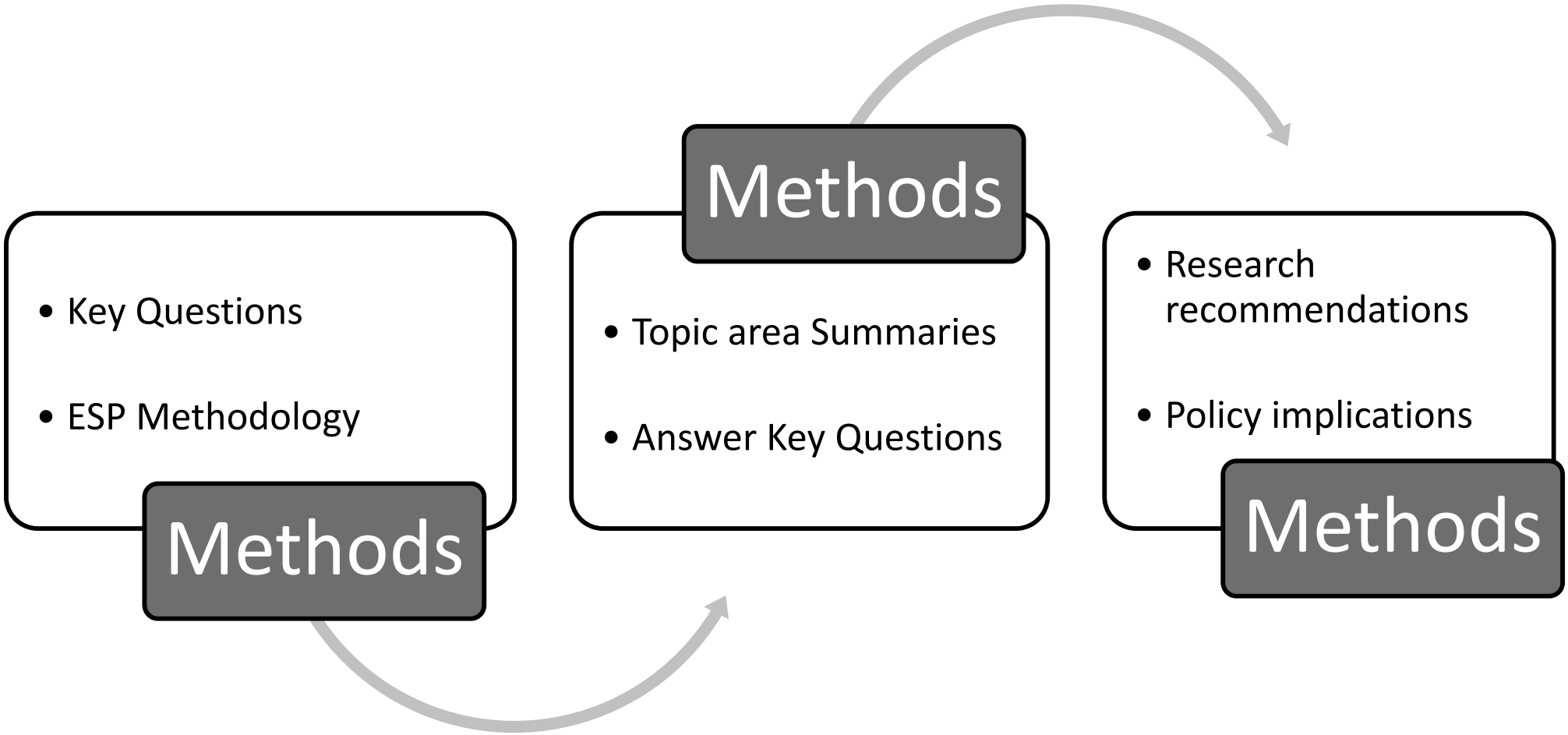

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Background

- Rural Veterans
  - 37% of the 8 million VA users
  - General population 17% rural

- Health of Rural Vets*
  - Lower overall **physical health quality of life**
  - Lower health quality of life within disease category
  - But, many population differences in rural vs. urban areas
    - Higher prevalence rates of numerous chronic conditions
    - Other differences (e.g., lower income, older age, lower rates of insured)

*Weeks, Wallace et al., 2006; Wallace et al., 2010; West & Weeks, 2009

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Key Questions

- Key Question 1
  - Do adults in rural areas with health care needs have different health outcomes than those in urban areas?

- Key Question 2
  - Is the structure or the process of health care different in rural vs. urban areas?

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Key Questions (continued)

- Key Question 3
  - If there are differences, are they associated with differential outcomes?

- Key Question 4
  - If there are differences in health outcomes, what non-healthcare system factors are associated with those differences?

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- Methods
  - OVID MEDLINE, PsycINFO, CINAHL
  - Limits: United States, English, Population 18yr +, published 1990 through March 2010
  - Ambulatory health care
  - RCT, comparative study, meta-analysis, review
  - *The Journal of Rural Health*

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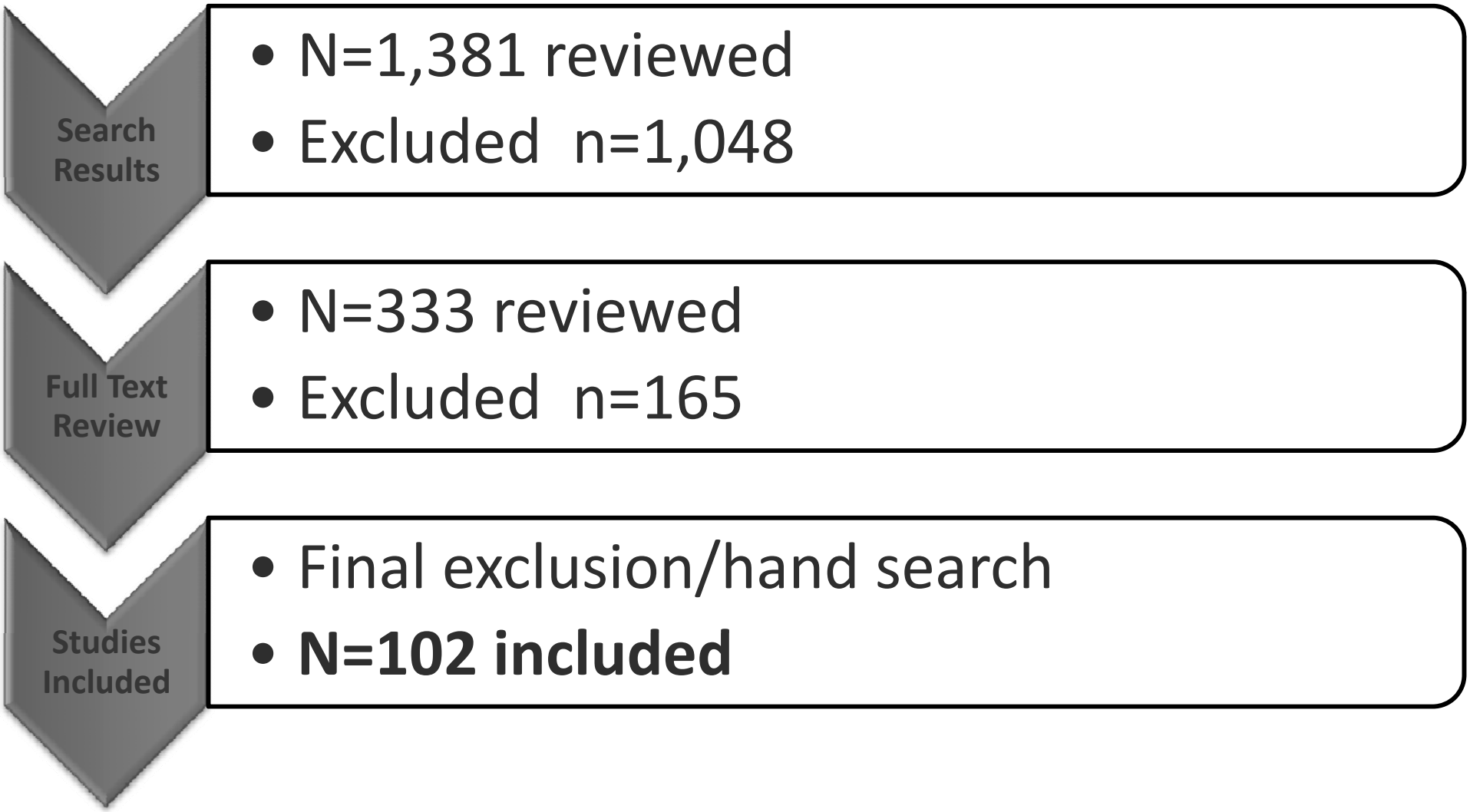

Disease Topic Areas

- Preventive care/ACSC
- Cancer
- Diabetes/End stage renal disease
- Cardiovascular Disease
- HIV/AIDS,
- Neurologic conditions
- Mental health

Health Care Topic Areas

- Medication use
- Medical procedures and tests
- Provider availability and training
- Service utilization

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- Studies were observational
- Databases: SEER, NHIS, Behavioral Risk Factor Surveillance System (BRFSS), Medicare claims
- Defining “Rural”

Rating Studies

Internal Validity	Rated G(Good), F(Fair), P(Poor)
Sampling	Low response rates without correction Convenience sampling
Predictors	Omission of SES/insurance factors or other factors associated with service use (e.g., age)
Outcomes	Unreliable or non-validated measures Use of proxy variables
Analyses	Omission of bivariate or multivariate statistics Ignore data clustering

Rating Studies

External Validity	Rated G(Good), F(Fair), P(Poor)
Aggregate measures	County level predictors or outcomes Dichotomized urban rural
Representativeness	Small, limited to one demographic group, No bias correction
Study design	Poorly conceptualized Data insufficient to answer primary research question

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What do we mean by “rural”?

What do we mean by rural?

- **Metropolitan Statistical Area (OMB)**
  - Micropolitan Statistical Area
- **Rural Urban Continuum Codes (USDA)**
  - 3 metro, 6 non-metro county pop.
- **VA (Urban, Rural, Highly Rural)**
  - Urban area 50,000 (1,000 per sq mile)+
  - Highly rural (7 per sq mile)

What else do we mean by rural?

- **Rural Urban Commuting Area (USDA)**
  - 33 Census tract codes and commuting areas
- **Pop. density of census blocks (US Census)**
  - Urban cluster/urbanized area vs. rural
- **Urban Influence Codes (USDA)**
  - Population and location

Preventive Care

Ambulatory Care Sensitive Conditions

1. Immunization Rates
2. Prenatal Care
3. Cancer Screening Rates
    1. Colorectal Cancer
    2. Breast and Cervical Cancer
4. Ambulatory Care Sensitive Condition Hospitalization Rates

Preventive Care

Ambulatory Care Sensitive Conditions

- Immunization Rates
  - 2 studies – 1994 and 1997 all 65yr+
  - US National Health Interview Survey
  - BRFSS and Area Resource File

- No Rural vs. Urban difference in rates of influenza or pneumonia vaccinations

Preventive Care
Ambulatory Care Sensitive Conditions

- Prenatal Care after first trimester
  - One retrospective survey study 2003, Oregon
  - No difference rural vs. urban, but not conclusive

Preventive Care
Ambulatory Care Sensitive Conditions

- Colorectal Cancer (CRC) Screen
  - 3 Studies: 2 national (1990's), North Carolina
  - **All showed lower rural screening rates**

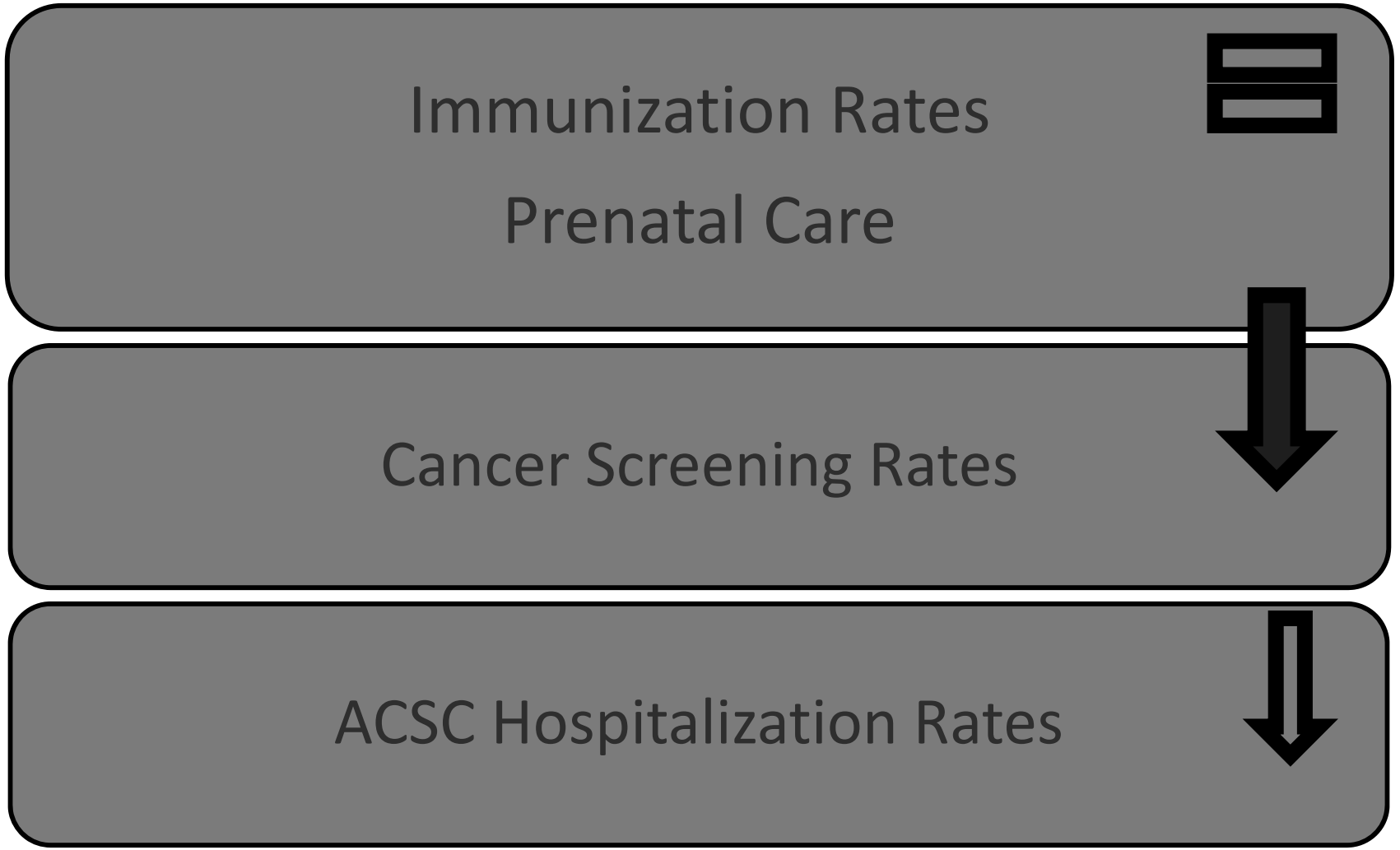
Preventive Care
Ambulatory Care Sensitive Conditions

- Breast and cervical CA screening
  - 5 national studies, 2 regional
  - Rural women less likely to get mammograms and PAP tests across studies
  - Rural vs. urban difference not significant when adjust for age, education, income, insurance status, physician availability

Preventive Care
Ambulatory Care Sensitive Conditions

- Ambulatory Care Sensitive Conditions
  - Three studies
  - Laditka (2009) eight states
    - Step-wise increase in admission rates by levels of rurality (demographics and service availability adjusted)
    - Partially due to lower rural insurance rates
    - Over 65 physician supply

Preventive Care
Ambulatory Care Sensitive Conditions
Summary



Cancer Care

1. Mortality (3)
2. Stage at time of diagnosis (9)
3. Relationship between screening and disease progression (3)
4. Treatment quality (5)

Cancer Care

- Mortality
  - No differences in breast or cervical CA
    - Availability subspecialists was significant
  - Nebraska: lymphoma-related mortality assoc'd with university vs. community provider

Cancer Care

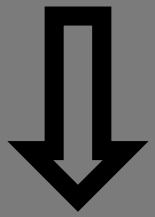
- Initial Staging
  - 3 of 4 studies found rural residents less likely to have CA staged at time of diagnosis
    - Rural disadvantage > women and African Americans
    - *Patients categorized by residence rather than by point of care*
- Severity of Staged Illness
  - Some **urban** disadvantages, and some due to race, age, income

Cancer Care

- Lower screening rates associated with lower rates of in situ breast and cervical cancer
- Treatment Quality:
  - Radiation for breast CA among older (but not younger) women affected by access
  - No other significant findings/studies

Cancer Care

Mortality 

Unstaged Illness 

Stage of Illness 

Quality of Care 

Diabetes/ESRD

1. Diabetes health outcomes (2)
2. Diabetes treatment (6)
3. ESRD treatment (1)

Diabetes/ESRD

- Diabetes health outcomes
  - Over 11,000 veterans, no difference rural vs. urban (A1c, eye or foot exams, BP, LDL)

Diabetes/ESRD

- Diabetes treatment
  - No consistent differences rural vs. urban
  - May be due to variation in rural-urban differences across geographic regions
  - Seeing an endocrinologist resulted in more guideline-concordant care

Diabetes/ESRD

- ESRD treatment
  - No increased odds of ESRD in rural vs. urban, but controlled for insurance, illness severity
  - Transplant rates and mortality showed an interaction between rurality and race/ethnicity in study of 500,000+ patients

Diabetes/ESRD

Cardiovascular Disease

5 studies, 3 of low quality

1. 23,000 vets with HTN
   - No difference in BP control across rural-urban levels
2. Provider survey post-appt survey study: No difference in quality of treatment urban vs. rural
   - Differences in population severity of HTN

Cardiovascular Disease

5 studies, 3 of low quality

1. 23,000 vets with HTN
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2. Provider survey post-appt survey study: No difference in quality of treatment urban vs. rural
   - Differences in population severity of HTN

HIV/AIDS

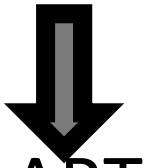
1. Treatment receipt/access (3)
2. Treatment quality (1).
   - 1 regional, 2 national (HCSUS database)
   - **All used data from 1990's**

HIV/AIDS

Treatment receipt/access

- 75% get care in urban area.
- No consistent evidence that distance is a barrier, may be for older patients.

Treatment quality



- Less likely to receive HAART or Pneumococcal vaccine if treated in rural area.

Neurologic Conditions

1. Multiple Sclerosis (3)
   - Same survey dataset, poor methodology
   - Rural residents less likely to see neurologists or MH providers
2. Availability of rehabilitation therapists (2)
   - Fewer rehabilitation therapists for TBI pts in rural areas

Mental Health

1. Suicide rates and Rx use (3)
2. Odds of MH hospitalization (2)
3. MH service access (8)
4. Quality of care (4)
5. Alcohol/Drug treatment (5)

Mental Health

- Suicide rates and antidepressant use
  - Suicide rates higher in rural areas
    - Associated with > tricyclics vs. SSRI's
    - Not associated with provider availability
    - Small regional prospective study no difference in tx quality

Mental Health

- Odds of MH hospitalization
  - Two national studies
  - Lower in rural vs. urban areas schizophrenia and depression
  - Housing stress in urban areas predictive of hospitalization, rural factors protective (e.g., farm-based economy)

Mental Health

- MH Service Access
  - Rural patients less likely to get MH care
    - Have fewer visits
    - Insurance a factor
    - Minorities more disadvantaged in *urban* areas
  - National VA MHICM study 5,000+ pts
    - Rural pts less likely to get recovery-oriented MH treatments
      - Therapy, SUD tx, rehab services

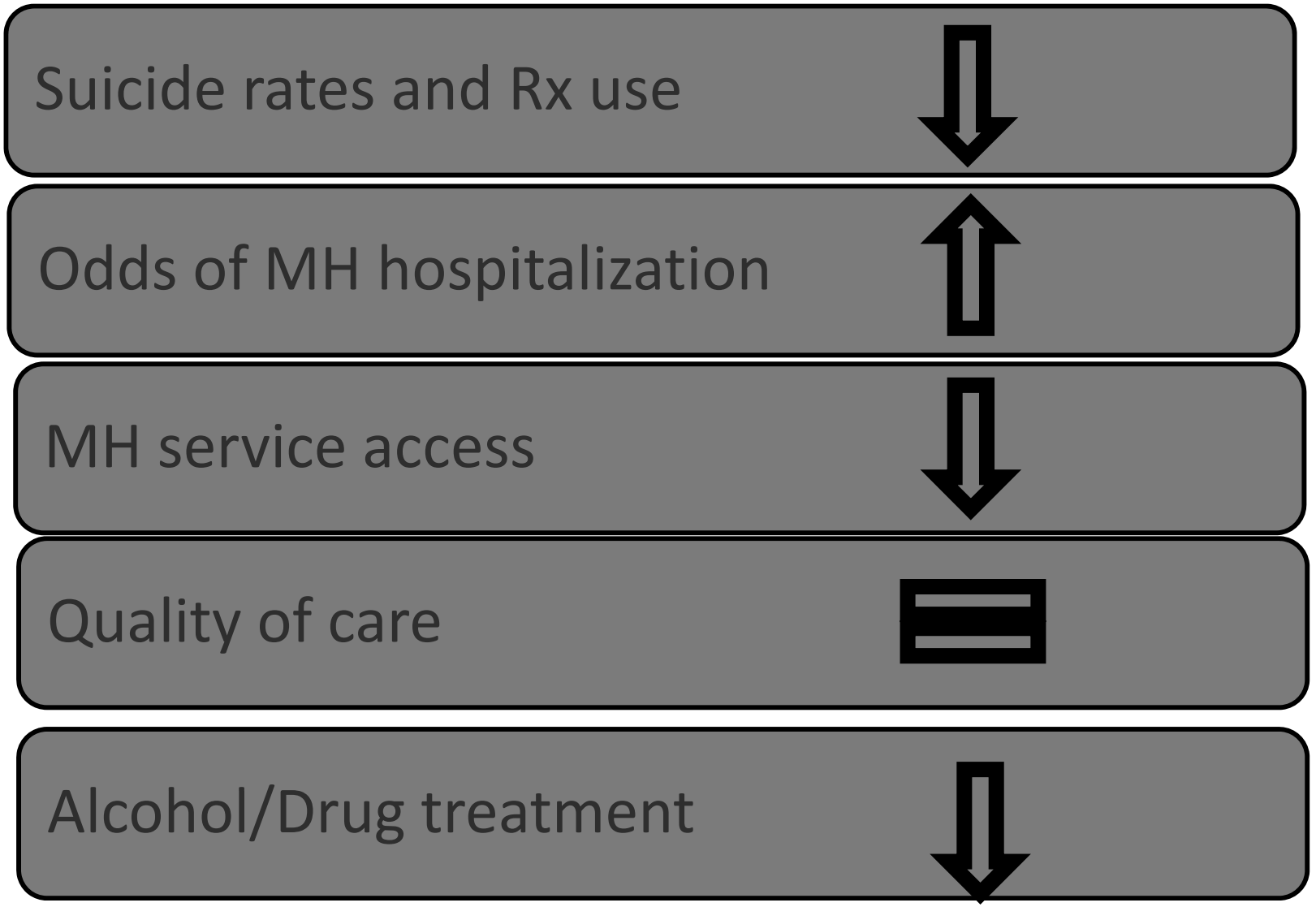
Mental Health

- Quality of Care
  - Better continuity of care in rural areas
  - Arkansas: quality of outpatient depression care comparable
  - More MH hospitalizations among rural pts in the 6 months after initial assessment
  - **NCS-R** fewer MH specialty services in rural areas, but MH specialty care better

Mental Health

- Alcohol/Drug treatment
  - Lower rates of SUD treatment receipt in rural areas
  - Rural vets better discharge follow-up treatment

Mental Health



Health Care Topic Areas

- Medication Use
  - 8 studies, 3 national, all age 66+ or “elderly”
  - National studies – mixed results for expenditures and use
  - Regional studies - mixed results for use

Health Care Topic Areas

- Medical procedures and tests
  - 2 studies, national, age 65+
  - Decreased service use – rural areas (office visits, imaging, diagnostic testing)
  - Use of 32 services – race/rurality interaction; greater racial disparity in rural areas

Health Care Topic Areas

- Provider availability and training
  - 12 studies, 4 national, 2 multi-state
  - Fewer physicians per population in rural areas; more NPs and PAs
  - Fewer internists and specialists in rural areas; more family practice physicians

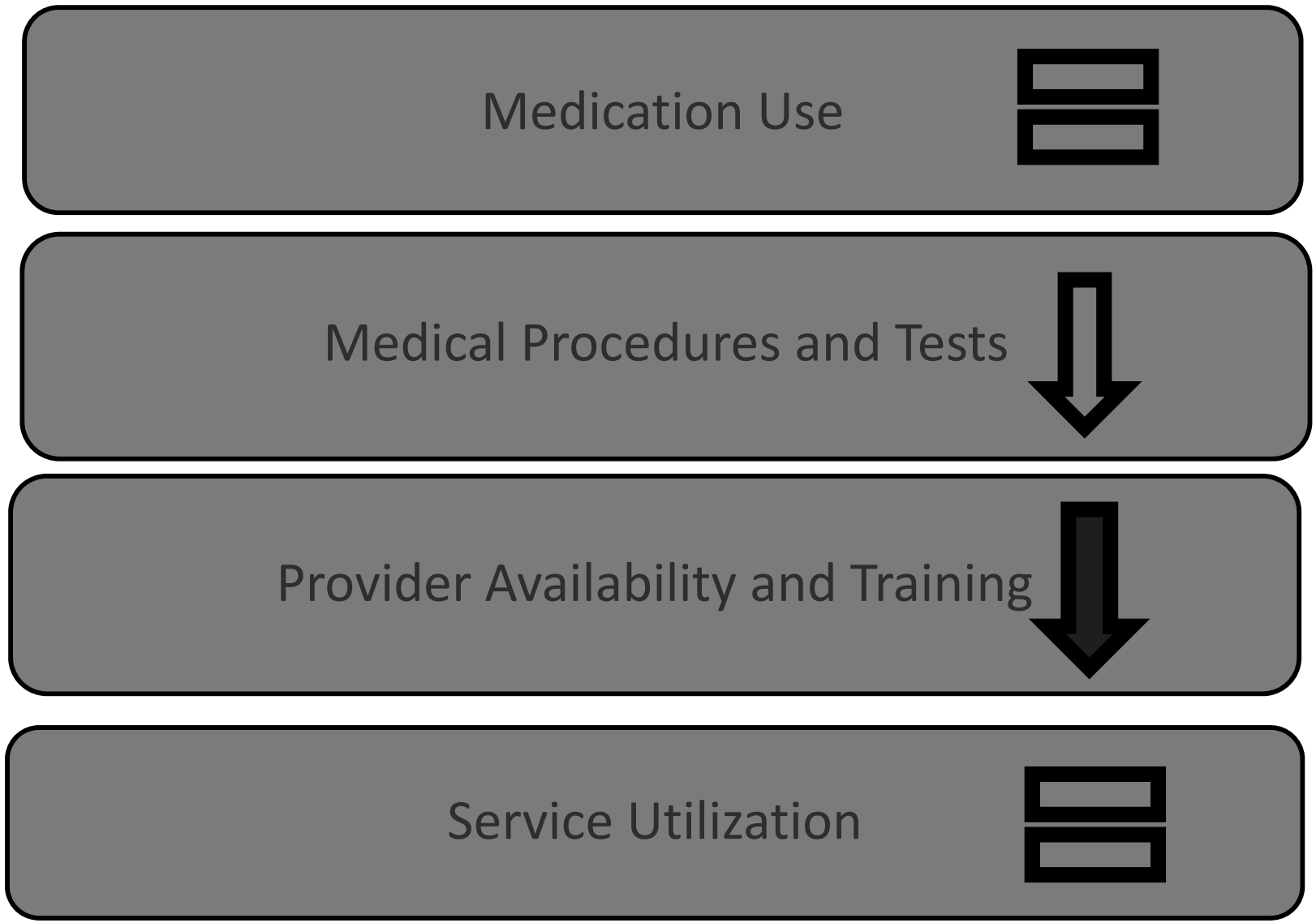
Health Care Topic Areas

- Service utilization
  - **Medical appointments with providers**
    - 10 studies, 7 national; 3 multi-site VA studies
    - Mixed results for frequency of visits
    - Rural VA patients had fewer visits (1 study)
    - More primary care, less specialty care at CBOCs (2 studies)

Health Care Topic Areas

- Service utilization
  - **Usual source of care**
    - 7 studies, 4 national
    - No difference in reporting of usual source of care
    - Some evidence of greater continuity of care in rural areas

Health Care Topic Areas



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Key Questions Answered

- Key Question 1: Do adults in rural areas with health care needs have different health outcomes than those in urban areas?

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Key Questions Answered

- Key Question 1: Do adults in rural areas with health care needs have different health outcomes than those in urban areas?
  - Increasing rurality is associated with a greater frequency of hospitalization for ACSC's.
  - Cancer mortality
  - Greater rates of DCIS and lower rates of invasive cervical cancer in urban areas where screening rates are higher.
  - Diabetes complications/prevalence of ESRD
    - Race by rurality interaction *
  - Hypertension control

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Key Questions Answered

- Key Question 2: Is the structure or the process of health care different in rural vs. urban areas?

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Key Questions Answered

- Key Question 2: Is the structure or the process of health care different in rural vs. urban areas?
  - Use of Medication
  - Medical Procedures and Diagnostic Tests
  - Medical Appointments with Providers
  - Usual Source of Care:
  - Provider Availability and Expertise
  - Quality of Care

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Key Questions Answered

- Key Question 3: If there are differences, are they associated with differential outcomes?

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Key Questions Answered

- Key Question 3: If there are differences, are they associated with differential outcomes?
  - Lower rural mammography and cervical cancer screening associated with higher rates of invasive cancers.
  - Rural Health Clinics improved adherence to treatment guidelines for diabetes.
  - Limited numbers of providers in rural areas may foster better continuity of care.
  - Limitations in provider availability may be associated with increased odds of hospitalization among older rural residents for ACSCs and lower odds of psychotherapy.

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Key Questions Answered

- Key Question 4: If there are differences in health outcomes, what non-healthcare system factors are associated with those differences?

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Key Questions Answered

- Key Question 4: If there are differences in health outcomes, what non-healthcare system factors are associated with those differences?
  - Insurance
  - Travel distance
  - Patient attitudes
  - Race disparities

Research Recommendations

1. <u>The Research Question</u>:
   - Differences in health care systems may not reflect disparities.
   - All barriers do not impede treatment.

Better question(s): Are these differences/barriers associated with differences in health care receipt or outcomes?

Research Recommendations

2. Sampling:
   - **Define convention used for "rural"**
     - Provide a rationale for choice and how it affects study outcomes.
     - Graded vs. dichotomous is more informative.
     - Consider using more than one convention.
     - Consequences of defining rural by residence or point of care.

Research Recommendations

3. Unit of analysis should match the research question
   - Associations between health care parameters and health outcomes may differ on aggregate vs. individual level.
   - Unit of analysis should reflect local health care systems or markets.

Research Recommendations

4. Analyses:
   - Many factors are correlated with rurality. Adjusting for them all may lead to false conclusions re: association of rurality and study outcomes, and limit development of healthcare policy.
   - Report bivariate associations.
   - Use contextual approach (e.g., multilevel models).

Research Recommendations

5. Consider assessing for interactions between rurality and race/region/age.
   - Few studies assessed them, but those that did tended to find differences.
   - Not doing so may obscure disparities.
   - Have implications for rural disparity interventions.

Summary

- There is weak evidence that rural health care disparities exist in some areas.
- There are large gaps in the evidence base.
  - Virtually no research in areas the VA cares a lot about (e.g., TBI).
  - Methodologically difficult.

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Questions?

If you have further questions,
feel free to contact:

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