QUERI

Evidence Brief: Update on Prevalence of and Interventions to Reduce Racial and Ethnic Disparities within the VA

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PREFACE

The VA Evidence-based Synthesis Program (ESP) was established in 2007 to provide timely and accurate syntheses of targeted healthcare topics of particular importance to clinicians, managers, and policymakers as they work to improve the health and healthcare of Veterans. QUERI provides funding for four ESP Centers, and each Center has an active University affiliation. Center Directors are recognized leaders in the field of evidence synthesis with close ties to the AHRQ Evidence-based Practice Centers. The ESP is governed by a Steering Committee comprised of participants from VHA Policy, Program, and Operations Offices, VISN leadership, field-based investigators, and others as designated appropriate by QUERI/HSR&D.

The ESP Centers generate evidence syntheses on important clinical practice topics. These reports help:

- Develop clinical policies informed by evidence;
- Implement effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures; and
- Set the direction for future research to address gaps in clinical knowledge.

The ESP disseminates these reports throughout VA and in the published literature; some evidence syntheses have informed the clinical guidelines of large professional organizations.

The ESP Coordinating Center (ESP CC), located in Portland, Oregon, was created in 2009 to expand the capacity of QUERI/HSR&D and is charged with oversight of national ESP program operations, program development and evaluation, and dissemination efforts. The ESP CC establishes standard operating procedures for the production of evidence synthesis reports; facilitates a national topic nomination, prioritization, and selection process; manages the research portfolio of each Center; facilitates editorial review processes; ensures methodological consistency and quality of products; produces “rapid response evidence briefs” at the request of VHA senior leadership; collaborates with HSR&D Center for Information Dissemination and Education Resources (CIDER) to develop a national dissemination strategy for all ESP products; and interfaces with stakeholders to effectively engage the program.

Comments on this evidence report are welcome and can be sent to Nicole Floyd, ESP CC Program Manager, at Nicole.Floyd@va.gov.

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This report is based on research conducted by the Evidence-based Synthesis Program (ESP) Coordinating Center located at the **Portland VA Health Care System, Portland, OR**, funded by the Department of Veterans Affairs, Veterans Health Administration, Office of Research and Development, Quality Enhancement Research Initiative. The findings and conclusions in this document are those of the author(s) who are responsible for its contents; the findings and conclusions do not necessarily represent the views of the Department of Veterans Affairs or the United States government. Therefore, no statement in this article should be construed as an official position of the Department of Veterans Affairs. No investigators have any affiliations or financial involvement (*eg*, employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties) that conflict with material presented in the report.

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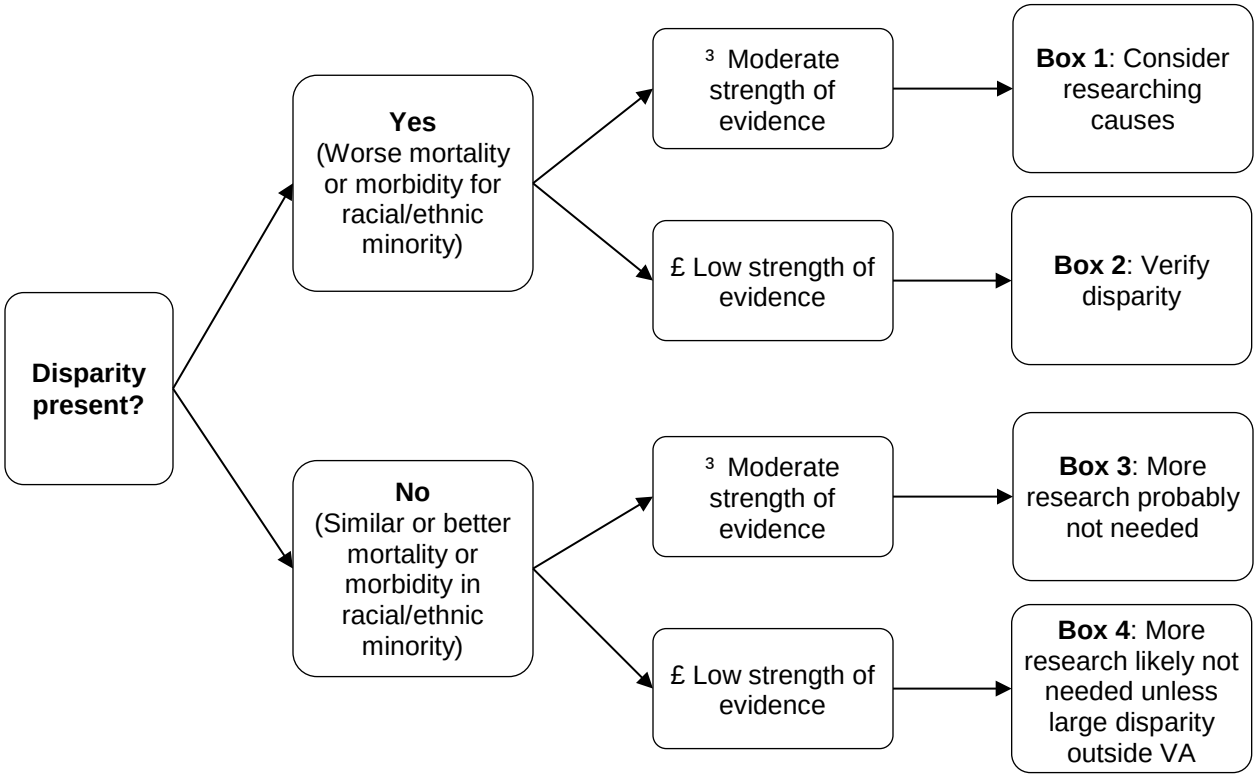
EXECUTIVE SUMMARY

PURPOSE

As part of its mission to champion the advancement of health equity, the Veterans Health Administration (VHA) Office of Health Equity (OHE) is partnering with the Quality Enhancement Research Initiative (QUERI) to evaluate gaps in morbidity and mortality outcomes among vulnerable Veteran populations with major conditions and to examine trends in quality of care across these conditions. To help inform selection of research priorities for the Partnered Evaluation Center (PEC), the OHE requested that the Evidence-based Synthesis Program Coordinating Center (ESP CC) provide an evidence brief update on what research and implementation priorities have emerged since (1) the 2007 ESP publication Racial and Ethnic Disparities in the VA Healthcare System that reviewed in which clinical areas racial and ethnic disparities are prevalent within the VA, and (2) the 2011 ESP review Interventions to Improve Minority Health Care and Racial and Ethnic Disparities.

Because of the shortened timeframe of this evidence brief, we only evaluated studies of race- and ethnicity-based mortality and morbidity differences since these are the OHE's highest priority indicators of health care quality. We did not evaluate studies of the *sources* of differences (*eg*, patient, provider, patient-provider, and system factors). To fit the purpose of this report, we defined disparity as any instance of worse mortality or morbidity outcomes for the racial/ethnic minority groups. Figure A illustrates the framework that guided our research recommendations.

Figure A. Research Recommendations Framework



METHODS

To identify relevant citations, we searched MEDLINE® (via PubMed®) and the Cochrane Central Register of Controlled Trials from 10/09/2006 to 2/13/2015 using terms for racial groups and disparities. To rate the internal validity of included studies, we used Cochrane's Risk of Bias Tool for controlled trials and the Drug Effectiveness Review Project's Tool for observational studies. We graded the strength of the overall body of evidence using the AHRQ Methods Guide for Comparative Effectiveness Reviews, based on risk of bias of individual studies (study design and internal validity), consistency, directness, and precision. The complete description of our full methods can be found on the PROSPERO international prospective register of systematic reviews website (http://www.crd.york.ac.uk/PROSPERO/; registration number CRD42015015974).

PREVALENCE OF MORTALITY AND MORBIDITY DISPARITIES

The only mortality/morbidity disparity observed in the 2007 report was higher mortality among African American Veterans diagnosed with HIV between 1999 and 2001. For this update, we identified no new studies of mortality among African American Veterans with HIV.

Since 2007 there has been a steady stream of new research and for this update, we identified 34 new studies of mortality and morbidity outcomes, primarily in cancer (9 studies), heart disease (6 studies) and acute care (6 studies). We found no studies in spinal cord injury, polytrauma, or blast-related injuries. In Table A below, we categorize the findings on prevalence of mortality and morbidity from this update by (1) whether a racial/ethnic mortality or morbidity disparity was found (greater mortality or morbidity or similar or better mortality or morbidity) and (2) the strength of the evidence (high, moderate, or low). We also make recommendations for future research.

Moderate strength evidence of a mortality or morbidity disparity (Box 1, Figure A)

African Americans with colon cancer, CKD, or HIV, and Hispanics with hepatitis C are the 4 groups with moderate-strength evidence of a mortality or morbidity disparity. For colon cancer, African Americans had a lower rate of survival after 3 years of follow-up. For CKD, African Americans had a higher rate of end-stage renal disease after 3.7 years of follow-up. For HIV, African Americans with or without comorbid diabetes had a higher rate of end-stage renal disease after 3.7 years of follow-up. For Hepatitis C, there was moderate-strength evidence that Hispanics had higher rates of incident cirrhosis and hepatocellular carcinoma after 5.2 years of follow-up.

In applying these findings, the OHE should consider 2 limitations of the evidence. First, all of these findings are based on VA cohorts from the early 2000s. Over the past 10 years, changes in the delivery system or in diagnostic and treatment approaches may have changed these disparities. OHE can decide whether these findings are still current, or can fund studies to verify them in more recent cohorts. Second, some of these disparities may have more impact on health outcomes than others. The impact depends on the prevalence of each condition and the size of the disparity.

If 10-year-old data is acceptable, or if the mortality and morbidity disparity is verified in a more recent cohort, then new research should examine its sources. The 2007 ESP review reported on the literature assessing the sources of each disparity. A first step would be to update that report with respect to African Americans with colon cancer, CKD, or Hepatitis C. If the 2007 ESP report's findings on decreased medication adherence and increased later-stage diagnosis are well-accepted as causes for the ESRD disparity identified in our report, then an update of the 2007 ESP review may not need to cover African Americans with HIV. However, for Hepatitis C, the source identified in the 2007 report (under treatment with interferon-based regimens, which cause debilitating side effects) is not likely to be useful because the new Direct Acting Antiviral Agents such as sofosbuvir (Sovaldi) have fewer side effects. If an update finds low-strength or no evidence on sources for the colon cancer, CKD, or Hepatitis C disparities, then the PEC should undertake new original research on sources.

Low-strength evidence of a mortality or morbidity disparity (Box 2, Figure A)

African Americans with cancer, diabetes, PTSD, rectal cancer, or venous thromboembolism, and American Indian or Alaska Natives with PTSD or following major non-cardiac surgery all had low-strength evidence of higher mortality or morbidity compared to whites Veterans. Additionally, in Veterans with Alcohol Use Disorders, non-African American minority Veterans had higher injury-related death than African Americans. Each of these low-strength findings is supported by a single retrospective study that only had a medium level of adjustment for potential confounders and had unknown consistency in the magnitude or direction of effect. Because of these limitations, for these groups we need original studies of VA populations to verify the potential disparities. However, for PTSD, because the higher risk of preterm birth was consistently found across 2 minority groups, we recommend examining sources of the disparity as the next step for future research.

Low-strength evidence of similar or better mortality or morbidity for racial/ethnic minorities (Box 4, Figure A)

For many conditions, there is low-strength evidence that African Americans and Hispanics have similar or better mortality or morbidity outcomes than white Veterans. Conditions with low-strength evidence of similar or better mortality or morbidity among minorities compared to whites are much fewer for American Indian/Alaskan Native, Asian, and Hawaiian and Pacific Islanders. Although each of these low-strength findings is supported by a single retrospective study with methodological limitations, there is probably not a need for more research to verify the presence or absence of a disparity. One exception of cause for verification is when there is a large proven disparity outside of the VA.

High or moderate-strength evidence of similar or better mortality or morbidity for racial/ethnic minorities (Box 3, Figure A)

For African American Veterans with stage 4-5 CKD, there is high-strength evidence from two good-quality studies of no mortality disparity compared with whites. There is moderate-strength evidence from multiple fair-quality studies or single good-quality studies that African American Veterans with prostate cancer, lung cancer, hepatitis C, those hospitalized for pneumonia, COPD,CHF, GI bleed, hip fracture, stroke, or AMI, or those classified as in a low-mortality

diagnosis related group have similar mortality and morbidity outcomes to white Veterans. Since these findings are likely to be stable, more research is likely not needed.

Evidence Gaps

As most of the mortality and morbidity disparity prevalence studies focused on African Americans or Hispanic minority groups and on cancer, heart disease, or acute care conditions, more work is needed to evaluate prevalence of disparities in other racial/ethnic minority groups and for OHE PEC's other priority conditions, including HIV, hepatitis C, mental illness, spinal cord injury, substance use disorders, polytrauma, and blast-related injuries. To more completely capture the totality of patients' care, future studies should supplement VHA data with Medicare data whenever possible. For morbidity outcomes, to maximize generalizability to the broadest disease populations, studies should examine multiple relevant outcomes, not just a single rare outcome in isolation. For example, future studies of rates of ESRD in HIV should be done in the context of other more common outcomes, such as severe bacterial infections or AIDS events.

Details about the magnitude of effect and the quantity, quality, and nature of the supporting evidence can be found in Tables 1 and 2 in the full report.

Table A. Summary of findings and future research recommendations

Findings: Strength of evidence and direction	Findings: Racial/ethnic minority group, conditions, outcomes (é=higher; ê=lower; ó no difference)	Future Research Recommendations
Moderate-strength evidence of *greater* mortality or morbidity in racial/ethnic minority groups in the VA (see Figure A, Box 1)	*African American vs white* · Chronic kidney disease (CKD): é End-stage renal disease (ESRD) after 3.7y of follow-up · Colon cancer: ê survival 3y after diagnosis · HIV: é ESRD after 3.7y of follow-up, with or without comorbid diabetes *Hispanic vs white* · Hepatitis C: é incident cirrhosis and hepatocellular carcinoma (HCC) at 5.2y after diagnosis	As findings are based on VA cohorts from the early 2000s, and changes are possible in the past 10 years, consider the need to verify the disparity in a more recent VA cohort. If evidence from the early 2000s is acceptable or if findings are verified in later cohort, then consider the need to identify the *sources* of the mortality/morbidity disparities and effective interventions to improve minority outcomes.
Low-strength evidence of *greater* mortality or morbidity in racial/ethnic minority groups in the VA See Figure A, Box 2	*African American vs white* · Diabetes: é All-cause mortality · Post-traumatic stress disorder (PTSD): é risk of preterm birth · Rectal cancer: ê 3-y all-cause survival 3y after diagnosis · Stroke: é mortality at 2y post-hospitalization · Venous thromboembolism (VTE): é complications at 90 days after event *American Indian or Alaskan Native vs white* · Post major, noncardiac surgery: é risk of 30-day post-op mortality · PTSD: é risk of preterm birth *Combined racial/ethnic minority groups (excluding African Americans) vs African American* · Alcohol use disorders (AUD): é injury-related death	More research is needed to establish the *presence/absence* of disparity in health outcomes
Low-strength evidence of similar or better mortality or morbidity in racial/ethnic minority groups in the VA See Figure A, Box 4	*African American vs white* · Advanced chronic systolic heart failure: ó all-cause mortality after 2y of follow-up · AUD: ê injury-related and non-injury-related death · CKD Stage 3A or 3B: Insufficient evidence to draw a conclusion about mortality · Diabetes: ó amputation · Hospitalized for common medical diagnoses: ó hospital mortality · Likely coronary artery disease per positive nuclear imaging: ó	More research to establish the *presence/absence* of disparity in health outcomes is probably not needed unless there is a large proven disparity outside of the VA.

Findings: Strength of evidence and direction	Findings: Racial/ethnic minority group, conditions, outcomes (é=higher; ê=lower; ó no difference)	Future Research Recommendations
	functional status after 1y follow-up · Lung cancer, any stage: ê mortality after 5y of follow-up · Lung cancer, late stage: é days from diagnosis to death at 2y · Stroke: ê post-stroke depression · Traumatic brain injury (TBI) ó mortality after 2y of follow-up · Ulcerative colitis: ó colorectal cancer *American Indian/Alaska Native vs white* · Low-mortality diagnosis related groups (DRGs): ó death · Major, noncardiac surgery patients: ó 30-day morbidity · Lung cancer: ó mortality after 5y of follow-up *Asian vs white* · Low-mortality DRGs: ó death · Lung cancer: ó mortality after 4y of follow-up · PTSD: ó risk of preterm birth *Hawaiian and Pacific Islander vs white* · PTSD: ó risk of preterm birth *Hispanic vs white* · Diabetes: ó amputation · Low-mortality DRGs: ó death · Prostate cancer: ó prostate cancer survival 6.6y post-treatment · Stroke: ê post-stroke depression · TBI: ó mortality after 2y of follow-up · Ulcerative colitis: ó colorectal cancer *Combined racial/ethnic minority groups (excluding African Americans) vs African American* · AUD: ó non-injury-related death · Stroke: ê post-stroke depression	
Moderate-strength evidence of similar or better mortality or morbidity in racial/ethnic minority groups in the VA See Figure A, Box 3	*African American vs white* · Admission for COPD exacerbation: ê in-hospital or mortality at 30 days post-admission · Admission to ICU for pneumonia: ê mortality at 30 days post-admission · Admission to medical ward for pneumonia: ó mortality at 30 days post-admission · HCV: ê Incident cirrhosis and HCC · Hospitalized for common medical diagnoses: ó or ê mortality after	More research to establish the *presence/absence* of disparity in health outcomes is not needed

Findings: Strength of evidence and direction	Findings: Racial/ethnic minority group, conditions, outcomes (é=higher; ê=lower; ó no difference)	Future Research Recommendations
	30 days · Low-mortality DRGs: ó in-hospital mortality · Lung cancer, any stage: ó survival at 1y · Prostate cancer: ó all-cause mortality at 5y-5.7y after diagnosis · Prostate cancer: ó prostate-cancer mortality at 5.7y after treatment to 16y after diagnosis · Stroke: ê all-cause mortality after 1y	
High-strength evidence of *similar or better* mortality or morbidity in racial/ethnic minority groups in the VA See Figure A, Box 3	*African American vs white* · CKD stage 4 or 5: ó mortality after 4.7-4.8y of follow-up	More research to establish the *presence/absence* of disparity in health outcomes is not needed

EFFECTS OF VA-BASED INTERVENTIONS TO REDUCE RACIAL OR ETHNIC DISPARITIES

The 2011 ESP review found that care coordination and in-home messaging improved 12-month glycemic control in African Americans, but not in white or Hispanic Veterans. In this update, we found low-strength evidence that (1) among African American Veterans with diabetes, peer mentorship can improve glycemic control and (2) among African American Veterans with knee osteoarthritis, there was no difference in 12-month attendance rates at the orthopedic surgeon consultation appointment between an attention control group who only received an educational booklet versus supplementation with a decision aid, motivational interviewing, or both. We did not identify any studies comparing interventions across Veterans of different minority groups, nor did we identify any intervention studies that measured health outcomes.

CONCLUSION

Our evidence brief update identified several research priorities for OHE's PEC. As the moderate-strength evidence of mortality or morbidity disparities for African American Veterans with colon cancer, HIV, and CKD and for Hispanics with hepatitis C were based on VA cohorts from the early 2000s, and changes are possible in the past 10 years, we recommend considering the need to verify each disparity in a more recent VA cohort. More research is needed to establish the presence or absence of a mortality or morbidity disparity for African Americans with diabetes, stroke, or VTE, American Indians or Alaskan Natives following major non-cardiac surgery, and African American and American Indian or Alaskan Native pregnant women with PTSD. The few interventions that have improved racial/ethnic disparities within the VA have focused only on African Americans and have covered a narrow scope of clinical areas. More research is needed to examine disparities in Hispanic, Asian, Native Hawaiian or other Pacific Islander, and American Indian and Alaska Native groups, and in other priority conditions including HIV, hepatitis C, mental illness, spinal cord injury, substance use disorders, polytrauma, and blast-related injuries. Ideally, future research should be done in the form of prospective studies that address multiple minority groups and supplement VHA data with Medicare data.

ABBREVIATIONS

AA	African American
ACTUR	Automated Central Tumor Registry
AF	Anginal frequency
aHR	Adjusted hazard ratio
AHRQ	Agency for Healthcare Research & Quality
AI/AN	American Indian/Alaskan Native
AMI	Acute myocardial infarction
aOR	Adjusted odds ratio
API	Asian Pacific Islander
AS	Anginal stability
AUD	Alcohol use disorders
B	Black
BE	Barrett's Esophagus
BEST	Beta-Blocker Evaluation of Survival Trial
BMI	Body mass index
BP	Blood pressure
CAD	Coronary artery disease
CEA	Carotid endarterectomy
CHD	Congenital heart defect
CHF	Congestive heart failure
CI	Confidence interval
CKD	Chronic kidney disease
COPD	Chronic obstructive pulmonary disease
CRC	Colorectal cancer
DB	Database
DCS	Direct Care System
DEERS	Defense Enrollment Eligibility Reporting System
DM	Diabetes mellitus
DOD	Department of Defense
DP	Disease perception
DRG	Diagnosis related group
DSS	Decision Support System
eGFR	Estimated glomerular filtration rate
ESP	Evidence-based Synthesis Program
ESP CC	Evidence-based Synthesis Program Coordinating Center
ESRD	End stage renal disease
GI	Gastrointestinal
HbA1c	Hemoglobin A1c
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
HIV	Human immunodeficiency virus
HTN	Hypertension
ICU	Intensive care unit
ILEA	Initial lower extremity amputation
LD	Lipid disorders

LVEF	Left ventricular ejection fraction
MCS	Mental component scale
MDCSS	Metropolitan Detroit Cancer Surveillance System
MedPAR	Medicare Provider Analysis and Review
MHS	Military Health System
NHW	Non-Hispanic white
NIH	National Institutes of Health
NLM	National Library of Medicine
NPCD	National Patient Care Database
NSAID	Nonsteroidal anti-inflammatory drug
NSCLC	Non-small cell lung cancer
NSD	No significant difference
NSQIP	National Surgical Quality Improvement Program
NYHA	New York Heart Association
OCF	Outpatient Care File
OPC	Outpatient Care
OPSCC	Oropharyngeal squamous cell carcinoma
PCS	Physical component scale
PL	Physical limitations
PSA	Prostate-specific antigen
PTF	Patient Treatment File
PTSD	Post-traumatic stress disorder
PVD	Peripheral vascular disease
RCT	Randomized controlled trial
RVEF	Right ventricular ejection fraction
SAQ	Seattle Angina Questionnaire
SCLC	Small cell lung cancer
SES	Socioeconomic status
SOE	Strength of evidence
SSI	Surgical site infection
TBI	Traumatic brain injury
TKR	Total knee replacement
TS	Treatment satisfaction
UC	Ulcerative colitis
VA	Veterans Affairs
VACCR	Veterans Affairs Central Cancer Registry
VAMC	Veterans Affairs Medical Center
VTE	Venous thromboembolism
W	White
WBC	White blood cell
WHR	Waist-to-hip ratio

INTRODUCTION

The AHRQ 2013 National Healthcare Disparities Report found little progress since 2000 in most quality and access disparities for racial and ethnic minorities.[1] Previous research has shown that racial disparities in health exist in the VA across a wide range of clinical areas[2,3] for which almost no promising interventions have been developed.[4] The mission of the VHA Office of Health Equity (OHE) (10A6) is to champion the advancement of health equity in the VA health system. In fiscal year 2015, the OHE is partnering with a new evaluation center under the Quality Enhancement Research Initiative (QUERI) to evaluate in which major conditions gaps in morbidity and mortality exist among vulnerable Veteran populations and to examine trends in quality of care across these conditions. To help inform selection of the Partnered Evaluation Center's (PEC) research priorities to better understand and reduce race and ethnicity-related mortality and morbidity disparities, the OHE requested that the Evidence-based Synthesis Program's Coordinating Center (ESP CC) provide an evidence brief on what evidence has emerged since (1) the 2007 ESP review Racial and Ethnic Disparities in the VA Healthcare System[2] on which clinical areas racial and ethnic disparities are prevalent within the VA, and (2) the 2011 ESP review Interventions to Improve Minority Health Care and Racial and Ethnic Disparities[4] on the effects of interventions implemented within the VA to reduce racial/ethnic disparities or to improve health and health care in minority populations.

An evidence brief differs from a full systematic review in that the scope is narrowly defined and the traditional review methods are streamlined in order to synthesize evidence within a shortened timeframe. An evidence brief does not outline the full context in which the information is to be used and does not present a comprehensive assessment of knowledge on the topic. Brief or rapid review methodology is still developing and there is not yet consensus on what represents best practice.

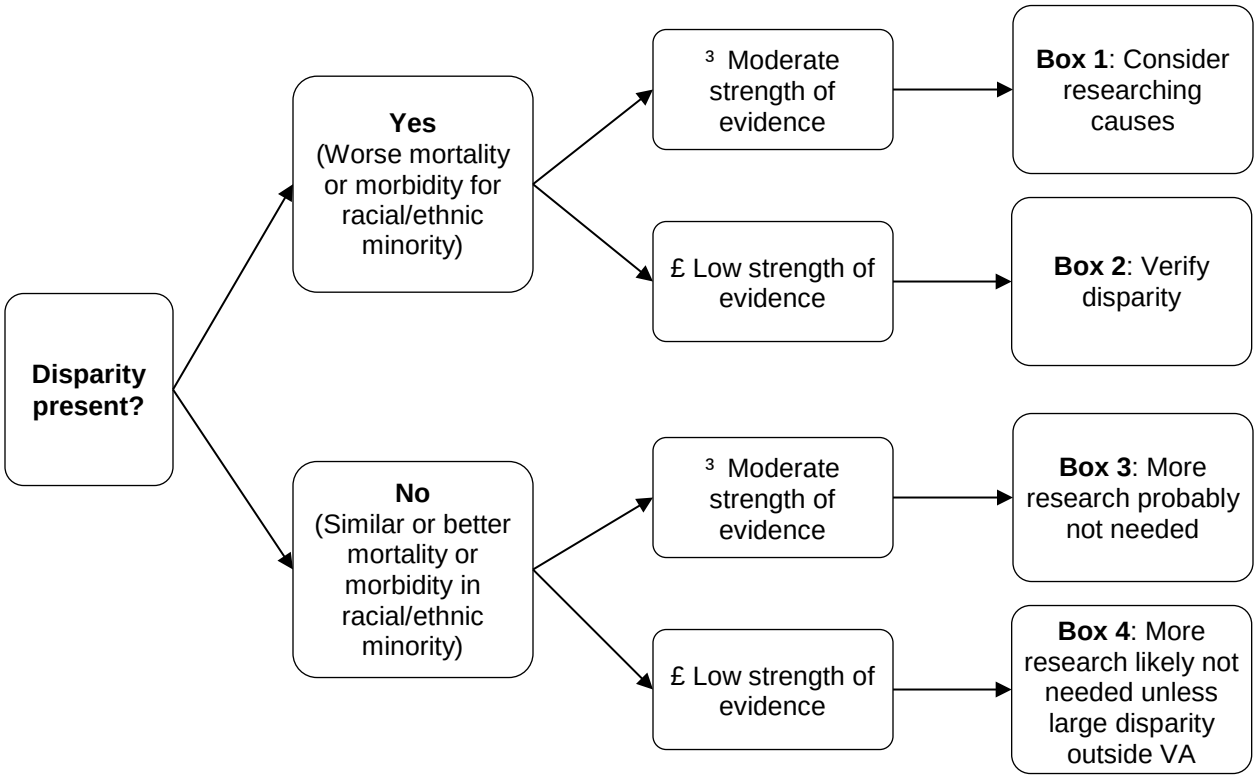
OVERVIEW OF RESEARCH PLAN

A first step in identifying research priorities for the PEC is to identify differences in health outcomes among racial and ethnic groups within the VA's equal access health care system. The second step is to explore the sources of these differences. This evidence brief focuses on the first step of identifying racial or ethnic differences in mortality and morbidity outcomes. Our exploration of the sources of health outcome disparities was limited to: (1) summarizing evidence from the 2007 ESP review on possible causes related to the identified health outcome differences, (2) noting when studies on health outcome disparities provided insights about causes by conducting additional analyses to assess whether differences in socioeconomic status, facility, access, preferences, needs, etcetera, accounted for the disparities, and (3) providing an inventory and data abstraction of VA studies on process and access measures.

We compared health outcomes of racial/ethnic minority groups to those of white Veterans. The range of potential findings for the comparison of racial/ethnic minority groups to those of white Veterans includes worse outcomes, similar outcomes, better outcomes, or inconclusive evidence for the minority group. To fit the purpose of this report, we defined disparity as any instance of worse mortality or morbidity outcomes for the racial/ethnic minority groups.

Figure 1 illustrates the framework that guided our research recommendations.

Figure 1. Research Recommendations Framework



SCOPE

The objective of this evidence brief is to update the findings of previous ESP reviews on the prevalence of and interventions for reducing racial and ethnic disparities within the VA. The ESP CC investigators and representatives of the OHE worked together to identify the population, comparator, outcome, timing, setting, and study design characteristics of interest. The OHE approved the following key questions and eligibility criteria to guide this review:

Key Question 1: In which clinical areas are racial and ethnic disparities prevalent within the VA?

Key Question 1 inclusion criteria:

- ***P****opulation:* Any VA population belonging to a racial or ethnic minority group
- ***I****ntervention:* N/A
- ***C****omparison:* Minority versus non-minority Veterans
- ***O****utcomes:* Mortality, morbidity, process measures (*ie*, offer and uptake of care, guideline adherence, *etc*), access (*eg*, wait times)

- ***T****iming:* No restrictions
- ***S****etting:* VA
- ***S****tudy design:* Using a best evidence approach, we will prioritize evidence from systematic reviews and multisite studies that adequately controlled for potential patient-, provider-, and system-level confounding factors. Inferior study designs (*eg*, single-site, inadequate control for confounding) will only be accepted for particular racial or ethnic minority groups that lack adequate data from preferred study designs.

Key Question 2: What are the effects of interventions implemented within the VA to reduce racial and ethnic disparities?

Key Question 2 inclusion criteria:

- ***P****opulation:* Any VA population belonging to a racial or ethnic minority group
- ***I****ntervention*: Any intervention primarily designed to reduce disparities or improve quality of care or outcomes for minority populations
- ***C****omparison*: Head-to-head comparisons of different interventions, comparisons of intervention to usual care, comparison of same intervention in different racial or ethnic groups or in VA versus non-VA population
- ***O****utcomes:* No restrictions
- ***T****iming:* No restrictions
- ***S****etting*: VA
- ***S****tudy design:* Systematic reviews, controlled studies, interrupted time series, repeated measures studies

METHODS

To identify relevant citations, we searched MEDLINE® (via PubMed®) and the Cochrane Central Register of Controlled Trials from 10/09/2006 to 2/13/2015 using terms for racial groups and disparities. To rate the internal validity of included studies, we used Cochrane's Risk of Bias Tool for controlled trials and the Drug Effectiveness Review Project's Tool for observational studies. We categorized level of adjustment for potential confounders as high, medium or low based on the degree to which studies accounted for (1) demographic, (2) illness severity, and (3) comorbidity variables, and also noted whether SES and treatment facility were included in the models and whether studies presented a conceptual model that explained covariate selection. For SES, we included studies whether or not they adjusted for SES. When studies adjusted for SES, we noted its impact. We graded the strength of the overall body of evidence using the AHRQ Methods Guide for Comparative Effectiveness Reviews, based on risk of bias of individual studies (study design and internal validity), consistency, directness, and precision. The complete

description of our full methods can be found on the PROSPERO international prospective register of systematic reviews website (http://www.crd.york.ac.uk/PROSPERO/; registration number CRD42015015974). Six invited peer reviewers provided comments on the draft version of this evidence brief. See the supplemental materials for the peer review disposition table.

SYNTHESIS

LITERATURE FLOW

We screened 1,790 unique records and included 40 articles in this evidence brief (Figure 2): 4 articles on the 2 previous ESP systematic reviews that we were updating,[2-5] 34 articles that include morbidity or mortality outcomes and describe multi-site studies (Key Question 1),[6-39] and 2 articles that describe interventions to reduce disparities (Key Question 2).[40,41] Additionally, we included data abstraction of 64 articles that include process measure or access outcomes (see supplemental spreadsheet) and data abstraction of 12 articles that include morbidity or mortality outcomes and describe single-site studies (see supplemental materials).[42-53] Among the 76 excluded studies, the majority were excluded for being in non-Veteran populations (N=18), involving an ineligible study design (*eg*, cross-sectional) (N=16), or having ineligible outcomes (N=26). Types of ineligible outcomes included intermediate clinical outcomes such as glucose or blood pressure control, which could contribute to mortality or morbidity disparities, but which were outside of the scope of this evidence brief.

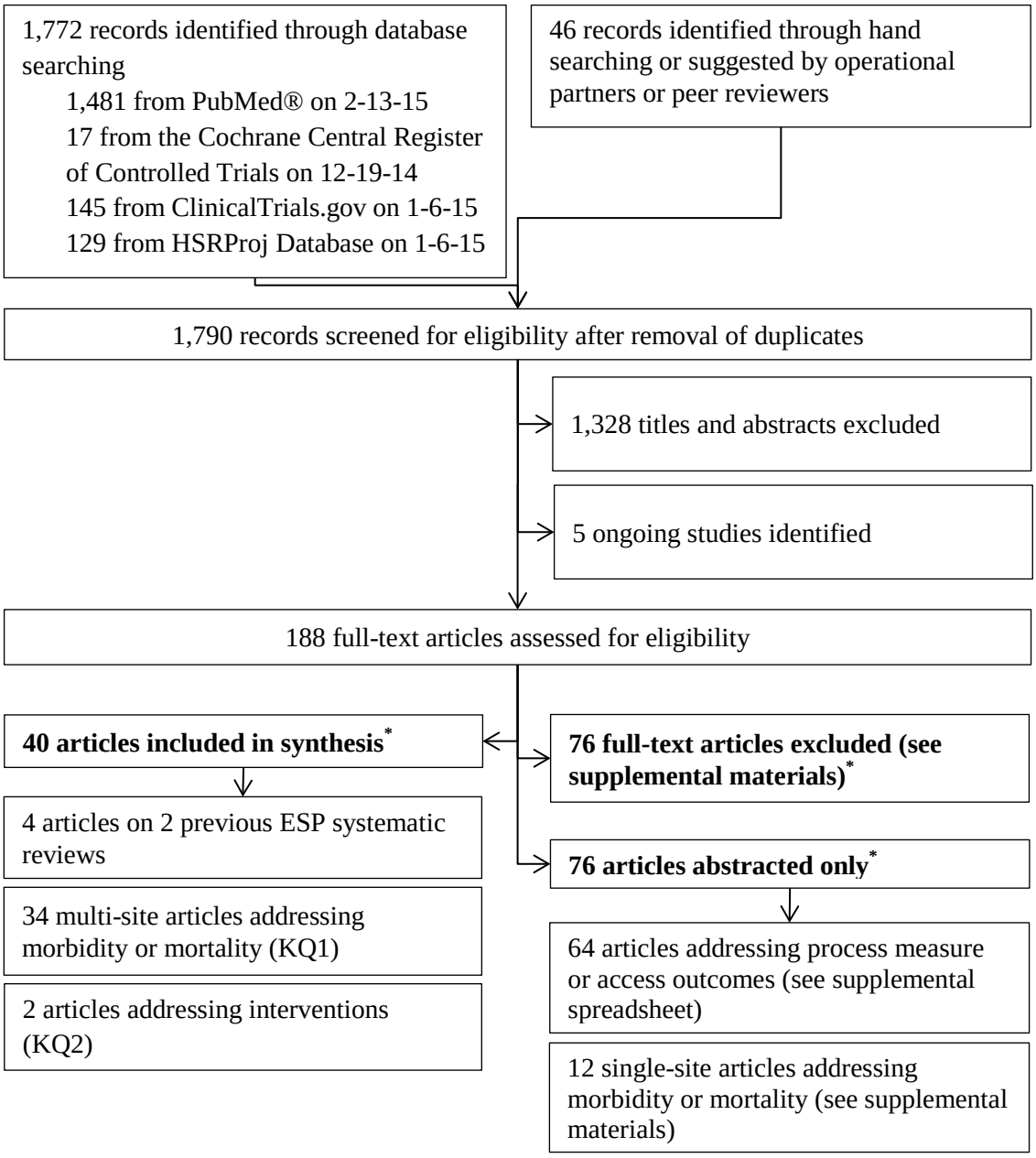
Of the 34 articles that include morbidity or mortality outcomes and describe multi-site studies, one was prospective.[27] Twenty-nine studies were rated fair or good quality for at least one outcome.[7,8,10-20,22-27,29-31,33-39] The majority of these studies reflected VA care use only, with only 28% supplemented with Medicare data to more completely capture the totality of care.[10,11,22,26,28,31,33,37] Three poor-quality studies failed to adjust for any potential confounders[6,9,28] and one study was rated poor quality for the outcome of death for not adjusting for potential confounders, but rated fair quality for the outcome of complications.[8] We excluded outcomes rated poor quality from our strength of evidence ratings and review of findings, but data abstraction and quality assessment of these outcomes can be found in the supplemental materials.

Articles addressed morbidity and mortality disparities among only African American Veterans in the clinical areas of cancer (8 studies),[15,18-20,30,33,39,45] cardiovascular disease (5 studies),[8,9,23,24,27] diabetes (2 studies),[11,25] inpatient and acute care (6 studies),[16,21,31,32,36,38] and kidney disease (2 studies).[10,26] Other studies addressed morbidity and mortality disparities among only American Indian and Alaska Native Veterans in the clinical area of inpatient and acute care (2 studies),[6,7] and among multiple minority Veteran groups in the clinical areas of cancer (1 study),[12] diabetes (1 study),[37] HIV/Hepatitis C (1 study),[14] inpatient and acute care (1 study),[29] and mental health and substance abuse (4 studies).[13,17,22,35]

We screened 247 citations from the HSRProj Database and ClinicalTrials.gov to identify potential ongoing or unpublished studies. Of these, 5 were identified as ongoing studies that met our inclusion criteria (see supplemental materials for a complete list). These studies focused on African Americans with Hepatitis C, osteoarthritis, hypertension, and diabetes. Two studies assessed the presence of a disparity (Key Question 1) and 3 studies assessed an intervention to

address a disparity (Key Question 2). We did not identify any unpublished studies that met our inclusion criteria.

Figure 2. Literature Flow Chart



*Total ≠ 188; many studies included more than one outcome

KEY QUESTION 1: In which clinical areas are racial and ethnic disparities prevalent within the VA?

The 2007 ESP systematic review found a higher risk of mortality for black and Hispanic Veterans compared to white Veterans based on a national sample of HIV-positive Veterans diagnosed between 1999 and 2001. Age-adjusted mortality was higher among black (HR=1.41;

95% CI: 1.19-1.66) and Hispanic Veterans (HR=1.41; 95% CI: 1.06-1.86) than among white Veterans.[54] The main limitation of this study is that it did not control for between-groups variability in disease characteristics, comorbidity, treatment, or between-facility effects.

The 2007 ESP review found no differences between African Americans and whites with colorectal cancer in surgery (OR=0.92; 95% CI: 0.74-1.15), chemotherapy (OR=0.99; 95% CI: 0.78-1.24), and radiation (OR=1.10; 95% CI: 0.85-1.43).

2015 EVIDENCE BRIEF FINDINGS

Evidence suggesting the presence of disparities

Table 1 summarizes (1) the magnitude and strength of evidence for each disparity, (2) information from the 2007 and 2011 ESP reports on their potential sources and promising interventions, and (3) results from our 2015 evidence brief update inventory of new process access measure studies that also may provide additional insights about potential sources of disparities.

Moderate-strength evidence of higher mortality or morbidity

African Americans with colon cancer, CKD, HIV, or stroke[10,11,33] and Hispanics with hepatitis C[14] are the four groups with the strongest evidence of a mortality or morbidity disparity. Each is supported by a single large, good-quality study.

African American Veterans with colon cancer: In a good-quality study of 4,642 Veterans from the VA Central Cancer Registry (VACCR) diagnosed with colon cancer between 2001 and 2004, African American Veterans with colon cancer had a lower rate of 3-year survival than white Veterans (absolute difference -7.9%, -11.5 to -4.3; OR=0.78, 0.64 to 0.96).[33] The authors speculated that racial differences in screening, early-stage diagnosis, clinician uncertainty, treatment preferences, and receipt of curative surgery might be factors. Other potential process- and access-related causes include guideline-concordant screening and care,[55-57] receipt of wanted care,[58] tumor characteristics,[51] disease extent,[51] and treatment.[51,59]

African American Veterans with chronic kidney disease: In a good-quality study by Choi and colleagues (2009) of 420,334Veterans that had a serum creatinine level recorded at a VA facility between October 2000 and September 2001, African American Veterans at all stages of CKD were at higher risk of end-stage renal disease (ESRD) at 3.7 years[10] The authors said the causes were poorly understood. Potential causes could include: inadequately controlled diabetes, hypertension, proteinuria, and lower achievement of quality of care goals. We did not identify any additional potential causes from the 2007 ESP report or from our scan of access and process measure studies.

African American Veterans with HIV: In one good-quality study by Choi and colleagues of 12,955 Veterans that had a serum creatinine level recorded at a VA facility between October 2000 and September 2001 and who were registered as having HIV in the Immunology Case Registry (ICR), African American Veterans had a much higher risk of developing ESRD than white Veterans (age- and sex-adjusted rate for ESRD per 1000 person-years: African American=7.3 (95% CI: 6.0-8.6) vs white=0.9 (95% CI: 0.4-1.4); adjusted hazard ratio (aHR)=5.97 (95% CI: 3.12-11)).[11] This study did not evaluate potential sources of the ESRD

disparity, but the authors proposed differences in socioeconomic status (SES), patient preferences, comorbid illnesses, environmental factors, genetics, and access to antiretroviral therapy as potential contributors. Lower HIV medication adherence is another potential cause of the ESRD disparity.[2,60] We did not identify any additional potential causes from the 2007 ESP report or from our scan of access and process measure studies.

Hispanic Veterans with hepatitis C: In a good-quality study by El-Serag and colleagues (2014) of 8,925 Hispanic and 84,065 non-Hispanic white Veterans with confirmed viremia between 2000 and 2009 in the VA HCV Clinical Case Registry and at least 1 year of follow-up in the VA, Hispanics had higher incidence rates of cirrhosis (aHR 1.28; 95% CI: 1.21-1.37) and hepatocellular carcinoma (aHR 1.61; 95% CI: 1.44-1.80) after an average follow-up of 5.2 years.[14] In terms of potential causes, El-Serag and colleagues ruled out diabetes, body mass index, and treatment, and suggested that future studies should explore the role of racial variation in overall care, rates of fatty liver, prevalence of PNPLA3 polymorphism, insulin resistance in nondiabetics, and adipose tissue amount and distribution.

Low-strength evidence of higher mortality or morbidity

Conditions with low-strength evidence of a mortality or morbidity disparity in outcomes include: (1) African American Veterans with diabetes, post-traumatic stress disorder (PTSD), stroke, and venous thromboembolism (VTE); (2) American Indian or Alaskan Native Veterans with PTSD or following major non-cardiac surgery; and (3) Hispanic Veterans with hepatitis C virus (HCV). Increased risk of pre-term birth in Veterans with PTSD is the only disparity that is present in multiple racial/ethnic minority groups, including African Americans and American Indian or Alaskan Natives. The main limitations of the majority of all other reported disparities included (1) the lack of statistical adjustment for between-facility differences and (2) that consistency was unknown because most were supported by only a single study. A few studies about the sources of disparities in diabetes and stroke have been published since our 2007 review. For diabetes, we identified studies on racial/ethnic differences in medication adherence, medication supply, and time between diagnosis and drug initiation.[61,62] For stroke, we identified studies of racial/ethnic differences in provider recommendation for patient to receive carotid endarterectomy (CEA) and receipt of carotid artery imaging.[63,64]

Table 1. Magnitude and strength of evidence of mortality and morbidity disparities found in 2015 evidence brief update, 2007 and 2011 ESP report findings on their potential sources and promising interventions, and inventory results of new process and access measure studies

Population: Disparity Strength of Evidence: « « « «=High « « «=Moderate « «=Low	Finding # and type of studies (timeframe); sample size; main limitations	2007 ESP report identified potential sources of disparities?	Promising interventions identified from this update or 2011 ESP report?	# of new process/access measure studies and types of outcomes identified in this brief
African-American vs white				
CKD all stages: é 3.7 year ESRD « « «	aHR (95% CI:): 1=2.14 (1.72-2.65), 2=2.30 (2.02-2.61), 3A=3.08 (2.74-3.46), 3B=2.47 (2.26-2.70), 4=1.86 (1.75-1.98) and 5=1.23 (1.12-1.34); 1 good VA NPCD study (2000-2001); N=2,015,891; unknown consistency (Choi, 2009)[10]	No studies	No studies	No studies
Colon cancer: ê 3y survival « « «	Absolute difference -7.9% (-11.5 to -4.3); OR (95% CI)=0.78 (0.64-0.96); 1 good VACCR study (2001-2004); N=4,642; unknown consistency (Samuel, 2014)[33]	No; ó surgery, chemotherapy, radiation, and screening.	No studies	6 studies: guideline concordant care; receipt of wanted care, tumor characteristics, disease extent, treatment
Diabetes: é All-cause mortality overall « «	Mortality: aHR (95% CI)=1.23 (1.02-1.47); 1 fair study of 2 VAMCs in WA DC and Palo Alto, CA (1986-2007); N=3,148; unknown handling of missing data, unknown consistency (Kokkinos 2009)[25]	Yes; ê quality of diabetes care (appropriate test ordering, control of blood pressure, glucose, and lipids) ê adherence among black and Hispanic é limb amputation for American Indian, black, and Hispanic.	2015 update: Peer mentoring ê mean HbA1c by 1 point (95% CI: -1.84, -0.31; *P*=0.006); 1 good RCT, N=117[41] 2011 report: Culturally tailored health education: ê HbA1c, é knowledge Interpersonal interventions: é dietary habits, physical activity, and self-management Self-care interventions: é glycemic control Use of non-physician providers: é diabetes control, knowledge, and satisfaction, ê onset of retinopathy, ER visits, and hospital admissions	2 studies: medication adherence, medication supply, time between diagnosis and drug initiation
é ESRD in HIV-infected Veterans « « «	ESRD in HIV-infected Veterans with diabetes: aHR (95% CI)=2.33 (1.02-5.35); 1 good VA NPCD, Medicare cohort (2000-2001); N=2,180; unknown consistency (Choi, 2007)[11]			
HIV: é ESRD « « «	Age- and sex-adjusted rate for ESRD per 1000 person-years	Yes; ê medication adherence, é later stage	No studies	No studies

Population: Disparity Strength of Evidence: « « « «=High « « «=Moderate « «=Low	Finding # and type of studies (timeframe); sample size; main limitations	2007 ESP report identified potential sources of disparities?	Promising interventions identified from this update or 2011 ESP report?	# of new process/access measure studies and types of outcomes identified in this brief
	(95% CI): African American=7.3 (6.0-8.6) vs white=0.9 (0.4-1.4); aHR=5.97 (3.12-11); 1 good VA NPCD, Medicare cohort (2000-2001); N=12,955; unknown consistency (Choi, 2007)[11]	diagnosis.		
PTSD: é risk of preterm birth « «	aOR (95% CI)=1.49 (1.29-1.71); 1 fair study of national clinical and administrative databases (2000-2012); N =13,935; medium-level adjustment for confounders, unknown consistency (Shaw, 2014)[35]	No; ó mental health services; é improvement in PTSD severity and treatment commitment	No studies	No studies
Rectal cancer: ê all-cause survival at 3y « «	-9.7% (-17.5% to 1.9%) lower 3-year all-cause survival; aOR=0.61 (0.42-0.87) without adjustment for hospital fixed effects and 0.66 (0.43 to 1.00) with adjustment for hospital fixed effects; 1 good VACCR study; N=1,301; unknown consistency, imprecise (Samuel, 2014)[33]	No; ó surgery, chemotherapy, radiation, and screening.	No studies	6 studies: guideline concordant care; receipt of wanted care, tumor characteristics, disease extent, treatment
Stroke: é 2y mortality « «	OR= 2.5 (p<.05); 1 fair MedPAR/VA PTF study (1998-2002); N=155,529; unknown handling of missing data, unknown consistency (Polsky, 2008)[31]	ê invasive procedures for stroke (ultrasound or angiography), CEA; é aversion to CEA	No studies	2 studies: provider recommendation for patient to receive CEA, receipt of carotid artery imaging
VTE: é 90-day complications « «	OR (95% CI)=5.2 (1.3-21.6); 1 fair study of 2 Philadelphia VA centers (2000-2002); N=168; unknown handling of missing data, unknown consistency, imprecise (Aujesky, 2007)[8]	No studies	No studies	No studies
American Indian or Alaskan Native (AI/AN)				
Post major, noncardiac surgery: é risk of 30-day post-op mortality « «	aOR (95% CI)=1.6 (1.0-2.4); 1 good VA NSQIP study (1991-2002); N=4,419; unknown consistency, imprecise (Alvord, 2005) [7]	Unclear; é inability to get needed medical care) for AI/AN and Hispanics	No studies	No studies
PTSD: é risk of preterm birth « «	aOR 1.99 (1.15-3.45); 1 fair study of national clinical and administrative databases (2000-2012); N=10,449; medium-level adjustment for confounders, unknown consistency, imprecise (Shaw, 2014)[35]	No studies	No studies	No studies

Population: Disparity Strength of Evidence: « « « «=High « « «=Moderate « «=Low	Finding # and type of studies (timeframe); sample size; main limitations	2007 ESP report identified potential sources of disparities?	Promising interventions identified from this update or 2011 ESP report?	# of new process/access measure studies and types of outcomes identified in this brief
Hispanic				
HCV: é incident cirrhosis and incident hepatocellular carcinoma (HCC) « « «	Cirrhosis: aHR=1.28 (1.21-1.37) HCC: aHR=1.61 (1.44-1.80); 1 good VA HCV CCR cohort (2000-2009); N=149,407; unknown consistency (El-Serag, 2014)[14]	Yes; ê receipt of antiviral treatment, é treatment discontinuation	No studies	No studies
Combined racial/ethnic minority groups (excluding African Americans) vs African American				
Alcohol use disorders (AUD): é injury-related death « «	HR (95% CI)=1.59 (1.40-1.80) 1 fair NPCD study (FY01); N=2,545; medium-level adjustment for confounders (Fudalej, 2010)[17]	No; ó inpatient and residential treatment	No studies	No studies

(é=higher; ê=lower; ó no difference)

Evidence suggesting similar or better mortality or morbidity for racial/ethnic minority groups

In 21 studies, mortality and morbidity outcomes were similar or better among racial and ethnic minority groups compared to white Veterans. Table 2 below categorizes these studies by racial and ethnic group and clinical area and provides information about the magnitude and strength of evidence of each finding.

There is high-strength evidence that African American Veterans with stage 4-5 CKD have similar mortality outcomes compared to white Veterans. This finding is supported by 2 good-quality studies.[10,26]

There is moderate-strength evidence that African American Veterans with prostate cancer, lung cancer, hepatitis C, those hospitalized for pneumonia, COPD, CHF, GI bleed, hip fracture, stroke, or AMI, or those classified as in a low-mortality diagnosis related group have similar mortality and morbidity outcomes to white Veterans. The finding of similar mortality outcomes among African American and white Veterans with prostate cancer is supported by 4 fair-quality studies.[12,15,19,30] The findings of similar mortality or morbidity outcomes among African American and white Veterans with lung cancer,[33] stroke,[24] hepatitis C,[14] hospitalized for pneumonia, CHF, GI bleed, hip fracture, stroke, or AMI,[38] admitted to a medical ward or ICU for pneumonia,[16] admitted for COPD exacerbation,[34] or classified as in a low-mortality diagnosis related group[36] are each supported by a single adequately powered, good-quality study that sufficiently controlled for all important confounding variables.

All other findings of similar or better mortality or morbidity for racial/ethnic minority groups are low strength. The primary limitations of the low-strength evidence studies were medium to low levels of adjustment for potential confounders, unknown consistency, and/or imprecision.

Table 2. Magnitude and strength of evidence of similar or better mortality or morbidity for racial and ethnic minority groups, organized by racial and ethnic group and clinical area

Clinical area **Population:** **Equity** **Strength of Evidence:** « « « «=High « « «=Moderate « «=Low	**Finding; # and type of studies; # of patients; main limitations**
African American	
Cardiovascular	
Advanced chronic systolic heart failure: ó all-cause mortality at 2y « «	2y all-cause mortality: aHR=1.14 (95% CI: 0.86-1.50); 1 good study of VA hospitals participating in BEST trial; N=898; unknown consistency, imprecise (Jones, 2014)[23]
Coronary artery disease: ó functional status at 1y « «	No disparity on SF-12 physical and mental components and SAQ physical limitations, treatment satisfaction, angina frequency, angina stability, disease perception; 1 fair *prospective* study of 5 VA Medical Centers with on-site cardiac catheterization; N=1,022; medium-level adjustment for confounders, unknown consistency, imprecise (Kressin, 2007)[27]
Stroke: ê post-stroke depression at 1y « «	ê Post-stroke depression for black vs white: 30.7% vs 42.5%; OR=0.57 (95% CI: 0.49-0.66); 1 fair study of several national VA sources; N=5,100; unknown handling of missing data, unknown consistency (Jia, 2010)[22]
Stroke: ê all-cause mortality after 1y « « «	1-year mortality higher for whites: 13.1% vs 12.2%; absolute difference = 0.9%; HR=1.06 (95% CI:1.02-1.10); 1 good VA PTF study; N=55,094; unknown consistency (Kamalesh, 2007)[24]
Cancer	
Lung cancer, any stage: ê mortality at 5y « «	5y mortality: aHR=0.94 (95% CI: 0.92-0.96); 1 fair VACCR study; N=81,823; medium-level adjustment for confounders, unknown consistency (Ganti, 2014)[18]
Lung cancer, late stage: é days from diagnosis to death at 2y « «	133 vs 117; aHR=1.31 (95%CI: 1.14-1.50); 1 fair VACCR study; N=2,200; medium-level adjustment for confounders, unknown consistency, imprecise (Zullig, 2013)[39]
Lung cancer, any stage: ó survival at 1y « « «	1-year survival NSCLC: 39.5% (black) vs 40.6% (white), aOR=1.05 (95% CI: 0.96-1.15) SCLC: 26.2% (black) vs 26.6% (white), aOR=1.07 (95% CI: 0.82-1.39); 1 good national registry study; N=4,642; unknown consistency (Samuel, 2014)[33]
Prostate cancer: ó all-cause mortality at 5-5.7 years « « «	All-cause mortality largest effect size: HR=1.50 (95% CI: 0.94-2.38); 2 fair multicenter studies; N=1,991; medium- to low-level adjustment for confounders, imprecise (Freeman, 2003; Optenberg, 1995)[15,30]
Prostate cancer: ó prostate-cancer mortality at 5.7y-16y « « «	Prostate cancer mortality: HR at 5.7 years=1.36 (95% CI: 0.62-2.96); HR at 11-16 years=0.90 (95% CI: 0.58-1.40); 3 multicenter studies; N=2,892; medium-level adjustment for confounders (Daskivich, 2015; Freeman, 2003; Graham-Steed, 2013)[12,15,19]
Chronic kidney disease	
CKD stage 4 or 5: ó mortality at 4.7-4.8y « « « «	ó Among Veterans with CKD Stage 4 or 5, black race is not associated with mortality risk; rate range: 9% to 11% in one study[10]; aHR range: Stage 4=1.01 (95% CI: 0.81-1.27) to 1.07 (p>.05) and stage 5=0.83 (95% CI: 0.48-1.44) to 0.97 (p>.05), respectively; 1 good VA NPCD study; N=32,578 (2000-2001) (Choi, 2009)[10] and 1 good VA inpatient and outpatient study; N=38,266 (2004-2006) (Kovesdy, 2013)[26]

Clinical area **Population:** **Equity** **Strength of Evidence:** « « « «=High « « «=Moderate « «=Low	**Finding; # and type of studies; # of patients; main limitations**
Diabetes	
Type 1 and 2 DM: ó rate of amputation over 5y « «	ó Rate of decline in initial lower extremity amputation (ILEA) is not different between black and white Veterans; 5-year reduction: -24.8% (black) vs -34% (white), p=.37; 1 good VA Diabetes Epidemiology Cohorts data study (2000-2004); N=405,580 to 739,377; unknown consistency, imprecise (Tseng, 2011)[37]
Infectious disease	
HCV: ê incident cirrhosis and hepatocellular carcinoma (HCC) at 5.2y « « «	ê Incident cirrhosis and incident HCC among black vs white Veterans with HCV; cirrhosis: 13.3% (black) vs 21.6% (white); HCC: 3.9% (black) vs 4.7% (white); aHR=0.58 (95% CI: 0.55-0.60) and aHR=0.77 (95% CI: 0.71-0.83), respectively; 1 good VA HCVCCR study (2000-2009); N=149,407; unknown consistency (El-Serag, 2014)[14]
Inpatient/acute care	
Hospitalization: ó or ê mortality at 30 days « « «	ó Black race not associated with mortality among Veterans under 65 hospitalized for pneumonia (6.8% (black) vs 7.5% (white); aOR=1.09 (95% CI: 0.98-1.21)), GI bleed (4.4% vs 5.3%; aOR=0.93 (95% CI: 0.78-1.10)), hip fracture (2.1% vs 3.3%; OR=0.66 (95% CI: 0.28-1.55)), stroke (6.7% vs 6.3%; OR=1.12 (95% CI: 0.95-1.32)), and AMI (5.5% vs 4.9%; OR=1.19 (95% CI: 0.99-1.43)) ê Black race associated with lower mortality among Veterans under 65 hospitalized for CHF (3.3% vs 4.9% OR=0.71 (95% CI: 0.62-0.82)), and among Veterans 65 and older hospitalized for pneumonia (16.9% vs 16%; OR=0.90 (95% CI: 0.85-0.95)), CHF (6.3% vs 9.1%; OR=0.70 (95% CI: 0.65-0.76)), GI bleed (6.7% vs 7.3%; OR=0.88 (95% CI: 0.79-0.99)), hip fracture (7.4% vs 10.4%; OR=0.73 (95% CI: 0.58-0.90)), stroke (10.9% vs 12.7%; OR=0.81 (95% CI: 0.74-0.89)), and AMI (13.0% vs 15.3%; OR=0.75 (95% CI: 0.67-0.84)). 1 good VA PTF study (1996-2002); N=283,912; unknown consistency (Volpp, 2007)[38*]
Low-mortality diagnosis related groups (DRGs): ó in-hospital mortality « « «	ó Black race not associated with death in low-mortality DRG; 0.3% vs 0.3%, aOR=1.18 (p>.05); 1 good VA study using inpatient and outpatient files (2001-2005); N=294,381; unknown consistency (Shimada, 2008)[36]
Hospitalization: ó in-hospital mortality « «	ó Black race not associated with hospital death; rate range: 1.4% to 10.6% (black) vs 1.7% to 11.4% (white); aOR=0.95 (95% CI: 0.92-1.26); 1 good MHS study (2000-2004); N=14,122; unknown consistency, imprecise (Meyers, 2008)[29]
Admission to medical ward for pneumonia: ó mortality at 30 days « « «	ó Black race not associated with mortality within 30 days of admission to a medical ward for pneumonia; 9% (black) vs 8% (white); aOR=0.98 (95% CI: 0.87-1.10); 1 good VA administrative data study (2002-2007); N=35,706; unknown consistency (Frei, 2010)[16]
Admission to ICU for pneumonia: ê mortality at 30 days « « «	ê Black race associated with lower mortality within 30 days of admission to ICU for pneumonia; 29% (black) vs 31% (white); aOR=0.82 (95% CI: 0.68-0.99); 1 good VA administrative data study (2002-2007); N=5,172; unknown consistency (Frei, 2010)[16]

[*]We are aware of 2 additional studies by some of the same authors that performed additional analyses of the same data set.[21, 32] We considered Volpp 2007 to be the primary publication because it was the earliest publication, had the largest sample size, and its primary focus was on comparing 30-day mortality between blacks and whites in the VA. Polsky 2007 additionally found that better outcomes for blacks are not unique to the VA.[32] Jha 2010 found that VA location did not contribute to variation in 30-day mortality.[21] We do not believe Volpp 2007's findings of no disparity are due to their adjustment for SES, as the additional analyses in Jha 2010 and Polsky 2007 did not adjust for SES and also found no disparity.[32]

Clinical area **Population:** **Equity** **Strength of Evidence:** « « « «=High « « «=Moderate « «=Low	**Finding; # and type of studies; # of patients; main limitations**
Admission for COPD exacerbation: ê in-hospital or mortality at 30 days « « «	ê Black race is associated with lower in-hospital or 30-day mortality after admission for COPD exacerbation; 7.1% vs 9.2% (p<.001); aOR=0.69 (95% CI: 0.62-0.77); 1 good VA PTF/OPC study (2002-2006); N=50,979; unknown consistency (Sarrazin, 2009)[34]
Mental, behavioral health	
Traumatic brain injury (TBI): ó mortality at 2y « «	ó 2y mortality for black vs white: 2.7% vs 2.9%; HR=1.25 (95% CI: 0.90-1.73); 1 fair national VA DB study; N=9,633; medium-level adjustment for confounders, unknown consistency, imprecise (Egede, 2012)[13]
Alcohol use disorders (AUD): é injury-related and non-injury-related death for whites at 5y « «	é Injury-related HR=2.16 (95% CI: 1.93-2.42) and non-injury-related death HR=1.32 (95% CI: 1.28-1.38) for white vs black; 1 fair NPCD study; N=2,545/N=19,381; medium-level adjustment for confounders, unknown consistency (Fudalej, 2010)[17]
Other	
Ulcerative colitis: ó colorectal cancer « «	ó Colorectal cancer: 1% vs 0.9%; HR=1.10 (95% CI: 0.65-1.87); 1 study of PTF and OPC files; N=16,490; unknown handling of missing data, unknown consistency, imprecise (Hou, 2012)[20]
American Indian and Alaska Native	
Inpatient/acute care	
Post-operation: ó morbidity at 30 days « «	ó AI/AN race not associated with risk of 30-day postop morbidity; 11.2% (AI/AN) vs 11.6% (white); aOR=0.9 (95% CI: 0.8-1.1); 1 good VA NSQIP study; N=4,419; unknown consistency, imprecise (Alvord, 2005)[7]
Low-mortality diagnosis related groups (DRGs): ó in-hospital mortality « «	ó American Indian race not associated with death in low-mortality DRGs; 0.2% vs 0.3%; aOR=0.94 (p>.05); 1 good study using VA Inpatient and Outpatient files (2001-2005); N=236,369; unknown consistency, imprecise (Shimada, 2008)[36]
Asian	
Cancer	
Lung cancer: ó mortality at 4y « «	aHR=0.96 (95% CI: 0.84-1.09); 1 fair study of VA CCR; N=67,332; unknown consistency, medium-level adjustment for confounders, unknown consistency (Ganti, 2014)[18]
Inpatient/acute care	
Low-mortality diagnosis related groups (DRGs): ó in-hospital mortality « «	ó Asian/Pacific Islander ethnicity not associated with death in low-mortality DRGs; 0.1% vs 0.3%; aOR=0.44 (p>.05); 1 good study using VA Inpatient and Outpatient files (2001-2005); N=236,845; unknown consistency, imprecise (Shimada, 2008)[36]
Mental, behavioral health	
PTSD: ó risk of preterm birth « «	aOR=1.27 (95% CI: 0.82-1.96); 1 fair study of national clinical and administrative databases; N=10,518; medium-level adjustment for confounders, unknown consistency, imprecise (Shaw, 2014)[35]
Hawaiian and Pacific Islander	
Mental, behavioral health	
PTSD: ó risk of preterm birth « «	ó Risk of preterm birth: aOR=1.35 (95% CI: 0.85-2.13); 1 fair study of national clinical and administrative databases; N=10,392; medium-level adjustment for confounders, unknown consistency, imprecise (Shaw, 2014)[35]

Clinical area **Population:** **Equity** **Strength of Evidence:** « « « «=High « « «=Moderate « «=Low	**Finding; # and type of studies; # of patients; main limitations**
Hispanic	
Cancer	
Prostate cancer: ó survival at 6.6y « «	ó 6.6y prostate cancer survival: HR=0.24 (95% CI: 0.03-1.82); 1 fair study of 2 Southern California VA hospitals (N=720); high level of incomplete data (22%), unknown consistency, imprecise (Daskivich, 2015)[12]
Cardiovascular	
Stroke: ê post-stroke depression at 1y « «	ê Post-stroke depression for Hispanic vs white: 41.7% vs 42.5%; OR=0.78 (95% CI: 0.56-1.08); 1 fair study of several national VA sources; N=4,226; unknown handling of missing data, unknown consistency (Jia, 2010)[22]
Diabetes	
Type 1 and 2 DM: ó rate of amputation over 5y « «	ó Rate of decline in initial lower extremity amputation (ILEA) is not different between Hispanic and white Veterans ; 5-year reduction: -14.6% (Hispanic) vs -34% (white), p=.91; 1 good serial cross-sectional study; N=405,580 to 739,377; unknown consistency, imprecise (Tseng, 2011)[37]
Inpatient/acute care	
Low-mortality diagnosis related groups (DRGs): ó in-hospital mortality « «	ó Hispanic/Latino ethnicity not associated with death in low-mortality DRGs; 0.3% vs 0.3%; aOR=1.32 (p>.05); 1 good study of VA Inpatient and Outpatient files (2001-2005); N=244,397 unknown consistency, imprecise (Shimada, 2008)[36]
Mental, behavioral health	
TBI: ó mortality at 2y « «	ó 2y mortality for Hispanic vs white: 6.7% vs 2.9%; HR=1.61 (95% CI: 1.00-2.58); 1 fair national VA DB study; N=8,199; medium-level adjustment for confounders, unknown consistency, imprecise (Egede, 2012)[13]
Other Clinical Areas	
Ulcerative colitis: ó colorectal cancer « «	ó Colorectal cancer: 1.1% vs 0.9%; HR=1.17 (95% CI: 0.55-2.51); 1 study of PTF and OPC files; N=15,573; unknown handling of missing data, unknown consistency, imprecise (Hou, 2012)[20]
Native American	
Cancer	
Lung cancer: ó mortality at 5y « «	aHR=1.05 (95% CI: 0.93-1.20); 1 fair study of VA CCR; N=67,323; unknown consistency, medium-level adjustment for confounders, unknown consistency (Ganti, 2014)[18]
Combined Race/Ethnic Groups (excluding African American) vs white	
Cardiovascular	
Stroke: ê post-stroke depression « «	ê Post-stroke depression for other vs white: 31.3% vs 42.5%; OR=0.64 (95% CI: 0.50-0.83); 1 fair study of several national VA sources; N=4,141; unknown handling of missing data, unknown consistency (Jia, 2010)[22]
Mental and behavioral health	
Alcohol use disorder (AUD): ó non-injury-related death at 5y « «	ó Non-injury-related death HR=0.97 (95% CI: 0.92-1.01); 1 fair NPCD study; N=2,545; medium-level adjustment for confounders, unknown consistency (Fudalej, 2010)[17]
Other Clinical Areas	
Ulcerative colitis: ó colorectal cancer « «	ó Colorectal cancer: 0.9% vs 0.9%; HR=1.04 (95% CI: 0.33-3.27); 1 study of PTF and OPC files; N=15,274; unknown handling of missing data, unknown consistency, imprecise (Hou, 2012)[20]

(é=higher; ê=lower; ó no difference)

Insufficient evidence about the presence of a racial/ethnic difference in mortality/morbidity

For African American Veterans with CKD Stage 3A or 3B, there is insufficient evidence to draw conclusions about the risk of mortality compared to whites because 2 studies had conflicting findings.[10,26] Mortality at 4.8 years was higher in a good-quality study by Choi and colleagues of 387,756 individuals treated between 2000-2001 (aHR: 3A=1.32; 95% CI:1.27-1.36 and 3B=1.21, p<.05),[10] but was lower at 4.7 years in a good-quality study by Kovesdy and colleagues of 532,542 individuals treated between 2004-2006 (aHR: 3A=0.88; 95% CI: 0.81-0.97 and 3B=0.81; 95% CI: 0.71-0.92).[26] In the study by Choi and colleagues, African American Veterans were also at higher risk of end-stage renal disease (ESRD) (3A=2.30; 95% CI: 2.02-2.61 and 3B=3.08; 95% CI: 2.74-3.46), which may have contributed to the higher risk of mortality, but Kovesdy and colleagues did not report ESRD. While there are many methodological differences between the studies, we could not find a satisfactory explanation for the discrepant results.

KEY QUESTION 2: What are the effects of interventions implemented within the VA to reduce race/ethnic disparities?

2011 ESP REVIEW

The 2011 ESP review[4] found that care coordination and in-home messaging improved 12-month glycemic control in African Americans, but not in white or Hispanic Veterans.[65]

2015 EVIDENCE BRIEF UPDATE

Summary

We identified only 2 new studies of interventions involving minority Veterans[40,41] published since the 2011 ESP review. For African American Veterans with diabetes, there is low-strength evidence that peer mentorship improves 6-month glucose control compared to usual care (mean HbA1c change, -1.08 vs -0.01; relative change: -1.07; 95% CI: -1.84 to -0.31), but that financial incentives do not (-0.46; relative change: -0.45; 95% CI: -1.23 to 0.32). For African American Veterans with knee osteoarthritis, there is low-strength evidence of no difference in 12-month attendance rates at the orthopedic surgeon between an attention control group who only received an educational booklet versus supplementation with a decision aid, motivational interviewing, or both.

Diabetes

One good-quality RCT from the Philadelphia VAMC compared the 6-month change in HbA1c levels in African American Veterans with diabetes randomized to one of 3 intervention groups: peer mentoring, financial incentives, or control group.[41] After enrollment, all 3 groups were notified of their baseline HbA1c level and informed of the HbA1c targets recommended by the American Diabetes Association and VA. Participants in the peer mentoring intervention group were matched to trained mentors by age and gender and participated in monthly calls regarding motivation and HbA1c level goals. Participants in the financial incentives group were offered up to $200 for a 2-point drop in HbA1c level or to 6.5%. Participants in the control group were not offered any additional resources. After 6 months, the mean HbA1c level was significantly lower

by 1.07 point (95% CI: -1.84 to -0.31) in the peer mentoring group compared to the control group (p=.006), but not significantly lower in the financial incentives group (-0.45; 95% CI: -1.23 to 0.32).

Arthritis and pain management

There is low-strength evidence from a good-quality RCT of 639 African American Veterans from the Pittsburgh, Cleveland, and Philadelphia VAMCs that, compared to an attention control group who only received an educational booklet, there was no difference in 12-month orthopedic surgeon appointment attendance for a decision aid intervention group who watched a video on the risks and benefits of different treatment options (aOR 1.27; 95% CI: 0.54-3.00), a motivational interviewing intervention group that underwent a counseling session with a trained interventionist (aOR 1.79; 95% CI: 0.78-4.07), or for a decision aid and motivational interviewing group that watched the video before their counseling session (aOR 2.05; 95% CI: 0.90-4.65).[40]

SUMMARY AND DISCUSSION

Although it would be useful to link interventions with any declines in disparities that were observed since the 2007 report, there was no opportunity to make this link. The only mortality/morbidity disparity observed in the 2007 report was higher mortality among African American Veterans with HIV, and we identified no subsequent studies of mortality among African American Veterans with HIV or of interventions to reduce disparities in African Americans with HIV.

Since 2007, there has been a steady stream of new research emerging, and for this update we identified 34 new studies of mortality and morbidity outcomes, primarily in cancer (9 studies), heart disease (6 studies), and acute care (6 studies). We found no studies in spinal cord injury, polytrauma, or blast-related injuries. In Table 3 below, we categorize the findings on prevalence of mortality and morbidity from this update by (1) whether a racial/ethnic mortality or morbidity disparity was found (greater mortality or morbidity or similar or better mortality or morbidity) and (2) the strength of the evidence (high, moderate, or low). We also make recommendations for future research.

Moderate strength evidence of a mortality or morbidity disparity (Box 1, Figure 1)

African Americans with colon cancer, CKD, or HIV, and Hispanics with hepatitis C are the 4 groups with moderate-strength evidence of a mortality or morbidity disparity. For colon cancer, African Americans had a lower rate of survival after 3 years of follow-up. For CKD, African Americans had a higher rate of end-stage renal disease after 3.7 years of follow-up. For HIV, African Americans with or without comorbid diabetes had a higher rate of end-stage renal disease after 3.7 years of follow-up. For Hepatitis C, there was moderate-strength evidence that Hispanics had higher rates of incident cirrhosis and hepatocellular carcinoma after 5.2 years of follow-up.

In applying these findings, the OHE should consider 2 limitations of the evidence. First, all of these findings are based on VA cohorts from the early 2000s. Over the past 10 years, changes in the delivery system or in diagnostic and treatment approaches may have changed these

disparities. OHE can decide whether these findings are still current, or can fund studies to verify them in more recent cohorts. Second, some of these disparities may have more impact on health outcomes than others. The impact depends on the prevalence of each condition and the size of the disparity.

If 10-year-old data is acceptable, or if the mortality and morbidity disparity is verified in a more recent cohort, then new research should examine its sources. The 2007 ESP review reported on the literature assessing the sources of each disparity. A first step would be to update that report with respect to African Americans with colon cancer, CKD, or Hepatitis C. If the 2007 ESP report's findings on decreased medication adherence and increased later stage diagnosis are well-accepted as causes for the ESRD disparity identified in our report, then an update of the 2007 ESP review may not need to cover African Americans with HIV. However, for Hepatitis C, the source identified in the 2007 report (under treatment with interferon-based regimens, which cause debilitating side effects) is not likely to be useful because the new Direct Acting Antiviral Agents such as sofosbuvir (Sovaldi) have fewer side effects. If an update finds low-strength or no evidence on sources for the colon cancer, CKD, or Hepatitis C disparities, then the PEC should undertake new original research on sources.

Low-strength evidence of a mortality or morbidity disparity (Box 2, Figure 1)

African Americans with cancer, diabetes, PTSD, rectal cancer, or venous thromboembolism, American Indian or Alaska Natives with PTSD or following major non-cardiac surgery all had low-strength evidence of higher mortality or morbidity compared to whites. Additionally, in Veterans with Alcohol Use Disorders, non-African American minority Veterans had higher injury-related death than African Americans. Each of these low-strength findings is supported by a single retrospective study that only had a medium level of adjustment for potential confounders and had unknown consistency in the magnitude or direction of effect. Because of these limitations, for these groups we need original studies of VA populations to verify the potential disparities. However, for PTSD, because the higher risk of preterm birth was consistently found across 2 minority groups, we recommend considering examining sources as the next step for future research.

Low-strength evidence of similar or better mortality or morbidity for racial/ethnic minorities (Box 4, Figure 1)

For many conditions, there is low-strength evidence that African Americans and Hispanics have similar or better mortality or morbidity outcomes than whites. Conditions with low-strength evidence of similar or better mortality or morbidity compared to whites are much fewer for American Indian/Alaskan Native, Asian, and Hawaiian and Pacific Islanders. Although each of these low-strength findings is supported by a single retrospective study with methodological limitations, there is probably not a need for more research to verify the presence or absence of a disparity. One exception of cause for verification is when there is a large proven disparity outside of the VA.

High or moderate-strength evidence of similar or better mortality or morbidity for racial/ethnic minorities (Box 3, Figure 1)

For African American Veterans with stage 4-5 CKD, there is high-strength evidence from 2 good-quality studies of no mortality disparity compared with whites. There is moderate-strength evidence from multiple fair-quality studies or single good-quality studies that African American Veterans with prostate cancer, lung cancer, hepatitis C, those hospitalized for pneumonia, COPD, CHF, GI bleed, hip fracture, stroke, or AMI, or those classified as in a low-mortality diagnosis related group have similar mortality and morbidity outcomes to white Veterans. Since these findings are likely to be stable, more research is likely not needed.

Evidence Gaps

As most of the mortality and morbidity disparity prevalence studies focused on African Americans or Hispanic minority groups and on cancer, heart disease, or acute care conditions, more work is needed to evaluate prevalence of disparities in other racial/ethnic minority groups and for OHE PEC's other priority conditions, including HIV, hepatitis C, mental illness, spinal cord injury, substance use disorders, polytrauma, and blast-related injuries. To more completely capture the totality of patients' care, future studies should supplement VHA data with Medicare data whenever possible. For morbidity outcomes, to maximize generalizability to the broadest disease populations, studies should examine multiple relevant outcomes, not just a single rare outcome in isolation. For example, future studies of rates of ESRD in HIV should be done in the context of other more common outcomes, such as severe bacterial infections or AIDS events.

Table 3. Summary of findings and future research recommendations

Findings: Strength of evidence and direction	Findings: Racial/ethnic minority group, conditions, outcomes (é=higher; ê=lower; ó no difference)	Future Research Recommendations
Moderate-strength evidence of *greater* mortality or morbidity in racial/ethnic minority groups in the VA See Figure 1, Box 1	*African American vs white* · Chronic kidney disease (CKD): é End-stage renal disease (ESRD) after 3.7y of follow-up · Colon cancer: ê survival 3y after diagnosis · HIV: é ESRD after 3.7y of follow-up, with or without comorbid diabetes *Hispanic vs white* · Hepatitis C: é incident cirrhosis and hepatocellular carcinoma (HCC) at 5.2y after diagnosis	As findings are based on VA cohorts from the early 2000s, and changes are possible in the past 10 years, consider the need to verify the disparity in a more recent VA cohort. If evidence from the early 2000s is acceptable or if findings are verified in later cohort, then consider the need to identify the *sources* of the mortality/morbidity disparities and effective interventions to improve minority outcomes.
Low-strength evidence of *greater* mortality or morbidity in racial/ethnic minority groups in the VA See Figure 1, Box 2	*African American vs white* · Diabetes: é All-cause mortality · Post-traumatic stress disorder (PTSD): é risk of preterm birth · Rectal cancer: ê 3-y all-cause survival 3y after diagnosis · Stroke: é mortality at 2y post-hospitalization · Venous thromboembolism (VTE): é complications at 90 days after event *American Indian or Alaskan Native vs white* · Post major, noncardiac surgery: é risk of 30-day post-op mortality · PTSD: é risk of preterm birth *Combined racial/ethnic minority groups (excluding African Americans) vs African American* · Alcohol use disorders (AUD): é injury-related death	More research is needed to establish the *presence/absence* of disparity in health outcomes
Low-strength evidence of similar or better mortality or morbidity in racial/ethnic minority groups in the VA See Figure 1, Box 4	*African American vs white* · Advanced chronic systolic heart failure: ó all-cause mortality after 2y of follow-up · AUD: ê injury-related and non-injury-related death · CKD Stage 3A or 3B: Insufficient evidence to draw a conclusion about mortality · Diabetes: ó amputation · Hospitalized for common medical diagnoses: ó hospital mortality · Likely coronary artery disease per positive nuclear imaging: ó functional status after 1y follow-up	More research to establish the *presence/absence* of a disparity in health outcomes is probably not needed unless there is a large proven disparity outside of the VA

Findings: Strength of evidence and direction	Findings: Racial/ethnic minority group, conditions, outcomes (é=higher; ê=lower; ó no difference)	Future Research Recommendations
	· Lung cancer, any stage: ê mortality after 5y of follow-up · Lung cancer, late stage: é days from diagnosis to death at 2y · Stroke: ê post-stroke depression · Traumatic brain injury (TBI) ó mortality after 2y of follow-up · Ulcerative colitis: ó colorectal cancer *American Indian/Alaska Native vs white* · Low-mortality diagnosis related groups (DRGs): ó death · Major, noncardiac surgery patients: ó 30-day morbidity · Lung cancer: ó mortality after 5y of follow-up *Asian vs white* · Low-mortality DRGs: ó death · Lung cancer: ó mortality after 4y of follow-up · PTSD: ó risk of preterm birth *Hawaiian and Pacific Islander vs white* · PTSD: ó risk of preterm birth *Hispanic vs white* · Diabetes: ó amputation · Low-mortality DRGs: ó death · Prostate cancer: ó prostate cancer survival 6.6y post-treatment · Stroke: ê post-stroke depression · TBI: ó mortality after 2y of follow-up · Ulcerative colitis: ó colorectal cancer *Combined racial/ethnic minority groups (excluding African Americans) vs African American* · AUD: ó non-injury-related death · Stroke: ê post-stroke depression	
Moderate-strength evidence of similar or better mortality or morbidity in racial/ethnic minority groups in the VA See Figure 1, Box 3	*African American vs white* · Admission for COPD exacerbation: ê in-hospital or mortality at 30 days post-admission · Admission to ICU for pneumonia: ê mortality at 30 days post-admission · Admission to medical ward for pneumonia: ó mortality at 30 days post-admission · HCV: ê Incident cirrhosis and HCC · Hospitalized for common medical diagnoses: ó or ê mortality after 30 days · Low-mortality DRGs: ó in-hospital mortality	More research is probably not needed to establish the *presence/absence* of disparity in health outcomes

Findings: Strength of evidence and direction	Findings: Racial/ethnic minority group, conditions, outcomes (é=higher; ê=lower; ó no difference)	Future Research Recommendations
	· Lung cancer, any stage: ó survival at 1y · Prostate cancer: ó all-cause mortality at 5y-5.7y after diagnosis · Prostate cancer: ó prostate-cancer mortality at 5.7y after treatment to 16y after diagnosis · Stroke: ê all-cause mortality after 1y	
High-strength evidence of *similar or better* mortality or morbidity in racial/ethnic minority groups in the VA See Figure 1, Box 3	*African American vs white* · CKD stage 4 or 5: ó mortality after 4.7-4.8y of follow-up	More research is not needed to establish the *presence/absence* of disparity in health outcomes

Regarding interventions to reduce racial and ethnic disparities among Veterans, the 2011 ESP review found that care coordination and in-home messaging improved 12-month glycemic control in African Americans, but not in white or Hispanic Veterans. In this update, we found low-strength evidence that (1) among African American Veterans with diabetes, peer mentorship can improve glycemic control and (2) among African American Veterans with knee osteoarthritis, neither a decision aid, motivational interviewing, nor both a decision aid and motivational interviewing result in a greater 12-month surgical consult rate compared with a control group. We did not identify any studies comparing interventions across Veterans of different minority groups, nor did we identify any intervention studies that measured health outcomes. Although much progress has been made since the 2007 ESP review in conducting studies on the presence of mortality and morbidity disparities, as noted in the 2011 ESP review, still much more work is needed to implement disparities intervention research.

LIMITATIONS

An evidence brief differs from a full systematic review in that the scope is narrowly defined and the traditional review methods are streamlined in order to synthesize evidence within a shortened timeframe. Brief or rapid review methodology is still developing and there is not yet consensus on what represents best practice. The main methodological limitation of this evidence brief within the defined scope is that because of the shortened timeframe, we only evaluated studies of racial and ethnicity-based mortality and morbidity differences since these are the OHE's highest-priority indicators of health care quality. We did not evaluate studies of the sources of differences in health care quality (*eg*, patient, provider, patient-provider, and system factors). Additionally, because we only synthesized evidence from multicenter studies, we may have missed additional studies of important disparities or interventions. Still, we do not think these exclusions would affect the conclusions of this brief because any findings single-center studies would have very limited generalizability to the broader US Veteran population.

CONCLUSION

Our evidence brief update identified several research priorities for OHE's PEC. As the moderate-strength evidence of mortality or morbidity disparities for African American Veterans with colon cancer, HIV, and CKD, and for Hispanics with hepatitis C was based on VA cohorts from the early 2000s, and changes are possible in the past 10 years, we recommend considering the need to verify each disparity in a more recent VA cohort. More research is needed to establish the presence or absence of a mortality or morbidity disparity for African Americans with diabetes, stroke, or VTE, American Indians or Alaskan Natives following major non-cardiac surgery, and African American and American Indian or Alaskan Native pregnant women with PTSD. The few interventions that have improved racial/ethnic disparities within the VA have focused only on African Americans and have covered a narrow scope of clinical areas. More research is needed to examine disparities in Hispanic, Asian, Native Hawaiian or other Pacific Islander, and American Indian and Alaska Native groups, and in other priority conditions including HIV, hepatitis C, mental illness, spinal cord injury, substance use disorders, polytrauma, and blast-related injuries. Ideally, future research should be done in the form of prospective studies that address multiple minority groups and supplement VHA data with Medicare data.

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