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# Health Disparities in Veterans

## *A Map of the Evidence*

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**Background:** Goals for improving the quality of care for all Veterans and eliminating health disparities are outlined in the Veterans Health Administration Blueprint for Excellence, but the degree to which disparities in utilization, health outcomes, and quality of care affect Veterans is not well understood.

**Objectives:** To characterize the research on health care disparities in the Veterans Health Administration by means of a map of the evidence.

**Research Design:** We conducted a systematic search for research studies published from 2006 to February 2016 in MEDLINE and other data sources. We included studies of Veteran populations that examined disparities in 3 outcome categories: utilization, quality of health care, and patient health.

**Measures:** We abstracted data on study design, setting, population, clinical area, outcomes, mediators, and presence of disparity for each outcome category. We grouped the data by population characteristics including race, disability status, mental illness, demographics (age, era of service, rural location, and distance from care), sex identity, socioeconomic status, and homelessness, and created maps illustrating the evidence.

**Results:** We reviewed 4249 citations and abstracted data from 351 studies which met inclusion criteria. Studies examining disparities by race/ethnicity comprised by far the vast majority of the literature, followed by studies examining disparities by sex, and mental health condition. Very few studies examined disparities related to lesbian, gay, bisexual, or transgender identity or homelessness. Disparities findings vary widely by population and outcome.

**Conclusions:** Our evidence maps provide a “lay of the land” and identify important gaps in knowledge about health disparities experienced by different Veteran populations.

**Key Words:** Veterans, health disparities, race, ethnicity, women, homeless, LGBT, rural

(*Med Care* 2017;55: S9–S15)

As the Veteran population becomes more diverse, attention and commitment to health equity becomes increasingly important. An understanding of whether disparities in utilization, health or health care exist for our racial and ethnic minority Veterans, our women, and our vulnerable populations is vital. The Veterans Health Administration (VHA) Blueprint for Excellence<sup>1</sup> outlines goals to broadly promote health equity and eliminate health disparities.<sup>2</sup> Many different populations can experience health disparities because the disadvantages that perpetuate health differences can be social, economic, and/or environmental in nature.

Although reducing disparities in the care provided to Veterans is a vital concern, the extent to which health and health care disparities affect different types of Veteran populations is not well understood. The purpose of this project was to identify studies examining the prevalence of disparities in utilization, the quality of health care, or the health of Veterans and characterize them visually using high-level evidence maps. Evidence maps are a relatively new form of evidence synthesis, and their purpose is to identify research gaps and future research needs, rather than to rigorously analyze and form conclusions about a narrow research question. Although standardized definitions and methodology are still being established, they generally include a systematic search of a broad field of research and a user-friendly, often visual representation of the body literature.<sup>3</sup> Our findings will broadly identify strengths, weaknesses, and gaps in

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the evidence base and highlight the populations for which more research is needed to better understand and address the need for equitable health care for all Veterans.

## METHODS

We systematically reviewed the literature related to health disparities affecting Veterans and created maps illustrating the evidence through the Department of Veterans Affairs Evidence-based Synthesis Program. Our approach was guided by an analytic framework developed for a 2007 systematic review by Saha et al,<sup>4</sup> which examined racial and ethnic disparities in the VHA. We expanded the analytic framework to include Veteran populations for whom a disparity may exist (Supplementary Digital Content 1, <http://links.lww.com/MLR/B404>). Our protocol was developed using established reporting standards, and was posted publically before study initiation (Supplementary Digital Content 2, <http://links.lww.com/MLR/B404>).<sup>5</sup>

### Data Sources and Searches

To capture the breadth of disparities related to the utilization or quality of Veteran health or health care, we expanded the search strategy developed by Saha et al<sup>4</sup> to include all populations. The search strategy was peer reviewed by a second research librarian using the instrument for Peer Review of Search Strategies.<sup>6,7</sup> To identify relevant articles, we searched MEDLINE, PubMed, PsycINFO, CINAHL, the Cochrane Library, Social Services Abstracts, Sociological Abstracts, and the VA's Health Services Research and Development (HSR&D) website from 2006 to February 2016 (Supplementary Digital Content 3, <http://links.lww.com/MLR/B404> for full-search strategy). To identify additional studies, we contacted the directors of the several VA research offices (Supplementary Digital Content 4, <http://links.lww.com/MLR/B404>) and evaluated the bibliographies and supplementary materials of relevant VA reviews.

### Study Selection

We identified studies for inclusion in several steps. First, using prespecified inclusion criteria (Supplementary Digital Content 5, <http://links.lww.com/MLR/B404> and 6, <http://links.lww.com/MLR/B404>), all investigators participated in dual-independent review of titles and abstracts for a random 10% of the search yield to ensure common understanding and application of study selection criteria. We then reviewed the remaining 90% titles and abstracts using a single reviewer. At the full-text screening stage, 2 independent reviewers assessed all articles for inclusion, and discordant results were resolved through consensus. We included studies of Veteran populations that had a comparison group and examined disparities in outcomes related to utilization, the quality of health care, or patient health. We included trials, cohort, and cross-sectional studies and identified additional studies from the bibliographies of systematic or nonsystematic reviews.

### Data Abstraction

Data from included studies were abstracted by one investigator and confirmed by a second. From each study, we abstracted data related to study design, setting, population,

clinical area, number of participants, groups compared, outcomes, mediators, and whether a disparity was reported.

## Evidence Maps

We created evidence maps for each population of interest: race or ethnicity; women; mental health; age; rural residence; distance from a Veterans Affairs Medical Center (VAMC); socioeconomic status (SES); homelessness; era of military service; lesbian, gay, bisexual, or transgender (LGBT) identity; and disability.

We categorized studies into those examining the following outcome categories: (1) utilization; (2) quality of care (ie, processes of care, patient evaluations of care, intermediate outcomes); or (3) patient health outcomes. For each category, we recorded whether a study reported a disparity, no disparity, or whether the findings within an outcome category were mixed or unclear. If a study reported multiple outcomes within the same category (eg, blood pressure screening and control), we classified a study as mixed if the findings were not in agreement (see Supplementary Digital Content 8, <http://links.lww.com/MLR/B404> for a detailed description of our methods).

Using methods from prior evidence maps,<sup>3,8</sup> we developed a simple estimate of confidence (represented by bubble size) for all studies. The confidence estimates were based on: (1) whether the study was prospective; (2) whether or not the study adjusted for confounders; (3) whether the study was single or multisite; and (4) sample size (see Supplementary Digital Content 7, <http://links.lww.com/MLR/B404> for our scoring criteria). As with prior evidence maps, the purpose of the confidence estimate was to provide an additional dimension on which to broadly assess gaps in evidence, rather than a definitive assessment of the internal validity of each study.

## RESULTS

We reviewed 4249 titles and abstracts and 736 studies at the full-text level (see Supplementary Digital Content 9, <http://links.lww.com/MLR/B404> for literature flow diagram). We included 351 studies, of which 133 reported outcomes for >1 population (see Supplementary Digital Content 10, <http://links.lww.com/MLR/B404> for a list of all included studies).

Across all outcomes, the largest number of studies focused on racial/ethnic disparities (189 studies). We identified 109 studies that examined disparities affecting women, and 73 studies examined disparities affecting Veterans with mental health conditions, most commonly major depressive disorder, posttraumatic stress disorder, and schizophrenia. Very few studies examined disparities in the health or health care experienced by LGBT Veterans (8 studies), and homeless Veterans (7 studies). Table 1 provides the number of studies examining each Veteran population along each of the 3 outcome categories (utilization, quality of care, patient health outcomes).

Across all populations, 83 studies examined outcomes related to utilization, 184 studies examined the quality of care, and 150 studies examined patient health outcomes. In general, studies examining racial/ethnic disparities focused

**TABLE 1.** Distribution of Total Studies and Studies Across Outcome Categories for Each Population

Population	Total Studies	N (%)		
		Utilization Studies	Quality of Care Studies	Patient Health Outcome Studies
Race/ethnicity	189	24 (12.7)	115 (60.8)	111 (58.7)
African American/black	184	23 (12.5)	107 (58.2)	82 (44.6)
Hispanic/Latino	69	8 (11.6)	40 (58)	26 (37.7)
American Indian/Alaska Native	21	4 (19)	8 (38.1)	11 (52.4)
Asian or Asian and/or Pacific Islander*	18	4 (22.2)	8 (44.4)	9 (50)
Native Hawaiian and/or Pacific Islander*	5	1 (20)	2 (40)	3 (60)
Women	109	24 (22)	54 (49.5)	41 (37.6)
Mental health	73	13 (17.8)	43 (58.9)	26 (35.6)
Age (y)	60	12 (20)	37 (61.7)	15 (25)
Rural residence	37	17 (45.9)	14 (37.8)	14 (37.8)
Distance	15	10 (66.7)	3 (20)	4 (26.7)
Socioeconomic status	30	7 (23.3)	14 (46.7)	10 (33.3)
Military era of service	13	7 (53.8)	4 (30.8)	5 (38.5)
Lesbian, gay, bisexual, transgender	8	3 (37.5)	2 (25)	9 (100)
Disability	16	7 (43.8)	7 (43.8)	2 (12.5)
Homeless	7	6 (85.7)	1 (14.3)	3 (42.9)

Studies may be represented more than once. In total, 133 studies examined >1 population, and studies often reported multiple outcomes that were included in >1 category; thus, the combined sum of studies across columns may exceed the total number of unique studies for a population.

\*Pacific Islanders were grouped inconsistently—sometimes being combined with Asians, and other times reported separately with Native Hawaiians.

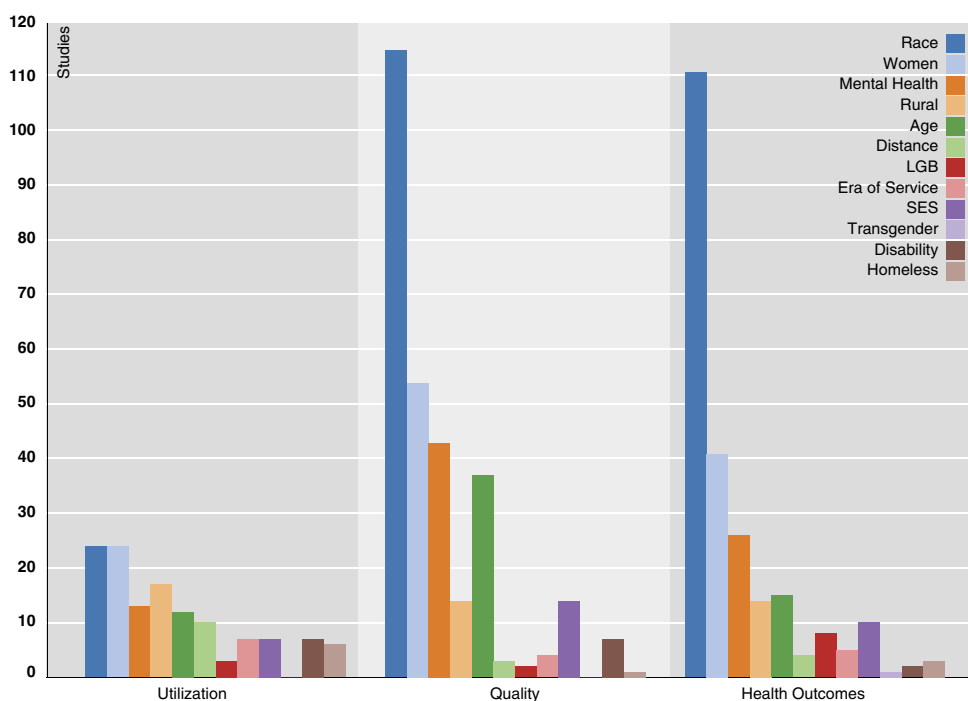
more heavily on outcomes related to the quality of care and patient health; whereas, studies examining disparities related to rural residence, distance, homelessness, military era of service, and disability more commonly reported outcomes related to utilization (Table 1 and Fig. 1).

We grouped studies into 38 distinct clinical areas. Mental health was the most widely studied, followed by cardiovascular disease, cancer, and diabetes. Most of the studies examining cardiovascular disease (68%), cancer (75.7%), and diabetes (63.3%) reported quality of care

outcomes (see Supplementary Digital Content 11, <http://links.lww.com/MLR/B404> for the distribution of studies by clinical area and outcome category).

### Race and Ethnicity

The 189 studies reporting data on the prevalence of health care or health disparities in Veterans by race or ethnicity largely compared the experiences of African American/blacks to whites. Studies examining the prevalence of disparities affecting Hispanic/Latino Veterans (69) were



**FIGURE 1.** Evidence map: all studies by outcome. LGB indicates lesbian, gay, bisexual; SES, socioeconomic status.

limited in comparison, and very few studies focused on American Indian/Alaska Natives, Asians, or Pacific Islanders (Table 1). Across all racial and ethnic groups, patient health and quality of care-related outcomes were more frequently reported, while utilization was the focus of relatively few studies. The majority of studies reported no or mixed/unclear evidence of racial/ethnic disparities, although this varied some with the outcome evaluated. The preponderance of studies examining health outcomes found no evidence for disparities, while findings among studies examining quality of care outcomes varied substantially with roughly equal proportions finding evidence for and against disparities, particularly for African American/black Veterans. Mean confidence estimates for African American/black Veterans and to a certain extent Hispanic/Latino Veterans. However, this is likely a function of the larger number of studies examining these populations, and regression toward the mean. Contributing to the overall mean confidence estimates were very few prospective studies, with nearly half of the studies with <10,000 participants. In addition, all but a very few studies controlled for confounders, and most were multisite or studies using national data. Figure 2 provides a bubble plot illustrating the number of studies providing evidence of no racial and ethnic disparities, mixed or unclear findings, or the presence of racial and ethnic disparities in Veterans for each outcome category.

When examining Veterans of color by racial or ethnic group, findings for both African American/black Veterans and Hispanic/Latino Veterans were similar to the overall race/ethnicity findings. Very few studies examined utilization, and studies examining patient health reported little evidence of disparities (see Supplementary Digital Content 12, <http://links.lww.com/MLR/B404> and 13, <http://links.lww.com/MLR/B404> for the African American/black evidence map and study-level data table). However, Hispanic/Latino Veterans differed from both African American/black Veterans and the overall race/ethnicity findings in quality of care outcomes—with larger proportions of studies reporting evidence of a disparity or mixed/unclear findings and a smaller percentage of

studies reporting evidence of no disparities (see Supplementary Digital Content 14, <http://links.lww.com/MLR/B404> and 15, <http://links.lww.com/MLR/B404> for the Hispanic/Latino evidence map and study-level data table). The distribution of findings for studies examining American Indian/Alaska Native Veterans was also similar to the overall findings for race/ethnicity (see Supplementary Digital Content 16, <http://links.lww.com/MLR/B404> and 17, <http://links.lww.com/MLR/B404> for the American Indian/Alaska Native evidence map and study-level data table). Conversely, studies examining Asian, Native Hawaiian, and Pacific Islander Veterans found no clear evidence of disparities; however, sample sizes were small, and there may not have been the power to detect differences (see Supplementary Digital Content 18, <http://links.lww.com/MLR/B404> and 19, <http://links.lww.com/MLR/B404> for the Asian/Pacific Islander evidence map and study-level data table and Supplementary Digital Content 20, <http://links.lww.com/MLR/B404> and 21, <http://links.lww.com/MLR/B404> for the Native Hawaiian/Pacific Islander evidence map and study-level data table).

### Women

We identified 109 studies providing data on the presence or absence of disparities in health and the utilization and quality of care in female Veterans. Across all outcomes, 51 studies reported evidence of no disparity, 38 studies reported mixed or unclear findings, and 24 studies identified a disparity in health or health care. Half of the studies reported quality of care outcomes, with outcomes related to utilization the least represented. Across all outcomes, more studies reported evidence of no disparity or mixed or unclear findings. Of the 24 studies examining disparities related to utilization only 1 study reported evidence of a disparity—that while women Veterans did not differ from men in their use of VHA outpatient health and mental health services, their non-VHA utilization was significantly higher (Fig. 3).<sup>9</sup>

Among studies examining sex-related disparities, we identified very few prospective studies, and the vast majority of studies were multisite or examined national data. In general, sample sizes were large, and most studies controlled for confounding variables (see Supplementary Digital Content 22, <http://links.lww.com/MLR/B404> for study-level data table).

### Mental Health

In total, 73 studies examined disparities affecting Veterans with mental health conditions, with included studies comparing Veterans by mental health status. Across all outcomes, 15 studies reported no evidence of a disparity, 32 studies reported mixed or unclear findings, and 30 studies reported evidence of a disparity. Studies reporting the prevalence of disparities for Veterans with mental health conditions examined outcomes related to the quality of care more than others, with a limited number of studies examining utilization. Across outcome categories, findings of a disparity or mixed or unclear findings were more common than not. There was wide variation in mean confidence estimates, largely due to the small number of studies examining disparities related to utilization or patient health outcomes (see Supplementary

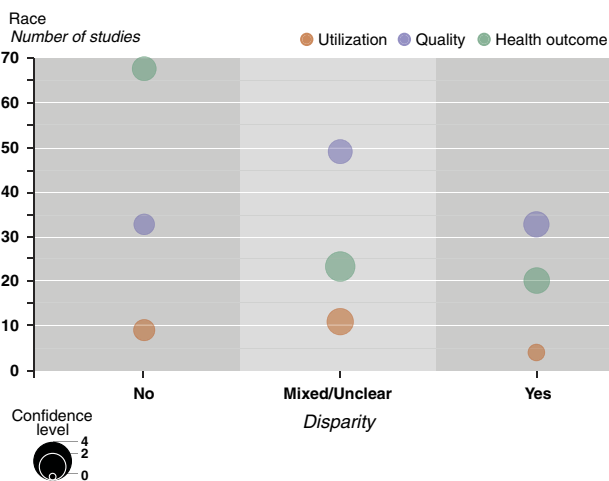
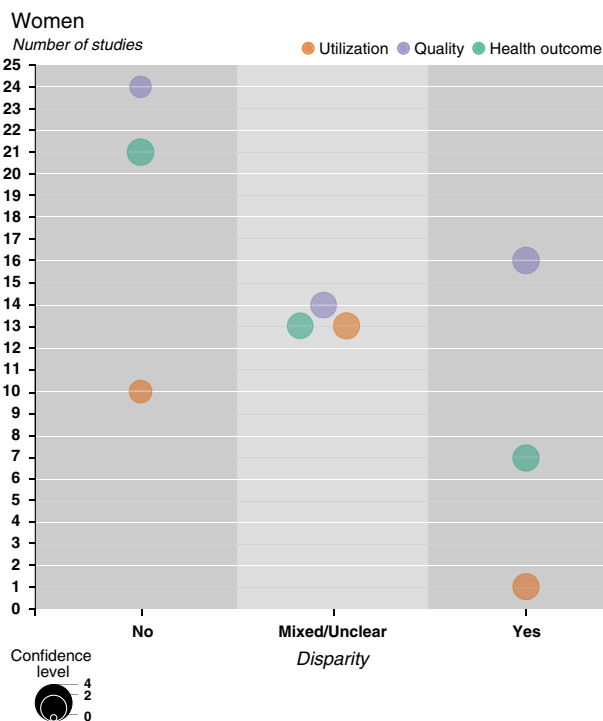


FIGURE 2. Evidence map: health disparities in Veterans by race and ethnicity.



**FIGURE 3.** Evidence map: health disparities among women Veterans.

Digital Content 23, <http://links.lww.com/MLR/B404> and 24, <http://links.lww.com/MLR/B404> for the mental health evidence map and study-level data table).

**Other Populations**

We also mapped the evidence-related disparities by age (see Supplementary Digital Content 25, <http://links.lww.com/MLR/B404> and 26, <http://links.lww.com/MLR/B404> for the age evidence map and study-level data table), rural residence (see Supplementary Digital Content 27, <http://links.lww.com/MLR/B404> and 28, <http://links.lww.com/MLR/B404> for the rural residence evidence map and study-level data table), SES (see Supplementary Digital Content 29, <http://links.lww.com/MLR/B404> and 30, <http://links.lww.com/MLR/B404> for the SES evidence map and study-level data table), disability (see Supplementary Digital Content 31, <http://links.lww.com/MLR/B404> and 32, <http://links.lww.com/MLR/B404> for the disability evidence map and study-level data table), distance from a VA medical center (see Supplementary Digital Content 33, <http://links.lww.com/MLR/B404> and 34, <http://links.lww.com/MLR/B404> for the distance evidence map and study-level data table), military era of service (see Supplementary Digital Content 35, <http://links.lww.com/MLR/B404> and 36, <http://links.lww.com/MLR/B404> for the era of service evidence map and study-level data table), LGBT identity (see Supplementary Digital Content 37, <http://links.lww.com/MLR/B404> and 38, <http://links.lww.com/MLR/B404> for the LGBT evidence map and study-level data table), and homelessness (see Supplementary Digital Content 39, <http://links.lww.com/MLR/B404> and 40, <http://links.lww.com/MLR/B404> for the homelessness evidence map and study-level data table).

com/MLR/B404 for the homeless evidence map and study-level data table).

Findings varied widely by population and depended on the outcome category examined. For example, 11 of 15 of studies examining distance from a VAMC reported evidence of a disparity (8 of which examined outcomes related to utilization), as did 6 of the 7 studies examining homeless Veterans. However, only 1 of the 8 studies examining LGBT Veterans found evidence of a clear disparity, with 5 finding evidence of none. For studies comparing outcomes by age, the number of studies reporting poorer outcomes associated with older or younger Veterans were similar for both utilization and patient health outcomes. However, more studies examining the quality of care reported poorer outcomes associated with older age.

**Summary of Findings by Outcome**

**Utilization**

Across all populations, outcomes related to utilization of care were the least studied, and utilization outcomes comprised less than a quarter of studies examining disparities related to race/ethnicity, women, mental health conditions, age, and SES. Conversely, a much stronger emphasis was placed on the utilization of care in studies examining disparities related to rural residence, distance from a VA medical center, military era of service, LGBT identity, disability, and homelessness. Studies examining many of the populations in which utilization outcomes were less emphasized, found no evidence of disparities or findings were mixed and unclear; whereas, larger proportions of the studies in populations emphasizing utilization found evidence of a disparity. Studies examining military era of service and LGBT Veterans were the exceptions, both placing emphasis on outcomes related to utilization, and in general reporting no disparity or findings that were mixed or unclear. Figure 4 highlights the number of studies reporting no disparity, mixed or unclear findings, and a disparity in utilization by population.

**Quality of Care**

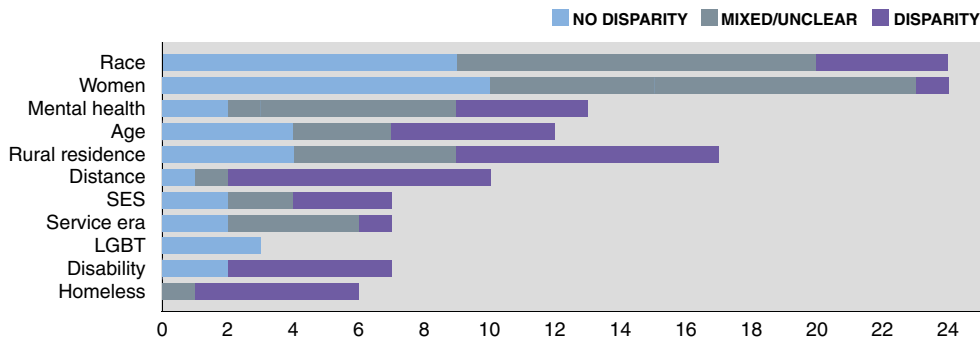
With 184 identified studies, outcomes related to the quality of care experienced by Veterans were the most widely studied, and comprised a large proportion of the outcomes of interest in populations such as race, mental health, women, and age. Conversely, in studies examining populations such as homeless Veterans, LGBT Veterans, and Veterans living farther distances from a VAMC, outcomes related to the quality of care were less emphasized.

With the exception of comparisons by age, the distribution of studies finding a disparity, no disparity, or reporting mixed or unclear outcomes were either similar or leaned toward no disparities (Fig. 5).

**Health Outcomes**

Of the 150 studies examining patient health outcomes, for the majority of populations, findings indicated no disparity or mixed or unclear findings. The exceptions were findings related to Veterans with mental health conditions,





**FIGURE 4.** Evidence map: utilization by population. LGBT indicates lesbian, gay, bisexual, or transgender; SES, socioeconomic status.

and Veterans of lower SES, for whom poorer health outcomes were more commonly found (Fig. 6).

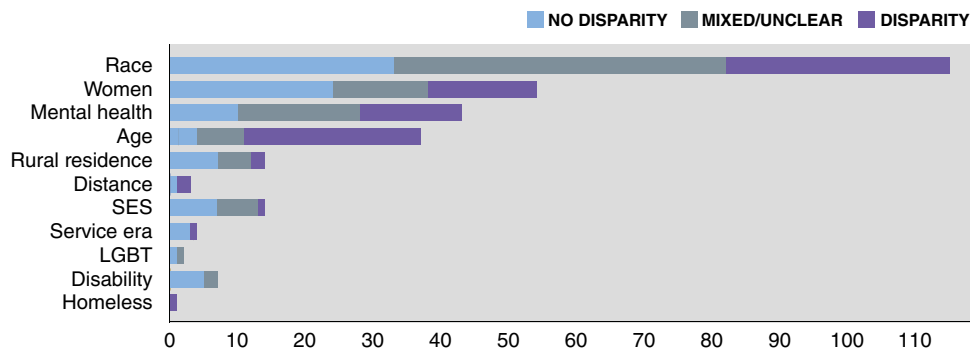
**DISCUSSION**

Our review of the evidence examining the prevalence of health disparities experienced by Veterans yielded a 351 studies, with many studies examining multiple populations, and reporting multiple outcomes. Studies examining disparities related to race and ethnicity were the most common, with the vast majority examining African American/blacks, and Hispanic/Latinos a very distant second. Many of the studies examining racial and ethnic minorities found no clear evidence of disparities. However, there were stark differences by racial/ethnic group and type of outcome. The bulk of studies examining racial/ethnic groups that comprise smaller percentages of the overall Veteran population (eg, Native Hawaiian, Pacific Islander, Asian) reported no disparities. It is important to note that the lack of significant findings in these smaller racial and ethnic groups may stem from a lack of statistical power due to their relatively small numbers, rather than an absence of disparities. Given that such a large proportion of the evidence base examining racial/ethnic disparities focus on African American/black Veterans, future research is needed to better understand the rapidly growing Hispanic/Latino and Asian populations, and targeted research is needed to capture the unique characteristics of American Indians/Alaska Natives, Native Hawaiians, and Pacific Islanders.

Also highly represented in the body of research were studies examining disparities by sex, mental health status, and age. Our evidence maps very clearly highlight the gaps in research—in particular the lack of studies examining health care disparities among LGBT and homeless Veteran populations.

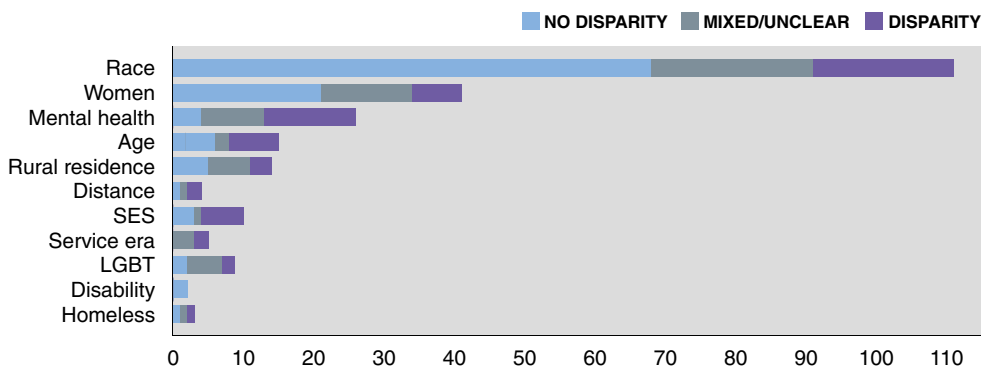
Maps examining utilization clearly illustrate that for some populations utilization of care may not be an area of concern; however, it is extremely salient for other Veteran groups—in particular those living farther from VA medical centers, those living in rural areas, and homeless Veterans. In addition, studies provide some evidence that disparities in the quality of care may exist, particularly those related to age, but also in women, Veterans of color, and Veterans with mental health conditions. Finally, maps of studies examining disparities in patient health highlight a distribution of findings that lean toward no disparity or mixed/unclear findings, with the exception of those examining Veterans with mental health conditions and those of low SES, for whom poorer health outcomes were more commonly found.

The task of finding and classifying the body of research-related health disparities affecting Veterans was a challenge, due not only to the breadth of the body of literature, but also the complexity of the topic. We are certain that our maps do not contain every published and unpublished study examining disparities in Veterans conducted in the last 10 years. To enable the capture of the presence or absence of disparities experienced by Veterans receiving care outside of the VHA



**FIGURE 5.** Evidence map: quality of care by population. LGBT indicates lesbian, gay, bisexual, or transgender; SES, socioeconomic status.





**FIGURE 6.** Evidence map: health outcomes by population. LGBT indicates lesbian, gay, bisexual, or transgender; SES, socio-economic status.

(eg, Patient Centered Community Care, Veterans Choice Program, Medicare or Medicaid eligibility), we included all studies examining health disparities affecting Veterans and meeting other inclusion criteria, regardless of site of care. We did not stratify or analyze studies by site of care; thus, our report does not address the question of whether disparities in health and health care differ in vulnerable populations of Veterans receiving care within the VHA, in the private sector, or a combination. Given that large numbers of Veterans receive care in the community, instead of, or in addition to VHA care, research is needed to better understand the role of site of care in the prevalence of health disparities experienced by vulnerable Veteran populations.

Although a handful of studies reported outcome data related to intersecting identities (ie, belonging to multiple vulnerable populations, eg, LGBT Veterans of color) the vast majority of studies did not. Although relevant data were mapped for each of the vulnerable populations of interest reported in included studies, our maps do not fully capture those Veterans who may be at increased risk as a result of belonging to multiple vulnerable populations. Future systematic reviews targeting specific populations should include a thorough subgroup examination.

The vast number of studies and comparisons we examined precluded a formal evaluation of study quality and depth of knowledge. The rough confidence estimates were not intended to replace evaluations of study quality, nor was the intent to provide a standard metric with which to compare study quality between populations. Instead, the purpose of these scores were to allow us to visually represent the relative differences for each population. Furthermore, given that we did not evaluate many important study-level factors that may influence conclusions related to the presence or absence of a disparity across studies (eg, appropriateness of confounders, adjustments, and outcomes, sampling bias), the maps presented in this report should not serve as evidence upon which policy decisions affecting the health or health care of Veterans are formed, but instead, they should serve as

a starting point—and provide the “lay of the land.” The maps in this report inform areas in which more primary research is needed—for example, prevalence studies to better understand disparities experienced by our American Indian/Alaska Native, Asian, Pacific Islander, Native Hawaiian, and LGBT Veterans. They also inform us of the areas or populations for which the research is rich, and for which a traditional systematic review would enable a deeper understanding not only what disparities exist, but also the context and mechanisms through which they occur. Finally, they allow us to see the VHA’s strengths and achievements, which in turn may serve to provide motivation to continue to work toward the goal of health equity for all Veterans.

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