

# Are We Closing the Gap? A Review of Health Equity Focused Interventions Along the Liver Cancer Care Cascade in the US

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## INTRODUCTION

- Medically underserved and racial/ethnic minorities with liver cancer have higher mortality risks than non-marginalized and White populations<sup>1</sup>
- Health disparities exist along the care cascade, and at various levels of care from patient-level to system-level<sup>2</sup>
- While several studies seek to quantify and describe these disparities, the effectiveness of equity-focused interventions remains uncertain<sup>1</sup>

## OBJECTIVE

This review sought to identify and characterize evidence-based interventions implemented in the United States to address health disparities in patients with liver cancer

## METHODS

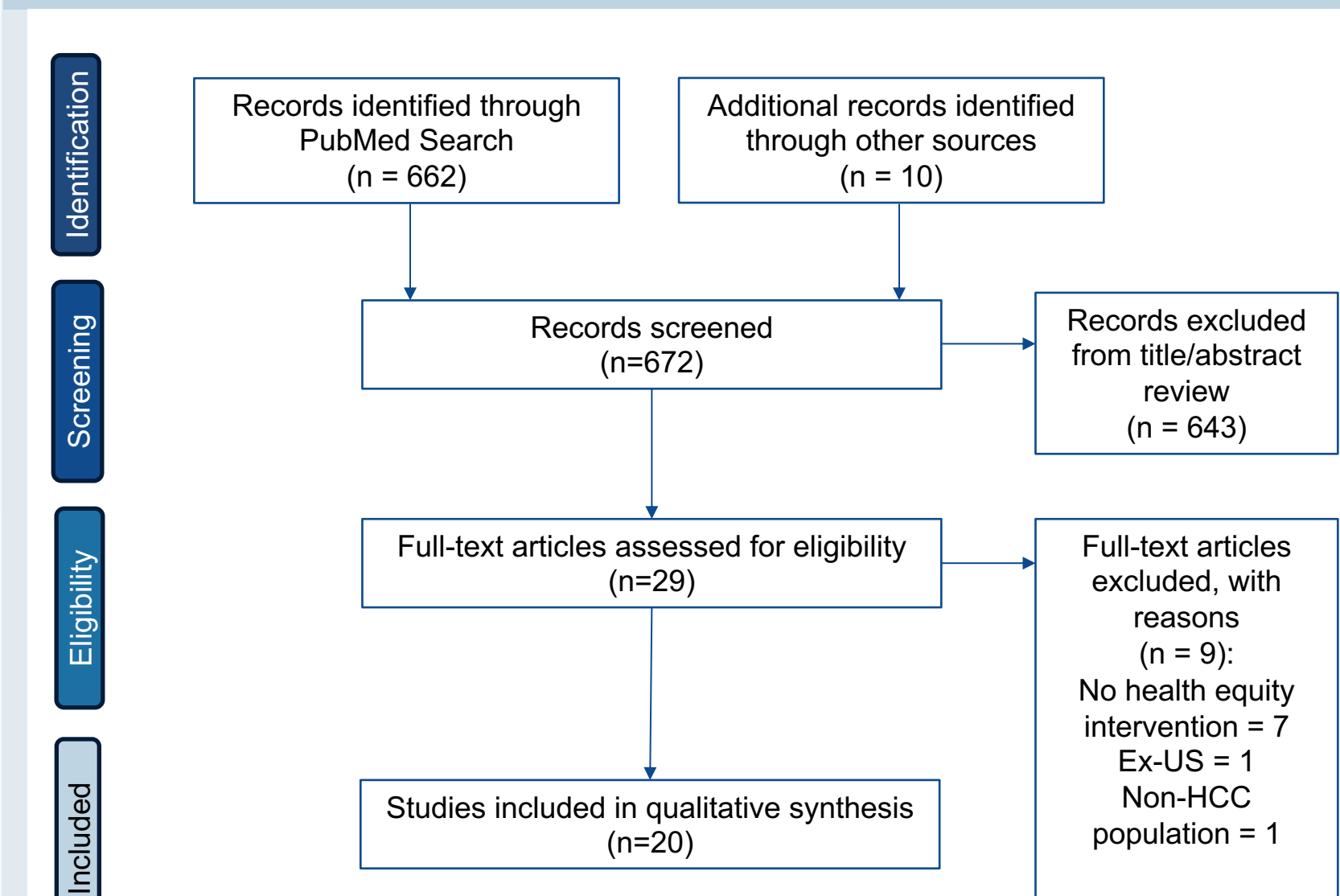
- A targeted literature review was performed in PubMed (MEDLINE) database using key words and medical subject headings
- All identified abstracts were screened for pre-specified inclusion criteria by a single reviewer followed by full-text review completed by two independent reviewers
- Study characteristics were reported, and interventions were characterized by level, care cascade target, and measurement of effectiveness

Table 1. Study Eligibility Criteria

| PICOT                | Inclusion Criteria   |
|----------------------|--|
| <b>Populations</b>   | Patients, caregivers, healthcare providers, community members, health systems in the United States   |
| <b>Interventions</b> | Interventions targeted at preventing liver cancer, improving care, and addressing disparities  |
| <b>Comparators</b>   | None   |
| <b>Outcomes</b>      | <ul style="list-style-type: none"><li>Study characteristics (publication year, population)</li><li>Level of intervention (patient, provider, organization, system)</li><li>Care cascade target (risk reduction, screening, surveillance, diagnosis, care delivery)</li><li>Measurement of effectiveness (yes/no)</li></ul> |
| <b>Time Frame</b>    | 2018 to 2023   |
| <b>Other</b>         | <ul style="list-style-type: none"><li>Original research studies (excluded reviews and epidemiologic studies with no intervention)</li><li>Ex-US studies were excluded</li></ul>  |

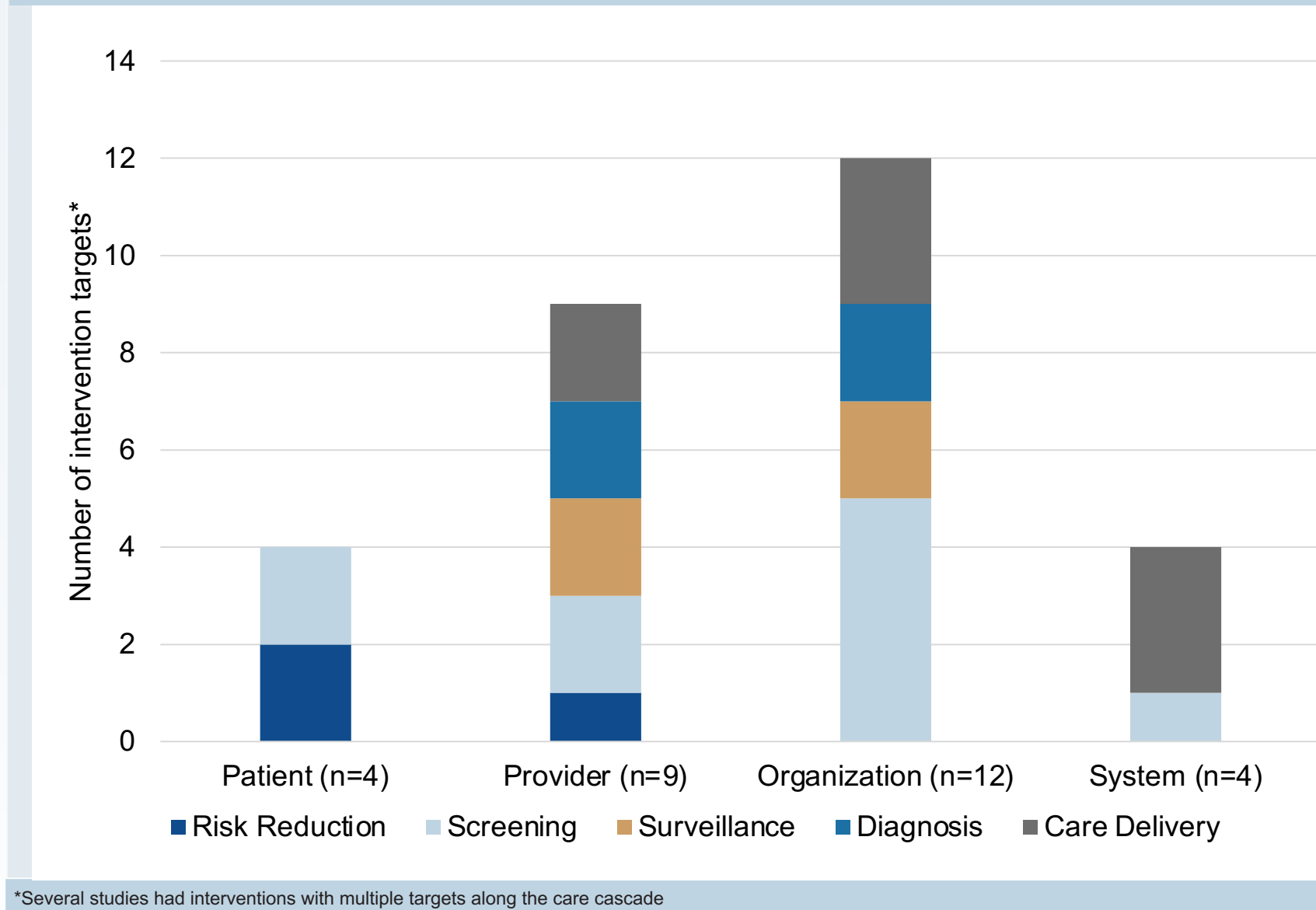
## RESULTS

Figure 1. PRISMA Flow Diagram



HCC = Hepatocellular carcinoma, PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Figure 2. Characterization of Interventions



- Over 600 papers were identified, 20 studies that met inclusion criteria were included in the final review
- Study populations included racial and ethnic minorities, safety-net, under/uninsured, rural, and low-income patients
- Health equity interventions were most commonly implemented at the organization level (n=12)
- Many of the interventions had multiple targets along the care continuum, and screening was the most frequently addressed point of care (n=10), followed by care delivery (n=8)
- Education programs were the most common type of intervention (n=6) and positive impact by the intervention was reported in 18 out of 20 studies

Table 2. Study Characteristics

| Study                         | Population   | Intervention*   | Key Findings   |
|-------------------------------|--|---|--|
| Aby (2020) <sup>3</sup>       | VA Los Angeles health system   | Phone outreach  | Patients who received phone outreach were more likely to receive surveillance (adjusted OR = 2.56, 95% CI: 1.03-6.33)  |
| Bolutayo (2018) <sup>4</sup>  | West African immigrants in New York City                             | Community-based education program   | Overall increase in HBV knowledge (70% pre-test vs 88% post-test)  |
| Duininck (2019) <sup>5</sup>  | Safety-net hospital  | MDT   | Significant increases in referrals to surgery, liver-directed therapy, radiation, and patients were more likely to receive treatment and had improved median OS                |
| Flores (2020) <sup>6</sup>    | Providers in low-income Hispanic communities                         | Provider education  | Providers showed knowledge and attitude improvements after HCV screening training  |
| Funchess (2022) <sup>7</sup>  | Vietnamese Americans   | Cultural- and linguistic-adapted screening, vaccination, and linkage-to-care initiative | Increased rates of HBV vaccination and recruitment of new chronic hepatitis B providers  |
| Gutierrez (2021) <sup>8</sup> | National Hispanic Medical Association                                | Provider education  | Providers had increased overall knowledge and competence from baseline, and reported increased clinical confidence   |
| Hack (2022) <sup>9</sup>      | Large health system in US mid-Atlantic region                        | Electronic health record prompt   | Increase in absolute number of HCV screens by 103% and screening rate by 62%   |
| Jones (2021) <sup>10</sup>    | Haitian immigrants   | Home-based HBV screening  | Established acceptability and feasibility of home-based HBV screening. Future implementations are pending  |
| Lee (2022) <sup>11</sup>      | Safety-net hospital  | Screening quality-improvement program, MDT  | Increased adherence to HCC screening, and higher proportions of patients diagnosed with stage I compared to stage IV   |
| Lima (2023) <sup>12</sup>     | Medicaid or uninsured  | Policy – Medicaid expansion   | Receipt of surgery increased among uninsured/Medicaid early-stage HCC patients living in expansion states  |
| Ma (2023) <sup>13</sup>       | Vietnamese, Korean, and Chinese Americans                            | Culturally tailored patient-navigator led intervention                                  | Higher rates of doctor visits in the intervention group than the control group at 6-month and 12-month assessments   |
| Mera (2020) <sup>14</sup>     | Alaska Native individuals of the Cherokee Nation                     | MDT   | Increases in HCV screening (20.9% to 38.2%), and identification of current HCV infection and treatment in newly screened individuals   |
| Momin (2019) <sup>15</sup>    | Cherokee Nation healthcare providers and community coalition members | Provider and community education  | Improvement in overall awareness and knowledge of liver cancer, and intention to treat, post education sessions  |
| Momin (2021) <sup>16</sup>    | Healthcare providers in Idaho  | Provider education, social media awareness campaign                                     | The social media campaign reached >42,000 unique users and providers had significant increases in awareness, knowledge, and ability post liver cancer education programs       |
| Rudnick (2023) <sup>17</sup>  | Tertiary medical center  | Phone-only HCC screening visits   | HCC screening rates were not significantly different between the phone-only and in-person visits   |
| Singal (2022) <sup>18</sup>   | Tertiary, safety-net, and VA medical centers                         | Mailed outreach   | Patients who received mailed outreach had increased rates of HCC screening compared to usual care (47.2% vs. 24.3%)  |
| Turner (2019) <sup>19</sup>   | Low-income communities with largely Hispanic populations             | multicomponent intervention for HCV screening   | HCV screening was completed in 48% of patients, and 85% of uninsured patients with HCV had disease staging and 40% initiated free antiviral therapy. There was no control arm. |
| Wong (2020) <sup>20</sup>     | Safety-net hospital  | Patient education   | Significant improvement in HBV knowledge scores, clinic follow-up, lab monitoring, and receipt of appropriate treatment  |
| Wong (2022) <sup>21</sup>     | Clinicians across specialties  | Digital Open-Access, Interactive Decision-Support                                       | Proposed intervention to facilitate guideline-driven care; data collection pending   |
| Zhou (2022) <sup>22</sup>     | Los Angeles hospitals  | Geographic hotspot detection  | Identified late-stage HCC hotspots included 30% of all late-stage cases and were more often in racial/ethnic minorities, underserved or patients with lower SES                |

HBV = Hepatitis B Virus, HCC = Hepatocellular carcinoma, HCV = Hepatitis C Virus, MDT = multidisciplinary team, OR = odds ratio, OS = overall survival, SES = socioeconomic status, VA = Veteran's Affairs

## CONCLUSIONS

- In recent years, few programs have targeted health disparities in patients at-risk or with liver cancer
- Most interventions focused on screening and utilized education tools
- While the majority of studies reported positive findings, this review highlighted gaps in addressing later stages of the care cascade including liver cancer diagnosis and care delivery
- These findings may be used to identify where future interventions are needed and assess feasibility
- Further research should be done to evaluate which interventions are most effective with limited health care resources

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## ACKNOWLEDGMENTS

- Kimberly Jinnett assisted with study design and data analysis

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## DISCLOSURES

- Amie Tan is an employee of Genentech and Spencer Cheng is a postdoctoral fellow at University of Washington funded by Genentech