

Cancer Screening: Interventions Engaging Community Health Workers—Breast Cancer (BC) and Cervical Cancer (CC)

Summary Evidence Table – Economic Review

Study	Intervention Characteristics	Population Characteristics	Results
<p>Author, Year: Hayhoe et al., 2018</p> <p>Cancer Types: Breast Cervical</p> <p>Design: Modeling</p> <p>Economic Analysis: Cost-Effectiveness (Per Additional Screen) Societal Perspective</p> <p>Funding source: Imperial National Institute for Health Research Biomedical Research Center and the National Institute for Health Research Collaborations for Leadership in Applied Health Research and Care for Northwest London</p> <p>Monetary values are in year 2017</p>	<p>Location: United Kingdom</p> <p>Setting: Community</p> <p>Intervention Time Frame: National 4 year program from April 2006 to December 2010</p> <p>Intervention Details: Modeling a scaled integration of CHWs in the UK National Health System</p> <p>Five chronic diseases common in UK primary care were used, and published prevalence data were applied to illustrate the numbers of patients with these conditions that community health workers might provide with homebased support, thus indicating the possible benefit to general practices in additional chronic disease management.</p> <p>Modeling was done with projected increase in screening rates of 10%, 20%, 30% and the attributable population and costs for the role of CHWs specific to the type of cancer screening were considered. CHW salaries were calculated based on national salary grades (£18,000-£22,148).</p>	<p>Target population/Eligibility: National population of UK patients with chronic conditions.</p> <p>Analytic Sample Size: BC N = 10%: 1,825,830 20%: 1,825,835 30%: 1,825,833</p> <p>CC N = 3,767,960</p> <p>Demographics: Age: BC: 25–49 years CC: 50–64 years</p>	<p>Screening Outcome: Mammogram and Pap test</p> <p>Follow-up Time: BC: 3.5 years CC: 5 .5 years</p> <p>Effects of intervention: Modeled rates of: 10%, 20%, 30%</p> <p>BC: 2018 Adjusted Intervention Cost per Person Salary Grade 2 10%: \$2,196 20%: \$1,464 30%: \$1,098</p> <p>Salary Grade 5 10%: \$2,367 20%: \$1,578 30%: \$1,184</p> <p>Salary Grade 8 10%: \$2,613 20%: \$1,742 30%: \$1,306</p> <p>2018 Adjusted Incremental Cost Per Additional Screen: 10% increase: \$21,963 20% increase: \$7,321 30% increase: \$3,660</p> <p>Salary Grade 5</p>

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	<p>Role of CHWs in chronic disease management has lower costs compared to costs of using medical practitioners in this capacity.</p> <p>Comparison: Comparator is No CHW.</p>		<p>10% increase: \$23,674 20% increase: \$7,891 30% increase: \$3,946</p> <p>Salary Grade 8 10% increase: \$26,125 20% increase: \$8,708 30% increase: \$4,354</p> <p>CC: 2018 Adjusted Intervention Cost per Person</p> <p>Salary Grade 2 10%: \$1,064 20%: \$710 30%: \$532</p> <p>Salary Grade 5 10%: \$1,147 20%: \$765 30%: \$574</p> <p>Salary Grade 8 10%: \$1,266 20%: \$844 30%: \$633</p> <p>2018 Adjusted Incremental Cost Per Additional Screen</p> <p>Salary Grade 2 10% increase: \$10,642 20% increase: \$3,548 30% increase: \$1,774</p> <p>Salary Grade 5 10% increase: \$11,472 20% increase: \$3,824 30% increase: \$1,912</p> <p>Salary Grade 8 10% increase: \$12,659 20% increase: \$4,220 30% increase: \$2,110</p> <p>Cost Driver: Wages</p>

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<p>Author, Year: Lairson et al., 2014</p> <p>Cancer Type: Cervical</p> <p>Study Design: Randomized Controlled Trial</p> <p>Economic Analysis: Cost-Effectiveness (Per Additional Screening) Both societal (accounting for participant time) and provider perspectives</p> <p>Funding source: CDC cooperative agreement to University of Texas at El Paso</p> <p>Monetary values are in year 2008 U.S dollars</p>	<p>Location: United States (El Paso, Houston TX; Yakima Valley, WA)</p> <p>Setting: Community</p> <p>Intervention Time Frame: During 2012-2013 6 months</p> <p>Intervention Details: AMIGAS trials. Delivered by trained <i>promotoras</i>. Used education materials to describe cervical cancer, related risk factors, benefits of screening, and screening process.</p> <p>Materials composed of video showing community women discussing and addressing barriers and beliefs about cervical cancer. Reinforced with a flipchart and if necessary, with additional materials.</p> <p><u>Study Arms:</u> Flipchart: 154 Video: 155 Video + flipchart: 151</p> <p>Comparison: No CHW</p>	<p>Target population/Eligibility: Women aged 21 years and older with no history of cancer, no hysterectomy, and no cervical cancer screening within past 3 years</p> <p>Analytic Sample Size: N = 613 Flipchart: 154 Video: 155 Video + flipchart: 151</p> <p>Demographics: Age: Mean age: 38 years Race/Ethnicity: Hispanic Insurance: 18.1% reported some healthcare coverage</p>	<p>Screening Outcome: Pap test</p> <p>Follow-up Time: 7 months</p> <p>Effects of intervention: Flipchart: 20.7% Video: 16.5% Video + flipchart: 27.5%</p> <p>2018 Adjusted Intervention Cost per Person: <u>Societal</u> Flipchart: \$234 Video: \$231 Video + flipchart: \$239 <u>Payer</u> Flipchart: \$176 Video: \$173 Video + flipchart: \$177</p> <p>2018 Adjusted Incremental Cost per Additional Screen): <u>Societal</u> Flipchart: \$1,132 Video: \$1,400 Video + flipchart: \$868 <u>Payer</u> Flipchart: \$852 Video: \$1,049 Video + flipchart: \$642</p> <p>Cost Driver: Wages, Supervision/Training</p>
<p>Author, Year: Larkey et al., 2012</p> <p>Cancer Type: Colorectal, Breast, Cervical</p>	<p>Location: United States (Phoenix, Arizona)</p> <p>Setting: Community</p>	<p>Target population/Eligibility: Hispanic/Latina women aged >= 18 years and due for one or more screenings, not being diagnosed</p>	<p>Screening Outcome: Colorectal, Breast, and Cervical</p> <p>Follow-up Time: 15 months</p>

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<p>Study Design: 2 arms (Group and Individual) Pre-Post</p> <p>Economic Analysis: Cost Analysis Payer Perspective</p> <p>Funding source: American Cancer Society</p> <p>Monetary values are in year 2006 U.S. dollars</p>	<p>Intervention Time Frame: 3 months</p> <p>Intervention Details: Total of 6 <i>promotoras</i> led classes to promote breast, cervical, and colorectal cancer screening and to promote prevention behaviors. Clusters of churches, schools, health centers, and apartment complexes recruited (144 total over 2004-2007). Block randomized to Arm 1 and Arm 2.</p> <p>6 weekly sessions of 80 minutes each. Seventh session for Arm 1 participant graduation session and Arm 2 for final Q&A with <i>promotora</i>.</p> <p>Topics included cancer descriptions; tobacco, diet, and physical activity guidelines; screening for the 3 cancers; screening locations.</p> <p>Arm 1: Delivered in groups Arm 2: Delivered one on one</p> <p>Content of Arms 1 and 2 similar but Arm 1 added group teaching exercises, group goal setting, discussion, and creative handouts that required interaction of participants.</p> <p>Comparison: No control group. Objective was to compare individual and group formats of the intervention.</p>	<p>with other cancers except non-melanoma skin cancer</p> <p>Analytic Sample Size: N = 509 Group: 307 Individual: 202</p> <p>Demographics: Age: Mean: 38.4 years</p> <p>Race/Ethnicity: Hispanic</p> <p>Income: <=\$25,000: 48% >\$25,000: 9% NR: 10%</p> <p>Education: <HS: 33% HS: 54% >HS: 10%</p> <p>Insurance: Private: 10% Public: 25% No Insurance: 65%</p>	<p>Effects of intervention: Group: 39% Individual: 46%</p> <p>2018 Adjusted Intervention Cost per Person: Group: \$113 Individual: \$430</p> <p>Cost Driver: Wages, Supervision/Training</p>
Author, Year:	Location:	Target population/Eligibility:	Screening Outcome:

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<p>Li et al., 2017</p> <p>Cancer Type: Cervical</p> <p>Study Design: Modeling</p> <p>Economic Analysis: Cost-Effectiveness (Per QALY) Societal Perspective</p> <p>Sensitivity analysis was performed.</p> <p>Funding Source: Cancer Prevention and Research Institute of Texas</p> <p>Monetary values are in year 2017 U.S dollars</p>	<p>United States (San Antonio, TX)</p> <p>Setting: Community</p> <p>Intervention Time Frame: 2012 to 2015</p> <p>Intervention Details: Microsimulation model of cervical cancer to project the long-term cost-effectiveness of a community-based patient navigation program compared with current practice. CHWs were on the implementation team.</p> <p>In addition to the patient navigators, the program also implemented multilevel strategies such as mass media, health education and incentives to help increase screening uptake.</p> <p>Comparison: No CHW</p>	<p>18 years & older Hispanic women.</p> <p>Analytic Sample Size: N = 4500</p> <p>Demographics: Age: 18 years or older Race/Ethnicity: Hispanic</p>	<p>Pap test</p> <p>Follow-up Time: Lifetime</p> <p>Effects of intervention: 65% to 80%</p> <p>2018 Adjusted Intervention Cost per Person: \$317</p> <p>2018 Adjusted Incremental Cost: \$46</p> <p>Incremental QALY: 0.06 years</p> <p>2018 Adjusted Cost per QALY: \$762</p> <p>Cost Driver: Wages</p>
<p>Author, Year: Mandelblatt et al., 2004</p> <p>Cancer Type: Breast</p> <p>Design: Modeling</p> <p>Economic Analysis: Cost-Effectiveness (Cost per life year) Societal Perspective</p> <p>Sensitivity analysis was performed</p>	<p>Location: United States</p> <p>Setting: Healthcare facility</p> <p>Intervention Time Frame: 3 months</p> <p>Intervention Details: One of two interventions modeled is relevant to present review, namely targeted patient reminders or lay health workers; extent of CHW involvement not reported.</p>	<p>Target population/Eligibility: Simulated 1.25 million 40-year-old African American patients</p> <p>Analytic Sample Size: N = 1.25 million</p> <p>Demographics: Age: 40 years Race/Ethnicity: African American</p>	<p>Screening Outcome: Mammogram</p> <p>Follow-up Time: Lifetime is modeled from age 40</p> <p>Medical care cost and patient time cost included in numerator. Cost of screening and related consultations for false positives included in medical care cost.</p> <p>Effects of intervention: Intervention group vs control group: 85.5% to 76%</p>

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<p>Funding source: National Cancer Institute</p> <p>Monetary values are in year 2000 U.S dollars</p>	<p>Model simulates incidence and progression of breast cancer in a Monte Carlo simulation of a cohort of African American women.</p> <p>The reminder or lay health worker interventions increase the probability of screen detection. Model accounts for false results, lead time, and recalculates stage of cancer based on screening. The screening interval is 2 years.</p> <p>Screening has enduring effect on relative risk of remaining unscreened. Effectiveness of mammography modeled as stage shift of lesions. Simulation was done across range of baseline screening since mean rates were high, at 76% for African American women. Screening rates increased from 76% to 85.5%</p> <p>Comparison: Comparator is no CHW or reminders</p>		<p>2018 Adjusted Intervention Cost per Person: \$83</p> <p>QALY utilities adjusted for morbidity and mortality of cancer but not used in main results because utility analysis did not change conclusions.</p> <p>2018 Adjusted Incremental Cost: \$143</p> <p>Incremental Life Year (LY): 0.000800</p> <p>2018 Adjusted Incremental Cost per LY: \$179,116</p> <p>Cost Driver: Wages</p>
<p>Author, Year: Marshall et al., 2016</p> <p>Cancer Type: Breast</p> <p>Study Design: Randomized Controlled Trial</p> <p>Economic Analysis: Cost Analysis Payer Perspective</p> <p>Funding source:</p>	<p>Location: United States (Baltimore, MD)</p> <p>Setting: Community and healthcare facility</p> <p>Intervention Time Frame: April 2006 to December 2010</p> <p>Intervention Details: Part of Cancer Prevention and Treatment Demonstration (CPTD) programs. One of 6 sites in the U.S.</p>	<p>Target population/Eligibility: African American women aged 65+ Medicare fee for service population</p> <p>Analytic Sample Size: N = 1358</p> <p>Demographics: Age: 65+ with about 30% above 75 Race/Ethnicity: African American Sex: Female Income: 53% less than \$20,000</p>	<p>Screening Outcome: Self-reported mammogram within 2 years of end of study.</p> <p>Follow-up Time: Median 17.8 months after end of trial</p> <p>Effects of intervention: Intervention group reported getting mammograms more than those in the control group (93.3 % and 87.5 %)</p>

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<p>Centers for Medicare and Medicaid Services (CMS)</p> <p>Monetary values are in year 2015 U.S dollars</p>	<p>Printed CMS education materials on cancer and cancer prevention covered by Medicare plus patient navigation to overcome barriers to screening. Navigation focused on multiple cancer screenings including for breast.</p> <p>Navigators not integrated with primary care teams.</p> <p>Navigator training: didactic, role playing, shadowing, use of database.</p> <p>Navigator activities included introductory phone call, review screening status, discuss print materials, address barriers, schedule appointments, accompany patient to appointment. Oncology nurse available for consultation with navigators. Contacts by phone and in-person with caseloads from 100 to 300 participants. Navigators were 71% African American.</p> <p>Comparison: Printed CMS education materials on cancer and cancer prevention covered by Medicare.</p>	<p>Education: 54% HS diploma or less</p> <p>Insurance: Medicaid: 13.1%; Medigap: 59.3%</p>	<p>2018 Adjusted Intervention Cost per Person: \$3,122 (both control and intervention)</p> <p>Cost Driver: Wages, Supervision/Training</p>
<p>Author, Year: Meghea et al., 2015</p> <p>Cancer Type: Breast, Cervical</p> <p>Study Design: Randomized Controlled Trial</p>	<p>Location: United States (Detroit and Dearborn, Michigan)</p> <p>Setting: Community</p> <p>Intervention Time Frame: 12 months</p>	<p>Target population/Eligibility: Women aged 19-88 years old served by CHWs in Detroit Department of Health and Wellness Promotion</p> <p>Analytic Sample Size 406</p>	<p>Screening Outcome: Breast and Cervical</p> <p>Follow-up Time: 12 months</p> <p>Effects of intervention: NR</p>

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<p>Economic Analysis: Cost Analysis Payer Perspective</p> <p>Funding source: National Institute of Nursing Research at NIH</p> <p>Monetary values are in year In 2011 U.S dollars</p>	<p>Intervention Details: Kin Keeper Cancer Prevention</p> <p>Cancer education through home visits with females in families. Implemented in delivery system that already employed CHWs. 16 CHWs involved in intervention, with caseload of 23 patients/month.</p> <p>Two home visits for cervical and breast cancer education and discussion. Average of 3 related females at each home visit.</p> <p>Comparison: Control group received one education visit and materials for breast and cervical cancer.</p>	<p>Demographics: Age: aged 19 to 88 years Race/Ethnicity: Black: 147 (48%) Latino: 33 (11%) Arab: 126 (41%)</p>	<p>2018 Adjusted Intervention Cost per Person \$53</p> <p>Cost Driver: Wages, Supervision/Training</p>
<p>Author, Year: Schuster et al., 2015</p> <p>Cancer Type: Breast</p> <p>Study Design: Randomized Controlled Trial</p> <p>Economic Analysis: Cost-Effectiveness (Per Additional Screening) Payer Perspective</p> <p>Funding Source: National Cancer Institute</p> <p>Monetary values are in year 2013 U.S dollars</p>	<p>Location: United States (Baltimore-Washington metropolitan area)</p> <p>Setting: Community</p> <p>Intervention Time Frame: 6 months</p> <p>Intervention Details: 2 hour health literacy education session delivered by trained CHW alone; brochure containing specific health messages tailored to individual risk factors and education levels; DVD and picture guidebook with detailed health literacy content addressing beliefs, attitudes, and experiences; follow-up reminder telephone calls and patient navigation including</p>	<p>Target population/Eligibility/Eligibility Criteria: Women aged 21- 65 years old, self-identified as Korean American, had not had a mammogram in the last 24 months, able to read/write Korean or English, willing to provide written consent for mammography records audit</p> <p>Analytic Sample Size: Intervention 278 (11 churches) Control 282 (12 churches)</p> <p>Demographics: Age: 21 to 65 years Race/Ethnicity: 100% Korean American</p>	<p>Screening Outcome: Self-reported mammogram</p> <p>Follow-up Time: 6 months</p> <p>Effect of Intervention: Incremental screening compared to control 202 (245 versus 43)</p> <p>2018 Adjusted Intervention Cost per Person: \$472</p> <p>2018 Adjusted Incremental Cost per Additional Screen): \$251 (smaller than cost per person because comparator group had CHW involvement and difference in costs less than when comparator had no CHW involvement).</p>

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	transportation and translation provided by CHWs. Comparison: Wait list control for monthly CHW meetings		Cost Driver: Wages, Supervision/Training
Author, Year: Scoggins et al., 2010 Cancer Type: Cervical Study Design: Randomized Controlled Trial Economic Analysis: Cost-Effectiveness (Per QALY) Societal Perspective Funding Source: National Cancer Institute Monetary values are in year 2008 U.S dollars	Location: United States (Seattle, WA) Setting: Community Intervention Time Frame: 6 months Intervention Details: Lay health workers visits home for one on one education. All were bilingual Vietnamese-American women. Comparison: Mailed physical activity pamphlet and fact sheet with pedometer.	Target population/Eligibility: Women aged 20-79 years. All Participants had to speak Vietnamese or English. Non-adherent to guideline of pap test every 3 years or never screened (age 70-79). Analytical Sample Size: N = 118 women (Vietnamese) Demographics: Age: 20–79 years Race/Ethnicity: 100% of participants Vietnamese-American women	Screening Outcome: Pap test Follow-up Time: 36 months 65% to 80% 2018 Adjusted Intervention Cost per Person: \$111 2018 Adjusted Incremental Cost: \$119 Incremental QALY: 0.00345 years 2018 Adjusted Cost per QALY: \$34,405 Cost Driver: Wages
Author, Year: Stockdale et al., 2000 Cancer Type: Breast Study Design: Randomized Controlled Trial Economic Analysis: Cost-Effectiveness (per Life Year)	Location: United States (Los Angeles) Setting: Community Intervention Time Frame: 1995 to 1997 Intervention Details: Los Angeles Mammography Program (LAMP)	Target population/Eligibility: Active church member women age 50 to 80. Target is approximately 56 women from each church based on study experience. Analytic Sample Size: N = 56 Demographics: Age: Mean 74 years Race/Ethnicity:	Screening Outcome: Self-reported mammogram Follow-up Time: Results based on Year One Effects of intervention: 2.6% increase in mammography for previously non-adherent 2018 Adjusted Intervention Cost per Person:

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<p>Payer Perspective</p> <p>Funding source: National Cancer Institute</p> <p>Monetary values are in year 1999 U.S dollars.</p>	<p>Targeted lower SES and minority women through churches.</p> <p>Three intervention arms with 15 churches each Mail Counseling Telephone Counseling Control</p> <p>Mailed counseling was not effective and is not considered in the paper.</p> <p>Volunteer peer counselors recruited from churches and trained for telephone counseling. Counseling started with screening status and proceeded to barrier counseling. Mailed materials supplemented the counseling and informed about community screening locations Each church received a cancer library. CHW was part of team.</p> <p>Comparison: No CHW</p>	<p>Non-White: 57% 18 (12) [15] churches with more than 60% African American (Hispanic) [Caucasian]</p> <p>Median church members: 275</p> <p>Median members with household income below \$15,000: 28</p>	<p>3 models based on labor costs: (Labor: \$0) \$15.78 (Labor: min. wage) \$40.72 (Labor: market value) \$75.47</p> <p>2018 Adjusted Incremental Cost: NR</p> <p>Life Year (LY): NR</p> <p>2018 Adjusted Cost per LY: (Labor: \$0) \$10,110 (Labor: min. wage) \$26,189 (Labor: market value) \$48,560</p> <p>Cost Driver: Wages, Supervision/Training</p>
<p>Author, Year: Thompson et al., 2017</p> <p>Cancer Type: Cervical</p> <p>Study Design: Randomized Controlled Trial</p> <p>Economic Analysis: Cost-Effectiveness (Per Additional Screening) Payer Perspective</p> <p>Funding Source: National Institute of Health</p>	<p>Location: United States (Yakima Valley, WA)</p> <p>Setting: Community</p> <p>Intervention Time Frame: 7 months</p> <p>Intervention Details: Arm1: culturally appropriate Spanish-language video mailed to participants about cervical cancer, screening, and location for screening. Arm2: Arm1 plus <i>promotora</i>-led educational session at home;</p>	<p>Target population/Eligibility: Latina women aged 21-64 years who were non-adherent to Pap guidelines (more than 3 years since last Pap)</p> <p>Analytic Sample Size: N = 146</p> <p>Demographics: Age: Mean age of women: 43.9 years Race/Ethnicity: Hispanic Education: 65.8% less than high school education Insurance: Previously insured: 57%; never: 18%</p>	<p>Screening Outcome: Pap test</p> <p>Follow-up Time: 7 months</p> <p>Intervention Effect: Intervention=78 persons Control: 50 persons</p> <p>2018 Adjusted Intervention Cost per Person: \$84</p> <p>2018 Adjusted Incremental Cost per Additional Screen) Societal:</p>

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<p>Monetary values are in year 2016 U.S dollars</p>	<p>reminder refrigerator magnet, appointment card; local information sheet for overcoming barriers; transportation assistance; childcare assistance</p> <p>All abnormal tests received <i>promotora</i> patient navigation.</p> <p>Comparison: 2 comparisons, one usual care, one video only; using the usual care arm</p>		<p>\$432</p> <p>Cost Driver: Wages, Supervision/Training</p>