Data Supplement S1. Supplemental material

Appendix S1: SDOH/SEM Emergency Medicine PubMed, CINAHL, Cochrane database search strategy

Database: PubMed
Date: 1/15/20
Results: 7000 (10 duplicates removed in EndNote from 7010 total references)

Strategy:

("Emergency Medicine"[MeSH Major Topic] OR "emergency service, hospital"[MeSH Major Topic]) OR (emergenc*[Title] AND (((service*[Title/Abstract] OR department*[Title/Abstract]) OR room*[Title/Abstract]) OR staff*[Title/Abstract]))

AND

((((((((((((housing[Title/Abstract] OR homeless*[Title/Abstract] OR transient*[Title/Abstract] OR residence[Title/Abstract] OR residential[Title/Abstract] OR neighborhood*[Title/Abstract] OR homeown*[Title/Abstract])) OR home-own*[Title/Abstract])) OR ((("Residence Characteristics"[Majr]) OR "Homeless Persons"[Majr]) OR "Transients and Migrants"[Majr]))) OR (((((environment*[Title/Abstract] OR condition*[Title/Abstract] OR isolation[Title/Abstract] OR marginaliz*[Title/Abstract] OR capital[Title/Abstract] OR depriv*[Title/Abstract])) AND (social*[Title/Abstract] OR cultural*[Title/Abstract]))) OR (((((("Socioeconomic Factors"[Majr]) OR "Social Conditions"[Majr]) OR "Social Environment"[Majr]) OR "Social Isolation"[Majr]) OR "Social Marginalization"[Majr]) OR "Cross-Cultural Comparison"[Majr]) OR "Social Capital"[Majr]))) OR ((social-determinant*[Title/Abstract]) OR "Social Determinants of Health"[Majr]))) OR ((income[Title/Abstract] OR poverty[Title/Abstract] OR employment[Title/Abstract] OR unemploy*[Title/Abstract]))) OR (("Insurance Coverage"[Majr]) OR "Medically Uninsured"[Majr])) OR (insurance[Title/Abstract] OR insured[Title/Abstract] OR uninsured[Title/Abstract]))) OR (((((((food assistance[MeSH Major Topic]) OR (((food-insecur*[Title/Abstract]) OR food-secur*[Title/Abstract]) OR food-assistance[Title/Abstract]))) OR (("Health Services Accessibility"[Majr]) OR (((health-care[Title/Abstract] OR healthcare[Title/Abstract])) AND access*[Title/Abstract]))) OR ((((("Crime Victims"[Majr]) OR "Crime"[Majr])) OR ((crime[Title/Abstract] OR crimes[Title/Abstract] OR violen*[Title/Abstract])))) OR (("Transportation"[Majr]) OR transportation[Title/Abstract])) OR ((((("Social Problems"[Majr]) OR "Racism"[Majr])) OR (((literacy[Title/Abstract] OR illiterate[Title/Abstract] OR literate[Title/Abstract])) OR (racis*[Title/Abstract] OR racial-discrimination[Title/Abstract] OR ethnic-discrimination[Title/Abstract])))) OR (("Digital Divide"[Majr]) OR (((technology[Title/Abstract] OR computer*[Title/Abstract] OR Internet[Title/Abstract])) AND access[Title/Abstract])))

AND

(United States [mh] OR "united states" OR usa OR u.s.a. OR Appalachia* OR "great lakes" OR mid-atlantic-state* OR mid-atlantic-region* OR middle-atlantic-state* OR middle-atlantic-region* OR midwestern-us* OR midwestern-u.s* OR Midwestern-state* OR Midwest-state* OR Midwest-us* OR Midwest-u.s* OR "great plains" OR heartland OR "new england" OR northeastern-us* OR northeastern-u.s* OR northeastern-state* OR northeast-state* OR northeast-us* OR northeast-u.s* OR "pacific northwest" OR northwestern-us* OR northwestern-u.s* OR northwest-u.s* OR northwest-us* OR northwestern-state* OR northwest-state* OR pacific-state* OR southeast-state*

OR southeastern-state* OR southeast-region OR southeastern-region OR southeast-us* OR southeastern-us* OR southeast-u.s* OR southeastern-u.s* OR southern-state* OR southern-us* OR southern-u.s* OR southwest-state* OR southwestern-state* OR southwest-us* OR southwestern-us* OR southwest-u.s* OR southwestern-u.s* OR "deep south" OR "black belt" OR "rust belt" OR "district of Columbia" OR "Washington dc" OR Washington-d.c. OR Alabama OR (Birmingham [ad] AND al [ad]) OR Huntsville [ad] OR (Montgomery [ad] AND al [ad])OR Alaska OR anchorage [ad] OR fairbanks [ad] OR Arizona OR Phoenix [ad] OR Tuscon [ad] OR Flagstaff [ad] OR Arkansas OR "little rock" OR California OR "los angeles" OR "san diego" OR "san Francisco" OR Berkeley [ad] OR Stanford [ad] OR Colorado OR Vail [ad] OR Denver [ad] OR Connecticut OR Farmington [ad] OR "new haven" [ad] OR Hartford [ad] OR Delaware OR Wilmington [ad] OR Newark [ad] OR Florida OR Miami [ad] OR Gainesville OR Jacksonville OR Tampa OR Tallahassee OR Georgia OR Atlanta OR (Athens [ad] AND ga [ad]) OR (Augusta [ad] AND ga [ad]) OR Hawaii OR Hawai'i OR Honolulu OR Idaho OR Boise [ad] OR Illinois OR Chicago OR Urbana [ad] OR Evanston [ad] OR Indiana OR Indianapolis OR "West Lafayette" OR Iowa OR Kansas OR Wichita OR Kentucky OR Lexington [ad] OR Louisville [ad] OR Bardstown [ad] OR Louisiana OR "new Orleans" OR "baton rouge" OR Shreveport OR Maine OR Orono OR (Scarborough [ad] AND me [ad]) OR Maryland OR Bethesda [ad] OR Baltimore [ad] OR Rockville [ad] OR "johns Hopkins" OR Massachusetts OR Boston OR Harvard OR (worcester [ad] AND ma [ad]) OR Burlington [ad] OR Michigan OR Detroit OR "ann arbor" OR "east lansing" OR Minnesota OR Minneapolis OR Rochester OR "st paul" [ad] OR "saint paul" [ad] OR Mississippi OR (Jackson [ad] AND ms [ad]) OR Missouri OR (Columbia [ad] AND mo [ad]) OR Montana OR Bozeman [ad] OR Missoula OR Nebraska OR Omaha [ad] OR Lincoln [ad] OR Nevada OR "Las Vegas" OR "New Hampshire" OR "New Jersey" OR "New Mexico" OR "New York" OR "North Carolina" OR "North Dakota" OR Ohio OR Columbus [ad] OR Cleveland [ad] OR Cincinnati OR Oklahoma OR Oregon OR Portland [ad] OR Pennsylvania OR Philadelphia OR Hershey [ad] OR "Rhode Island" OR providence [ad] OR "South Carolina" OR "South Dakota" OR Tennessee OR Nashville OR Memphis OR Texas OR Houston OR Utah OR Vermont OR Virginia OR Richmond [ad] OR Washington [tiab] OR Washington [ad] OR Seattle OR "West Virginia" OR Wisconsin OR Wyoming)

CINAHL Search Strategy
January 16, 2020

*Results: 611 (176 duplicates removed in EndNote from 787 [excluding Medline overlap] results)

(MM "Emergency Medicine") OR (MM "Emergency Service+") OR ((TI emergenc*) AND (TI service* OR AB service* OR TI department* OR AB department* OR TI room* OR AB room* OR TI staff OR AB staff))

AND

(TI housing OR AB housing OR TI homeless* OR AB homeless* OR TI transient* OR AB transient* OR TI residence OR AB residence OR TI residential OR AB residential OR TI neighborhood OR AB neighborhood OR TI homeown* OR AB homeown*) OR ((MM "Residence Characteristics+") OR (MM "Homeless Persons") OR (MM "Transients and Migrants")) OR ((TI environment* OR AB environment* OR TI condition* OR AB condition* OR TI isolation OR AB isolation OR TI marginaliz* OR AB marginaliz* OR TI capital OR AB capital OR TI depriv* OR AB depriv*) AND (TI social OR AB social OR TI cultural* OR AB cultural*)) OR (((MM "Socioeconomic Factors+") OR TI social-condition* OR AB social-condition* OR TI living-condition* OR AB living-condition* OR (MM "Social Environment+") OR (MM "Social Isolation+") OR TI social-marginaliz* OR AB social-marginaliz* OR (MM "Ethnological Research") OR TI cross-cultural-

comparison OR AB cross-cultural-comparison OR (MM "Social Capital")) OR (TI social-determinant* OR AB social-determinant* OR (MM "Social Determinants of Health")) OR (TI income OR AB income OR TI poverty OR AB poverty OR TI employment OR AB employment OR TI unemploy* OR AB unemploy*) OR ((MM "Insurance Coverage") OR (MM "Medically Uninsured")) OR (TI insurance OR AB insurance OR TI insured OR AB insured OR TI uninsured OR AB uninsured) OR (TI food-assistance OR AB food-assistance OR (MM "Food Assistance") OR TI food-secur* OR AB food-secur* OR TI food-insecur* OR AB food-insecur*) OR (((MM "Health Services Accessibility+") OR TI health-care OR AB health-care OR TI healthcare OR AB healthcare) AND (TI access* OR AB access*)) OR ((MM "Crime Victims") OR (MM "Crime+") OR TI crime OR AB crime OR TI crimes OR AB crimes OR TI violenc* OR AB violenc*) OR ((MM "Transportation+") OR TI transportation OR AB transportation) OR (MM "Social Problems+") OR (MM "Racism") OR TI literacy OR AB literacy OR TI illiterate OR AB illiterate OR TI literate OR AB literate OR TI racis* OR AB racis* OR TI racial-discrimination OR AB racial-discrimination) OR ((MM "Digital Divide") OR ((TI technology OR AB technology OR TI computer* OR AB computer* OR TI internet OR AB internet) AND (TI access OR AB access))

AND

(MH "United States+") OR “united states” OR usa OR u.s.a. OR Appalachia* OR “great lakes” OR mid-atlantic-states* OR mid-atlantic-region* OR middle-atlantic-state* OR middle-atlantic-region* OR Midwestern-us* OR Midwestern-u.s* OR Midwestern-state* OR Midwest-state* OR Midwest-u.s* OR northwest-u.s* OR northwest-us* OR northwestern-state* OR northwest-state* OR pacific-state* OR southeast-state* OR southeastern-state* OR southeast-region OR southeastern-region OR southeast-us* OR southeastern-us* OR southeast-u.s* OR southeastern-u.s* OR southern-state* OR southern-us* OR southern-u.s* OR southwest-state* OR southwestern-state* OR southwest-us* OR southwestern-us* OR southwest-u.s* OR southwestern-u.s* OR “deep south” OR “black belt” OR “rust belt” OR “district of Columbia” OR “Washington dc” OR Washington-d.c. OR Alabama OR “Birmingham, AL” OR “Huntsville, AL” OR “Montgomery, AL” OR Alaska OR “Anchorage, AL” OR “Fairbanks, AL” OR Arizona OR “Phoenix, AZ” OR “Tucson, AZ” OR “Flagstaff, AZ” OR Arkansas OR “little rock” OR California OR “los angeles” OR “san diego” OR “san Francisco” OR “Berkley, CA” OR Stanford OR Colorado OR “Vail, CO” OR “Denver, CO” OR Connecticut OR “Farmington, CT” OR “New Haven, CT” OR “Hartford, CT” OR Delaware OR “Wilmington, DE” OR “Newark, NJ” OR Florida OR “Miami, FL” OR Gainesville OR Jacksonville OR Tampa OR Tallahassee OR Georgia OR Atlanta OR “Athens, GA” OR “Augusta, GA” OR Hawaii OR Hawai'i OR Honolulu OR Idaho OR “Boise, ID” OR Illinois OR Chicago OR “Urbana, IL” OR “Evanston, IL” OR Indiana OR Indianapolis OR "West Lafayette" OR Iowa OR Kansas OR Wichita OR Kentucky OR “Lexington, KY” OR “Louisville, KY” OR “Bardstown, KY” OR Louisiana OR “new Orleans” OR “baton rouge” OR Shreveport OR Maine OR “Scarborough, ME” OR Maryland OR Bethesda OR Baltimore OR Rockville OR “johns Hopkins” OR Massachusetts OR Boston OR Harvard OR “Worcester, MA” OR Burlington OR Michigan OR Detroit OR “ann arbor” OR “east lansing” OR Minnesota OR Minneapolis OR Rochester OR “st paul” OR “saint paul” OR Mississippi OR “Jackson, MS” OR Missouri OR “Columbia, MO” OR Montana OR “Bozeman, MT” OR Missoula OR Nebraska OR “Omaha.NE” OR “Lincoln, NE” OR Nevada OR “Las Vegas” OR “New Hampshire” OR “New Jersey” OR “New Mexico” OR “New York” OR “North Carolina” OR “North Dakota” OR Ohio OR “Columbus. OH” OR “Cleveland, OH” OR Cincinnati OR Oklahoma OR Oregon OR “Portland, OR” OR Pennsylvania OR Philadelphia OR “Hershey, PA” OR “Rhode Island” OR “providence, RI” OR “South Carolina” OR “South Dakota” OR

Tennessee OR Nashville OR Memphis OR Texas OR Houston OR Utah OR Vermont OR Virginia OR "Richmond, VA" OR Washington OR Seattle OR "West Virginia" OR Wisconsin OR Wyoming)

*(*Initial Results: 2689, before excluding Medline overlap)*

Database: PubMed
Similar articles search
Date: 1/21/20
Results: 565 (17 duplicates removed in EndNote from 582 total results)

Strategy:

"Similar articles" search performed on the following PMID references: 30800989, 29795202, 30051066, 29560076, 29227155, 25367545

[*Note: 86 additional duplicates identified in Covidence out of a total of 8176 references, leaving 8090 total results for this review.]

Addendum: Pearl-growing search of highly relevant representative articles identified by review team in initial review

Database: PubMed
Date: 4/28/20
Results: 1047 (206 duplicates removed in EndNote from 1253 total results)

Strategy: PubMed "Similar articles" searches of PMIDS: 19070939; 31853480; 18977971; 31484676; 30316620; 26617669; 15741585

[*Note: 3 additional duplicates identified in Covidence for this addendum set, leaving 1044 total results. KHS]

Database: Cochrane CENTRAL (Trials)
Date: 5/26/20
Results: 1246* (135 duplicates removed in EndNote from 1381 total CENTRAL results)

Strategy:

ID	Search	Hits
#1	MeSH descriptor: [Emergency Medicine] explode all trees	262
#2	MeSH descriptor: [Emergency Service, Hospital] explode all trees	2290
#3	(emergency service):ti,ab,kw (Word variations have been searched)	7658
#4	(emergency department):ti,ab,kw (Word variations have been searched)	10843
#5	(emergency room):ti,ab,kw (Word variations have been searched)	3321
#6	(emergency staff):ti,ab,kw (Word variations have been searched)	1848

#7 #1 OR #2 OR #3 OR #4 OR #5 OR #6 18047

#8 MeSH descriptor: [Food Assistance] explode all trees 67

#9 (food insecurity):ti,ab,kw (Word variations have been searched) 358

#10 (food security):ti,ab,kw (Word variations have been searched) 514

#11 (food assistance):ti,ab,kw (Word variations have been searched) 1223

#12 (food desert):ti,ab,kw (Word variations have been searched) 18

#13 MeSH descriptor: [Food] explode all trees 33369

#14 food 45993

#15 (access):ti,ab,kw (Word variations have been searched) 30315

#16 #13 OR #14 68808

#17 #16 AND #15 1513

#18 (food stamp):ti,ab,kw (Word variations have been searched) 45

#19 MeSH descriptor: [Social Determinants of Health] explode all trees 19

#20 nutrition 50058

#21 (social determinants):ti,ab,kw (Word variations have been searched) 8354

#22 #19 OR #21 8354

#23 #22 AND #20 524

#24 #8 OR #9 OR #10 OR #11 OR #12 OR #17 OR #18 OR #23 3521

#25 #7 AND #24 118

#26 MeSH descriptor: [United States] explode all trees 18590

#27 United States 160982

#28 #26 OR #27 168706

#29 #25 AND #28 34

#30 Alabama OR Georgia OR Kentucky OR Maryland OR New York OR North Carolina OR Ohio or Pennsylvania OR South Carolina OR Tennessee OR Virginia 54130

#31 West Virginia OR Illinois OR Indiana OR Michigan OR Minnesota OR Wisconsin OR Delaware OR New Jersey OR Iowa OR Kansas OR Missouri OR Nebraska 28687

#32 North Dakota OR Oklahoma OR South Dakota OR Connecticut OR Maine OR Massachusetts OR New Hampshire OR Rhode Island OR Vermont OR Idaho 18322

#33 Montana OR Oregon OR Washington OR Florida OR Arkansas OR Louisiana OR Mississippi OR Arizona OR California OR Colorado OR Nevada OR Hawaii 52678

#34 Alaska OR New Mexico OR Texas OR Utah OR District of Columbia 14351

#35 #28 OR #30 OR #31 OR #32 OR #33 OR #34 265135

#36 #25 AND #35 57

#37 hunger 3031

#38 meals 9032

#39 #22 OR #37 OR #38 19783

#40 #7 AND #39 AND #35 153

#41 (housing):ti,ab,kw (Word variations have been searched) 6049

#42 (homeless):ti,ab,kw (Word variations have been searched) 880

#43 (transient):ti,ab,kw (Word variations have been searched) 16660

#44 (residence):ti,ab,kw (Word variations have been searched) 15354

#45 (neighborhood):ti,ab,kw (Word variations have been searched) 1181

#46 (homeowner):ti,ab,kw (Word variations have been searched) 10

#47 MeSH descriptor: [Residence Characteristics] explode all trees 1417

#48 MeSH descriptor: [Homeless Persons] explode all trees 333

#49 MeSH descriptor: [Transients and Migrants] explode all trees 66

#50 ("marginalization"):ti,ab,kw (Word variations have been searched) 17630

#51 MeSH descriptor: [Socioeconomic Factors] explode all trees 9455

#52 MeSH descriptor: [Social Conditions] explode all trees 24

#53 MeSH descriptor: [Social Environment] explode all trees 4166

#54 MeSH descriptor: [Social Isolation] explode all trees 281

#55 MeSH descriptor: [Social Marginalization] explode all trees 6

#56 MeSH descriptor: [Cross-Cultural Comparison] explode all trees 207

#57 MeSH descriptor: [Social Capital] explode all trees 11

#58 MeSH descriptor: [Social Determinants of Health] explode all trees 19

#59 (social determinants):ti,ab,kw (Word variations have been searched) 8354

#60 (income):ti,ab,kw (Word variations have been searched) 9002

#61 (poverty):ti,ab,kw (Word variations have been searched) 2547

#62 (employment):ti,ab,kw (Word variations have been searched) 21435

#63 ("unemployed"):ti,ab,kw (Word variations have been searched) 978

#64 MeSH descriptor: [Insurance Coverage] explode all trees 68

#65 MeSH descriptor: [Medically Uninsured] explode all trees 66

#66 (uninsured):ti,ab,kw (Word variations have been searched) 358

#67 MeSH descriptor: [Health Services Accessibility] explode all trees 913

#68 (healthcare access):ti,ab,kw (Word variations have been searched) 2243

#69 MeSH descriptor: [Crime Victims] explode all trees 251

#70 (crime):ti,ab,kw (Word variations have been searched) 865

#71 (violence):ti,ab,kw (Word variations have been searched) 2741

#72 MeSH descriptor: [Transportation] explode all trees 654

#73 (transportation):ti,ab,kw (Word variations have been searched) 10314

#74 MeSH descriptor: [Social Problems] explode all trees 5381

#75 MeSH descriptor: [Racism] explode all trees 29

#76 (literacy):ti,ab,kw (Word variations have been searched) 3391

#77 (racism):ti,ab,kw (Word variations have been searched) 112

#78 MeSH descriptor: [Digital Divide] explode all trees 2

#79 (technology):ti,ab,kw (Word variations have been searched) 19998

#80 (computer):ti,ab,kw (Word variations have been searched) 53702

#81 (Internet):ti,ab,kw (Word variations have been searched) 10155

#82 (access):ti,ab,kw 24667

#83 #79 OR #80 OR #81 77943

#84 #83 AND #82 5808

#85 #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #51 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 74940

#86 #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67 OR #68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78 OR #84 56867

#87 #39 OR #85 OR #86 132250

#88 #7 AND #87 AND #35 1456 ***[including non-CENTRAL results]***

[*22 additional duplicates were identified and removed in Covidence, yielding 1224 total results from CENTRAL.]

Table S1. Included Manuscript Data Abstraction, by Domain Focus

ACCESS TO CARE			
Citation	**Type of Intervention**	**# affected by intervention**	**Summary**
Acosta C, Dibble C, Giammona M, Wang NE. A model for improving uninsured children's access to health insurance via the emergency department. J Healthc Manag 2009;54(2):105-116.	Direct Social Need	799 patients	An insurance-referral program integrated into a pediatric ED had a linkage success rate of 54.5% (88.6% for Medicaid) and resulted in $105,829.25 in insurance reimbursements and $658,559.97 deflected from bad-debt conversion.
Anderson D, Patch E, Oxandale B, Kincade A, Gamber A, Ohm R. Nursing Student Coaches for Emergency Department Super Utilizers. J Nurs Educ 2017;56(1):27-30.	Direct Social Need	23 patients	Nursing student partnership with ED super utilizers with multiple social needs, facilitating patient integration into an interdisciplinary resource team, decreased non-emergent ED visits by this patient cohort.
Baren JM, Shofer FS, Ivey B, et al. A randomized, controlled trial of a simple emergency department intervention to improve the rate of primary care follow-up for patients with acute asthma exacerbations. Ann Emerg Med 2001;38(2):115-122. Baren JM, Boudreaux ED, Brenner BE, et al. Randomized controlled trial of emergency department interventions to improve primary care follow-up for patients with acute asthma. Chest 2006;129(2):257-265.	Disease Modification Disease Modification	192 patients 384 patients	Social interventions including free medication, transportation vouchers, and linkage efforts improved primary follow-up for ED asthma patients, but did not impact long-term disease outcomes.
Bernstein J, Dorfman D, Lunstead J, et al. Reaching Adolescents for Prevention: The Role of Pediatric Emergency Department Health Promotion Advocates. Pediatr Emerg Care 2017;33(4):223-229.	Direct Social Need	1470 patients	A health promotion advocate in a pediatric ED provided valuable health navigation services for patients with a variety of social needs (e.g., primary care, mental health, insurance, personal safety, human immunodeficiency virus testing, general education diploma (GED), employment, housing, and food pantries).
Capp R, Misky GJ, Lindrooth RC, et al. Coordination Program Reduced Acute Care Use And Increased Primary Care Visits Among Frequent Emergency Care Users. Health Aff (Millwood) 2017;36(10):1705-1711.	Direct Social Need	406 patients	An ED-initiated, multidisciplinary, community-based program (B2C) reduced acute care use and increased the number of primary care visits among low-income high ED utilizers.
Cerisier K. Connecting Chronically Ill, Uninsured Patients Who Use the Emergency Department as a Medical Home: A Process	Provider Education AND Direct Social	15 EM nurse participants, 13 patient referrals	ED nurses were trained to refer uninsured patients with chronic health problems to care coordinators when they were discharged from emergency departments. Participants reported improved knowledge

Improvement Project. J Emerg Nurs 2019;45(3):249-253.	Need		about the overuse of the emergency department and successfully referred uninsured patients who were discharged.
Chan TC, Killeen JP, Castillo EM, et al. Impact of an internet-based emergency department appointment system to access primary care at safety net community clinics. Ann Emerg Med 2009;54(2):279-284.	Direct Social Need	326 patients	The use of an Internet-based scheduling program linking a safety net ED with local community clinics significantly improved the frequency of follow-up for patients without primary care.
Chande VT, Kimes D. A health promotion intervention for families in a Medicaid managed care plan. Acad Emerg Med 1999;6(8):823-827.	Direct Social Need	195 patients	Health care promotion teaching for parents of Medicaid pediatric patients did not alter healthcare utilization patterns, including number of subsequent PCP or ED visits.
Crane S, Collins L, Hall J, Rochester D, Patch S. Reducing utilization by uninsured frequent users of the emergency department: combining case management and drop-in group medical appointments. J Am Board Fam Med 2012;25(2):184-191.	Direct Social Need	36 patients	Low income, uninsured, frequent ED users engaged in an interdisciplinary primary care and case management follow-up program, resulting in a cost-effective measure to reduce ED visits.
DeHaven M, Kitzman-Ulrich H, Gimpel N, et al. The effects of a community-based partnership, Project Access Dallas (PAD), on emergency department utilization and costs among the uninsured. J Public Health (Oxf) 2012;34(4):577-583.	Direct Social Need	265 patients	Uninsured ED patients enrolled in a community partnership program to provide medical access resulted in decreased ED utilization and ED costs.
Duchesne JC, Kyle A, Simmons J, et al. Impact of telemedicine upon rural trauma care. J Trauma 2008;64(1):92-98.	Disease Modification	7 rural EDs, 463 virtual consults	Telemedicine consults significantly improved rural local community hospital evaluation and management of trauma patients, including more rapid transfer for severely injured patients to trauma center.
Enard KR, Ganelin DM. Reducing preventable emergency department utilization and costs by using community health workers as patient navigators. J Healthc Manag 2013;58(6):412-428.	Direct Social Need	1905 patients	A patient navigation system instituted to connect medically underserved ED patients to primary care decreased non-emergent ED visits and resulted in cost savings.
Engelstad LP, Stewart SL, Nguyen BH, et al. Abnormal Pap smear follow-up in a high-risk population. Cancer Epidemiol Biomarkers Prev 2001;10(10):1015-1020.	Disease Modification	54 patients	Aggressive facilitated follow-up for abnormal coincidental pap smears performed in the ED improves the rate of both initial follow-up and diagnostic resolution of abnormal Pap smears among low-income women.
Fairchild RM, Ferng-Kuo SF, Laws S, Rahmouni H, Hardesty D. Telehealth Decreases Rural Emergency Department Wait Times for Behavioral Health Patients in a Group of Critical Access Hospitals. Telemed J E Health 2019;25(12):1154-1164.	Disease Modification	287 telehealth patients	Telehealth consultation in the ED for behavioral health cases was associated with decreased wait time to mental health provider contact and longer ED length of stay.

Foster SD, Hart K, Lindsell CJ, Miller CN, Lyons MS. Impact of a low intensity and broadly inclusive ED care coordination intervention on linkage to primary care and ED utilization. Am J Emerg Med 2018;36(12):2219-2224.	Direct Social Need	2,142 patients	A care coordination specialist engaged in the ED to gauge medical access barriers and provide follow-up referral and scheduling assistance was effective in linking patients to a primary care home.
Gordon JA, Dupuie TA. Child health insurance outreach through the emergency department: a pilot study. Acad Emerg Med 2001;8(11):1088-1090.	Direct Social Need	78 patients	Case manager intervention for uninsured children in an ED resulted in 44% successfully obtaining government-sponsored insurance, demonstrating the ED as an important outreach site.
Gordon JA, Emond JA, Camargo CA Jr. The State Children's Health Insurance Program: a multicenter trial of outreach through the emergency department. Am J Public Health 2005;95(2):250-253.	Direct Social Need	115 patients	Handing out health insurance applications to uninsured children in an ED, particularly minority children, resulted in increased insurance enrollments compared to controls.
Hardin L, Kilian A, Muller L, Callison K, Olgren M. Cross-Continuum Tool Is Associated with Reduced Utilization and Cost for Frequent High-Need Users. West J Emerg Med 2017;18(2):189-200.	Direct Social Need	349 patients	An interdisciplinary, EMR flagging tool utilized to improve communication and defragment the care of 'high cost, high need' patients (to include social needs), including in the ED, decreased healthcare overutilization and cost of care.
Heath B, Salerno R, Hopkins A, Hertzig J, Caputo M. Pediatric critical care telemedicine in rural underserved emergency departments. Pediatr Crit Care Med 2009;10(5):588-591.	Disease Modification	63 consults in 10 rural EDs	Urgent subspecialty critical care consultations for children in rural EDs was feasible and resulted in a high degree of provider satisfaction.
Horwitz SM, Busch SH, Balestracci KM, Ellingson KD, Rawlings J. Intensive intervention improves primary care follow-up for uninsured emergency department patients. Acad Emerg Med 2005;12(7):647-652.	Direct Social Need	121 patients	An intensive ED case management intervention for uninsured patients resulted in increased primary care visits however, no difference in number of postintervention ED visits or hospital admissions.
Kanak M, Rutman L, Pirrotta EA, Giammona M, Bermudez M, Wang NE. Emergency department-based health insurance enrollment for children: does linkage lead to insurance retention and utilization?. Pediatr Emerg Care 2015;31(3):169-172.	Direct Social Need	443 patients	An ED insurance linkage program for uninsured children resulted in increased length of insurance enrollment and higher reenrollment rates than children referred from other settings.
Katznelson JH, Mills WA, Forsythe CS, Shaikh S, Tolleson-Rinehart S. Project CAPE: a high-fidelity, in situ simulation program to increase Critical Access Hospital Emergency Department	Provider Education	5 critical access hospitals (CAH), 150 participants	An in situ pediatric simulation program was implemented effectively in CAH EDs and resulted in increased provider comfort with pediatric patients.

provider comfort with seriously ill pediatric patients. Pediatr Emerg Care 2014;30(6):397-402.			
Kim TY, Mortensen K, Eldridge B. Linking uninsured patients treated in the emergency department to primary care shows some promise in Maryland. Health Aff (Millwood) 2015;34(5):796-804.	Direct Social Need	10,761 patients	Linking low-income or uninsured patients to a primary care clinic reduced subsequent non-emergency ED visits in specific subpopulations.
Kwan BM, Rockwood A, Bandle B, Fernald D, Hamer MK, Capp R. Community Health Workers: Addressing Client Objectives Among Frequent Emergency Department Users. J Public Health Manag Pract 2018;24(2):146-154.	Direct Social Need	1600 patients	Community health workers engaged effectively with adult Medicaid and/or Medicare patients with at least two ED visits in the prior year to improve linkage to community resources and provide healthcare navigation.
Lee KH, Davenport L. Can case management interventions reduce the number of emergency department visits by frequent users?. Health Care Manag (Frederick) 2006;25(2):155-159.	Direct Social Need	50 patients	Nurse case management intervention for ED patients without primary care access did not reduce overall subsequent ED visits.
Losonczy LI, Hsieh D, Wang M, et al. The Highland Health Advocates: a preliminary evaluation of a novel programme addressing the social needs of emergency department patients. Emerg Med J 2017;34(9):599-605.	Direct Social Need	154 patients	An ED-based help desk and medical-legal partnership using undergraduate volunteers to help patients navigate public resources and provide onsite legal and social work referral was an effective venue to help patients connect with a medical home and social resources.
Mahajan P, Stanley R, Ross KW, Clark L, Sandberg K, Lichtenstein R. Evaluation of an emergency department-based enrollment program for uninsured children. Ann Emerg Med 2005;45(3):245-250.	Direct Social Need	1803 patients	Enrollment of uninsured children into government-funded state and/or federal insurance programs in an inner-city ED was effective and generated revenue that paid for program costs.
Marr AL, Pillow T, Brown S. Southside medical homes network: linking emergency department patients to community care. Prehosp Disaster Med 2008;23(3):282-284.	Direct Social Need	7185 patients	A patient navigator providing primary care and community resource referral in an inner-city ED resulted in a 43% primary care follow-up rate.
McCarthy ML, Hirshon JM, Ruggles RL, Docimo AB, Welinsky M, Bessman ES. Referral of medically uninsured emergency department patients to primary care. Acad Emerg Med 2002;9(6):639-642.	Direct Social Need	655 patients	ED referral of uninsured patients without a primary care provider resulted in primary care follow-up visits for 22% of enrolled patients however, did not change subsequent ED utilization rates.
Michelen W, Martinez J, Lee A, Wheeler DP. Reducing frequent flyer emergency department visits. J Health Care Poor Underserved 2006;17(1 Suppl):59-69.	Direct Social Need	539 patients	Health priority specialists and community health workers engaging with low-income and socially marginalized ED patient cohorts, providing health and health care system education, and providing counseling on social/emotional issues, decreased non-emergent ED

			utilization.
Murnik M, Randal F, Guevara M, Skipper B, Kaufman A. Web-based primary care referral program associated with reduced emergency department utilization. Fam Med 2006;38(3):185-189.	Direct Social Need	756 patients	Implementing an enhanced referral system to family medicine homes from the ED was associated with decreased subsequent ED utilization by uninsured patients.
Nossel IR, Lee RJ, Isaacs A, Herman DB, Marcus SM, Essock SM. Use of Peer Staff in a Critical Time Intervention for Frequent Users of a Psychiatric Emergency Room. Psychiatr Serv 2016;67(5):479-481.	Direct Social Need	47 patients	Care coordinator specialists engaged with frequent users of the ED for psychiatric reasons (with disproportionate representation of social risk including disability and homelessness) to provide discharge planning assistance, benefit/insurance referral, and teach self-management skills. Participants increased their use of outpatient services over 12 months compared to controls, however no change was seen in subsequent ED use.
O'Brien GM, Stein MD, Fagan MJ, Shapiro MJ, Nasta A. Enhanced emergency department referral improves primary care access. Am J Manag Care 1999;5(10):1265-1269.	Direct Social Need	97 patients	ED patients without primary care and/or with primary care access barriers, provided with primary care follow-up appointment and instructions from the ED, were more likely to follow-up post-ED visit.
Schrader CD, Robinson RD, Blair S, et al. Common step-wise interventions improved primary care clinic visits and reduced emergency department discharge failures: a large-scale retrospective observational study. BMC Health Serv Res 2019;19(1):451. Published 2019 Jul 4.	Direct Social Need	41,427 patients	Step-wise case management interventions, including charity hospital-based insurance coverage and primary care referral, improved post-ED visit primary care follow-up.
Schumacher JR, Lutz BJ, Hall AG, et al. Feasibility of an ED-to-Home Intervention to Engage Patients: A Mixed-Methods Investigation. West J Emerg Med 2017;18(4):743-751	Direct Social Need	35 patients	Chronically ill older ED patients with limited health literacy and Medicare as a payer source were assigned to a post-ED visit ‘coaching intervention’ to improve patient engagement and subsequent primary care follow-up; no significant difference in subsequent doctor visits was noted however, the coaching intervention did reduce declines in patient engagement observed after usual post-ED care.
Shumway M, Boccellari A, O'Brien K, Okin RL. Cost-effectiveness of clinical case management for ED frequent users: results of a randomized trial. Am J Emerg Med 2008;26(2):155-164.	Direct Social Need	167 patients	Case management engagement with frequent ED users was associated with statistically significant reductions in psychosocial problems common among ED frequent users, including homelessness, alcohol use, lack of health insurance and social security income, and financial need.
Slobodkin D, Kitlas J, Zielske P. Opportunities not missed--systematic influenza and pneumococcal immunization in a public inner-city emergency department. Vaccine. 1998;16(19):1795-1802.	Disease Modification	1612 patients	An immunization program (influenza and pneumococcus) instituted in an inner-city ED, with predominantly minority patients with either government or no insurance, was feasible and successfully identified and immunized high-risk patients.

Southard EP, Neufeld JD, Laws S. Telemental health evaluations enhance access and efficiency in a critical access hospital emergency department. Telemed J E Health 2014;20(7):664-668.	Disease Modification	38 patients	Telemedicine implemented for mental health evaluation offered an effective intervention for mentally ill patients and provided more timely access to mental health evaluations in rural emergency departments.
Sterling SA, Seals SR, Jones AE, et al. The impact of the TelEmergency program on rural emergency care: An implementation study. J Telemed Telecare 2017;23(6):588-594.	Direct Social Need	9 rural hospitals	A TelEmergency program, utilizing a nurse practitioner (NP) onsite at a rural ED and an emergency medicine-trained, board-certified physician available via telemedicine model, resulted in increased rural ED admissions and high NP satisfaction rates.
Szilagyi PG, Rodewald LE, Humiston SG, et al. Effect of 2 urban emergency department immunization programs on childhood immunization rates. Arch Pediatr Adolesc Med 1997;151(10):999-1006.	Disease Modification	484 patients	An immunization program in an urban ED (two-thirds government insured) temporarily improved the immunization rates of the ED population, however substantial personnel time was required and is unlikely to be cost-effective.
Tsai MH, Xirasagar S, Carroll S, et al. Reducing High-Users' Visits to the Emergency Department by a Primary Care Intervention for the Uninsured: A Retrospective Study. Inquiry 2018;55:46958018763917.	Direct Social Need	6899 patients	Creation of a free clinic for uninsured adults on the healthcare campus reduced non-emergent ED visit rates from previous high-frequency ED users.
Wexler R, Hefner JL, Sieck C, et al. Connecting Emergency Department Patients to Primary Care. J Am Board Fam Med 2015;28(6):722-732.	Direct Social Need	72 patients	Connecting Medicaid ED patients without a primary care provider to a primary care office for post-ED follow-up did not decrease ED visits nor increase primary care use.
Zorc JJ, Scarfone RJ, Li Y, et al. Scheduled follow-up after a pediatric emergency department visit for asthma: a randomized trial. Pediatrics 2003;111(3):495-502.	Disease Modification	144 patients	Facilitation of primary care follow-up for pediatric, inner-city asthma patients, majority Black and enrolled in medical assistance programs, improved primary care follow-up but did not alter use of controller medications.

DISCRIMINATION/GROUP DISPARITIES			
Citation	**Type of Intervention**	**# affected by intervention**	**Summary**
Bone LR, Mamon J, Levine DM, et al. Emergency department detection and follow-up of high blood pressure: use and effectiveness of community health workers. Am J Emerg Med 1989;7(1):16-20.	Disease Modification	>800 patients	Community-trained paraprofessionals integrated into the ED improved appointment keeping as well as screening and counselling for hypertension and cardiovascular risk factors among African-American men.
Bristol S, Kostelec T, MacDonald R. Improving Emergency Health Care Workers' Knowledge,	Provider Education	135 participants	Cultural competency training improved collective participant knowledge about challenges facing the LGBT community and

Competency, and Attitudes Toward Lesbian, Gay, Bisexual, and Transgender Patients Through Interdisciplinary Cultural Competency Training. J Emerg Nurs 2018;44(6):632-639.			improved openness, support, and awareness of oppression.
Burner ER, Menchine MD, Kubicek K, Robles M, Arora S. Perceptions of successful cues to action and opportunities to augment behavioral triggers in diabetes self-management: qualitative analysis of a mobile intervention for low-income Latinos with diabetes. J Med Internet Res 2014;16(1):e25.	Disease Modification	24 participants	Participants enjoyed their experience with TExT-MED, a daily health behavior motivational and reminder texting system focused on diabetes, and believed it improved their diabetes management.
Burner E, Lam CN, DeRoss R, Kagawa-Singer M, Menchine M, Arora S. Using Mobile Health to Improve Social Support for Low-Income Latino Patients with Diabetes: A Mixed-Methods Analysis of the Feasibility Trial of TExT-MED + FANS. Diabetes Technol Ther 2018;20(1):39-48.	Disease Modification	22 patients	Adding a supporter and supporter curriculum (family and/or friend network) to TExtT-MED was feasible and acceptable to improve social support.
Flores G, Bridon C, Torres S, et al. Improving asthma outcomes in minority children: a randomized, controlled trial of parent mentors. Pediatrics 2009;124(6):1522-1532.	Disease Modification	112 patients	Trained parent mentors assigned to parents of minority asthmatic children in the ED, resulted in a reduction in asthma exacerbations and ED visits, as well as decreased missed workdays for parents.
Haber JJ, Atti S, Gerber LM, Waseem M. Promoting an obesity education program among minority patients in a single urban pediatric Emergency Department (ED). Int J Emerg Med 2015;8(1):38.	Disease Modification	100 children & their families	An educational intervention providing age appropriate diet and exercise information for Latino and African-American children was implemented in the ED. The majority of patients and families agreed the ED should provide education on obesity with many reported considering changes to diet and lifestyle with information gleaned from intervention.
Houry D, Hankin A, Daugherty J, Smith LS, Kaslow N. Effect of a Targeted Women's Health Intervention in an Inner-City Emergency Department. Emerg Med Int 2011;2011:543493.	Direct Social Need	157 patients	African-American women in the ED waiting room who screened positive for health risk behaviors (including IPV) who received targeted educational handouts based upon their screening results were more likely to connect with local resources and undertake risk-reducing action.
Joseph CLM, Mahajan P, Stokes-Buzzelli S, et al. Pilot study of a randomized trial to evaluate a Web-based intervention targeting adolescents presenting to the emergency department with acute asthma [published correction appears in	Disease Modification	65 patients	A web-based asthma management program (Puff City) introduced in the ED setting, targeting urban, primarily African-American adolescents, showed a trend toward reducing subsequent ED visits and demonstrated feasibility utilizing an intervention via technology.

Pilot Feasibility Stud. 2017 Oct 24;3:48]. Pilot Feasibility Stud 2017;4:5.			
McMichael B, Nickel A, Duffy EA, et al. The Impact of Health Equity Coaching on Patient's Perceptions of Cultural Competency and Communication in a Pediatric Emergency Department: An Intervention Design. J Patient Exp 2019;6(4):257-264.	Provider Education	7 participants	A protocol to train health equity coaches focused on local American Indian communities was implemented for ED providers. Participants reported a subsequent better understanding and awareness of one's own implicit bias and reported an increase in cultural sensitivity and knowledge of health disparities.
Zeidan AJ, Khatri UG, Aysola J, et al. Implicit Bias Education and Emergency Medicine Training: Step One? Awareness. AEM Educ Train 2018;3(1):81-85. Published 2018 Sep 24.	Provider Education	21 participants	A formalized educational intervention targeted on the topic of implicit bias was implemented for EM residents. Participants reported an increased awareness of implicit bias and its effect on patient care.

EXPOSURE TO VIOLENCE/CRIME			
Citation	**Type of Intervention**	**# affected by intervention**	**Summary**
Allert C, Chalkley C, Whitney J, Librett A. Domestic Violence: Efficacy of Health Provider Training in Utah. Prehospital and Disaster Medicine 1997;12(1):52-56.	Provider Education	266 participants	Healthcare professional training, including ED personnel, regarding interpersonal violence (IPV), improved participant's knowledge concerning referral options and the law.
Campbell JC, Coben JH, McLoughlin E, et al. An evaluation of a system-change training model to improve emergency department response to battered women. Acad Emerg Med 2001;8(2):131-138.	Provider Education	12 Hospitals/EDs	A system-change model of IPV ED training was effective in improving staff attitudes and knowledge about battered women however, despite improved screening protocols, actual practice change was more difficult to achieve.
Carson SM. Implementation of a Comprehensive Program to Improve Child Physical Abuse Screening and Detection in the Emergency Department. J Emerg Nurs 2018;44(6):576-581.	Provider Education	52 participants	An educational session resulted in significant increases in provider knowledge and confidence scores for child physical abuse screening and recognition however, there was no difference in providers' diagnostic coding of child physical abuse.
Carter PM, Walton MA, Zimmerman MA, Chermack ST, Roche JS, Cunningham RM. Efficacy of a Universal Brief Intervention for Violence Among Urban Emergency Department Youth. Acad Emerg Med 2016;23(9):1061-1070.	Direct Social Need	409 patients	A therapist delivered brief violence intervention in the ED for youth in a high- risk community ED increased self-efficacy for avoiding fighting and decreased the frequency of violent aggression.
Cheng TL, Haynie D, Brenner R, Wright JL, Chung SE, Simons-Morton B. Effectiveness of a	Direct Social Need	166 families	A community-based mentor program for assault injured youths in the ED reduced subsequent misdemeanor activity and increased self-

mentor-implemented, violence prevention intervention for assault-injured youths presenting to the emergency department: results of a randomized trial. Pediatrics 2008;122(5):938-946.			efficacy.
Cheng TL, Wright JL, Markakis D, Copeland-Linder N, Menvielle E. Randomized trial of a case management program for assault-injured youth: impact on service utilization and risk for reinjury. Pediatr Emerg Care 2008;24(3):130-136.	Direct Social Need	88 families	A violence prevention intervention program for ED youth and their families did not increase case management service utilization or reduce risk factors for injury.
Chisolm-Straker M, Richardson LD, Cossio T. Combating slavery in the 21st century: the role of emergency medicine. J Health Care Poor Underserved 2012;23(3):980-987.	Provider Education	104 participants	An educational intervention increased knowledge and confidence amongst participants with regards to human trafficking identification and emergency management.
Choo E, Guthrie KM, Mello M, et al. "I need to hear from women who have 'been there'": Developing a woman-focused intervention for drug use and partner violence in the emergency department. Partner Abuse 2016;7(2):193-220. Choo EK, Zlotnick C, Strong DR, Squires DD, Tapé C, Mello MJ. BSAFER: A Web-based intervention for drug use and intimate partner violence demonstrates feasibility and acceptability among women in the emergency department. Subst Abus 2016;37(3):441-449. Choo EK, Tapé C, Glerum KM, Mello MJ, Zlotnick C, Guthrie KM. "That's Where the Arguments Come in": A Qualitative Analysis of Booster Sessions Following a Brief Intervention for Drug Use and Intimate Partner Violence in the Emergency Department. Subst Abuse 2016;10:77-87.	Direct Social Need Direct Social Need Direct Social Need	23 patients 21 patients 18 patients	A web-based intervention to address violence and drug use among women patients in the ED was developed using qualitative input from a focus group. The intervention, along with motivational interviewing, was subsequently utilized for women affected by coexisting substance use disorder and IPV and found to be both acceptable and feasible. A booster call occurring two weeks after the initial intervention was implemented in a subsequent study.
Cunningham RM, Vaidya RS, Walton M, Maio RF. Training emergency medicine nurses and physicians in youth violence prevention. *Am J* Prev Med 2005;29(5 Suppl 2):220-225.	Provider Education	51 participants	Delivery of a case-based, one-hour continuing medical education presentation for ED physicians, residents, and nursing staff on youth violence prevention was feasible.
Cunningham RM, Walton MA, Goldstein A, et	Direct Social	533 patients	Universal computerized screening and brief intervention for multiple

al. Three-month follow-up of brief computerized and therapist interventions for alcohol and violence among teens. Acad Emerg Med 2009;16(11):1193-1207.	Need		risk behaviors among adolescents, including violent behavior, was feasible, well received, and effective at altering attitudes and self-efficacy.
Cunningham RM, Chermack ST, Zimmerman MA, et al. Brief motivational interviewing intervention for peer violence and alcohol use in teens: one-year follow-up. Pediatrics 2012;129(6):1083-1090.	Direct Social Need	607 patients	Follow-up studies supported the efficacy of brief interventions in the ED in reducing peer aggression and victimization as well as moderate and severe dating victimization for up to one-year following an ED visit.
Cunningham RM, Whiteside LK, Chermack ST, et al. Dating violence: outcomes following a brief motivational interviewing intervention among at-risk adolescents in an urban emergency department. Acad Emerg Med 2013;20(6):562-569.	Direct Social Need	266 patients	ED-based brief intervention to affect dating violence perpetration and victimization (secondary outcomes) demonstrated promising results (lower perpetration and victimization at 12 months as compared to control).
Ngo QM, Eisman AB, Walton MA, et al. Emergency Department Alcohol Intervention: Effects on Dating Violence and Depression. Pediatrics 2018;142(1):e20173525.	Direct Social Need	555 patients	Brief, ED-based interventions for youth with positive screens for alcohol and violence resulted in a decrease in the prevalence of self-reported aggression and alcohol consequences.
Walton MA, Chermack ST, Shope JT, et al. Effects of a brief intervention for reducing violence and alcohol misuse among adolescents: a randomized controlled trial. JAMA 2010;304(5):527-535.	Direct Social Need	491 patients	
De Vos E, Stone DA, Goetz MA, Dahlberg LL. Evaluation of a hospital-based youth violence intervention. Am J Prev Med 1996;12(5 Suppl):101-108.	Direct Social Need	20 patients	For inner-city adolescent victims of violent assault, an ED/hospital-based reinjury prevention program, including a violence prevention counselor and social worker, offered a unique opportunity for intervention and was feasible.
Donahue S, Schwien M, LaVallee D. Educating Emergency Department Staff on the Identification and Treatment of Human Trafficking Victims. J Emerg Nurs 2019;45(1):16-23.	Provider Education	75 participants	Participants reported improved knowledge and comfort regarding screening for human trafficking victims after participating in an online module.
Edwardsen EA, Morse D. Intimate partner violence resource materials: assessment of information distribution. J Interpers Violence	Direct Social Need	122 patients/visitors	Placing intimate partner violence resource pamphlets and cards in the ED was an effective means of educating community and promoting violence prevention.

2006;21(8):971-981.			
Egyud A, Stephens K, Swanson-Bierman B, DiCuccio M, Whiteman K. Implementation of Human Trafficking Education and Treatment Algorithm in the Emergency Department. J Emerg Nurs 2017;43(6):526-531.	Provider Education	99 participants	Education and a treatment algorithm were effective strategies to improve recognition and human trafficking victims.
Grace AM, Lippert S, Collins K, et al. Educating health care professionals on human trafficking. Pediatr Emerg Care 2014;30(12):856-861.	Provider Education	258 participants	A brief educational intervention increased ED provider knowledge and self-reported recognition of human trafficking victims.
Guenther E, Olsen C, Keenan H, Newberry C, Dean JM, Olson LM. Randomized prospective study to evaluate child abuse documentation in the emergency department. Acad Emerg Med 2009;16(3):249-257.	Provider Education	14 EDs	Educational interventions did not significantly affect ED health care provider documentation of child abuse; even when consideration of possible child abuse was documented in the chart, compliance with specific documentation recommendations was sporadic.
Harris MH, Weber M. Providing crisis counselors on-site to victims of domestic violence in the emergency department: a report of a local pilot project. S D J Med 2002;55(4):147-149.	Direct Social Need	63 patients	Providing crisis counselors on site to victims of domestic violence in the ED facilitated provision of services and local resources.
Heinze JE, Reischl TM, Bai M, et al. A Comprehensive Prevention Approach to Reducing Assault Offenses and Assault Injuries among Youth. Prev Sci 2016;17(2):167-176.	Direct Social Need	183 patients	Individual at-risk youth counseling in the ED was feasible as part of a comprehensive community-wide multi-pronged approach program to reduce local youth violence and injury.
Jordan KS, Moore-Nadler M. Children at risk of maltreatment: identification and intervention in the emergency department. Adv Emerg Nurs J 2014;36(1):97-106.	Provider Education	31 participants	An education intervention improved participant content knowledge and subsequent practical application of a screening process to assess for child abuse.
Juillard C, Cooperman L, Allen I, et al. A decade of hospital-based violence intervention: Benefits and shortcomings. J Trauma Acute Care Surg 2016;81(6):1156-1161.	Direct Social Need	466 patients	This ED-/hospital-based violence intervention program demonstrated sustained recidivism reduction and success in addressing client needs from a traditionally underserved population.
Kendall J, Pelucio MT, Casaletto J, et al. Impact of emergency department intimate partner violence intervention. J Interpers Violence 2009;24(2):280-306.	Provider Education and Direct Social Need	360 patients	While screening capture gaps were noted, training of ED nurses and physicians with subsequent implementation of a screening and intervention protocol to engage an IPV advocacy counselor for victims of domestic violence resulted in beneficial resource referrals (e.g. legal, law enforcement) and increased patient perception of safety.
Knapp JF, Dowd MD, Kennedy CS, Stallbaumer-Rouyer J, Henderson DP. Evaluation of a curriculum for intimate partner	Provider Education	87 participants	A two-hour training course designed to aid in the identification and intervention for IPV in the pediatric acute care setting resulted in significant, self-reported changes in attitudes, self-efficacy, and

violence screening in a pediatric emergency department. Pediatrics. 2006;117(1):110-116.			behaviors/clinical practice regarding screening for IPV in a pediatric ED.
Krasnoff M, Moscati R. Domestic violence screening and referral can be effective. Ann Emerg Med 2002;40(5):485-492.	Direct Social Need	475 patients	Universal screening, onsite IPV advocacy and crisis intervention, along with case manager follow-up, resulted in >50% of IPV victims receiving ongoing community-based services to address their experience of IPV.
Madsen TE, Riese A, Choo EK, Ranney ML. Effects of a web-based educational module on pediatric emergency medicine physicians' knowledge, attitudes, and behaviors regarding youth violence. West J Emerg Med 2014;15(5):615-622.	Provider Education	18 participants	An interactive web-based education module (and one-month booster) regarding youth violence (how to screen, counsel and refer youth violence-involved patients), influenced participants' knowledge and attitudes about youth violence prevention and may have affected behavior changes related to caring for youth violence victims in the ED.
Muelleman RL, Feighny KM. Effects of an emergency department-based advocacy program for battered women on community resource utilization. Ann Emerg Med 1999;33(1):62-66.	Direct Social Need	105 patients	An ED-based advocacy program for battered women resulted in increased utilization of shelters and shelter-based counseling.
Olson L, Anctil C, Fullerton L, Brillman J, Arbuckle J, Sklar D. Increasing emergency physician recognition of domestic violence. Ann Emerg Med 1996;27(6):741-746.	Provider Education AND Direct Social Need	Unknown # of participants/98 patients	A one-hour educational lecture to ED personnel in addition to chart modification via integrated ‘prompt’/screening question resulted in increased recognition of domestic violence.
Powers E, Tiyyagura G, Asnes AG, et al. Early Involvement of the Child Protection Team in the Care of Injured Infants in a Pediatric Emergency Department. J Emerg Med 2019;56(6):592-600.	Direct Social Need	192 patients	Implementation of a clinical pathway focused on early involvement of the child protection team and social work team for infants presenting to a pediatric emergency department with an injury concerning for abuse was successful.
Ranney ML, Pittman SK, Dunsiger S, et al. Emergency department text messaging for adolescent violence and depression prevention: A pilot randomized controlled trial. Psychol Serv 2018;15(4):419-428.	Direct Social Need	58 participants	A technology-augmented (text-based) violence and depression prevention intervention for high-risk adolescents seen in the ED demonstrated high feasibility and acceptability and showed promise for reducing violence amongst symptomatic youth.
Rhodes KV, Lauderdale DS, He T, Howes DS, Levinson W. "Between me and the computer": increased detection of intimate partner violence using a computer questionnaire. Ann Emerg Med 2002;40(5):476-484.	Direct Social Need	19 patients	Confidential computer-based screening for IPV has the potential to supplement current screening efforts and to allow providers to focus on assessment, counseling, and referral for those at risk.
Rhodes KV, Rodgers M, Sommers M, et al. Brief Motivational Intervention for Intimate Partner Violence and Heavy Drinking in the Emergency Department: A Randomized Clinical Trial [published correction appears in JAMA. 2017 Sep 26;318(12):1188]. JAMA	Direct Social Need	242 patients	For women experiencing IPV and heavy drinking, the use of a brief motivational intervention in the ED did not significantly reduce incidents of IPV.

2015;314(5):466-477.			
Schrager JD, Smith LS, Heron SL, Houry D. Does stage of change predict improved intimate partner violence outcomes following an emergency department intervention? Acad Emerg Med 2013;20(2):169-177.	Direct Social Need	154 patients	An ED-based computer screening and referral intervention for female IPV victims was a feasible method of health information dissemination and was associated with a high proportion of study participants taking protective action.
Showers J, Laird M. Improving knowledge of emergency physicians about child physical and sexual abuse. Pediatr Emerg Care 1991;7(5):275-277.	Provider Education	191 participants	Self-instructional programs regarding physical and sexual abuse resulted in a high level of knowledge transmission and was regarded as highly-valuable by participants.
Sixsmith DM, Weissman L, Constant F. Telephone follow-up for case finding of domestic violence in an emergency department. Acad Emerg Med 1997;4(4):301-304.	Direct Social Need	142 patients	A structured interview telephone follow-up with women deemed high-risk for domestic violence based upon ED presentation condition identified victims who had not been recognized during ED visit however, was labor intensive.
Tiyyagura G, Asnes AG, Leventhal JM, et al. Impact of Project ECHO on Community ED Providers' Perceptions of Child Abuse Knowledge and Access to Subspecialists for Child Abuse and Neglect. Acad Pediatr 2019;19(8):985-987.	Provider Education	41 participants	Case-based tele-education sessions lead by child maltreatment experts for ED providers, improved perceptions of knowledge and practice as well as access to subspecialty consultation.
Walton M, Cunningham R, Xue Y, Trowbridge M, Zimmerman M, Maio RF. Internet referrals for adolescent violence prevention: an innovative mechanism for inner-city emergency departments. J Adolesc Health 2008;43(3):309-312.	Direct Social Need	115 patients	Patient referral to a violence prevention website was a low-intensity intervention that could compliment other violence prevention strategies among adolescents.
Wolff J, Cantos A, Zun L, Taylor A. Enhanced Versus Basic Referral for Intimate Partner Violence in an Urban Emergency Department Setting. J Emerg Med 2017;53(5):771-777.	Direct Social Need	41 patients	Enhanced referral methods, including behavioral health resource brochures and paper copies of psychoeducational information about common mental health and IPV issues was effective in connecting IPV victims to behavioral health resources.
Zanoni J, Avila S, Murray LR, Guzman A, Levine D, Joseph K. Youth violence prevention curriculum evaluation: outcomes of a Cook County, Illinois community based partnership. Int Q Community Health Educ 2010;31(2):171-186.	Provider Education	225 participants	A youth violence prevention curriculum utilizing a train-the-trainer model was feasible and increased participant 'ownership' of youth violence from a public health perspective.
Zun LS, Downey LV, Rosen J. Violence prevention in the ED: linkage of the ED to a social service agency. Am J Emerg Med	Direct Social Need	96 patients	Extended case management (six months) for adolescent and young adult victims of IPV resulted in a reduction of self-reported reinjury rate but no difference in self-reported arrests, state-reported

2003;21(6):454-457.			incarcerations, or state-reported reinjuries via trauma registry.
Zun LS, Downey L, Rosen J. An emergency department-based program to change attitudes of youth toward violence. J Emerg Med 2004;26(2):247-251.	Direct Social Need	96 patients	The referral of young victims of violence from the ED to psychosocial services demonstrated a successful case management model.
Zun LS, Downey L, Rosen J. The effectiveness of an ED-based violence prevention program. Am J Emerg Med 2006;24(1):8-13.	Direct Social Need	96 patients	An ED-based violence prevention program for youth did not change attitudes of youth toward violence nor have an effect on family support.

FOOD INSECURITY			
Citation	**Type of Intervention**	**# affected by intervention**	**Summary**
Cullen D, Blauch A, Mirth M, Fein J. Complete Eats: Summer Meals Offered by the Emergency Department for Food Insecurity. Pediatrics 2019;144(4):e20190201.	Direct Social Need	367 meals delivered	Situating a Summer Food Service Program in an acute-care clinical setting was acceptable and was felt to have strong potential to improve the historically poor connection between families and critical community resources.
Martel ML, Klein LR, Hager KA, Cutts DB. Emergency Department Experience with Novel Electronic Medical Record Order for Referral to Food Resources. West J Emerg Med 2018;19(2):232-237.	Provider Education AND Direct Social Need	55 referrals	Referrals for food resources, communication between resources, and acceptance of assistance increased following ED provider education. Use of the EMR as a tool to refer patients to partner organizations for food resources is plausible.

HOUSING INSECURITY/ HOMELESSNESS			
Citation	**Type of Intervention**	**# affected by intervention**	**Summary**
Castillo EM, Chan TC, Tolia VM, et al. Effect of a Computerized Alert on Emergency Department Hepatitis A Vaccination in Homeless Patients During a Large Regional Outbreak. J Emerg Med 2018;55(6):764-768.	Disease Modification	465 patients	Electronic health record notification of high-risk patients (homeless) enabled providers to increase vaccination efforts to help control a community-wide outbreak.
Gabrielian S, Chen JC, Minhaj BP, et al. Feasibility and Acceptability of a Colocated Homeless-Tailored Primary Care Clinic and Emergency Department. J Prim Care	Direct Social Need	172 patients	A homeless tailored primary care clinic co-located in the ED was feasible although provider acceptability was mixed.

Community Health 2017;8(4):338-344.			
McCormack RP, Hoffman LF, Wall SP, Goldfrank LR. Resource-limited, collaborative pilot intervention for chronically homeless, alcohol-dependent frequent emergency department users. Am J Public Health 2013;103 Suppl 2(Suppl 2):S221-S224.	Disease Modification	20 patients	Case management outreach to chronically homeless alcoholics lead to decreased ED visits, shorter hospital stays, and increased shelter placement/housing for patients.
Witbeck G, Hornfeld S, Dalack GW. Emergency room outreach to chronically addicted individuals. A pilot study. J Subst Abuse Treat 2000;19(1):39-43.	Disease Modification	10 patients	A community-based outreach program for substance-abusing or chronically mentally ill homeless individuals who frequently utilize emergency medical services decreased emergency ambulance and ED services and resulted in successful linkage to substance abuse treatment, housing options, and payee services.

LANGUAGE/LITERACY/HEALTH LITERACY

Citation	**Type of Intervention**	**Participants/# affected**	**Summary**
Austin PE, Matlack R 2nd, Dunn KA, Kesler C, Brown CK. Discharge instructions: do illustrations help our patients understand them?. Ann Emerg Med 1995;25(3):317-320.	Direct Social Need	54 patients	Addition of illustrations to discharge instructions increased patient comprehension of discharge instructions with the greatest effect among patients with low health literacy.
Bloch SA, Bloch AJ. Using video discharge instructions as an adjunct to standard written instructions improved caregivers' understanding of their child's emergency department visit, plan, and follow-up: a randomized controlled trial. Pediatr Emerg Care 2013;29(6):699-704.	Direct Social Need	216 patients	Brief video discharge instructions provided greater comprehension and satisfaction at time of discharge and in the following days as compared to conventional discharge instructions.
Buckley BA, McCarthy DM, Forth VE, et al. Patient input into the development and enhancement of ED discharge instructions: a focus group study. J Emerg Nurs 2013;39(6):553-561.	Direct Social Need	14 participants	Direct patient involvement with discharge instruction modifications allowed for better coverage of diversity in health literacy.
Delp C, Jones J. Communicating information to patients: the use of cartoon illustrations to improve comprehension of instructions. Acad Emerg Med 1996;3(3):264-270	Direct Social Need	105 patients	Inclusion of cartoons in discharge instructions resulted in greater comprehension and daily compliance, as well as increased likelihood of reading instructions.
Griffey RT, Shin N, Jones S, et al. The impact of teach-back on comprehension of discharge instructions and satisfaction among emergency	Direct Social Need	212 patients	Teach-back method with discharge instructions resulted in increased comprehension of post-ED medication, self-care, and follow-up instructions; no change however in regard to patient satisfaction.

patients with limited health literacy: A randomized, controlled study. J Commun Healthc 2015;8(1):10-21.			
Hadden KB, McLemore H, White W, Marks MH, Gan JM, Seupaul RA. Implementation of a health-literate patient decision aid for chest pain in the emergency department. Patient Educ Couns 2020;103(4):864-869.	Disease Modification	169 patients	With decision aid, intervention arm was less likely to be admitted for chest pain and had higher knowledge scores. There was no difference in decisional conflict or patient satisfaction scores.
Herman A, Young KD, Espitia D, Fu N, Farshidi A. Impact of a health literacy intervention on pediatric emergency department use. Pediatr Emerg Care 2009;25(7):434-438	Direct Social Need	113 parents	A health aid book provided to parents to improve their health literacy for mild children's health complaints increased knowledge on nonurgent complaints, resulting in decreased ED utilization for low-acuity health concerns.
Ismail S, McIntosh M, Kalynych C, et al. Impact of Video Discharge Instructions for Pediatric Fever and Closed Head Injury from the Emergency Department. J Emerg Med 2016;50(3):e177-e183.	Disease Modification	31 patients	Video discharge instructions resulted in better understanding of diagnosis and course, regardless of education level.
Jolly BT, Scott JL, Sanford SM. Simplification of emergency department discharge instructions improves patient comprehension. Ann Emerg Med 1995;26(4):443-446	Direct Social Need	440 patients	Simplified discharge instructions resulted in improved comprehension in all demographic groups.
Koonce TY, Giuse NB, Storrow AB. A pilot study to evaluate learning style-tailored information prescriptions for hypertensive emergency department patients. J Med Libr Assoc 2011;99(4):280-289.	Disease Modification	38 patients	Individualizing discharge instructions to each patient's learning-style preference resulting in no change in knowledge assessment however, patients receiving the tailored information prescriptions reported higher levels of satisfaction with intervention materials.
Lion KC, Brown JC, Ebel BE, et al. Effect of Telephone vs Video Interpretation on Parent Comprehension, Communication, and Utilization in the Pediatric Emergency Department: A Randomized Clinical Trial. JAMA Pediatr 2015;169(12):1117-1125.	Direct Social Need	208 parents	Families with limited English proficiency who received video interpretation were more likely to correctly name the child's diagnosis and had fewer lapses in interpreter use. No difference in quality of communication or interpretation
Macy ML, Davis MM, Clark SJ, Stanley RM. Parental health literacy and asthma education delivery during a visit to a community-based pediatric emergency department: a pilot study. Pediatr Emerg Care 2011;27(6):469-474.	Disease Modification	129 parents	Written or video asthma education materials distributed at the time of an ED visit increased parental knowledge about the disease.
Nagamine WH, Ishida JT, Williams DR, Yamamoto RI, Yamamoto LG. Child literacy promotion in the emergency department. Pediatr	Direct Social Need	51 families	Child reading/literacy promotion material distributed in the ED resulted in no change noted in parent-child reading at home, either through book plus brochure or brochure alone.

Emerg Care 2001;17(1):19-21.			
Olives TD, Patel RG, Thompson HM, Joing S, Miner JR. Seventy-two-hour antibiotic retrieval from the ED: a randomized controlled trial of discharge instructional modality. Am J Emerg Med 2016;34(6):999-1005	Disease Modification	2521 patients	There was no significant association in antibiotic retrieval between three different discharge instruction modalities (standard, standard plus text, standard plus voicemail); however, those receiving text messages retrieved antibiotics more frequently compared to other groups.
Wilkin ZL. Effects of Video Discharge Instructions on Patient Understanding: A Prospective, Randomized Trial. Adv Emerg Nurs J 2020;42(1):71-78.	Disease Modification	30 patients	Video discharge instructions, used as an adjunct to standard verbal and written discharge methods, improved patient understanding and retention of their discharge instructions.
Yin HS, Dreyer BP, van Schaick L, Foltin GL, Dinglas C, Mendelsohn AL. Randomized controlled trial of a pictogram-based intervention to reduce liquid medication dosing errors and improve adherence among caregivers of young children. Arch Pediatr Adolesc Med 2008;162(9):814-822.	Disease Modification	113 caregivers	Medication counseling using plain language, pictogram-based medication instruction sheets used as part of medication counseling resulted in decreased medication dosing errors and improved adherence among multiethnic, low socioeconomic status caregivers.

SOCIOECONOMIC DISPARITIES/POVERTY			
Citation	**Type of Intervention**	**# affected by intervention**	**Summary**
Arora S, Peters AL, Agy C, Menchine M. A mobile health intervention for inner city patients with poorly controlled diabetes: proof-of-concept of the TExT-MED program. Diabetes Technol Ther 2012;14(6):492-496.	Disease Modification	23 patients	A program to engaged low-income, resource poor, diabetic ED patients in a daily text messaging program (TExT-MED) to improve health behaviors was feasible and resulted in excellent patient satisfaction.
Arora S, Peters AL, Burner E, Lam CN, Menchine M. Trial to examine text message-based mHealth in emergency department patients with diabetes (TExT-MED): a randomized controlled trial [published correction appears in Ann Emerg Med. 2017 Jun;69(6):802]. Ann Emerg Med 2014;63(6):745-54.e6.	Disease Modification	64 patients	While TExT-MED did not result in a statistically significant difference in HbA1C, trends toward HbA1C improvement and other secondary outcomes, including self-reported quality of life, did improve; these findings were magnified in the Spanish speaking sub-groups.
Asthana V, Sundararajan M, Ackah RL, et al. Heart failure education in the emergency department markedly reduces readmissions in	Disease Modification	45 patients	An ED educational intervention markedly decreased ED and hospital readmissions in un- and under-insured heart failure patients.

un- and under-insured patients. Am J Emerg Med 2018;36(12):2166-2171.			
Bernstein SL, Whitaker D, Winograd J, Brennan JA. An electronic chart prompt to decrease proprietary antibiotic prescription to self-pay patients. Acad Emerg Med 2005;12(3):225-231.	Provider Education AND Direct Social Need	61 providers, 447 patients	An educational intervention for prescribers and an electronic prescribing prompt displaying patient insurance status, decreased writing of proprietary antibiotics for self-pay ED patients.
Bernstein SL, D'Onofrio G, Rosner J, et al. Successful Tobacco Dependence Treatment in Low-Income Emergency Department Patients: A Randomized Trial. Ann Emerg Med 2015;66(2):140-147.	Disease Modification	386 patients	Low income self-pay or Medicaid ED smokers provided with a motivational interview and six weeks of nicotine replacement product, along with referral to smokers' 'quitline' services, improved tobacco abstinence rates.
Farber HJ, Oliveria L. Trial of an Asthma Education Program in an Inner-City Pediatric Emergency Department Pediatr Asthma Allergy Immunol 2004;17(2)107-115.	Disease Modification	28 patients	Education intervention (for patients and families) plus asthma medication provision (long- and short-acting) for Medicaid children with asthma in a pediatric ED improved use of long-acting asthma controller medication, but did not demonstrate a large impact on functional severity of asthma or subsequent hospital-based events.
Gielen AC, McKenzie LB, McDonald EM, et al. Using a computer kiosk to promote child safety: results of a randomized, controlled trial in an urban pediatric emergency department. Pediatrics 2007;120(2):330-339.	Direct Social Need	448 parents	A computer kiosk intervention for parents' in a pediatric ED serving predominantly low-income, urban families aimed at improving knowledge and behaviors regarding child safety seats, smoke alarm, and poison storage was a feasible mechanism for delivery of early childhood safety education.
Gittelman MA, Pomerantz WJ, Laurence S. An emergency department intervention to increase booster seat use for lower socioeconomic families. Acad Emerg Med 2006;13(4):396-400.	Direct Social Need	150 parents	Education in a pediatric ED did not convince parents to purchase and use booster seats; however, the combination of education with installation significantly increased booster seat use in this population.
Hayes BD, Zaharna L, Winters ME, Feemster AA, Browne BJ, Hirshon JM. To-Go medications for decreasing ED return visits. Am J Emerg Med 2012;30(9):2011-2014.	Disease Modification	243 patients	Providing patients with limited or no health insurance or limited access to medications with 'to-go' antibiotics resulted in a 50% reduction in ED return visits for select conditions.
Mahabee-Gittens EM, Khoury JC, Ho M, Stone L, Gordon JS. A smoking cessation intervention for low-income smokers in the ED. Am J Emerg Med 2015;33(8):1056-1061.	Disease Modification	200 caregivers	A brief pediatric ED-based smoking cessation intervention for caregivers of Medicaid recipients (patients) resulted in quit attempts and successful quits.
McKenzie LB, Roberts KJ, Kaercher RM, et al. Paediatric emergency department-based carbon monoxide detector intervention: a randomised trial. Inj Prev 2017;23(5):314-320.	Direct Social Need	131 parents	A pediatric ED-delivered intervention containing an educational tool paired with a carbon monoxide (CO) detector can be an effective method for increasing knowledge about CO poisoning, prevention and for appropriate use of a CO detector.

Smith SR, Jaffe DM, Fisher EB Jr, Trinkaus KM, Highstein G, Strunk RC. Improving follow-up for children with asthma after an acute Emergency Department visit [published correction appears in J Pediatr. 2005 Mar;146(3):413]. J Pediatr 2004;145(6):772-777.	Disease Modification	263 parents	Telephone coaching and a monetary incentive significantly increased the proportion of low-income urban parents who brought their children for asthma-planning visits, and decreased asthma symptoms shortly after asthma ED visits however, did not decrease ED visits or hospitalizations.
Smith SR, Jaffe DM, Highstein G, Fisher EB, Trinkaus KM, Strunk RC. Asthma coaching in the pediatric emergency department. Acad Emerg Med 2006;13(8):835-839.	Disease Modification	50 parents	Coaching during acute ED visits and a monetary incentive to return for a PCP visit for parents of uninsured or Medicaid-insured children in a pediatric ED did not increase follow-up with the PCP.

Abbreviations: emergency department (ED), primary care provider (PCP), nurse practitioner (NP), interpersonal violence (IPV)