Supplemental Digital Appendix 1

Search strategy for PubMed

Concept #1: Health Disparities

"Social determinants of health"[mesh] OR "health status disparities"[mesh] OR "Healthcare Disparities"[mesh] OR "health equity"[mesh] OR "Health literacy" [mesh] OR "Social Justice"[mesh] OR "community medicine"[mesh] OR "cultural competency"[mesh] OR "culturally competent care"[mesh] OR "gender identity"[mesh] OR "sexuality"[mesh] OR "sexual minorities"[mesh] OR "health services for transgender persons"[mesh] OR "refugees"[mesh] OR "emigrants and immigrants"[mesh] OR "racism"[mesh] OR "social discrimination"[mesh] OR "prejudice"[mesh] OR "vulnerable populations"[mesh] OR "medically underserved area"[mesh] OR "communication barriers"[mesh] OR "translating"[mesh] OR "socioeconomic factors"[mesh] OR "social class"[mesh] OR "medical indigency"[mesh] OR "medically uninsured"[mesh] OR "domestic violence"[mesh] OR "intimate partner violence"[mesh] OR "minority health"[mesh] OR "health services accessibility"[mesh] OR "violence"[Mesh] OR "Firearms"[Mesh] OR "environmental exposure"[Mesh] OR "educational status"[Mesh] OR "unemployment"[Mesh] OR "social determinants of health"[tiab] OR "social determinant of health"[tiab] OR "health social determinants"[tiab] OR "social determinant"[tiab] OR "social determinants"[tiab] OR "health status disparities"[tiab] OR "health status disparity"[tiab] OR "healthcare disparity"[tiab] OR "healthcare disparities"[tiab] OR "health disparities"[tiab] OR "health disparity"[tiab] OR "health care disparity"[tiab] OR "health care disparities"[tiab] OR "healthcare inequality"[tiab] OR "healthcare inequalities"[tiab] OR "health care inequality"[tiab] OR "health care inequalities"[tiab] OR "healthcare inequity"[tiab] OR "healthcare inequities"[tiab] OR "health care inequity"[tiab] OR "health care inequities"[tiab] OR "healthcare equity"[tiab] OR "healthcare equities"[tiab] OR "health care equity"[tiab] OR "health care equities"[tiab] OR "health inequity"[tiab] OR "health inequities"[tiab] OR "health equity"[tiab] OR "health equities"[tiab] OR "health literacy"[tiab] OR "social justice"[tiab] OR "obligations of society"[tiab] OR "obligation of society"[tiab] OR "common good"[tiab] OR "community medicine"[tiab] OR "community health"[tiab] OR "population health"[tiab] OR "cultural competence"[tiab] OR "cultural competency"[tiab] OR "cultural competencies"[tiab] OR "culturally competent"[tiab] OR "cultural care"[tiab] OR "culturally congruent"[tiab] OR "gender identity"[tiab] OR "gender identities"[tiab] OR sexuality[tiab] OR "sexual orientation"[tiab] OR bisexual[tiab] OR bisexuals[tiab] OR bisexuality[tiab] OR homosexual[tiab] OR homosexuals[tiab] OR homosexuality[tiab] OR lesbian[tiab] OR lesbians[tiab] OR lesbianism[tiab] OR gay[tiab] OR gays[tiab] OR queer[tiab] OR queers[tiab] OR LGBT[tiab] OR LGBTQ[tiab] OR transsexualism[tiab] OR transsexual[tiab] OR transsexuals[tiab] OR "sexual minority"[tiab] OR "sexual minorities"[tiab] OR "gender minority"[tiab] OR "gender minorities"[tiab] OR "gender queer"[tiab] OR

genderqueer[tiab] OR intersex[tiab] OR transgender[tiab] OR transgenders[tiab] OR transgendered[tiab] OR "transgender medicine"[tiab] OR refugees[tiab] OR refugee[tiab] OR "immigrant health"[tiab] OR immigrants[tiab] OR immigrant[tiab] OR alien[tiab] OR aliens[tiab] OR bias[tiab] OR biases[tiab] OR biased[tiab] OR racism[tiab] OR race[tiab] OR racist[tiab] OR discrimination[tiab] OR ageism[tiab] OR homophobia[tiab] OR homophobic[tiab] OR "anti homosexual"[tiab] OR "anti gay"[tiab] OR sexism[tiab] OR sexist[tiab] OR xenophobia [tiab] OR xenophobic [tiab] OR prejudice[tiab] OR prejudices[tiab] OR prejudicial[tiab] OR prejudiced[tiab] OR "vulnerable population"[tiab] OR "vulnerable populations"[tiab] OR "sensitive population"[tiab] OR "sensitive populations"[tiab] OR Disadvantaged[tiab] OR underserved[tiab] OR "Medically underserved"[tiab] OR "cross-cultural communication"[tiab] OR "communication barrier"[tiab] OR "communication barriers"[tiab] OR "language barrier"[tiab] OR "language barriers"[tiab] OR "medical interpreter"[tiab] OR "medical interpreters"[tiab] OR "medical interpretation"[tiab] OR translating[tiab] OR translation[tiab] OR translate[tiab] OR translator [tiab] OR translators[tiab] OR "socioeconomic status"[tiab] OR "socioeconomic factor"[tiab] OR "socioeconomic factors" [tiab] OR "social class" [tiab] OR "social classes" [tiab] OR "medical indigency" [tiab] OR "medical indigencies" [tiab] OR indigent[tiab] OR uninsured[tiab] OR underinsured[tiab] OR "domestic violence"[tiab] OR "family violence"[tiab] OR "domestic abuse"[tiab] OR "family abuse"[tiab] OR "child abuse"[tiab] OR "elder abuse"[tiab] OR "spouse abuse"[tiab] OR "spousal abuse"[tiab] OR "partner abuse"[tiab] OR IPV[tiab] OR "intimate partner violence"[tiab] OR "intimate partner abuse"[tiab] OR "dating violence"[tiab] OR "gender violence"[tiab] OR "minority health"[tiab] OR Minority[tiab] OR Minorities[tiab] OR "health services accessibility"[tiab] OR "health services availability"[tiab] OR "Accessibility of health services"[tiab] OR "availability of health services"[tiab] OR "access to health care"[tiab]

Concept #2: Medical Resident Education

"Education, Medical, Graduate"[mesh] OR "Internship and residency"[mesh] OR "Teaching"[mesh] OR "curriculum"[mesh] OR "Models, Educational"[mesh] OR "problem-based learning"[mesh] OR "graduate medical education"[tiab] OR "residency program"[tiab] OR "residency programs"[tiab] OR "internship"[tiab] OR "internships"[tiab] OR "medical resident"[tiab] OR "medical residents"[tiab] OR "residency"[tiab] OR "residencies"[tiab] OR "house staff"[tiab] OR "medical residency"[tiab] OR "medical instruction"[tiab] OR "teaching"[tiab] OR "curriculum"[tiab] OR "curricula"[tiab] OR "educational models"[tiab] OR "pedagogy"[tiab] OR "pedagogies"[tiab] OR "educational model"[tiab] OR "teaching method"[tiab] OR "teaching methods"[tiab] OR "problem-based learning"[tiab] OR "problem-based curricula"[tiab] OR "problem based learning"[tiab] OR "problem based curricula"[tiab] OR "service learning"[tiab] OR "experiential learning"[tiab] OR "interprofessional education"[tiab] OR "community based education"[tiab] OR "community-based education"[tiab] OR "community based learning"[tiab] OR "community-based learning"[tiab] OR "explanatory model"[tiab] OR "biopsychosocial model"[tiab] OR "physician-in-training"[tiab] OR "learning mastery"[tiab] OR "patient centered communication"[tiab] OR "patient-centered communication"[tiab]

Concept #3: Specialty

"Physicians, Primary Care"[mesh] OR "primary health care"[mesh:noexp] OR "Pediatrics"[mesh] OR "Pediatricians"[mesh] OR "Family Practice"[mesh] OR "Physicians, Family"[mesh] OR "General practice"[mesh] OR "general practitioners"[mesh] OR "Internal medicine"[mesh] OR "primary care"[tiab] OR "primary health care"[tiab] OR "primary healthcare"[tiab] OR "pediatrics"[tiab] OR Pediatrician[tiab] OR Pediatricians[tiab] OR "family medicine"[tiab] OR "family practice"[tiab] OR "family practices"[tiab] OR "family physician"[tiab] OR "family physicians"[tiab] OR "general practice"[tiab] OR "general medicine"[tiab] OR "general practitioner"[tiab] OR "general practitioners"[tiab] OR "Internal medicine"[tiab]

Final Search Strategy (filters have been incorporated into search query)

("Social determinants of health"[mesh] OR "health status disparities"[mesh] OR "Healthcare Disparities"[mesh] OR "health equity"[mesh] OR "Health literacy" [mesh] OR "Social Justice"[mesh] OR "community medicine"[mesh] OR "cultural competency"[mesh] OR "culturally competent care"[mesh] OR "gender identity"[mesh] OR "sexuality"[mesh] OR "sexual minorities"[mesh] OR "health services for transgender persons"[mesh] OR "refugees"[mesh] OR "emigrants and immigrants"[mesh] OR "racism"[mesh] OR "social discrimination"[mesh] OR "prejudice"[mesh] OR "vulnerable populations"[mesh] OR "medically underserved area"[mesh] OR "communication barriers"[mesh] OR "translating"[mesh] OR "socioeconomic factors"[mesh] OR "social class"[mesh] OR "medical indigency"[mesh] OR "medically uninsured"[mesh] OR "domestic violence"[mesh] OR "intimate partner violence"[mesh] OR "minority health"[mesh] OR "health services accessibility"[mesh] OR "violence"[Mesh] OR "Firearms"[Mesh] OR "environmental exposure"[Mesh] OR "educational status"[Mesh] OR "unemployment"[Mesh] OR "social determinants of health"[tiab] OR "social determinant of health"[tiab] OR "health social determinants"[tiab] OR "social determinant"[tiab] OR "social determinants"[tiab] OR "health status disparities"[tiab] OR "health status disparity"[tiab] OR "healthcare disparity"[tiab] OR "healthcare disparities"[tiab] OR "health disparities"[tiab] OR "health disparity"[tiab] OR "health care disparity"[tiab] OR "health care disparities"[tiab] OR "healthcare inequality"[tiab] OR "healthcare inequalities"[tiab] OR "health care inequality"[tiab] OR "health care inequalities"[tiab] OR "healthcare inequity"[tiab] OR "healthcare inequities"[tiab] OR "health care inequity"[tiab] OR "health care inequities"[tiab] OR "healthcare equity"[tiab] OR "healthcare equities"[tiab] OR "health care equity"[tiab] OR "health care equities"[tiab] OR "health inequity"[tiab] OR "health inequities"[tiab] OR "health equity"[tiab] OR "health equities"[tiab] OR "health literacy"[tiab] OR "social justice"[tiab] OR "obligations of society"[tiab] OR "obligation of society"[tiab] OR "common good"[tiab] OR "community medicine"[tiab] OR "community health"[tiab] OR "population health"[tiab] OR "cultural competence"[tiab] OR "cultural competency"[tiab] OR "cultural competencies"[tiab] OR "culturally competent"[tiab] OR "cultural care"[tiab] OR "culturally congruent"[tiab] OR "gender identity"[tiab] OR "gender identities"[tiab] OR sexuality[tiab] OR "sexual orientation"[tiab] OR bisexual[tiab] OR bisexuals[tiab] OR bisexuality[tiab] OR homosexual[tiab] OR homosexuals[tiab]

OR homosexuality[tiab] OR lesbian[tiab] OR lesbians[tiab] OR lesbianism[tiab] OR gay[tiab] OR gays[tiab] OR queer[tiab] OR queers[tiab] OR LGBT[tiab] OR LGBTQ[tiab] OR transsexualism[tiab] OR transsexual[tiab] OR transsexuals[tiab] OR "sexual minority"[tiab] OR "sexual minorities"[tiab] OR "gender minority"[tiab] OR "gender minorities"[tiab] OR "gender queer"[tiab] OR genderqueer[tiab] OR intersex[tiab] OR transgender[tiab] OR transgenders[tiab] OR transgendered[tiab] OR "transgender medicine"[tiab] OR refugees[tiab] OR refugee[tiab] OR "immigrant health"[tiab] OR immigrants[tiab] OR immigrant[tiab] OR alien[tiab] OR aliens[tiab] OR bias[tiab] OR biases[tiab] OR biased[tiab] OR racism[tiab] OR race[tiab] OR racist[tiab] OR discrimination[tiab] OR ageism[tiab] OR homophobia[tiab] OR homophobic[tiab] OR "anti homosexual"[tiab] OR "anti gay"[tiab] OR sexism[tiab] OR sexist[tiab] OR xenophobia [tiab] OR xenophobic [tiab] OR prejudice[tiab] OR prejudices[tiab] OR prejudicial[tiab] OR prejudiced[tiab] OR "vulnerable population"[tiab] OR "vulnerable populations"[tiab] OR "sensitive population"[tiab] OR "sensitive populations"[tiab] OR Disadvantaged[tiab] OR underserved[tiab] OR "Medically underserved"[tiab] OR "cross-cultural communication"[tiab] OR "communication barrier"[tiab] OR "communication barriers"[tiab] OR "language barrier"[tiab] OR "language barriers"[tiab] OR "medical interpreter"[tiab] OR "medical interpreters"[tiab] OR "medical interpretation"[tiab] OR translating[tiab] OR translation[tiab] OR translate[tiab] OR translator [tiab] OR translators[tiab] OR "socioeconomic status"[tiab] OR "socioeconomic factor"[tiab] OR "socioeconomic factors" [tiab] OR "social class" [tiab] OR "social classes" [tiab] OR "medical indigency" [tiab] OR "medical indigencies" [tiab] OR indigent[tiab] OR uninsured[tiab] OR underinsured[tiab] OR "domestic violence"[tiab] OR "family violence"[tiab] OR "domestic abuse"[tiab] OR "family abuse"[tiab] OR "child abuse"[tiab] OR "elder abuse"[tiab] OR "spouse abuse"[tiab] OR "spousal abuse"[tiab] OR "partner abuse"[tiab] OR IPV[tiab] OR "intimate partner violence"[tiab] OR "intimate partner abuse"[tiab] OR "dating violence"[tiab] OR "gender violence"[tiab] OR "minority health"[tiab] OR Minority[tiab] OR Minorities[tiab] OR "health services accessibility"[tiab] OR "health services availability"[tiab] OR "Accessibility of health services"[tiab] OR "availability of health services"[tiab] OR "access to health care"[tiab]) AND ("Education, Medical, Graduate"[mesh] OR "Internship and residency"[mesh] OR "Teaching"[mesh] OR "curriculum"[mesh] OR "Models, Educational"[mesh] OR "problem-based learning"[mesh] OR "graduate medical education"[tiab] OR "residency program"[tiab] OR "residency programs"[tiab] OR "internship"[tiab] OR "internships"[tiab] OR "medical resident"[tiab] OR "medical residents"[tiab] OR "residency"[tiab] OR "residencies"[tiab] OR "house staff"[tiab] OR "medical residency"[tiab] OR "medical instruction"[tiab] OR "teaching"[tiab] OR "curriculum"[tiab] OR "curricula"[tiab] OR "educational models"[tiab] OR "pedagogy"[tiab] OR "pedagogies"[tiab] OR "educational model"[tiab] OR "teaching method"[tiab] OR "teaching methods"[tiab] OR "problem-based learning"[tiab] OR "problem-based curricula"[tiab] OR "problem based learning"[tiab] OR "problem based curricula"[tiab] OR "service learning"[tiab] OR "experiential learning"[tiab] OR "interprofessional education"[tiab] OR "community based education"[tiab] OR "community-based education"[tiab] OR "community based learning"[tiab] OR "community-based learning"[tiab] OR "explanatory model"[tiab] OR "biopsychosocial model"[tiab] OR "physician-in-training"[tiab] OR "learning mastery"[tiab] OR "patient centered communication"[tiab] OR "patient-centered communication"[tiab]) AND

("Physicians, Primary Care"[mesh] OR "primary health care"[mesh:noexp] OR "Pediatrics"[mesh] OR "Pediatricians"[mesh] OR "Family Practice"[mesh] OR "Physicians, Family"[mesh] OR "General practice"[mesh] OR "general practitioners"[mesh] OR "Internal medicine"[mesh] OR "primary care"[tiab] OR "primary health care"[tiab] OR "primary healthcare"[tiab] OR "pediatrics"[tiab] OR Pediatrician[tiab] OR Pediatricians[tiab] OR "family medicine"[tiab] OR "family practice"[tiab] OR "family practices"[tiab] OR "family physician"[tiab] OR "family physicians"[tiab] OR "general practice"[tiab] OR "general medicine"[tiab] OR "general practitioner"[tiab] OR "general practitioners"[tiab] OR "Internal medicine"[tiab]) AND ("2007/01/01"[PDat] : "3000/12/31"[PDat]) AND English[lang])

Supplemental Digital Appendix 2

Characteristics of 16 Programs[a] Providing Training on the Social Determinants of Health for Primary Care Residents, That Did Not Report Outcomes

First author (Year)	Residency	PGY	Topic	Intervention
Furin (2006)[33]	IM	1-3	SDH, CH	*Content:* Residents received formal training on research methodology and selected a primary field site for clinical training and research. Residents spent a total of nine months working on a selected project over the course of residency. Residents maintained continuity clinics, with one being in a resource-poor site. *Contact time:* Longitudinal over four years *Delivered by:* Faculty from associated school of public health. Residents matched with primary clinical and research mentor in the field of health disparities.
Gregg[b] (2008)[34]	IM	1-3	SDH, CH	*Content:* Training implemented in two phases. Phase 1: residents attended didactic sessions on U.S. health policy, health care safety net, motivational interviewing, addiction medicine and others. Residents completed a variety of experiential learning sessions such as exposure to local community organizations. Phase 2: residents choose one of three pathways: addiction, primary care or community outreach. *Contact time:* Phase 1: Three-hour didactic sessions, three-hour experiential learning. Sessions were one day per week during a four-week ambulatory block Phase 2: Two days per week experiential learning

First author (Year)	Residency	PGY	Topic	Intervention
				Delivered by: Academic-community partnership: Internal medicine residency faculty and staff at a community organizations
Hufford (2009)[35]	P	1-3	CH	*Content:* Residents participated in community site tours and didactic sessions on principles of asset-based community development. Residents collaborated with community members to develop individual projects. In final their year of training, residents implemented and evaluated their projects. *Contact time:* Longitudinal over three years *Delivered by:* Community-based "collaborative coordinators" were tasked with guiding residents' experiential learning and project development.
Shakil (2009)[36]	FM	1-3	CH	*Content:* During PGY1, residents attended didactics on community health, attended community action research journal clubs and volunteered in community health activities. In PGY2, residents partnered with a community health organization to formulate a research question. In their final year, residents implemented and evaluated their research project. *Contact time:* Eight journal club sessions, with additional didactic clinical and educational sessions, four-week community action research rotation and three elective months with community partners. Longitudinally implemented over three years *Delivered by:* NS
Oates[b] (2010)[37]	IM, FM, P	1-3	HL	*Content:*

First author (Year)	Residency	PGY	Topic	Intervention
				Interns attended seminars on health literacy. Junior residents participated in a conference led by a clinical pharmacist to review barriers to patient understanding and adherence to medications. Pharmacists also modeled medication reviews with patient participants during these conferences. Lastly, pharmacists shadowed residents during clinical sessions to observe and provide feedback. *Contact time:* Three-hour multi-media seminar during one-month primary care seminar block, pharmacist-led clinical conferences, and during structured feedback sessions with pharmacists *Delivered by:* NS
Saravana (2011)[38]	IM	1-3	CH	*Content:* Residents attended didactic sessions on the history of public health, functions of public health department and community-orientated primary care models. Residents attended a workshop on conducting needs assessments and focus groups. Residents partnered with a community health partner to complete a practicum project. *Contact time:* Didactics occurred for two hours per week and practicum work occurred for three hours per week during a one-month ambulatory block *Delivered by:* Course director with public health training; lecturers included the nursing director of the public health department, faculty with experience doing health advocacy work, and anthropologist with experience in community-based participatory research.
Stewart (2012)[39]	IM, P	1-4	UH	*Content:* Residents in the urban health residency program attended didactic and experiential learning sessions focused on issues that disproportionately impact an urban inner-city and underserved patients. Residents worked in continuity clinics in one of the city's most

First author (Year)	Residency	PGY	Topic	Intervention
				disadvantaged neighborhoods to learn to minimize barriers and maximize health care opportunities for patients. *Contact Time:* Longitudinal over entire residency period *Delivered by:* Community health center faculty
Kimbrough-Sugick[b] (2013)[40]	IM	1-3	SDH	*Content:* Residents completed interactive web-based modules that depicted diverse groups of patients in different clinical settings to highlight the role of SDH, cultural and language barriers, health literacy, and stigma on health. The modules highlighted the role that residents can play to help to eliminate health disparities and include assessment questions. *Contact time:* NS *Delivered by:* Web-based module
McCormick (2013)[41]	IM	1-3	SDH	*Content:* Residents participated in didactic sessions on health policy, financing, SDH, physician advocacy and organizing for social change. Groups of residents worked together to identify a clinical/health care system barriers, conducted a literature review on the barriers, formulated a solution, and conducted an advocacy campaign as the project-based learning component of the curriculum. *Contact time:* Twenty-seven half-day sessions over one year *Delivered by:*

First author (Year)	Residency	PGY	Topic	Intervention
				Faculty members
Canada[b] (2014)[42]	IM	1-3	CH	*Content:* Residents participated in didactics on SDH, gun violence, community health centers, structural causes of disease, racial disparities and others. Residents spent one month at a community clinic and toured non-profit organizations that address social determinants. *Contact time:* One-month rotation during junior year and longitudinal lectures series throughout junior and senior years *Delivered by:* Researchers and practitioners working in academics, public health or the community
Zakaria (2015)[43]	IM	1-3	CH	*Content:* Residents attended workshops focused on health SDH, disparities research, health policy and working with public health organizations. Residents were required to complete one community-based, structured, mentored project over the course of three years (e.g., organizing health fairs). *Contact time:* Twelve 1-hour workshops *Delivered by:* Residency directors
Chamberlain (2016)[44]	P	NS	POV	*Content:* Web-based modules were developed on the following topics: epidemiology of child poverty, SDH, biomedical influences of poverty and leadership and taking action. The modules included assignments to complete prior to the session and in-person sessions to discuss module topics. *Contact time:* One-hour in-person discussion section. Time for preparation and follow-up: NS

First author (Year)	Residency	PGY	Topic	Intervention
				Delivered by: Web-based modules
Essien (2016)[45]	IM	1-3	CH	*Content:* Residents tailored their training by completing rotations is advocacy and community leadership, global health, homeless health, prison health, addiction medicine, refugee/immigrant health and others. Residents completed a service initiative or capstone as their final project. *Contact time:* Longitudinal experience over three years *Delivered by:* Residents assigned faculty mentorship
Hassan[b] (2016)[46]	IM	2	SDH	*Content:* Residents attended seminars on the following topics: SDH, immigration, incarceration, identifying socioeconomic and environmental risks and making referrals to clinic and community resources. Residents attended journal club sessions on required readings. Faculty attended seminars on evidence based teaching points for preceptors. *Contact time:* Intervention completed during ambulatory clinic blocks *Delivered by:* NS
Klein (2016)[47]	FM	NS	LGBTQ	*Content:* Residents participated in a written word cloud activity to share thoughts and explore assumptions/biases/stereotypes about LGBTQ patients. They learned about common terminology and definitions using the "Genderbread Person" activity. Small group case-based discussions were used to reinforce the concepts. Residents were trained to use

First author (Year)	Residency	PGY	Topic	Intervention
				inclusive language while taking a history during clinic visits. Residents attended lectures on the health disparities facts between LGBTQ patients and heterosexual patients. *Contact time:* NS *Delivered by:* NS
Vessell[b] (2016)[48]	IM	NS	SDH	*Content:* Residents participate in community site visits, clinical electives and noon conferences that featured presentations on topics such as refugee and immigrant health, homelessness, reproductive rights, legal advocacy, health policy and systems. Residents could take a two-week elective to work in correctional health setting and learn about incarcerated individuals' health needs. *Contact time:* Monthly noon conferences (period of time not specified) and a two-week elective *Delivered by:* Speakers invited from city agencies

Abbreviations: PGY indicates post graduate year; IM, internal medicine; SDH, social determinants of health/health disparities; CH, community/population health; P, pediatrics; FM, family medicine; NS, not specified; HL, Health literacy; UH, urban health; POV, poverty; LGBTQ, lesbian, gay, bisexual, transgender, queer health

[a]These 16 programs and 27 that did report outcomes (see Supplemental Digital Appendix 3) were identified in a 2017 scoping review of the literature.

[b]Authors reported plan to evaluate program; data not formally analyzed at time of publication.

Supplemental Digital Appendix 3

Characteristics of 27 Programs[a] Providing Training on the Social Determinants of Health for Primary Care Residents, That Did Report Outcomes

First author (Year)	Residency	PGY	Topic	Intervention
Haist (2007)[49]	IM	1-3	DV	*Content:* Residents attended a workshop to learn about DV signs, screening, safety planning and state law. Residents practiced interviewing standardized patients in small groups. After practicing, expert faculty reviewed the cases and debriefed. *Contact time:* One 2-hour workshop *Delivered by:* Faculty experts
Willis (2007)[50]	P	2	CH	*Content:* Residents participated in interactive discussions with low-income families; worked as a team with local agencies to address a specific community need by developing a focused plan; and implemented community initiatives (e.g., designing interventions to improve nutritional habits). *Contact time:* Four-week community rotation *Delivered by:* NS
Strelnick (2008)[51]	IM, FM, P	1-3	SDH	*Content:*

First author (Year)	Residency	PGY	Topic	Intervention
				Residents were oriented to the community by visiting local organizations and completing a community-mapping exercise. Residents took core courses on topics such as medical Spanish, interviewing skills and psychosocial clinical consultations. All residents were required to design and implement a social medicine project over the course of their residency. *Contact time:* Community orientation completed in two clinical sessions per week for one month. Courses were conducted during a one-month block each year. Small group session seminars were held every morning for four weeks. *Delivered by:* Faculty and guest lecturers
Jirasevijinda (2010)[52]	FM, P	1-3	SDH	*Content:* Residents played a Jeopardy! style game with five categories: (1) Roots (history and immigration), (2) lay of the land (geography), (3) educational & cultural (community resources), (4) family places & people (community resources), and (5) health of the borough (challenges and opportunities). *Contact time:* Integrated into morning lectures during a year-long monthly workshop *Delivered by:* Pediatric faculty
Klein (2010)[53]	P	1	SDH	*Content:* Interns were oriented to the community by visiting local public benefit organizations and shadowing case workers. Didactic sessions included topics on medical legal partnerships, budgeting on fixed incomes, public benefits, housing and educational rights and laws. Residents completed a "memo-to-myself" reflection on what they learned and how the new knowledge would impact their practice.

First author (Year)	Residency	PGY	Topic	Intervention
				Contact time: One day during two-week block *Delivered by:* Co-taught by a pediatrician, legal aid attorneys, paralegals and social workers
Fornari (2011)[54]	IM, FM, P	1	SDH	*Content:* Residents participated in a series of lectures on sociocultural analysis of clinical problems and attended "advocacy lunches" where faculty discussed their community projects to promote resident participation. Residents were oriented to the community with a walking/bus tour of the neighborhood and meeting community leaders. *Contact time:* Interns were relieved of inpatients duties during orientation month *Delivered by:* NS
Hayashi (2011)[55]	FM	1	CH	*Content:* Using geographic information system (GIS) maps, residents were introduced to their community. Residents attended a seminar focused on 1) data types, availability and uses, 2) community characteristics and patient visit patterns, and 3) relevance and utility of the information to practice medicine. *Contact time:* Training occurred during an intern-orientation seminar *Delivered by:* Faculty with expertise in community-oriented primary care
Klein (2011)[56]	P	1-2	SDH	*Content:* Residents shadowed social workers in clinic as they obtained patient social histories. Social workers then observed the residents to provide feedback. Residents attended a half-day, guided immersion activity to become familiar with community resources and public

First author (Year)	Residency	PGY	Topic	Intervention
				benefits. Residents also observed legal interviews through the medical-legal partnership in clinic. *Contact time:* Incorporated into a mandatory two-week advocacy rotation *Delivered by:* Co-taught with medical-legal partnerships
Kuo (2011)[57]	P	1-3	SDH	*Content:* The Community Health Advocacy Training (CHAT) consisted of: 1) continuity clinics in federally qualified health centers for 3 years, 2) longitudinal community/advocacy projects and 3) seminars with guest speakers on public health, community and advocacy. *Contact time:* Four-week block each PGY year *Delivered by:* Faculty preceptors trained in public health and guest speakers
Zickafoose (2011)[58]	FM, P	1-3	EH	*Content:* Residents were oriented to home environmental health principles. Residents identified infants in continuity clinics and geriatric patients through a special primary care program. Residents accompanied home health specialists for inspection of patient's home. Based on visit, residents provided assessment, family education and behavior interventions at routine primary care visits. *Contact time:* NS *Delivered by:* Home assessments performed by certified "Healthy Homes" practitioner from local community based environmental health organization

First author (Year)	Residency	PGY	Topic	Intervention
Strosaker (2012)[59]	P	1	HL	*Content:* Residents participated in structured simulations of children with complex psycho-social histories using standardized patients. The simulations were designed to improve communication skills in areas of context of care. Sessions were recorded and evaluated by faculty. Residents received individual feedback then participated in follow-up simulations. *Contact time:* NS *Delivered by:* Faculty members and social workers
Catalanotti (2013)[60]	IM	1-3	CH	*Content:* Volunteer guest lecturers led two 75-minute sessions in foundational knowledge, career development and health needs of vulnerable communities. Residents spent six afternoon sessions at local health centers focused on the medically underserved and one afternoon per week at a continuity clinic. *Contact time:* Two-week community health elective *Delivered by:* Community physicians and faculty, governmental employees and local health advocates
Galiatsatos (2013)[61]	IM	NS	HL	*Content:* Lay Health Educator Program (LEHP): Residents presented at weekly seminars on common medical conditions and health topics. Residents presented to an audience of representatives from local religious congregations. *Contact time:* One 2-hour evening per week over 10 weeks total *Delivered by:*

First author (Year)	Residency	PGY	Topic	Intervention
				Seminars delivered by residents
Hicks (2013)[62]	IM	1-3	SDH	*Content:* Residents participated in small group discussions and readings on topics such as collaboration skills and being a change agent with the aim of advocating to reduce health disparities. The training included personality testing and leadership activities to prepare residents to be change agents. *Contact time:* NS *Delivered by:* Faculty
O'Toole (2013)[63]	IM, P	2-3	SDH	*Content:* Residents watched four videos that depicted residents screening for SDH. Two versions were presented: an appropriate example (i.e. where depicted residents caught "triggers" and screen for SDH) and inappropriate example (where depicted residents missed the "triggers" and did not engage in SDH screening). Residents participated in small and large group discussions after watching the videos. *Contact time:* NS *Delivered by:* Faculty with content expertise
Sirotin (2013)[64]	IM	2	CC	*Content:* Residents attended didactic sessions focused on health disparities, food insecurity, immigrant health, LGBT health, disabilities, mistrust and bias. Sessions included small group discussions, case studies and role-playing. *Contact time:* NS

First author (Year)	Residency	PGY	Topic	Intervention
				Delivered by: NS
Staton (2013)[65]	IM	1-3	CC	*Content:* Residents participated in interactive online case-based training focused on cross-cultural communication, small group discussions, and webinars with national experts and panel discussions. *Contact time:* One week during existing conference time *Delivered by:* NS
Wallace (2013)[66]	IM, FM, P	1	POV	*Content:* Residents attended lectures to orient them to community medicine and the demographics of local neighborhoods, SDH and cultural competency. Residents visited two community organizations and completed several activities designed to teach them about poverty. *Contact time:* Two day "Resident Academy" orientation *Delivered by:* NS
Chick (2014)[67]	IM, FM, P	NS	SDH	*Content:* This curriculum included case-based learning modules on public healthcare systems (epidemiology, insurance systems and delivery systems) and biosocial model of care (SDH, homeless population needs and interprofessional team care). *Contact time:* NS

First author (Year)	Residency	PGY	Topic	Intervention
				Delivered by: Online curriculum
Green (2014)[68]	IM	2	HL	*Content:* Residents attended didactic sessions covering health literacy and clear communication techniques. Afterwards, residents practiced learned communication techniques with standardized patients and facilitators. *Contact time:* Two hours per week for three weeks total during ambulatory rotation *Delivered by:* Faculty preceptor trained in health literacy skills
Klein (2014)[69]	P	2-3	SDH	*Content:* Residents attended didactic presentations introducing SDH concepts. Residents watched simulated video vignettes depicting residents screening for SDH in appropriate and inappropriate manners (e.g., actor-resident failed to screen SDH despite cues). Residents then watched "day of the life" series where families share how screening and intervening on SDH impacted their lives. *Contact time:* Two 90-minute conferences presented in two successive months *Delivered by:* Faculty, medical educators and medical-legal partners
MacNamara (2014)[70]	IM	1	CC	*Content:* Residents were provided with information sheets about recent immigrant groups in local neighborhoods. They attended seminars on context (learn about newly resettled populations in neighborhood), communication (effectively using interpreters), analytical thinking (culture and medicine) and advocacy (understanding contextual factors with which people emigrate). Residents were assigned incoming refugees in their longitudinal clinics.

First author (Year)	Residency	PGY	Topic	Intervention
				Contact time: Three 2-3 hours seminars during psychosocial medicine block *Delivered by:* General internal medicine faculty member and outside speakers
Pagels (2015)[71]	FM	1-3	HL	*Content:* Residents attended didactic sessions on patient-centered communication, using clear health communication techniques, confirming patient understanding and providing reinforcement. Residents used role-playing during sessions to practice their communication skills. An OSCE was administered two to four weeks after training. The OSCE consisted of four stations: 1) administer and score the Newest Vital Sign 2) Use "Ask Me 3" technique 3) Employ the "teach-back" method 4) work with an interpreter *Contact time:* Ninety-minute didactic sessions and one-hour OSCE *Delivered by:* NS
Temple (2015)[72]	IM	1-3	DIS	*Content:* Residents attended general didactic sessions, an experiential workshop on caring for patients with disabilities, a talk by disability experts on working with this population. They participated in small group clinical case discussions and visited local and national organizations working with people with disabilities. *Contact time:* Four half-day sessions during one-month ambulatory block

First author (Year)	Residency	PGY	Topic	Intervention
				Delivered by: NS
Deanna Wilson (2016)[73]	IM	1	CC	*Content:* Interns participated in monthly home visits accompanied by a community health nurse. Residents were trained to complete medication reconciliation and provided a guided questionnaire to probe patient understanding of their diagnosis and disease. Residents were trained to use teach-back method. *Contact time:* Monthly home visits for seven months *Delivered by:* NS
Haddad (2016)[74]	IM	2-3	SDH	*Content:* The "Health Disparities Track" included didactic series on bias, discrimination, social and environmental determinants, language, disparities in research and advocacy. Residents were assigned one-quarter of their continuity clinic time to local clinics for uninsured patients. Residents completed structured community tours and reflective writing exercises. *Contact time:* Two year didactic lecture series *Delivered by:* Program leadership, chief residents, publicly available resources and community clinics
Martinez (2016)[75]	IM	1	CC	*Content:* Residents attended lectures on addressing SDH, taking advanced history, using an interpreter, health literacy, disparities, mistrust and implicit bias. Residents practiced learned skills during clinic then reported back at next session. *Contact time:* Implemented during ambulatory care rotation during year-long psychosocial course

First author (Year)	Residency	PGY	Topic	Intervention
				Delivered by: NS

Abbreviations: PGY indicates post graduate year; IM, internal medicine; DV, domestic violence; P, pediatrics; CH, community/population health; NS, not specified; FM, family medicine; SDH, social determinants of health/health disparities; EH, environmental health; HL, health literacy; CC, cultural competency; LGBT, lesbian, gay, bisexual, transgender health; POV, poverty; OSCE, objective structured clinical examination; DIS, patients with disabilities.

[a]These 27 programs and 16 that did not report outcomes (see Supplemental Digital Appendix 2) were identified in a 2017 LGBTscoping review of the literature.

Supplemental Digital Appendix 4

Study Design and Outcomes of 27 Articles That Reported Evaluation Results of Curricula on Social Determinants of Health (SDH) for Residents[a]

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
Zickafoose (2011)[58]	Environ-mental health	• Orientation to home environmental health principles • Shadowing home-health inspections	Post only	• S	• Residents rated[c] usefulness & impact on clinical practice	• 100% reported program was useful • 79% reported it would change clinical practice	5
Sirotin[b] (2013)[64]	Cultural competency	• Small group discussions, case presentations and literature reviews	Post only	• S	• Residents rated[c] satisfaction & impact on clinical practice	• 86% rated sessions as good or excellent • 76% agreed the course would change clinical practice	5
Staton (2013)[65]	Cultural competency	• Reviewed online case-based modules • Oriented to cultural competence principles	Pre/ Post	• S	• Residents surveyed[c] on usefulness of program & change in attitudes	• 71% reported the course would help their future encounters • 89% reported they were more comfortable obtaining social histories post-intervention	8

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
Jirasevijinda (2010)[52]	SDH	• Jeopardy! style game on categories related to local community	Post only	• S	• Residents rated[c] content & format of the training	• 97% reported improved understanding of diversity in community • 100% reported Jeopardy! format effective	6
Fornari (2011)[54]	SDH	• Small-group discussions of clinical cases • Weekly activities • Community tour	Post only	• S	• Residents rated[c] course activities, presentations, & relevance to social medicine	• Community activities rated highest compared to other activities.	5
Galiatsatos[b] (2013)[61]	Health literacy	• Residents presented at seminars on common medical conditions to religious congregations	Pre/ Post	• S	• Residents completed surveys[c] measuring impact of sessions	• Post-seminar, residents had improved confidence recognizing patients' health literacy • Improved perspectives on importance of health literacy	5.5
Wallace (2013)[66]	Caring for low-income patients	• Oriented to the community • Community organization interviews • Activities such as cultural	Pre/ Post	• S	• Residents surveyed[c] on satisfaction with program on 5-point Likert scale. • Residents asked if program improved	• Community interviews were rated the highest of all activities. • Residents commented that poverty simulations did not	5.5

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
		bingo, poverty simulation and poverty lunch			knowledge of community resources	change their practices or biases.	
Temple[b] (2015)[72]	Caring for patients with disabilities	• General didactic sessions, small group clinical case discussions, experiential workshop • Site visits to organizations focused working with people with disabilities	Post only	• S	• Residents were surveyed[c] on each activity on relevance to practice, and knowledge	• Didactic sessions, case discussions and site visits were rated highest for contribution to knowledge and relevance to practice compared to other activities.	5
Haddad[b] (2016)[74]	Health disparities	• Didactic sessions • Continuity clinics at local clinics • Community exploration and reflective writing	Pre/ Post	• S • DK	• Measured resident voluntary participation • Surveyed[c] on preparedness to care for patients of different culture	• Increased participation in first to second year • Increased preparedness to care for patients of other cultures compared to pre-curriculum	6
Catalanotti (2013)[60]	Community health	• Lectures on health disparities, career development	Pre/ Post	• S • DK	• Residents surveyed[c] on likelihood to practice in underserved community, importance of topic to their	• No increased likelihood to practice in underserved communities	6.5

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
		and health needs of vulnerable populations • Residents work at local health centers focused on medically underserved communities			education, and perceived competence	• 94% agreed that learning about community health was important • 13-fold increase in perceived competence compared to baseline.	
MacNamara (2014)[70]	Cultural competency	• Online information sheets on most recent immigrant populations in their location • Didactic sessions on psychosocial medicine and addressing patients with a history of trauma • Increased clinical time with recently resettled patients	Post only	• S • DK	• 2 semi-structured focus groups	• Residents felt their care for recently resettled populations would improve • Improved communication with patients • Residents remained uncomfortable addressing patients' history of trauma.	No score (Qualitative)

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
Willis (2007)[50]	SDH	• Interactive discussing with families in their community • Participation in community initiatives	Pre/ Post	• DK	• Residents self-assessed their level of exposures and competencies in the curricular domains	• Statistically significant increase in resident exposures and competencies across all educational domains	7.5
Klein (2010)[53]	SDH	• Didactic sessions on medical-legal partnerships, budgeting, public benefits, housing and educational laws. • Shadowing case workers at local public benefits organizations • Site visits to local food banks	Post only	• DK	• Residents completed "memos-to-myself" to reflect on how to curriculum improved their knowledge and would impact their practice	• Residents reflected that they had a deeper awareness of how socioeconomics impacts families and improved their knowledge about advocacy	No score (Qualitative)
Kuo (2011)[57]	Community health	• Continuity clinics at Federally Qualified Health Centers • Community/advocacy projects	NRCT	• DK	• Residents self-rated their attitudes, beliefs and self-perceived skills in the curricular topic areas	• Compared to control, residents who participated in program had significantly higher scores in attitudes and self-perceived skills	10

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
		• Seminars with guest speakers					
Hicks[b] (2013)[62]	Underserved communities	• Small group discussions, assigned readings • Mentorship by faculty, personality testing, leadership activities	Pre/ Post	• DK	• Residents were surveyed[c] on their self-perceived knowledge, beliefs and attitudes.	• Residents reported feeling better able to describe potential causes of health disparities, actions they can take to reduce them.	5.5
Chick[b] (2014)[67]	SDH	• Case-based modules on public healthcare systems, biopsychosocial model of care, SDH and interprofessional team care	Pre/ Post	• DK	• Knowledge evaluated[c] after modules	• Post examination scores significantly increased for all assessed content areas compared to pre-module scores.	9
Hayashi (2011)[55]	Community health	• Didactic lectures • Community orientation using geographic information systems (GIS) derived data	Pre/ Post	• DK	• Residents surveyed with 13-item, multiple-choice test[c] to assess seminar effectiveness	• All residents reported that the seminar helped understanding patients and the community. • Resident scores improved after seminar.	8

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
Martinez[b] (2016)[75]	Cultural competency	• Didactic sessions on SDH, mistrust and implicit bias and use of an interpreter	Pre/ Post	• DK	• The Cross-Cultural Care Survey was administered prior to sessions and 12 months later.	• Significant increased preparedness providing culturally competent care and identifying mistrust form patients	10
Deanna Wilson[b] (2016)[73]	Cultural competency	• Residents paired with community health nurses to conduct home visits • Training on medication reconciliation	RCT	• DK • PK	• Residents surveyed[c] to assess feasibility and acceptability of the program	• 74% reported the experience was somewhat or very valuable • 91% reported the experience was valuable • Residents in program reported greater confidence in caring for patients with limited health literacy than those who were not.	9.5
Strosaker[b] (2012)[59]	Health literacy	• Structured simulations sessions with standardized patients with complex psycho-social histories	Pre/ Post	• C	• Sessions were video recorded and scored by faculty	• Significant increase in use of "teach-back" at the follow-up session compared to the initial. • Asking patients about ability to obtain prescribed medications increased at follow-up sessions	10.5

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
Pagels (2015)[71]	Health literacy	• Didactic sessions, videos and role-playing	NRCT	• DK • PK • C	• Questionnaire assessing knowledge & attitudes[c] • Post-didactic evaluation[c] • Objective structured clinical examination (OSCE)	• Overall significant increase in HL knowledge post-intervention • Residents indicated that training would change their practice • Residents who participated in training had higher OSCE scores working with interpreters than those who did not.	9
Strelnick (2008)[51]	Community health	• Community orientation • Didactics in medical Spanish, interviewing skills and psychosocial clinical consultations • Design and complete a social medicine project	NRCT	• PER	• Residents were surveyed[c] on where they practiced post-residency	• Residents who participated in training were more likely to practice primary care in underserved communities after residency compared to those who did not.	10
Haist (2007)[49]	Domestic violence (DV)	• Workshop on domestic violence signs, screening,	RCT	• PER	• Unannounced standardized patients (SPs) insinuated into resident clinics.	• No significant difference between DV or control group	13

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
		safety planning and state laws. • Practice interviewing standardized patients in small groups			• SPs completed checklist[c] to score residents on identifying and addressing domestic violence (DV) patients.	in identifying DV victims in clinic. • DV-workshop residents were significantly more likely to score 75% or higher on a DV checklist compared to control group	
Klein (2011)[56]	SDH	• Interns shadow social workers to obtain social histories • Guided community immersion activities • Didactics on SDH, medical-legal partnerships and public benefits	NRCT	• DK • PER	• Residents completed survey[c] on attitudes and comfort addressing SDH. • Electronic medical records (EMR) audited for documentation of social history	• Residents reported significant improvement in their attitudes and knowledge of SDH • Residents in intervention had significantly increased documentation of social issues compared to those who did not.	13
O'Toole (2013)[63]	SDH	• Residents watched "trigger videos" depicting appropriate and inappropriate	NRCT	• DK • PER	• Residents surveyed[c] on comfort and screening practices for SDH. • Faculty directly observed residents	• No significant difference in knowledge between control and intervention groups. • In direct observation, intervention residents spent more time	13

First author (year)	Content	Topic & implementation	Study design	Moore's outcome[29]	Assessment method	Results	MERSQI[30,31]
		examples of SDH screening				screening for SDH compared to control	
Green (2014)[68]	Health literacy	• Didactic sessions on health literacy concepts Practice with standardized patients in small group settings	Pre/ Post	• DK • PER	• Residents surveyed[c] on attitudes and knowledge of health literacy • Residents video-taped patient encounters	• Knowledge scores significantly increased post-intervention • Use of plain language significantly increased at post-intervention.	10.5
Klein (2014)[69]	SDH	• Residents watched video vignettes depicting inappropriate and appropriate screening practices. • Didactics on specific social determinants at local and national level	NRCT	• PK • PER	• Residents self-rated[c] competence in screening for SDH. • EMRs audited for referral rate to medical-legal partnerships (MLPs) and formula distribution	• Residents in intervention group had significantly higher competence compared to control. • Residents in the intervention had higher rates of SDH screening, greater MLP referral rates and formula distribution compared to controls.	14

Abbreviations: MERSQI indicates Medical Education Research Study Quality Instrument; S, satisfaction; DK, declarative knowledge; NRCT, nonrandomized controlled trial; RCT, randomized controlled trial; PK, procedural knowledge; C, competence; PER, performance.

[a]These 27 programs and 16 that did not report outcomes (see Supplemental Digital Appendix 2) were identified in a 2017 scoping review of the literature.

[b]Abstract

[c]Survey or assessment tool developed for the study by the author(s).