

Table 2. Characteristics of the studies included

Study (reference)		Country	Study design	Setting	Sample	Finding
1.	Aulakh et al 2017	Aberdeen , UK	This was a student-led, mixed methods study, using online surveys and semi-structured interviews	The University of Aberdeen began to integrate global health into the MBChB curriculum in 2013 through a 6-week Global Health and Humanities (GHH) student-selected component (SSC) offered within an existing Medical Humanities block in the third year	31 students, who have completed the course to date were asked to complete two separate questionnaires. Tutors involved with teaching and developing the module (11) were approached to participate in semi-structured interviews	Integrating global health into the undergraduate medical curriculum through student-selected component was an effective and realistic approach. Exposed students to the social determinants of health through interdisciplinary teaching. Strengthening both student knowledge and a range of generic skills ¹
2.	Baker et al 2020	USA	Descriptive cross-sectional survey	University of Minnesota Rural and Metropolitan Physician Associate Program's (RPAP/MetroPAP) 9-month longitudinal integrated curriculum	Assess alumni perceptions of the influence of community health assessment projects	key finding was alumni perceived project ideas arising from community partners had greater impact on their acquisition of several community engagement skills. One-half reported projects influenced their professional activities, evidenced by ongoing community engagement, interest and participation in public health and preventive

						health initiatives, efforts to learn about specific health issues, social determinants of health and patient advocacy ²
3.	Bakshi et al 2015	USA	To understand the effect of the service and advocacy component of HRSJSP on early clinical experiences and self perception, we developed a 9-question qualitative survey	Mount Sinai Hospital and the East Harlem community	The EHCHC is a large coalition of social services and health providers in East Harlem. Partnering with the EHCHC pediatric subcommittee, past scholars have worked to map pediatric mental health services in the neighborhood	Implementation and evaluation of the HRSJ Scholars Program, we demonstrate an innovative model for social justice education; the enduring effect of service-learning experiences on participants' knowledge, skills, and attitudes; and the potential to increase community capacity for improved health through a collaborative educational model ³
4.	Brooks et al 2016	USA	An evidence-based case-study approach	Warren Alpert Medical School (AMS) of Brown University	122 rising third year. Students, 79 students responded to post course satisfaction surveys	Session was evaluated using a 6-point Likert scale (1 = poor, 6 = exceptional). Students rated this session overall a 4.28 out of 6 (N = 79). Qualitative feedback varied, with the most common theme focusing on the need for more time to discuss this topic ⁴

5.	Brooks et al 2018	Richmond, VA, USA	Students completed self-reflexive writing exercises during a post-tour debriefing session. Student writings were analyzed to assess the tour's effect on their awareness of poverty's impact on vulnerable populations' health and wellbeing, and their personal reactions to the tour	Department of Family Medicine and Population Health, Virginia Commonwealth University,	50 second-year medical students	Themes from qualitative analysis included: increased awareness of the extent of poverty, enhanced self-reflexive attitude towards personal feelings, biases and misperceptions concerning the poor, increased intentional awareness of the effects of poverty on patient health and well-being, and, encouragement to pursue careers of medical service ⁵
6.	Daya et al 2021	San Francisco, CA, USA	A four-part curriculum, titled Advocacy in Action (AiA), with specific learning objectives to facilitate student development of patient-level advocacy	UCSF – Medicine	Sixty-six medical students rotating on their 8-week inpatient-based, IM clerkship at a tertiary care hospital in San Francisco were recruited to participate in curriculum during 20	Themes surrounding advocacy skills development, meaningful personal experiences, interprofessional dynamics in patient advocacy and discovery of barriers to optimal patient care ⁶
7.	Dharamsi et al 2010	Canada	A phenomenological approach	UBC in Canada and the Makerere University Medical School in Uganda (MU) enabled two second year UBC medical students to spend 8 weeks in Kampala, Uganda	Carried out a detailed exploration of the international service-learning (ISL) experience of three medical students and the value of critical reflection as a pedagogical approach to enhance	Students noted an increasingly meaningful sense of what it means to be vulnerable and marginalized, a heightened level of awareness of the social determinants of health and the related importance of

					medical students' conceptions of the Canadian Medical Education Directions for Specialists (CanMEDS) Health Advocate Role	community engagement, and a deeper appreciation of the health advocate role and key concepts embedded within it ⁷
8.	Essa-Hadad et al 2015	Israel and UK	75 first year students completed the required public health course utilizing participatory community methods, including community visits, Team Based Learning, an ethnic forum, and lifestyle medicine	All were located in Safed, where the population is predominantly Jewish, and serve disadvantaged populations including Ethiopian and Russian immigrants, ultra-orthodox Haradi populations, individuals coping with mental illness	Twelve community organisations (see Table 1) were recruited, with the help of the Safed Center for Young Adults, to participate in the community project component of the course.	Participatory community learning equips students with public health skills, knowledge, and enhanced understanding of communities. It offers a way to effectively teach public health, while emphasizing the extended role and societal responsibilities of doctors ⁸
9.	Filek et al 2013	Canada	Qualitative study, used interpretive descriptive methodology. Semi-structured, individual, in-depth telephone interviews were conducted and digitally recorded.	University of British Columbia	Participant inclusion criterion was restricted to medical students who, as undergraduate medical students, had worked in the prison system	Themes emerged: (1) exposure to incarcerated populations increases students' insight into issues that diverse marginalized sub-populations encounter; (2) positive interactions with the incarcerated individuals enhances relationship building; (3) collaboration reinforces teamwork skills

						and (4) community placements garner important learning opportunities within the medical school curriculum ⁹
10.	Godley 2020	Chapel Hill, NC, USA	4 SHS classes of approximately 16 students each visited the Ackland Art Museum with their SHS seminars to participate in CWTAR, a facilitated discussion about race through art	University of North Carolina School of Medicine, Chapel Hill, NC, USA. Ackland Art Museum, Chapel Hill, NC, USA	Sixty-four first-year medical students were randomly selected to participate in "Can We Talk About Race?" (CWTAR)	63 (98%) responded to at least one course evaluation question. The majority (89%) of participants rated the program quality as either "Very Good" or "Excellent" ¹⁰
11.	Gonzalez et al 2020	USA	Nine 1.5-hour sessions were delivered to 15 first-year medical students from 2017 to 2019	Albert Einstein College of Medicine, an urban medical school in Bronx, New York,	Three, 8, and 4 first-year medical students participated in our course during the spring of, respectively, 2017, 2018, and 2019, for a total of 15 students	3 themes from the program evaluation: (1) Student engagement can be enhanced, (2) Instruction is empowering, and (3) It (addressing bias in one's own and witnessed encounters) can be done! ¹¹
12.	Gostelow et al 2018	London, UK	A mixed-methods approach collected questionnaire data using 4-point Likert scales and free text answers. A semi-structured group interview was conducted with six voluntary participants	University College London. Barts and the London School of Medicine and Dentistry, Queen Mary's University	Two hundred and eighty-nine students completed questionnaires	Session helped their understanding of key concepts (mean 3.2), was improved by having an actor (mean 3.6), and was enjoyable (mean 3.2). Data revealed three themes: engagement; structure; and attitudes towards social

						determinants of health. The simulation increased clinical relevance and students gained understanding of the impact of health inequalities upon individuals ¹²
13.	Haq et al 2013	USA	<p>Training in Urban Medicine and Public Health: TRIUMPH</p> <p>TRIUMPH integrates urban clinical training, community and public health curricula, longitudinal community and public health projects, mentoring, and peer support for select third- and fourth-year medical students</p>	University of Wisconsin–Madison, School of Medicine and Public Health	Program capacity was initially 6 students per year (in the 2009 pilot) and has recently expanded to 16 per year—approximately 10% of the total class. A summer/fall program was added in 2011 to accommodate 8 additional students per year	53 students enrolled in the program, and 45 have conducted projects with community organizations. Participants increased their knowledge, skills, confidence, and commitment to work with urban medically underserved populations. Compared with local peers ¹³
14.	Hernandez et al 2016	Chía, Colombia. Alicante, Spain	A descriptive study of a participatory action research (PAR) initiative. Qualitative methodology was performed in two stages: (i) initial exploration (self administered questionnaires and review of curricula) and (ii) validation of the	Center for Studies in Community Health, School of Medicine, Universidad de La Sabana, and Department of Clinical Medicine, Division of Medicine, Universidad Miguel Hernández	Nine universities, six private and three public, were selected from the five main regions of the country (north, west, east, central and south west)	This approach addresses a broad cross-section of the curriculum, especially in the subjects of public health and Primary Health Care (PHC), where community outreach generates greater internalization by students. The dominance of the biomedical model of study plans and practice scenarios focusing on disease and little

			information (semistructured interviews)			emphasis on community outreach are factors that limit the inclusion of the approach ¹⁴
15.	Huria et al 2017	New Zealand	Analyzed quantitative and qualitative student evaluations (n = 602) of a three-day immersed indigenous health orientation program between 2006 and 2014 based on Likert-scale responses and open-text comments. We conducted a thematic analysis of narrative student experiences (n = 426)	Indigenous health orientation program was nested within a two-week clinical orientation program to the hospital and primary care settings	The study was conducted at the University of Otago, Christchurch. 550 students in the clinical orientation program who were invited to complete a survey, 351 (64%) offered complete responses. The response rates for individual questions in the indigenous health orientation survey ranged between 88.3% and 91.3%	509 of 551 respondents (92%) rated the indigenous health orientation program as extremely or highly valuable and most (87%) reported that the course strongly increased their interest in indigenous health ¹⁵
16.	Jones et al 2014	USA	University of Chicago Pritzker School of Medicine developed a novel 1-year longitudinal service-learning elective called SERVE (Service, Education, Reflection, Volunteerism Elective). Students earned elective credit for completing three course requirements: 10 service sessions, monthly	The University of Chicago Pritzker School of Medicine is a private medical school located in a culturally rich but socioeconomically disadvantaged urban community	33 students enrolled in the course from a class of 99 (33.3%). A total of 25 students completed the course, 16 women and nine men	One third of the class enrolled in the course (33/99), 25 students completed the course, and 20 completed the final evaluation. Both quantitative and qualitative analyses of the final evaluations demonstrated high satisfaction with the course, and appreciation of the opportunity to volunteer,

			reflections, and a service learning project			teach, and develop service projects ¹⁶
17.	Kenison et al 2017	USA	students had previously (6–10 months earlier) participated in an IP pilot curriculum focused on providing safe, effective, and humanistic care for patients with LEP called the Macy Curriculum on Safe, Effective, and Humanistic Care for Patients with limited English proficiency (LEP)	Disparities Solutions Center, Massachusetts General Hospital	13 students were interviewed, 7 were medical students and 6 were nursing students; 4 were men and 9 were women. On average, they were 27 years of age. Members of some race/ethnicity groups numbered too small to report	Four major themes emerged: role modeling, systems factors, learning environment, and organizational culture. All 13 students described negative role modeling experiences, and most described role modeling that the authors coded as “indifferent” ¹⁷
18.	Laven et al 2011	Adelaide, South Australia, Australia	International Primary Health Care (IPHC) is to provide students with a greater understanding of the social determinants of health. These include health issues related to poverty, powerlessness, lack of access to resources and health education – concepts that are equally relevant in Australian rural and remote locations and the developing world.	Spencer Gulf Rural Health School, University of Adelaide and University of South Australia,	Medical students at all Australian medical schools are required by RUSC agreements to undertake a minimum of 4 weeks in an Australian rural or remote area. Students are also encouraged and supported to undertake an international placement. Although approximately two-thirds of IPHC students are in their final (6th) year, the remainder of students are spread across 4th and 5th year	3 structural themes for global health: the burden of global disease, travellers’ medicine and immigrant/refugee health. Student opinion expressed in qualitative evaluation has been largely positive and consistent with the debate about whether this content should be a core unit or an elective part of the curriculum. From 2011 the course will be known as ‘Global Health’ and ongoing

						content development is expected ¹⁸
19.	Lee et al 2015	Boston, USA	In 2009, Tufts University School of Medicine (TUSM) implemented a longitudinal 3-year required cultural competency curriculum. With at least one study demonstrating a positive impact of online CC teaching on student self-assessment	Tufts University School of Medicine (TUSM)	Created a 1-hour online teaching module about CC and health disparities in collaboration with Tufts Health Care Institute, targeting clinical students during the family medicine clerkship.	Students (n=119) who participated in the online module (n=60) demonstrated increased use of cross-cultural communication PACT questions compared to the control group (n=59) and generally had positive themes emerge from their reflective writing. The module had the biggest impact on students who later went on to match in high communication specialties ¹⁹
20.	Lewis et al 2017	USA	A mixed-methods needs assessment was implemented to inform the instructional design of the curriculum	The University of Minnesota Medical School, Duluth campus, a project to develop an Indigenous health curriculum	This project used collaborative and decolonizing methods to gather ideas and opinions from multiple stakeholders, including students, community members, faculty, and administration, to guide the process of adding Indigenous health content to the curriculum to prepare students to	Survey responses indicated that the most important topics to include were cultural humility, Indigenous culture, social/political/economic determinants of health, and successful tribal health interventions. Stakeholders also emphasized that this content should be taught by tribal members, medical

					work effectively with Indigenous populations	school faculty, and faculty in complementary departments (e.g., American Indian Studies, Education, Social Work) in a way that incorporates experiential learning ²⁰
21.	Maar et al 2020	Canada	Piloted 9 Simulated Cultural Communication Scenarios with 64 medical students and 17 tutors. We collected quantitative and qualitative data regarding their experiences and perceptions of the new curriculum	Northern Ontario School of Medicine (NOSM) was created in 2004 with a social accountability mandate, including a strong focus on addressing the health needs of Indigenous communities.	All medical students were in the final weeks of their first year and completed the scenarios during their regular clinical skills sessions. Tutors were selected for their previous experience in facilitating structured clinical skills (SCS)	Emergent themes indicate that co-created Simulated Cultural Communication Scenarios support the acquisition of culturally safe clinical skills because the modality fosters authentic, safe, context rich, and anti-oppressive patient dialogue with Indigenous animators. Recommendations for optimizing the sessions included ensuring tutors have a deep understanding of the significance of cultural safety in patient care ²¹
22.	Mayfield et al 2017	USA	3 hours, students participate in a 30-minute large-group lecture and three 40-minute small-group standardized patient encounters with debrief. Prework consists of a short video on sexual history	University of New Mexico School of Medicine	Medical class of 2018 (n = 84) at our institution in November of the clerkship year	Qualitative student evaluations were positive, and post participation surveys revealed statistically significant improvement in comfort with their ability to take a sexual history in general, and take one from

			taking, assigned readings, and an implicit bias activity. These materials are included in this resource, along with lecture slides, facilitator guide, and standardized patient cases			patients with a differing sexual orientation. Deployed in the second year of our Doctoring curriculum, this module continues to receive positive evaluations ²²
23.	McElfish et al 2018	USA	All students attending the UAMS NW regional campus were encouraged but not required to participate in the pilot program. Ninety-eight of the 158 (62.0%) students from medicine, nursing, pharmacy, and radiologic imaging science engaged in three types of interprofessional activities over the course of 6 months of August 2014 to January 2015	A unique interprofessional education program was developed at the University of Arkansas for Medical Sciences Northwest	University of Arkansas for Medical Sciences (UAMS) Northwest (NW)	Comparison tests revealed statistically significant changes in participants' retrospectively reported pre/post-test scores for Subscales 1 and 2 of the Readiness for Interpersonal Learning Scale and for the Caffrey Cultural Competence in Healthcare Scale. However, no significant change was found for Subscale 3 of the Readiness for Interpersonal Learning Scale. Qualitative findings demonstrated a change in students' knowledge, attitudes, and behavior toward working with other professions and the underserved population ²³
24.	Meili et al 2011	Canada	Qualitative evaluation.	College of Health Science, University of Saskatchewan, 2	Fourteen students, representing three first year cohorts (60 students	Six themes emerged from qualitative data analysis. (1) relationships, (2) social

			Qualitative data analysis was conducted using structured open-ended written questionnaires	Department of Social and Preventive Medicine, Université de Montréal, Canada, 3 Department of Health Science, McMaster University	per cohort), participated in the study	determinants of health in real life, (3) community development, (4) interdisciplinarity, (5) linking health and communities, and personal learning ²⁴
25.	Meurer et al 2011	USA	An Introduction to Pathways program was implemented (fall 2009) to orient students to the five pathways and guide them in their pathway selection.	Department of Family and Community Medicine, Medical College of Wisconsin	All 425 first- and second year students were required to participate. 135 third-year students elected to participate in the Urban and Community Health Pathway (UCHP)	Students enjoyed working with peers across classes and favored interactive, community-based sessions over didactics in the classroom. Students' papers reflected a range of service and scholarly activities and a deepened appreciation of social and economic influences on health. The UCHP enriches the traditional curriculum with individualized, community-based experiences to build knowledge about health determinants and skills in partnering with communities to improve health ²⁵
26.	Motzkus et al 2019	USA	Grounded theory methodology was used to anchor the qualitative analysis of students' essays	University of Massachusetts	All first and second year medical students at University of Massachusetts Medical School (UMMS) are enrolled in the course:	250 essays, three-quarters discussed students' results on the IAT. Theme comments related to a) experience taking the IAT, b) bias in medicine, and c)

					Determinants of Health (DOH). This required course provides students with a systematic framework for understanding the disparities and inequities found in humans' health status as well as the impact of context/environment on health	prescriptive comments. Most of the comments (84%) related to students' acknowledging the importance of recognizing implicit bias. More than one-half (60%) noted that bias affects clinical decision-making, and one-fifth (19%) stated that they believe it is the physician's responsibility to advocate for dismantling bias ²⁶
27.	Mudarikwa 2010	Australia	Evaluates a Community-based practice program (CBPP). The evaluation methods included questionnaires, focus groups and individual telephone interviews. All students and community educators were invited to complete questionnaires. Students were selected purposively for focus group interviews. One community educator from each site was invited to participate in individual interviews	Gippsland Medical School, Monash University	Students (N ¼ 57) and community educators (N ¼ 19) were involved in the evaluation process	Students agree that participating in the CBPP improves understanding of community services, barriers and social determinants of health and the roles of health professionals. Community educators view the CBPP as a valuable platform for mutual learning for all parties involved, with students gaining real life experience. Challenges in the CBPP include formulating and conducting a research project and contextualisation of didactic

						material at community sites ²⁷
28.	Neff et al 2020	USA	Report on a brief, interprofessional structural competency curriculum implemented in 32 distinct instances between 2015 and 2017	Throughout the San Francisco Bay Area. The University of California, San Francisco	Those participating included physicians and physicians-in-training at various stages: medical students (MS1, 2, and 4), primary care and categorical-track internal medicine residents, family medicine residents and faculty, and global health fellows	Three core themes emerged from analysis of participants' comments. First, participants valued the curriculum's focus on the application of the structural competency framework in real-world clinical, community, and policy contexts. Second, participants with clinical experience (residents, fellows, and faculty) reported that the curriculum helped them reframe how they thought about patients. Third, participants reported feeling reconnected to their original motivations for entering the health professions ²⁸
29.	Ona et al 2020	USA	Antiracism curriculum was delivered and evaluated in 2019 through focus groups and written input before and after each module. The process and outcome evaluation used a grounded theory approach.	Tufts University School of Medicine, Department of Public Health and Community Medicine	A total of 26 medical students volunteered to enroll into the 3 sessions of 3 hours each. Twenty-two students completed the curriculum. The final sample included 16 second	Three emergent themes reflect how medical students experienced the antiracism curriculum and inform recommendations for integrating an antiracism curriculum into future medical education. The themes are: 1) the

					year and 6 fourth-year medical students	differential needs and experiences of persons of color and Whites, 2) the need to address issues of racism within medical education as well as in medical care, and 3) the need for structures of accountability in medical education ²⁹
30.	Press et al 2015	USA	A mixed methods approach was used to evaluate 88 first-year medical students' advocacy themed reflective essays, independently coded by three investigators, and Likert-response questions were compared to published benchmarked items	At the Pritzker School of Medicine, first-year students complete a mandatory health care disparities (HCD) course	To introduce an advocacy curriculum to a mandatory health care disparities (HCD) course for 88 first-year medical students	Analysis of student essays revealed that students were better able to identify as an advocate in medicine. The survey also revealed that 86 % post-course versus 73 % pre-course agreed/strongly agreed with the following statement: BI consider myself an advocate [^] (p=0.006) ³⁰
31.	Schonholz et al 2020	USA	semi-structured interviews, this qualitative study Responses were coded using a content analysis approach	Mount Sinai	Gathered the experiences of 15 fourth year and recently graduated medical students who participated in the comprehensive training, research, and direct service opportunities provided by the program	The study captured students' perceptions of the role of the program on their personal growth, clinical skills, and career vision. Nearly all the students interviewed indicated they developed important, clinically applicable skills that enhanced their traditional

						medical education. Students indicated that their participation directly influenced their professional identities and future career directions by reinforcing previous interests in human rights and social justice work, impacting medical specialty and residency program selections and fostering commitment to working with immigrant populations ³¹
32.	Sequeira et al 2012	USA	4 educational sessions for preclinical medical students	At the Tulane University School of Medicine in New Orleans, LA	Thirty-five students filled out the survey after session 1, 39 students after session 2, and 30 students after session 3	Thematic analysis of student responses identified key themes: a current lack of exposure to LGBT content, agreement that LGBT material is applicable to students' work as future physicians, and the relevance of including such information in the medical school curriculum ³²
33.	Sokal-Gutierrez et al 2015	USA	A mixed-method evaluation strategy to maximize the programmatic value of the results	University of California, Berkeley	This is an evaluation of the experiences of the 16 Joint Medical Program (JMP) The Program in Medical Education for the Urban Underserved (PRIME-US)	Most PRIME-US students came from socioeconomically disadvantaged backgrounds and ethnic backgrounds underrepresented in

					medical students during their preclerkship medical student (MS 1–3) and first clerkship (MS-4) years; and the impact of PRIME-US on the entire JMP program including non-PRIME students, faculty, and staff	medicine, and all were committed to caring for underserved populations. The PRIME-US students experienced many program benefits including peer support, professional role models and mentorship, and curricular enrichment activities that developed their knowledge, skills, and sustained commitment to care for underserved populations ³³
34.	Stumbar et al 2020	USA	Thematic analysis was used to examine patterns in reflective essays provided by 99 medical students. Two independent reviewers read the essays and created initial codes, which were developed into a common codebook by consensus. Codes were categorized into themes, including observations of the social determinants and emotional reactions to household visits	Herbert Wertheim College of Medicine	At the start of their second year of medical school and after the deadline for completion of their first household visit, students were required to participate in a two-hour Reflections Round session, which included five to eight students and a faculty member	Through the provision of household-centered care, medical students recognize the roles that social determinants play in the health of patients, households, and communities. Furthermore, they are able to identify household and community level interventions to address these identified needs. A variety of emotional responses to household visits were identified, ranging from

						frustration and sadness to empathy and humility ³⁴
35.	Thomas et al 2020	USA	Mixed method assessment study	Ohio University Heritage College of Osteopathic Medicine	First- and second-year students on the main OUHCOM campus received recruitment emails and flyers, class Facebook announcements, and word of mouth notifications. Investigators held an information session in September 2018	Compared to the pre-test, mean response scores increased for most of the parameters including familiarity with LGBTQ healthcare issues, confidence in the ability to identify harmful medical provider practices, and reading and assessing scientific literature. Qualitative data showed increased confidence, comfort and knowledge about LGBTQ health barriers ³⁵
36.	Yang et al 2019	Taiwan	We designed an LGBT+ Health and Medical Care course in a medical school. Feedback was collected using in-depth interviews and thematic analysis was used to analyze the collected data	Graduate Institute of Gender Studies, Kaohsiung Medical University	Feedback was collected from two teachers and 19 medical	The findings of this study were as follows: (1) Games encouraged student participation and benefited gender knowledge transmission and transformation through competency learning, and (2) games embodied the idea of assessment as learning. The enjoyable feeling of pressure from playing games

						<p>motivated students to learn. Using games as both a teaching activity and an assessment tool provided the assessment and instant feedback required in the CBME learning process. Game-based teaching successfully guided medical students to learn about gender and achieve the learning goals of integrating knowledge, attitudes, and skills³⁶</p>
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