

# Diversity in health care institutions reduces Israeli patients' prejudice toward Arabs

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Diversity in the lines of public institutions, such as hospitals, schools, and police forces, is thought to improve provision for minority group members. Nonetheless, whether and how diversity in public institutions shapes majority citizens' prejudice toward minorities are unclear. Building on insights from the intergroup contact literature, I suggest that diversity in public institutions can facilitate positive intergroup contact between majority group members and minorities in elevated social positions. Such unique interactions, which exceed the equal status condition for effective intergroup contact, can serve to reduce prejudice and facilitate more inclusive attitudes among majority group members. To test this expectation, I focus on health care provision-a leading sector with regard to minority representation. Leveraging a natural experiment unfolding in 21 Israeli medical clinics where Jewish patients are haphazardly assigned to receive care from Jewish or Arab doctors and embedding prejudice-related questions in a routine evaluation survey, I demonstrate that brief contact with an Arab doctor reduces prejudice. Specifically, contact with an Arab doctor reduces Jewish patients' exclusionary preferences toward Arabs by one-sixth of an SD and increases Jewish patients' optimism about peace by a 10th of an SD. The modest magnitude of these effects is similar to the impact of well-powered interventions recently reviewed in a meta-analysis of prejudice reduction experiments. These findings emphasize how the demographic makeup of public institutions can reduce mass prejudice, even in a context of intractable conflict.

prejudice reduction | diversity | health care provision

A rich social scientific literature demonstrates that diverse and representative institutions provide better outcomes for minority group members (1). Specifically, recent evidence demonstrates that diversity in institutions can improve policing (2–4), education (5, 6), and health outcomes (7, 8). Nonetheless, whether and how the demographic makeup of public institutions affects intergroup relations and specifically, majority group members' attitudes toward minorities remain unclear.

Identifying how the demographic makeup of institutions affects intergroup relations is crucial since institutional diversity may have mixed effects on attitudes and behaviors. Specifically, the mere presence of minorities within institutions, especially in positions of power, may engender threat perceptions among majority group members. These perceptions may lead to prejudice and discriminatory attitudes that can escalate intergroup conflict (9). Alternatively, the presence of minorities within institutions may foster positive intergroup contact between majority group members and minorities in elevated social positions. Such interactions, which exceed Allport's equal status condition for effective intergroup contact (10), might improve intergroup relations and help reduce prejudice in divided societies (11).

To shed light on this question, I focus on diversity in Israeli health care institutions and its effects on prejudice, conceptualized as "a negative bias toward a social category of people" (ref. 12, p. 340). My focus on diversity in health care provision and its

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effects on Jewish patients' prejudice toward Arabs is motivated by three reasons. First, existing findings suggest that diversity in health care can improve consequential outcomes including mortality rates (7, 13) and take up of preventive care among minorities (8). Second, major organizations, including the National Medical Association and the Institute of Medicine, have prescribed representation and diversity as policy tools to promote more equitable societal outcomes (14, 15). Lastly, health care provision is a leading sector with regard to minority representation in multiple countries, including Israel where this study is conducted (16, 17). Therefore, identifying if and how diversity in health care institutions shapes intergroup relations is of key importance for scientists and practitioners. This is especially the case given recent global developments around COVID-19, which have emphasized the centrality of health care institutions and providers around the world.

### **Diversity in Health Care and Prejudice Reduction**

A host of mechanisms might link diversity in health care provision with prejudice reduction. However, given the direct and intimate engagement between doctors and patients, I focus on a particular mechanism—intergroup contact. Over the past decades, intergroup contact has emerged as a central strategy for prejudice reduction. Indeed, a canonical theoretical framework developed by Gordon W. Allport suggests that intergroup contact can reduce prejudice, especially when contact occurs between equal status group members who share common goals and cooperate under an institutionally supportive environment (10, 11, 18, 19).

For decades, social scientists have employed different approaches to test Allport's theoretical expectations. In recent years, the contact hypothesis has received growing empirical

### **Significance**

Diversity in public institutions is thought to improve provision for minority group members. However, the effects of such diversity on majority group members' prejudice toward minorities are unclear. In this paper, I demonstrate that diversity in health care institutions can facilitate positive intergroup contact between majority group members and minorities in elevated social positions. In turn, this unique contact serves to reduce prejudice. These findings emphasize how the demographic makeup of public institutions and specifically, institutions providing health care can affect mass attitudes, even in a context of intractable conflict.

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Fig. 1. Five steps that patients follow from the moment they enter the clinic until they receive care from a doctor.

attention from researchers employing field experiments in divided societies and conflict zones to assess the suitability of intergroup contact as an effective policy tool for prejudice reduction (11, 19–23). For the most part, experimental studies of contact have considered carefully devised interventions, which facilitate prolonged engagement in which members of different groups cooperate as equals in structured environments, such as classrooms, sporting teams, and military dorms (20–25). Such interactions have been shown to reduce some forms of prejudice—at times in a modest fashion (11).

Clearly, interactions between patients and doctors differ from the intergroup contact examined in recent interventions in at least three important ways. First, contact between doctors and patients is rather brief, limiting potential for familiarity or relationship building. Second, such interactions are hierarchal in nature, and in a rather unique way, they often position minority group members in an elevated and authoritative position vis-á-vis majority group members. Third, unlike many contact initiatives, which are explicitly designed to reduce prejudice, interactions between patients and doctors are not directly designed or intended to improve intergroup relations.

Despite these notable differences, I expect that intergroup contact with an Arab doctor will reduce prejudice among Jewish patients for two central reasons. First, the context of caregiving is positive in nature, and recent evidence suggests that positive interactions reduce prejudice (22, 23), whereas competitive or superficial contact and exposure impair intergroup relations (23, 26, 27). Second, contact in this case positions minorities as authoritative experts. This elevated position can counter stereotypes held by majority group members and in turn, lead to a more favorable assessment of out-group members (28, 29).

## Study Context: Contact between Jewish Patients and Arab Doctors in Israel

To evaluate the effects of institutional diversity on prejudice and identify how Jewish patients respond to intergroup contact with an Arab doctor, I collaborate with a chain of Israeli medical clinics. These clinics provide treatment for patients who do not need hospitalization. Over the past 20 y, this chain of clinics has grown to be a large health care provider in Israel, operating in 25 centers across the country and providing services to over 800,000 patients a year. For the purpose of this study, I focus on 21 clinics where assignment procedures of patients to doctors and data availability allow me to identify the effects of contact between patients and doctors.

My empirical focus allows me to advance on recent studies of diversity in health care provision, as well as on studies of prejudice reduction, and identify the effects of intergroup contact in multiple locations across Israel. Indeed, the clinics I study employ both Jewish and Arab doctors and provide services to a diverse group of patients across the country—ranging from ultraorthodox Jews in Beit Shemesh to secular Jews in Carmiel (a list of clinic locations is provided in *SI Appendix*). In the studied clinics, patients are treated for a host of medical conditions that range from viruses to physical injuries, which do not require hospitalization. In *SI Appendix*, Fig. S1, I provide a description of conditions treated in the clinics.

A key feature of the medical clinics I study is that they provide services in multiple locations across Israel, around the clock with minimal waiting time, on a first-come, first-served basis. Given short waiting times and immediate service provision, many Israelis approach these clinics to receive medical care, which is partially subsidized by Israeli Health maintenance organizations. After arriving in a clinic, patients do not select their doctors or nurses. Indeed, doctors and nurses rotate across different clinics, and requests for specific caregivers are not met.

From the moment patients enter a given clinic on a particular day, they follow five steps until they are assigned to a doctor (Fig. 1). First, the patient signs in with a receptionist and fills out a form detailing personal information. Second, after filling the form, the patient waits in a reception room (Fig. 2) until a midlevel practitioner (usually a nurse) is available to implement an initial triage. Third, after a midlevel practitioner is available, the patient is directed to a private room (Fig. 3), where he or she is triaged by the available midlevel practitioner. At this stage, the practitioner fills out a report detailing the patient's medical condition. Fourth, after the practitioner completes the triage, they place the report in a bin of triaged patient files and instruct the patient to wait (usually in the same room) until the next doctor is available to provide care. At this stage, the next available doctor will pick up the patient's file from the stack of triaged patient files and attend to provide the patient with medical care. Patient files are picked up by doctors according to the order in which they are received.

As noted above, doctors rotate between clinics over time, and the roster of doctors in each clinic is not constant. Consequentially, the overall probability that a Jewish patient attending clinic c on day d will receive care from an Arab doctor varies across clinics and over time (*SI Appendix*, Fig. S2). However, within clinic c on day d, the assignment of Jewish patients to Jewish or



Fig. 2. Illustration of clinic facilities—reception room.



Fig. 3. Illustration of clinic facilities—treatment room.

Arab doctors depends on multiple factors, including the overall roster of doctors in clinic c on day d, the daily workload of those doctors, the exact time in which the triage of a patient was completed, and the length of the line in the clinic, which determines which doctor is immediately available to provide care to the next triaged patient.

### **Materials and Methods**

**Identification Strategy.** Given the multiple determinants of assignment to doctors within clinics and the fact that doctors pick up cases from the file bin in the order in which they are stacked, it is extremely unlikely that within a given clinic, Jewish patients will be able to select a Jewish or Arab doctor. Therefore, I assume that the assignment of patients to doctors in clinic *c* on day *d*, and in this case, the assignment of patients to intergroup contact or lack thereof, is likely orthogonal to an individual's social attitudes. More so, the clinics' firm policy to decline patients' requests for specific doctors limits concerns regarding treatment compliers and noncompliers.

In Fig. 4, I provide evidence in support of my identifying assumption that assignment to an Arab doctor in clinic c on day d is orthogonal to Jewish patients' characteristics, by regressing a binary variable Arab doctor or over patients' demographics. Specifically, I show that religiosity, gender, education, and age are balanced across respondents assigned to Jewish and Arab doctors. More generally, the assignment mechanism of patients to doctors within the studied clinics and the ancillary evidence regarding covariate balance allow for a natural and unobtrusive empirical investigation identifying the effects of contact with an Arab doctor on Jewish patients' prejudice.

**Outcome Measures.** For the purpose of this study, the clinics with which I collaborated embedded within their routine treatment evaluation surveys several questions relating to demographics and intergroup attitudes, which serve as the outcome measures of this study.<sup>\*</sup> Usually, evaluation surveys are sent out to all patients immediately after their clinic visit via short message service (SMS). However, as part of this study, the clinics randomly assigned respondents to receive surveys either 1 or 10 d post-treatment. This randomization was implemented to allow for a comparison of respondents randomly assigned to report outcomes at different points of time after their exposure to treatment.<sup>†</sup> By delaying outcome measurement up to 10 d posttreatment, I improve on many of the experimental studies of prejudice reduction, which measure attitudes immediately after interventions (11, 19).

In my analyses, I focus on Jewish respondents' answers to four distinct survey measures previously employed in Israel: a commonly used social distance scale (30), an item relating to intergroup peace (31), an intergroup feeling thermometer (20), and a measure of intergroup trust (31).<sup>‡</sup> It is important to note that all outcomes measure general attitudes toward out-groups, rather than attitudes toward specific doctors. Therefore, my analyses consider how engagement with a particular out-group (i.e., an Arab doctor) shapes attitudes toward the out-group as a whole (i.e., Arabs in general). The full survey is described in *SI Appendix*, and the wording of items employed to measure outcomes is depicted in *SI Appendix*, Table 51. Hebrew translations of the survey can be found in my preregistration materials (https://osf.io/6xh8a).

Although my four outcome variables measure distinct concepts, I combine them into a general index of intergroup attitudes by averaging their z scores (this index has a 0.8 Corenbach's alpha). This intergroup attitude index serves as my fifth outcome (note that I did not register this index in my preanalysis plan). I report descriptive statistics of all variables used in my analyses in *SI Appendix*, Table S2.

Estimation Strategy. To identify the effects of contact (i.e., doctor assignment) on intergroup attitudes (i.e., survey responses), my estimation strategy leverages the fact that within clinic c on day d, patients are assigned haphazardly to intergroup contact with Arab doctors. In my main model, I include clinic and day fixed effects and cluster errors by clinic.<sup>§</sup> Eq. 1 depicts my main model, an ordinary least squares (OLS) regression, where  $Y_{icd}$  denotes a survey response of patient *i* receiving treatment in clinic c on day d.  $\beta$  represents the coefficient of my main treatment, and  $\eta$  and  $\Psi$ represent clinic and day fixed effects successively.  $\epsilon_{\it icd}$  represents my model's error term. My key identifying assumption is that after including  $\eta$  and  $\Psi$ in my model to account for clinic and day unobservables, the treatment condition of respondent *i* is orthogonal to their potential outcome. This assumption is supported by the models reported in Fig. 4. I supplement my main preregistered specification with additional models (presented in SI Appendix, Fig. S3) where I control for pretreatment covariates, include a clinic-day fixed effect, and employ alternative clustering approaches for my SEs. Most results presented here are robust to alternative specifications:

$$Y_{icd} = \beta X_{treatment} + \eta_c + \Psi_d + \epsilon_{icd}.$$
 [1]

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#### Results

As reported in *SI Appendix*, Table S2, the average age of survey respondents in my sample is 32.4 (SD=24.6), 46% of respondents are male, and the sample is relatively educated and rightwing leaning. In *SI Appendix*, Table S3, I demonstrate that my sample is similar to a nationally representative sample of Israeli adults responding to a public opinion poll implemented by the Israeli Democracy Institute several months before my study (32). This similarity is reassuring yet unsurprising, given that clinics are dispersed across different localities in Israel, providing care to a diverse crowd of Israeli citizens.

In Fig. 5, I report the main effects of intergroup contact with an Arab doctor on Jewish patients' prejudice. Effect sizes that are greater than zero suggest that brief interactions with Arab doctors promote more tolerant attitudes toward Arabs in Israel. As demonstrated in the first column of Fig. 5, contact accounts for one-sixth of an SD shift in responses to a social distance scale (P < 0.01, two-tailed test). The average Jewish respondent in my data is willing to accept an Arab as a coworker ( $\mu = 3.20$ ). Therefore, the effect of contact moves respondents toward willing to accept Arabs as neighbors ( $\mu = 3.52$ ).

The identified effect of intergroup contact on responses to the social distance scale is modest in magnitude, emphasizing that prejudice reduction via intergroup contact is a rather challenging endeavor (11). That said, this identified effect is important and informative given the stark patterns of residential segregation,

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<sup>\*</sup>The study was exempt by the University of Wisconsin–Madison Institutional Review Board (submission identification no. 2020-0381).

<sup>&</sup>lt;sup>†</sup>In my main analyses, I analyze all responses pooling over the timing condition. However, in *SI Appendix*, Table 59, I consider how survey timing moderates the effects of contact on prejudice. Doing so provides some insight regarding the longer-term effects of intergroup contact, as further discussed in *SI Appendix*.

<sup>&</sup>lt;sup>+</sup>My main analyses focus on Jewish respondents, who represent the majority of patients in clinics and the majority of responders to the evaluation survey. In *SI Appendix*, Table S15, I analyze Arab responses to the survey (n = 166).

<sup>&</sup>lt;sup>§</sup>In my preanalysis plan, I mistakenly preregistered a similar specification including doctor fixed effects. Since doctor fixed effects correlate perfectly with my treatment indicator (i.e., Arab doctor), including doctor fixed effects in my specification is impossible.



**Fig. 4.** Demographic balance. Each point estimate and its corresponding 95% CI are extracted from a separate OLS model in which treatment (i.e., assignment to an Arab doctor) is regressed over a demographic variable. Models include clinic and date fixed effects, and errors are clustered by clinic.

the high levels of prejudice, and the legacies of intergroup violence in Israel, all of which pose unfavorable conditions for prejudice reduction between Jews and Arabs. Substantively, the effect of contact with an Arab doctor on responses to the social distance scale is equivalent to the impact of a half-unit shift on a religiosity scale, moving from traditionalist to religious Jewish practices. This comparison is important given previously documented exclusionary preferences toward Arabs among ultraorthodox Jews and given the strong links between exclusionary preferences and costly noncooperative behavior (30).

Similarly, after engaging with an Arab doctor, Jewish patients report being more optimistic about the extent to which most Arabs want to live in peace. Indeed, experiencing contact with an Arab doctor accounts for slightly more than a 10th of an SD increase in responses to a question about intergroup peace (P <0.05, two-tailed test). When considering general affect toward Arabs as an outcome, a somewhat similar pattern emerges. Intergroup contact accounts for a 10th of an SD increase in a five-point feeling thermometer (P < 0.1, two-tailed test), but this effect does not reach conventional levels of statistical significance (i.e., P < 0.05). In addition, although the point estimate of contact on a measure of intergroup trust is also positive, this effect does not reach conventional levels of statistical significance (i.e., P = 0.15). I therefore interpret this latter finding to suggest that brief intergroup contact with an Arab doctor does not have a precisely estimated effect on Jewish patients' trust toward Arabs. Lastly, when considering an index of all four outcomes, it appears that intergroup contact has a general positive and statistically significant effect on intergroup attitudes (P < 0.01, two-tailed test).

In *SI Appendix*, I consider a set of robustness checks to ensure that identified effects are not driven by doctor quality, pretreatment covariates, responses submitted by guardians of minor patients, endogenous selection into survey, or nonresponse to specific questions. I demonstrate limited heterogeneity in treatment effects conditional on experiences of contact during a cycle of violence, doctor quality, survey timing (1 or 10 d posttreatment), and patient characteristics (*SI Appendix*, Tables S4–S13). I also consider the extent to which contact with Arab doctors shapes prejudice toward other stigmatized communities in Israel (*SI Appendix*, Table S14). The null effects of these additional models suggest that in this case, contact affects prejudice toward all minorities in Israel. Lastly, I provide suggestive evidence that contact with Jewish doctors reduces some forms of Arab patients' prejudice toward the Jewish community (*SI Appendix*, Table S15).

### Discussion

These findings contribute to several theoretical and applied questions. First, I advance a broad literature on diversity in public institutions (1, 4, 7, 8, 13, 33), by considering a relatively unexplored positive externality of diversity and minority representation in the realm of health care provision. My evidence suggests that in addition to improving health outcomes (7, 8, 13), diversity in health care provision can facilitate positive intergroup contact, which reduces prejudice and promotes inclusive attitudes among majority group members.

Second, I contribute to the literature on prejudice reduction and intergroup contact. Following recent calls to rigorously evaluate the effects of intergroup contact in field settings (19), I provide evidence that brief interactions between patients and doctors reduce prejudice toward Arabs as a group in multiple locations across Israel. The broad geographical scope of my evidence differs from recent field experiments, which understandably focus on one or several geographical locations (21, 22, 34, 35). This evidence is important, as recent reviews have emphasized that "the jury is still out regarding the contact hypothesis and its efficacy as a policy tool" (ref. 19, p. 5).

Third, by linking the contact hypothesis with an institutional framework of diversity and representation, I highlight how structural dynamics can serve to improve intergroup relations (11). Thus, my evidence suggests that scholars of prejudice reduction should further consider how institutions that facilitate innumerable and repeated interactions between providers and citizens (36, 37) may serve to amplify and spread the effects of intergroup contact and promote prejudice reduction in a scalable and sustainable way. Unlike people to people reconciliation interventions, which often focus on one village or urban neighborhood, my exploration of intergroup contact in a broader institutional context examines many interactions occurring across multiple



**Fig. 5.** Effects of intergroup contact with an Arab doctor. Each point estimate and its corresponding 95% CI are extracted from a separate OLS regression in which I identify the effect of intergroup contact with an Arab doctor on a different outcome measure. All models include clinic and date fixed effects, and errors are clustered at the clinic level. All outcomes are standardized.

medical clinics, dispersed across Israel. The broader geographical scope of this study stems from the far-reaching arms of institutions. Therefore, further considering the link between intergroup relations and institutions is a promising path for scholars of prejudice reduction.

Lastly, an institutional approach to prejudice reduction sidesteps a common trend in the intergroup contact literature by which minority group members are often instrumentalized for the purpose of attitudinal change among majority group members (38). In contrast, approaches that rely on diversity and representation in reputable public institutions can potentially empower minority group members while reducing prejudice among majority group members. Whether and to what extent these effects materialize in tandem are other promising avenues for future research.

Despite these contributions, my findings are not without limitations. First, the response rate to the satisfaction survey through which I collected my outcomes of interest was rather low (approximately 1.5% of all patients participated in my survey).<sup>¶</sup> More so, of the 2,164 Jewish respondents who engaged in the survey, approximately 30% of respondents did not respond to outcome measures. Such challenges relating to low response rates in surveys and specifically, in SMS-based surveys are not uncommon in existing research (39, 40). It follows that like other research relying on samples with low response rates, the effects in this paper should be interpreted as a sample average treatment effect rather than a population average treatment effect. Accordingly, readers might be concerned that identified effects may not generalize to the population of patients receiving treatment in the studied clinics. This concern may be especially acute if assignment to an Arab doctor correlates with selection into survey or missing values for specific outcomes of interest. In SI Appendix, Tables S3-S6, I address such concerns in several ways. First, I demonstrate that doctor assignment does not predict participation in the survey or nonresponse to specific questions. Second, I demonstrate that my main results are robust to models where I employ inverse probability weighting in order to account for attrition (41). Lastly, I demonstrate that even though my sample of respondents is older and composed of more female patients than the population of people receiving care in the observed clinics, this sample is similar to a representative sample of Jewish Israelis responding to a survey implemented by the Israeli Democracy Institute several months before my intervention. These supplementary analyses are aimed to reduce concerns regarding low response rates. However, future research should consider employing incentives or nudges to increase response rates in similar surveys.

Second, like in earlier research (26, 27) yet improving on many studies of prejudice reduction (11), the focus of this study is on relatively short-term effects. Although I do not find evidence for statistically significant differences in prejudice reduction between patients surveyed 1 and 10 d posttreatment (*SI Appendix*, Table S9), it is likely that the identified effects in this study dissipate after a few weeks. Indeed, in *SI Appendix*, Fig. S5 and Table S16, I provide supplementary evidence

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that contact between patients and doctors is unlikely to have long-term effects. Nonetheless, the power of diversity and the contact that it facilitates is closely tied to its ongoing occurrence. Indeed, if subjects experience recurring instances of positive intergroup contact, such interactions may become cognitively accessible and lead to durable prejudice reduction (42).

Third, like previous field experiments (26, 34) and the majority of studies on prejudice reduction (11), I identify the effects of contact on symbolic attitudes rather than revealed preferences. Whether identified effects translate into costly behavior is a topic for future research. However, recent evidence demonstrating that contact affects behaviors but not attitudes (21) and that symbolic attitudes are a potent cause of discriminatory behavior (30) emphasizes the importance of my findings.

Lastly, the evidence in this paper is generated from a single country and from a single institutional context. Given extreme levels of segregation and intergroup animus (30, 43), as well as an ongoing intractable conflict (44), and given the prevalence of Arab doctors in Israeli health care institutions (16), my focus bears important relevance for scholars of prejudice reduction, public health, and institutions. Indeed, this study follows a rich tradition of social scientists who rigorously consider different approaches for prejudice reduction and attitudinal change in the Israeli case (20, 45, 46). However, despite the importance of the Israeli case, like any other field-based study, future work is needed to evaluate the generalizability of my results across different geographical contexts and institutional settings.

One encouraging piece of evidence regarding the possible generalizability of effects identified in this paper comes from a series of recent experiments in Israel and the United States. These experiments demonstrate that mere information regarding the role of Arab and Muslim doctors in combatting COVID-19 reduces prejudice among Israeli as well as American majority group members (47). These findings provide an encouraging intuition regarding the generalizability of the results identified in this paper. However, by collaborating with medical clinics, as well as other public institutions in different contexts, future work should test and establish the generalizability of identified effects presented in this paper.

**Data Availability.** All data and replication materials are available on Harvard Dataverse (DOI: 10.7910/DVN/VLXMOL).

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<sup>&</sup>lt;sup>¶</sup>The overall response rate to this survey was lower than response rates to the routine evaluation surveys, which stand at approximately 5%.

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