Discrimination in healthcare: A field experiment with Pakistan's Transgender community[1]

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Abstract

Transgender individuals face high levels of discrimination including in healthcare. Lack of adequate legal protections can exacerbate the problem in developing countries. At the same time, low-cost private clinics can mitigate discriminatory practices due to the costs of discrimination. We conduct an audit study with male and transgender standardized patients visiting private health care clinics in Pakistan and find evidence of discrimination in non-obvious domains. Physicians differentiate between patients in culturally sensitive areas: they substitute in procedures that require less physical contact; are less likely to engage in verbal examination (i.e. avoid uncomfortable questions); and are subsequently more likely to recommend placebo or insufficient treatments for transgender patients, relative to the male benchmark. This ultimately yields lower quality of care for transgender patients.

Keywords: Health, access, transgender, LGBTQ+, gender

JEL codes: C93, I12, I14, J15, J16

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1. Introduction

In 2009, the Pakistan Supreme Court officially recognised transgender as the *third gender,* granting the country's transgender individuals both recognition and rights under the constitution (Redding, 2016). These legal protections codify cultural norms in the region, which have historically recognised a distinct third gender for centuries. However, despite their socio-cultural recognition and the spate of recent policy initiatives, transgender individuals continue to face discrimination due to their non-conformity with traditional gender norms; discrimination that is persistent and present in all aspects of life, including access to basic healthcare (Khan, 2014; Ming et al., 2016). While recognition of a civic identity for the transgender population is a landmark achievement, Ming et al. (2016) argue that persistent lack of anti-discrimination laws yield inequality in access to healthcare for the transgender population, even amidst calls to improve transgender health (Winter et al. 2016).[2]

In this paper, we present the results of a novel audit study of low-cost private health clinics in a developing country (Pakistan), with transgender (*Khwaja Sira*[3]) and male patients. Our data comes from all 36 low-cost private clinics from two major low-income neighbourhoods in Lahore, Pakistan.[4] Each clinic is visited twice, once by a male patient and once by a transgender patient (where the order is randomly assigned). We utilize a standardized patient protocol, modifying the vignette developed by Das et. al. (2016) and document the entire process of visits to health clinics.[5] We record physician behavior in three broad areas: verbal interactions (e.g., demeanor and obtaining patient history), physical interaction (e.g. examinations), and follow-ups (e.g. diagnostics, advise, etc.). Our choice of low-cost clinics is motivated by two main considerations; first, by paying for services, we avoid ethical concerns of *crowding out* deserving patients in public sector hospitals, and second, low-cost clinics are the natural first visit for our subjects, and indeed most individuals in urban settings in Pakistan.

Our results are striking. While on most measures, there appears to be no difference between treating transgender or males, we find that subtle differences arise in culturally sensitive contexts. For instance, while obtaining patient history, physicians explicitly refrain from asking family history for transgender patients. Similarly, during the physical examinations, they refrain from checking auscultations from the chest for transgender patients and instead check them from the back. These differences may be motivated by statistical discrimination (Arrow, 1973)[6]: healthcare providers

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[2] In May 2018, just after our data collection, Pakistan enacted the Transgender Persons (Protection of Rights) Act, which prohibits discrimination on the basis of gender identity in a number of domains, including healthcare (more here: https://www.icj.org/wp-content/uploads/2020/03/Pakistan-Transgender-Advocacy-Analysis-brief-2020-ENG.pdf). However, some have argued that enforcement continues to be low, calling for additional laws to protect transgender individuals (more here: https://www.pinknews.co.uk/2020/09/17/pakistan-trans-historic-bill-protection-violence-punjab/)

[3] The correct local term for our transgender actors is *khwaja sira,* whose closest western analogue would be transwomen. Details are provided in section 2.1.

[4] Lahore is Pakistan's second largest city with an estimated population in 2017 of 11.13 million (Pakistan Bureau of Statistics, 2017). We visited two major neighborhoods of Walton and Dharamphura.

[5] We are cognizant of our small sample and the fact that we test multiple hypotheses. Please see section 3.2 for a discussion on the constraints and their statistical corrections.

[6] The economics literature focuses on two main motives for engaging in discrimination, statistical discrimination (Arrow, 1971) vs taste-based discrimination (Becker, 1973). Statistical discrimination is one where observable characteristics (such as gender) are used to substitute for missing information, such as assuming socio-economic status, or health behavior, etc. Taste based discrimination is one where an individual engages in discriminatory practices to avoid loss in utility from interacting with certain types of individuals.

substitute in procedures that require less physical contact; are less likely to engage in verbal examination (i.e. avoid uncomfortable questions); and are subsequently more likely to recommend placebo or insufficient treatments for transgender patients, relative to the male benchmark.

A surprising aspect of our study was the lack of overt discriminatory practices: transgender patients were never refused services, nor were they treated poorly, or differently in terms of wait times and other non-clinical procedures. However, we note that private clinics in developing countries (the main primary care providers in such settings) are likely to find discriminatory practices to be very costly (Becker, 1971), and hence have reduced incentives to engage in such practices.[7] Nevertheless, more subtle forms of discriminatory practices can (and do) manifest themselves when the quality of service is not immediately observable (common for credence goods and services – Hermalin, 2014).

While data on transgender experiences in Pakistan is limited, our results are consistent with survey data from developed countries. Despite recent progress, transgender individuals continue to face significant discrimination which negatively impacts their socioeconomic status (Hughto, Reisner, and Pachankis 2015; James et al. 2016).[8] In healthcare, the US Transgender Survey (2015) reports that at least a third of respondents reported having at least one negative experience with a healthcare provider in the preceding year, with about 23% not seeking help because of discrimination. Similarly, the EU's Agency for Fundamental Rights (2014) reports that about 22% of transgender respondents reported being discriminated against by healthcare providers.[9]

Beyond physical health, in more developed countries, transgender individuals face high levels of discrimination in many respects including access to employment (Badgett et al. 2020), income (Russomanno et al. 2019), insurance (Carpenter et al. 2020), and even access to mental health (Button et al. 2020). However, there is a dearth of literature on discrimination against transgender individuals from developing countries. Furthermore, while more data exists for the transgender experience in western nations, it (nearly) exclusively relies on survey methodologies.[10] In this respect, this paper joins the nascent literature focusing on audit and correspondence studies. These techniques allow more control over confounds and allow for establishing causation (Bertrand and Duflo, 2017). The use of this methodology allows us to document, for the first time, discrimination in the provision of health services for transgender individuals, and (in particular) the process leading to poor health outcomes in marginalized populations. To our knowledge, we are the first study to use an in-person audit study focusing on the transgender experience in healthcare and are the first of two that use any form of audit or correspondence design; the second study being an in-progress multi-wave study on transgender access to mental health services in the US by Button et al. (2020).

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[7] An alternative explanation for the lack of results on overt discriminatory behaviour may simply be due to statistical power. Our small sample (36 clinics with 2 visits each) does not allow us to rule out no differences in overt discriminatory practices. Nevertheless, we note that our transgender patients were never refused service and were not asked to wait any more or less than the male patients on average, and if anything, were treated more respectfully by support staff (see results section below).

[8] For more information on the history of anti-LGBTQ laws in former British colonies, please see: https://www.bbc.co.uk/news/world-asia-57606847

[9] These negative experiences may be attributed to the healthcare providers inability to communicate, build relationships, their lack of knowledge, or systematic weaknesses in the healthcare system. See Heng, et. al (2018) for a detailed review.

[10] See Button et al. (2020) for an important exception.

In what follows, we detail our local context: both the local healthcare system and the transgender experience has features that distinguish it from their counterparts in western societies. We then detail the design of our audit study in light of this unique context, and highlight caveats to our design, in particular the small sample, and how we adjust for them, followed by our results. We conclude by highlighting the urgent need for more quantitative research in transgender rights and access to basic services.

2. Local context

2.1 Transgender individuals (*Khawaja sira*) in Pakistan

The *Khawaja sira* is an institutionalized third gender role in South Asia (Nanda, 1986). Tracing their origins back to the events of the *Majabharata,* the community held positions of import in pre-colonial India, but today live on the margins of society. Despite the overturning of colonial laws and legal recognition of their rights in recent years (Redding, 2016), the khawaja sira continue to face discrimination and harassment (Saeed et al., 2018). While a detailed history of the community is beyond the scope of the current paper, we highlight a few characteristics that are relevant to the current study.

While no firm definition exists, khawaja sira can be interpreted as an umbrella term that includes individuals that are intersex, transwoman (*zanana)* or eunuchs (*hijra)* (Khan 2014).[11] Khan (2014) documents that the defining characteristic of a khawaja sira is her feminine spirit, which drives her to a more feminine gender role. Under traditional gender binarism then, the Khawaja sira, especially the *hijra* and *zanana* could be classified as individuals who are assigned male at birth but identify as women, and either undergo castration (*hijra)* or not (*zanana)*. However, as aforementioned, such a classification would be too simplistic. While more effeminate, a khawaja sira occupies a social role distinct from men and women, and resist categorisation as either men or women.

Due to their non-conformity to stereotypical gender roles, the transgender community faces significant discrimination and abuse that may start in early childhood and continue throughout their life (Alizai et. al, 2017). As a result, they live in tight-knight *guru-chela* (leader-disciple) households and isolate themselves from the rest of society. The guru "adopts" transexual children either at the time of birth, when they begin exhibiting feminine characteristics, or once they run away from abuse from family members (de Lind van Wijngaarden et al., 2013).

In the context of our study, it is important to note that we focus on the khawaja sira community, which is a subset of transgender individuals in Pakistan. Importantly, the khawaja sira reveal their identity, through both appearance and personality traits that are in line with their well-defined role. Second, the community continues to face discrimination despite recent advances in the legislative framework. As Ming et al. (2016) note, the lack of anti-discrimination laws can yield differences in treatment by healthcare providers, despite official recognition of the third gender. Furthermore,

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[11] While to our knowledge, no empirical study exists on the distribution of the subcategories of khawaja siras, Khan (2014) states that it is widely believed in the khawaja sira community that the vast majority of khawaja sira are zanana (transwomen), i.e. those who are biologically male but identify as khawaja sira and have not undergone any medical procedure.

even in the presence of anti-discrimination laws, the lack of enforcement in developing countries can yield high degrees of discriminatory practices.

2.2 Private low-cost health clinics

Investment in healthcare is low in Pakistan, which results in its weak healthcare system. Coupled with its low investment in education, in 2016 Pakistan ranked lowest in South Asia, and 164th globally (out of 195 countries) for human capital (Lim et al., 2018). While a highly subsidized multi-tier public health system exists, its perpetual lack of funding means that approximately 67.4% of households report utilising the private health care system (ibid).

The private healthcare system in Pakistan is vast and diverse, spanning large privately run hospitals to small single room medical clinics, run by a single healthcare provider and typically a helper. Our study focuses on the low-cost end of this spectrum, that is private clinics in low-income areas that cater specifically to poor populations. To understand the dynamics of this form of healthcare provision, we consulted with healthcare providers in the area at each stage of our design. Such clinics typically operate in the afternoon, out of small single room storefronts. As is the case in India (reported by Das et al. 2016), providers may also be employed at other public or private hospitals that operate in the morning, and these clinics are their "private practice". Our experts highlighted that healthcare providers in such clinics focus on maximizing the number of patients seen, due to high levels of demand in the absence of suitable alternatives. Hence, the providers' objective is to diagnose "quickly" and move on to the next patient.   Relevant to our design then, is the fact that at these clinics, the appropriate benchmark for quality care may not be the textbook best practices, but to provide a reasonable level of care given their constraints. There is typically no triage, and no nurses to help the doctor with his examination. In short, while more expensive clinics are similar to western counterparts, the low-cost system is meaningfully distinct in both processes and goals. Finally, it is important to note that these clinics will typically dispense medicines for treatment as part of their services at no additional cost.

To determine our universe of clinics, we conducted a census of private clinics in two low-income neighbourhoods of Pakistan's second largest city, Lahore: Walton and Dharmapura. Listing was done in two phases: (1) clinics were identified, photographed, and geo-located by local informants. Our research team confirmed these locations, and collected other preliminary information, such as fees and specialities. This process generated a set of 52 clinics, with consultancy fees ranging from PKR 50 to 1,000 (about USD 0.42 to 8.40 at the time of the study), which were then refined to a universe of 36 feasible clinics, after excluding irrelevant clinics (i.e., clinics for mental health, paediatrics, and gynaecology). A vast majority of clinics were single provider clinics and while our unit of analysis is the clinic, the study was designed such that all visits were at the same time and day for each clinic, to maximise the likelihood of meeting the same healthcare provider.[12]

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[12] Note, however, that because we did not record any audio or video of the interaction between patient and healthcare provider, we are unable to state with certainty that our patients faced the exact same healthcare provider when visiting any given clinic. However, given that these are typically single healthcare provider clinics, we are reasonably certain that this is the case.

3. Experimental design

We conduct an audit study, using professional actors hired through a local acting troupe. We began the study by auditioning 12 actors (supplied by the acting troupe) at a clinic (outside of our catchment area) with three confidant healthcare providers. Based on their performance, we selected 4 actors for the study: 2 male and 2 transgender actors. Our actors were given a consistent background, symptoms and opening script, adapted from the one used by Das et al. (2016). Our standardised patients reported symptoms that were consistent with asthma. We workshopped the script by having our actors hold multiple practice sessions with confidant healthcare providers. We then piloted and adjusted our safety protocols by conducting visits to 2 clinics outside our study area (data not included). Finally, before the full implementation of the study, our actors were once again tested for standardisation by a panel of confidant healthcare providers. A translation of the script can be found in Appendix A.2.

Each of our 36 clinics were visited twice, at least two weeks apart, once by a male actor and once by a transgender actor (order randomly determined). We kept the day and time across each wave constant for every clinic to maximize the probability of facing the same healthcare provider. We randomised the gender of the patient visiting each clinic in the first wave. The minimum two-week gap was implemented to ensure there was limited contamination across the two visits. Recall that patient load at these clinics is large, and given this and the gap in time, we do not anticipate healthcare providers noticing any similarities across visits and found no evidence that they did.

Before each visit, actor health was checked to ensure they did not carry any contaminating physical symptoms. Across all visits, actors were accompanied by a research assistant who would remain outside the clinic. The research assistant formed part of our safety protocol, in addition to collecting data immediately after a completed visit. For our actors' safety, we refrained from conducting any audio-visual recording of the visits: all data collection was based on the actor's (immediate) recollection. Our scripts, actor background texts and survey instrument can be found in Appendix A.2 and A.3.

Upon completion of all visits, medicines dispensed (typically unmarked) or prescribed were identified and categorised by a team of three pharmacists. Overall, the study took a year to run, with background work, such as focus groups with our panel of doctors, and identifying an appropriate acting troupe beginning in the summer of 2017 and continuing into the fall. Preparations for the visits (auditions, training, piloting and two rounds of listing) took place in the Winter of 2017, with our rounds of data collection taking place in February and March 2018. Finally, medication categorisation and data cleaning were completed over the summer of 2018.

3.1 Variables of interest

We utilise the British guidelines on the management of asthma (SIGN 2019) to pre-specify our diagnostic variables of interest (Table 1).

Patient History	Physical Examination	Miscellaneous
1. Previous breathing problems	7. Recorded observation of wheezing Vital signs:	11. Ask for follow-up visits

2. History of asthma (family)	8. Pulse	12. Inquire about past visits to other doctors for same ailment
3. Chest tightness	9. Temperature check	
4. Episodic nature of cough	10. Blood pressure	13. Recommend advanced tests
5. Exposure to allergens		14. Throat Examination (to rule out other ailments)
6. Previous medication		15. Prescribe medicines

Table 1: Variables used for diagnosis of asthma

In addition, we also measured the patient's subjective evaluation of the clinic environment, the time taken at each stage of the process, fees paid, as well as any treatment recommendations (including injections offered, medicines dispensed, and tests prescribed).

Most visits (80%) resulted in medicines being dispensed, with the cost included in the consultation fee. A significant number of these medicines were dispensed in unmarked "packets", typically arranged by how and when they were to be taken. Syrups were also dispensed in unmarked plastic bottles, that on some occasions leaked and destroyed other medicines dispensed in the same visit. With the help of three independent pharmacists, we were able to ascertain the type of medication dispensed for 30 matched clinics (60 visits in total).

As the (to our knowledge) first study of this nature, our primary goal is to document differences in patient experience, which we attribute to discriminatory practice on behalf of the healthcare providers.[13] We note that while there exists considerable anecdotal evidence in favour of discrimination against transgender individuals all over the world, there is a dearth of systemic evidence on this topic, especially in developing countries. Furthermore, the extent to which market-based incentives mitigate discrimination is also not well understood, particularly in the case of credence goods. Our study is primarily concerned with evidence for discrimination in such contexts but cannot say the extent to which profit motives mitigate discriminatory practices.

3.2 Caveats and Multiple Hypothesis Testing

We employ a randomised field audit study which allows us to quantify differences in healthcare received by our standardized patients. Audit studies avoid any Hawthorne effects, as our subjects (i.e., the clinics and healthcare providers) are unaware of the study. Furthermore, we hired professional actors as they were able to perform their tasks consistently, allowing us to control for any patient effects.

Despite these benefits, there are however a few limitations to the audit design. First, audit studies are expensive, both in monetary costs and administrative overhead. For this reason, we made the difficult choice of excluding female patients from the study. Female patients would allow us to compare the behaviour of healthcare providers with female patients, where they may also avoid physical contact. However, financial considerations forced us to use a single benchmark, and male

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[13] We note, however, that there can be sensitivity-based reasons for lower engagement with transgender patients. For example, healthcare providers may feel that due to the secretive nature of the khwaja sira community, it would not be appropriate to collect information on family history (as it is possible that the patient had been abandoned as a child). Nevertheless, we maintain that while the intention remains unobserved, the outcome yields lower patient engagement, which is consistent with lower quality of care.

patients were the natural choice due to the expectation that they would receive the highest level of care.

Second, there may be ethical concerns with such a study. By introducing fake patients, we may be putting stress on an already over-stretched system. This is less of a consideration for us, as we restrict attention to low cost private health clinics, where we are both paying for services, and are not likely to be excluding someone else from receiving healthcare. We also note that low-cost clinics are the most likely first source of healthcare for low-income individuals in urban areas.

Third, like most other experimental studies, we engage in pre-specified multiple hypothesis testing.[14] While pre-specification is a standard method for addressing concerns about multiple hypothesis testing in the literature, we note that even when pre-specified we have a total of 37 hypotheses, which may increase the probability of obtaining at least one false positive. While the risk is mitigated by our small sample size, we also correct for multiple hypothesis testing ex-post. Our primary correction is by employing False Discovery Rate (FDR) methods proposed by Benjamini and Hochberg (1995) and its more precise linear step-up method (Benjamini et al., 2006). We choose FDR over Family Wise Error Rate methods,[15] as FDR methods allow the researcher to trade some false negatives for more power. For our study, the cost of a false positive is low, and so we set our false discovery rate at 20% (i.e., we allow up to 20% of our rejections to be false discoveries). Furthermore, note that both Benjamini and Hochberg (1995) and Benjamini et al. (2006) work well for independent and positively dependent hypotheses (Benjamini & Yekutieli, 2001; Anderson, 2008), which makes them suitable for our setting. Full calculations for Benjamini and Hochberg (1995) and Benjamini et al. (2006) are provided in the appendix; the corrections result in easy-to-use p-value cut-offs for rejection of 0.037 (Benjamini and Hochberg, 1995) and 0.036 (Benjamini et al., 2006), and allow us to continue to reject all variables under the uncorrected cut-off of 0.05. While not reported in the text, in addition to FDR corrections, we also adjust for multiple hypothesis testing using Anderson's q-values (Anderson, 2008). Finally, given our small sample of clinics and visits, we also check the robustness of our standard errors by conducting permutation tests using a logit model with clinic level clusters. All reported results are robust to these tests.

In the analysis that follows, we present our results and highlight hypothesis that are rejected both using unadjusted cut-offs and Benjamini et al. (2006) adjusted cut-offs.

4. Results and discussion

We test for differences in patient experience and diagnostic processes across male (control) and transgender (treatment) patients. Table 2 reports the results for each of our pre-identified variables of interest. The table reports the results from a fixed effects model to control for clinic effects. Note that one visit by a transgender patient was not completed as the clinic in question was not open when we attempted to return, and hence the final analysis contains 71 observations.

We begin by exploring the data for evidence of overt discrimination, meaning any interaction that made our patients feel uncomfortable during their visit. This is outside the scope of the diagnostic

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[14] See section 3.1 for more details.
[15] See for example Bonferroni (1936), Holm (1975), Romano & Wolf (2005) and List et. al (2019).

provider-patient interaction. Note that the likelihood of being mistreated is low due to the profit motives of the low-cost private clinics in question, nevertheless given anecdotal evidence, it is appropriate to check for any differences in perceptions. We find no differences, specifically with regards to patient perceptions of treatment. Both male and transgender patients reported feeling equally comfortable and were treated fairly. We do find some suggestive evidence that the transgender patients were more likely to be addressed by more respectful pronouns: providers were more likely to refer to transgender patients using the more respectful pronoun (*app*), as opposed to the more informal pronouns (*tum or tu*). Overall, we find no evidence of transgender patients being treated differently than male patients outside of the core provider-patient interaction.

Next, we focus on the diagnostic provider-patient interaction. We have evidence in favour of healthcare providers avoiding physical contact with our transgender patients. When conducting physical examinations, healthcare providers are observed to avoid physical tests with transgender patients: auscultations were taken from the back, rather than the front[16] (*p=0.0026*); providers were also less likely to check blood pressure of transgender patients (*p=0.0579*). These results are broadly consistent with gender differences in treatment, though have arguably limited bearing on quality of care, as reasonable substitutions were implemented.

Next, we observe the impact of transgender patients on patient history. We expect to find greater differences in this dimension of diagnostic procedure given that healthcare providers can reduce their engagement levels with no discernible impact on patient perceptions, allowing the profit motive to remain intact. Overall, we find evidence of lower engagement with our transgender patients, with nearly all variables concerning patient history displaying some negative impact. We find that transgender patients are significantly less likely to be asked questions about both their family history (*p=0.0033*) and their occupation (*p=0.0033*). More striking than the statistical results, we find that not a single healthcare provider in our sample asked transgender patients about their family history, while only one asked them about their occupation. We also found that healthcare providers were less likely to ask transgender patients about the length of each episode (*p=0.0237*), and (more tentatively) about any accompanying chest pains (*p=0.0589*). Taken together, these results provide strong evidence in favour of lower engagement with transgender patients.

We next move to patient outcomes. The nature of our chosen condition (asthma) is difficult to diagnose within one interaction, needing multiple tests and visits to arrive at the potential diagnosis. This means that diagnostic accuracy is difficult to observe with such a study. Nevertheless, given the lower levels of interaction, we would expect poorer outcomes for our transgender patients. Overall, outcomes are broadly similar across patient types, though with some important differences consistent with lower quality of care for our transgender patients. On average about 4.2 distinct (unique types) medicines were prescribed for all patients (3.9 for males and 4.5 (*p= 0.247*) for transgender patients). Disaggregating by the type of medication, asthma medication was given out 25% of the time across both male and transgender patients. We find that allergy and pain medication were the most common type of medications dispensed (53.33% and 43.3% across the sample).

Perhaps more importantly, transgender patients were significantly more likely to be offered injections (17 transgender patients were offered injections, compared to 10 male patients; *p=0.0192*).

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[16] Note that the differences in auscultations is broadly consistent with routine auscultations for female patients.

This is important because there is little basis for offering injections to our patients. Our patients were under strict instructions to reject any on-site injections; hence we do not know the content of these injections. Conversations with local healthcare providers suggest that these were most likely B-complex injections, that are commonly given as placebos to placate patients, and are routinely used in low-cost private clinics to generate a perception of service that is typical of markets with credence goods (Olshavsky and Kumar, 2001; Balafoutas et al. 2013) . Furthermore, our experts agreed that none of our patients should have been offered injections for the symptoms they were reporting at the time.

Finally, transgender patients are more likely to be administered basic cough medicine for their symptoms ($p=0.0036$) behavior that is again consistent with lower quality of care. This difference coupled with healthcare providers being less likely to inquire about the episodic nature of the cough is suggestive of a different diagnosis for transgender patients, with healthcare providers seemingly taking our transgender patients less seriously. The results suggest different levels of care for transgender patients due to lower levels of engagement overall.

	Treatment effect (Transgender patient)		Constant (Control/male patient)		N
Patient interaction and subjective perceptions					
Respectful pronoun	0.172*	(0.09)	0.792	(0.04)	65
Treated fairly	-0.029	(0.11)	0.743	(0.05)	70
Provider Highly rated	-0.143	(0.11)	0.451	(0.05)	71
Liked provider	0.057	(0.11)	0.648	(0.05)	71
Provider was attentive	-0.029	(0.11)	0.732	(0.06)	71
Provider took me seriously	-0.143	(0.10)	0.620	(0.05)	71
Patient History					
Q re: previous breathing problems	0.171	(0.11)	0.577	(0.05)	71
Q re: childhood illnesses (breathing)	-0.057	(0.07)	0.169	(0.03)	71
Q re: freq. of breathing difficulty	-0.086	(0.08)	0.169	(0.04)	71
Q re: history of current episode	0.000	(0.12)	0.408	(0.06)	71
Q re: length of each episode	-0.143††	(0.06)	0.169	(0.03)	71
Q re: family history	-0.229***	(0.07)	0.225	(0.04)	71
Q re: occupation	-0.229***	(0.07)	0.268	(0.04)	71
Q re: chest pains	-0.143*	(0.07)	0.310	(0.04)	71
Q re: episodic nature of cough	-0.057	(0.09)	0.211	(0.05)	71
Q re: episode triggers	-0.029	(0.09)	0.225	(0.04)	71
Q re: current medication	0.057	(0.10)	0.225	(0.05)	71
Physical Examination					
Auscultation (front)	-0.286***	(0.09)	0.408	(0.04)	71
Auscultation (back)	0.171††	(0.08)	0.592	(0.04)	71
Pulse checked	-0.114	(0.08)	0.254	(0.04)	71
Temperature checked (touch)	-0.029	(0.08)	0.141	(0.04)	71
Temperature checked (thermometer)	0.029	(0.08)	0.169	(0.04)	71

Blood pressure checked	-0.171*	(0.09)	0.408	(0.04)	71
Miscellaneous					
Provided follow-up/referral	-0.088	(0.12)	0.429	(0.06)	70
Q re: past doctor visits	0.029	(0.05)	0.028	(0.02)	71
Prescribed tests	-0.029	(0.07)	0.113	(0.03)	71
Throat examined	0.057	(0.09)	0.282	(0.05)	71
Medication					
Medicines dispensed/prescribed	0.577	(0.49)	3.931	(0.23)	60
Offered injection	0.229††	(0.09)	0.268	(0.05)	71
Medicine type					
Asthma medication	0.154	(0.12)	0.178	(0.06)	60
Allergy medication	-0.077	(0.12)	0.569	(0.06)	60
Antibiotics	0.231	(0.14)	0.276	(0.07)	60
Steroids	-0.115*	(0.06)	0.371	(0.03)	60
Cough syrup	0.346***	(0.11)	0.205	(0.05)	60
Painkillers	0.039	(0.09)	0.415	(0.04)	60
Other/undefined	-0.077	(0.15)	0.653	(0.07)	60

Table 2: Treatment effects (differences between male and transgender visits)
Notes: Average results reported, with robust standard errors in parentheses using a linear regression model with clinic fixed effects. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. ††$p<0.0365$ corresponds to Benjamini and Hochberg (1995) 2-step False Discovery Rate correction with an FDR of 20%. Results are robust to permutation tests using logit models with clinic level clusters, and to Anderson's q-values (Anderson, 2008).

5. Concluding remarks

This paper presents the results of an in-depth standardized patient field experiment on discrimination in healthcare against transgender patients. We select low cost private clinics in a developing country with a significant transgender population (Pakistan). We utilize professional male and transgender actors with standard scripts (standardized patients) to assess differences in healthcare delivery. Transgender identity is simple to signal in our context, as transgender patients are easy to identify due to clear differences in appearance. Patients are randomly assigned to 36 clinics in two low-income neighbourhoods in Lahore, Pakistan. Each clinic in our sample is visited twice, once with a transgender patient, and once again with a male patient (randomly assigned). At the end of each visit, our patients respond to an extensive survey detailing out all aspects of the visit, which forms the bulk of our data. In addition to this, we conduct interviews with local experts (healthcare providers that are outside of our sample) and utilize a panel of pharmacists to identify unmarked dispensed medicines.

Our results are consistent with lower levels of care for transgender patients. Despite our small sample size, we find evidence that healthcare providers substitute procedures that require less physical contact; are less likely to engage in overall examination of transgender patients; and are more likely to recommend placebo or insufficient treatments. While the level of discrimination in the population, and against different sub-populations, remain open questions, our study is the first to report systematic differences in patient treatment beyond the issues of access reported by Button

et al. (2020). The results also point to some limitations in the provision of healthcare for discriminated sub-populations, pointing to challenges in the use of low-cost private clinics as a solution to problems of access to healthcare.

Beyond our findings, we establish the viability of audit designs to study discrimination against non-binary individuals and lay the foundation for future research. Extensions to other areas of healthcare, as well as other dimension of rights, such as access to education, employment, governance and justice, would help quantify discrimination faced by transgender individuals and highlight weaknesses in current systems of care. An obvious direct extension of the current exercise is to scale it up to identify the mechanisms of bias, and to expand to other forms of healthcare provision, in particular public healthcare. Bias in healthcare can have deadly consequences, something that has been reaffirmed by recent events (Akbar, 2016) and identifying its existence is a crucial first step in rectifying the problem.

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Appendix

A.1 MHT corrections

We conduct Benjamini and Hochberg (BH, 1995) and Benjamini et al. (BYK, 2006) FDR corrections. As part of the process, we first rank our variables/tests by increasing p-values, and then compare the unadjusted p-values to their relevant benchmark. For BH, the p-value at rank i (p_i) is compared to the benchmark $Q_i = q(\frac{i}{m})$, where q is the selected FDR (0.2 or 20% for our case) and m the total number of tests. The researcher finds the largest i such that $p_i \leq Q_i$ and rejects all hypothesis ranked 1 to i.

The BKY method contains additional steps. Starting with the same $q = 0.2$, it first conducts BH analysis using $q' = \frac{q}{1+q} = 0.167$. Then let c be the number of tests rejected using q', a new FDR threshold is calculated, such that $q^* = q'(\frac{m}{m-c})$ and used for the final BH calculation. Table A1 reports the results for both tests.

	Unadjusted			BH (q=0.2)		BH2: linear step-up (q=0.2)			
	Difference	p-value	i	$q(\frac{i}{m})$	Reject	$q'(\frac{i}{m})$	Reject	$q^*(\frac{i}{m})$	Reject
Auscultation (front).	-0.286	0.0026	1	0.0053	Y	0.0044	Y	0.0052	Y
Family history.	-0.229	0.0033	2	0.0105	Y	0.0088	Y	0.0104	Y
Occupation.	-0.229	0.0033	3	0.0158	Y	0.0132	Y	0.0156	Y
Cough syrup.	0.346	0.0036	4	0.0211	Y	0.0175	Y	0.0208	Y
Offered an injection.	0.229	0.0192	5	0.0263	Y	0.0219	Y	0.0260	Y
How long does an attack (episode) last?	-0.143	0.0237	6	0.0316	Y	0.0263	Y (c=6)	0.0313	Y
Auscultation (back).	0.171	0.0327	7	0.0368	Y	0.0307		0.0365	Y
Respectful pronoun.	0.172	0.0563	8	0.0421		0.0351		0.0417	
Blood pressure checked.	-0.171	0.0579	9	0.0474		0.0395		0.0469	
Chest pain.	-0.143	0.0589	10	0.0526		0.0439		0.0521	
Steroids.	-0.115	0.0812	11	0.0579		0.0482		0.0573	
Antibiotics.	0.231	0.108	12	0.0632		0.0526		0.0625	
Have you had breathing problems previously?	0.171	0.112	13	0.0684		0.0570		0.0677	
Pulse taken.	-0.114	0.163	14	0.0737		0.0614		0.0729	
Doctor took me seriously.	-0.143	0.171	15	0.0789		0.0658		0.0781	
Doctor Highly rated	-0.143	0.204	16	0.0842		0.0702		0.0833	
Asthma medication.	0.154	0.211	17	0.0894		0.0746		0.0885	
Distinct medicines dispensed or prescribed.	0.577	0.247	18	0.0947		0.0789		0.0938	

(Breathing difficulty) How often does this happen?	-0.0857	0.266	19	0.1	0.0833	0.0990
Auscultation (any).	-0.0571	0.327	20	0.1052	0.0877	0.1042
Childhood illnesses especially re: cough or breathing problems?	-0.0571	0.425	21	0.1105	0.0921	0.1094
Follow-up/Referral.	-0.0882	0.449	22	0.1158	0.0965	0.1146
Nature of cough (episodic or constant).	-0.0571	0.538	23	0.1211	0.1009	0.1198
Throat examined.	0.0571	0.538	24	0.1263	0.1053	0.1250
Allergy medication.	-0.0769	0.538	25	0.1316	0.1096	0.1302
Currently taking medication.	0.0571	0.574	26	0.1368	0.1140	0.1354
Past doctor visits.	0.0286	0.574	27	0.1421	0.1184	0.1406
Liked doctor.	0.0571	0.603	28	0.1474	0.1228	0.1458
Other/undefined .	-0.0769	0.603	29	0.1526	0.1272	0.1510
Prescribed tests.	-0.0286	0.663	30	0.1579	0.1316	0.1563
Painkillers.	0.0385	0.664	31	0.1632	0.1360	0.1615
Temperature checked by touch.	-0.0286	0.713	32	0.1684	0.1404	0.1667
Temperature checked using thermometer.	0.0286	0.713	33	0.1737	0.1447	0.1719
Episode triggers.	-0.0286	0.746	34	0.1789	0.1491	0.1771
Treated fairly.	-0.0294	0.787	35	0.1842	0.1535	0.1823
Doctor was attentive.	-0.0286	0.802	36	0.1895	0.1579	0.1875
Since when have you had breathing problems?	0	1	37	0.1947	0.1623	0.1927
Temperature checked.	0	1	38	0.2	0.1667	0.1979

Table A1: BH and BH2 multiple hypothesis testing.

A.2 Patient script and background

English Translation

Urdu text and full translation available on request.

Hello doctor, I had severe breathing problems last night. I had difficulties in taking deep breaths. I got really scared.

Backstory

Being the friendly and helpful person that he is, he often visits his friends to help out with all kinds of chores.

Over the past week, he has been going back and forth on a motorbike to his friend's house every day. Last evening, he went over to his friends' house to help them with their moving to a new house (shifting). While he was there, he had a really really bad and scary attack. After eating a simple dinner of dal, rice and sabzi they were cleaning the house when Mohammed Ali started coughing and had a lot of difficulty breathing.

He felt very bad for about 15-20 minutes; afterwards he felt tired and weak for hours and had to go to sleep. As compared to earlier episodes, this one seemed much more severe and took a lot longer to settle. He was unable to take his friend's medication since he was not at home. His neighbour suggested that he should visit a good doctor who practices nearby.

Patient Background
Diet: Bread and vegetables, and occasionally lentils and rice (dal chawal);

- Father's name: Bashir Ali
- 25 years, unmarried
- Has frequent breathing problems
    - (3-4 times per year)
    - usually when cleaning his room
    - when pollution is high
    - when the season changes
- Breathing problems happen quite often
    - about 2-3 times per year
    - happening from childhood
    - elders say used to cough a lot as a child
- Parents died at young age
- Occupation: fieldworker at a local NGO
- No smoke / drink
- Primary school graduate
- Cheerful personality
- Takes a pill for breathing troubles (name unknown)
- Daily routine: wakes, cleans, works – takes break – works, eats, goes sleep
- Appearance: shalwar kameez
- Residence (if pressed):
    - Baghbanpura (if clinic is in Dharampura)
    - Makkah Colony (if clinic is in Walton)

	MODULE 1: ADMINISTRATION (To be filled pre-visit)		
#	Question	Response	Additional notes
1.01	Patient gender:	1 = Male; 2 = Trans	
1.02	How is the patient feeling? Please probe about any fever, cough, or other obvious issues. Please make detailed notes about their response.		
1.03	Doctor's Gender?	1 = Male; 2 = Female	
1.04	At what time did you reach the area? HH: MM:SS		
1.05	At what time did you exit the area? HH: MM:SS		
1.06	Name of the Clinic (from the schedule)		
1.07	Clinic address/location (from the schedule)		
1.08	Was the clinic location correct?	1 = Yes; 2 = No	
1.09	Clinic ID		
1.10	Clinic GPS coordinates		
1.11	Doctor name (from schedule)		
1.12	Time patient went inside clinic: HH:MM:SS		
1.13	Time patient exited clinic: HH:MM:SS		
1.14	Time patient went inside the doctor's room: HH:MM:SS (from the Patient)		
1.15	Time patient came outside from the doctor's room: HH:MM:SS (from the Patient)		
1.16	Date: DD/MM/YYYY		
1.17	Patient name (Actor name)		
1.18	Patient ID (from schedule)		
1.19	Interviewer name (RA name)		

1.20	Interviewer ID (from schedule)		
1.21	Was the visit completed successfully?	1 = Yes 2 = No	
1.22	If not, explain why?		

MODULE 2: CLINIC ENVIRONMENT I			
#	Question	Response	Additional notes
2.00	Please ask: How was the experience overall?		
2.01	Doctor's Gender (from the Patient)	1 = Male; 2 = Female	
2.02	How many patients were in the waiting room when you entered the clinic? (from the Patient)		
2.03	Was the doctor present when you entered the clinic?	1 = Yes; 2 = No	
2.04	If no to above, what time did the doctor arrive? HH:MM:SS		
2.05	How many patients were in the waiting room when you left?		
2.06	How many patients did the doctor see before you?		
2.07	What was the waiting system? (please give details)		
2.08	How did you get assigned into the waiting system?	1= Preferential 2 = Normal 3 = Bad 4 = Other (Please Explain)	
2.09	Were you treated fairly?	1 = Highly unfair 2 = Slightly unfair 3 = Neither fair nor unfair 4 = Slightly fair 5 = Highly fair	

MODULE 3: PERCEPTIONS ABOUT DOCTOR			
#	Question	Response	Additional notes
3.01	Did you like the doctor?	1 = Yes 2 = No	

3.02	Please rate the doctor on a scale of 1 to 5:	1 = Very bad 2 = Slightly bad 3 = Neither good nor bad 4 = Slightly good 5 = Very good	
3.03	Why did you give the doctor this rating?		
3.04	How likely are you to visit this doctor again?	1 = Highly unlikely 2 = Slightly unlikely 3 = Neutral 4 = Slightly likely 5 = Highly likely	
3.05	Did the doctor create an environment in which you could easily convey your symptoms and concerns easily? Was the doctor attentive?	1 = Highly inattentive 2 = Slightly inattentive 3 = Neither attentive nor inattentive 4 = Slightly attentive 5 = Highly attentive	
3.06	Did the doctor appear to be knowledgeable about your illness?	1 = Highly unknowledgeable 2 = Slightly unknowledgeable 3 = Neither 4 = Slightly knowledgeable 5 = Highly knowledgeable	
3.07	Please explain why, or give examples of how you assessed doctor knowledge		
3.08	Did the doctor address your worries seriously?	1 = Not at all seriously 2 = A little seriously 3 = Very seriously	
3.09	Please explain why you thought the doctor was/was not taking your worries seriously		
3.10	Did the doctor explain anything about your illness? Please explain	1 = No information at all 2 = A little information 3 = An appropriate level of information 4 = A lot of information	
3.11	Did the doctor explain your treatment plan? Please explain	1 = No information at all 2 = A little information 3 = An appropriate level of information 4 = A lot of information	
3.12	Please explain		
3.13	How did the doctor refer to you?	1 = Respectful	

		2 = Neutral 3 = Casual 4 = Other	
3.14	What gender did the doctor refer to you as?	1 = Masculine 2 = Feminine 3 = Mixed 4= Other (write in)	
3.15	Any other question asked that was not listed above		
3.16	Any other problems?		

MODULE 4: PERCEPTIONS ABOUT THE ATTENDANT			
#	Question	Response	Additional notes
4.01	Attendant's Gender? (from the Patient)	1 = Male; 2 = Female	
4.02	Did the attendant create an environment in which you could convey your symptoms and concerns easily?	1 = Highly inattentive 2 = Slightly inattentive 3 = Neither attentive nor inattentive 4 = Slightly attentive 5 = Highly attentive	
4.03	Did the attendant address your worries seriously?	1 = Not at all seriously 2 = A little seriously 3 = Very seriously	
4.04	How did the attendant refer to you?	1 = Respectful 2 = Neutral 3 = Casual 4 = Other	
4.05	What gender did the attendant refer to you as?	1 = Masculine 2 = Feminine 3 = Mixed 4= Other (write in)	

MODULE 5: DOCTOR INTERACTION I			
#	Question	Response	Additional notes
5.01	What was your opening statement?	1= Correct (as per script); 2 = Incorrect (something else)	

5.02	If incorrect, what was said?		
5.03	Did the doctor ask about (probe):		
5.03.01	Breathing difficulty (current episode)	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.02	Cough?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.03	Expectoration (i.e. does anything come up such as mucus/blood or is this a dry cough)?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.04	Have you had breathing problems previously?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.05	Since when have you had breathing problems?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.06	How often does this happen?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.07	Is the shortness of breath constant or episodic?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.08	What triggers episodes?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	

5.03.09	How long does an attack last?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.10	Did you eat anything that you had not taken before?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.11	Childhood illnesses especially re: cough or breathing problems?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.12	Age?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.13	Fever?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.14	Chest pain?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.15	Weight loss?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.16	Night Sweats?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.17	Throat or upper respiratory symptoms?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.18	Cigarette?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	

5.03.19	Occupation?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.20	Questions regarding family history?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.21	Have you seen a doctor about this before?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.22	Any medicines currently taking?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.03.23	Anything else that was asked?	1= Yes 2 = No and information not volunteered 3 = No and information was volunteered	
5.04	Did the Doctor check?		
5.04.01	Pulse?	1= Yes 2 = No	
5.04.02	Blood Pressure?	1= Yes 2 = No	
5.04.03	Auscultations front (Checked with stethoscope)	1= Yes 2 = No	
5.04.04	Auscultations back (Checked with stethoscope)	1= Yes 2 = No	
5.04.05	Throat exam	1= Yes 2 = No	
5.04.06	Temperature attempted with thermometer	1= Yes 2 = No	
5.04.07	Temperature taken by touch	1= Yes 2 = No	
5.04.08	Other invasive examination attempted?	1= Yes 2 = No	
5.04.09	Other investigations recommended?	1= Yes 2 = No	

#	Question	Response	Additional notes
5.04.10	Any tests prescribed?	1= Yes 2 = No	
5.04.11	Did the Doctor referred you to anyone? To whom?	1= Yes 2 = No	

MODULE 6: DOCTOR INTERACTION - II			
#	Question	Response	Additional notes
6.01	Prescribed or offered inhaler?	1= Yes 2 = No	
6.02	Injection offered?	1= Yes 2 = No	
6.03	Educated patient regarding breathing problems?	1= Yes 2 = No	
6.04	If yes, what did the doctor say?		
6.05	Fee Charged by clinic		
6.06	Cost of medicines dispensed		
6.07	Total Fee		
6.08	Did the doctor ask you to return?	1 = No 2 = Return to get a refill of the medicine 3 = Return after completion of recommended test 4 = Unconditional return: After how many days? _____ 5 = Unconditional return: After how many weeks?____	
6.09	Did the doctor discuss a possible diagnosis?	1= Yes 2 = No	
6.10	If yes, then what was the diagnosis?		
6.11	If yes, was the diagnosis correct? (Fill in)	1 = Asthma, Allergic Asthma, Bronchial Asthma 2 = Allergies 3 = Anything else	

MODULE 7: MEDICINES			
#	Question	Response	Additional notes

7.01	Medicines <u>dispensed</u>?	Provide details below	
7.01.01	Name: Dose: Frequency: Duration:		
7.01.01	Name: Dose: Frequency: Duration:		
7.01.01	Name: Dose: Frequency: Duration:		
7.01.01	Name: Dose: Frequency: Duration:		
7.01.01	Name: Dose: Frequency: Duration:		
	Add more if needed		
7.02	Medicines <u>prescribed</u>?	Provide details below	
7.01.01	Name: Dose: Frequency: Duration:		
7.01.01	Name: Dose: Frequency: Duration:		
7.01.01	Name: Dose: Frequency: Duration:		
7.01.01	Name: Dose: Frequency: Duration:		

7.01.01	Name: Dose: Frequency: Duration:		
	Add more if needed		

MODULE 8: CLINIC ENVIRONMENT II			
#	Question	Response	Additional notes
8.01	Cleanliness of the clinic	1 = Highly unclean 2 = Slightly unclean 3 = Neither clean nor unclean 4 = Slightly clean 5 = Highly clean	
8.02	Furniture Quality	1 = Very low quality 2 = Slightly low quality 3 = Neutral 4 = Slightly high quality 5 = Very high quality	
8.03	Paint Quality	1 = Very low quality 2 = Slightly low quality 3 = Neutral 4 = Slightly high quality 5 = Very high quality	
8.04	Quality of lighting	1 = Very low quality 2 = Slightly low quality 3 = Neutral 4 = Slightly high quality 5 = Very high quality	
8.05	Size of the Clinic	1 = Small 2 = Medium 3 = Large	