

A Painful Bias:

Racial and Gender Disparities in Medical Diagnoses and Treatment

Institutional and individual biases against women and BIPOC frequently lead to undesirable medical outcomes, or even malpractice. The fact that these biases are often unconscious only makes them more insidious and difficult to address.

Healthcare policies and practices that minimize or dismiss patient input and feedback can exacerbate the impact of these biases. Such policies include short appointments (often mandated or encouraged by insurance pricing) that discourage discussion in favor of quick diagnoses and easy answers.

In his book *Thinking, Fast and Slow*, Daniel Kahneman described two modes of human thought and cognitive processes as “systems.” (Kahneman 2011) System 1 is a quick, almost effortless response that often relies on impressions and feelings formed by prior experiences. System 2 is more concentrated and focused, exerting mental effort to analyze data or stimuli. When patients and medical providers have limited time to interact, whether through policy-dictated short appointments or because of the urgency of a medical emergency, there is not enough time and mental space for the mind’s System 2 to work out a proper analysis, so System 1 kicks in, bringing its collection of biases and heuristics along with it.

Research on Treatment Disparities

One of the most significant areas where treatment disparities manifest is in the treatment of pain. Several studies exploring how medical professionals respond to patients' reports of experienced pain have shed some light on how pain is assessed and treated differently for women and BIPOC.

A study this year out of the University of Miami found that when male and female patients expressed the same amount of pain while moving an injured joint, observers viewed female patients' pain both as less intense than male patients', and also more likely to benefit from psychotherapy, whereas men were seen as more likely to benefit from medication. The gender of the observers was irrelevant; both men and women interpreted women's pain to be less intense. The researchers found a potential gender bias in the study participants' responses:

The Gender Role Expectations of Pain measure (GREP). . . asks about perceptions of typical men's and women's sensitivity to, endurance of, and willingness to report pain. Studies using the GREP have reported that women are viewed as more willing to report pain, more sensitive to pain and less able to endure pain than men. These gender pain stereotypes may represent mechanisms underlying gender biases in pain assessment and treatment.

Lanlan Zhang et al., *Gender Biases in Estimation of Others' Pain*, The Journal of Pain, Volume 22, Issue 9, 1048-1059 (September 2021).

These beliefs about how men and women manifest and report their pain may be why disparities have been found in treatment responses. In a study of 981 patients who presented to an emergency department with acute abdominal pain, women were 13-25% less likely to receive opioid pain treatment, after controlling for age, race, pain score, and other factors. Women were also treated more slowly, having to wait on average 16 minutes longer than men to receive analgesic relief. Esther H. Chen MD, et al., *Gender Disparity in Analgesic Treatment of*

Emergency Department Patients with Acute Abdominal Pain, Academic Emergency Medicine, Volume 15, Issue 5, 414-418 (May 2008). <https://doi.org/10.1111/j.1553-2712.2008.00100.x>

Huge disparities have also been found in how white and BIPOC patients are treated for pain. In one study, black patients were almost 20% less likely than white patients to receive pain medicines for a bone fracture. K.H. Todd, et al., *Ethnicity and Analgesic Practice*, Annals of Emergency Medicine, Volume 35, Issue 1, 11–16 (2000). In another, physicians underestimated the pain of black patients more often than nonblack patients (47% versus 33.5%). L.J. Staton et al., *When Race Matters: Disagreement in Pain Perception between Patients and their Physicians in Primary Care*, Journal of the National Medical Association, Volume 99, Issue 5, 532–538 (2007).

Myths about physical differences in BIPOC that affect their response to pain, such that they have thicker skin and do not feel pain as acutely as white people, have been around for centuries. These self-serving beliefs were used to excuse a range of abuses towards BIPOC, from inhumane treatment by slave owners to unethical medical experiments. While it is hard to believe that anyone could still believe these myths, a University of Virginia study found that a large number of people do. And when that belief is held by a doctor, it impacts how they make treatment decisions. Kelly M. Hoffman, Sophie Trawalter, Jordan R. Axt, & M. Norman Oliver, *Racial Bias in Pain Assessment and Treatment Recommendations, and False Beliefs about Biological Differences Between Blacks and Whites*, Proceedings of the National Academy of Sciences, 113 (16), 4296-4301 (April 2016). <https://www.pnas.org/content/113/16/4296>

The two-part study first looked at lay people's beliefs about biological differences between black and white people. When asked to assess the validity of 15 false statements about supposed biological differences, "[a]bout 73% of the sample endorsed at least one of the false

items (i.e., indicated that an item was possibly, probably, or definitely true.” (Hoffman April 2016)

The study then presented the same false statements to medical students and residents; 50% found at least some truth in at least one of the false statements. The researchers may not have expected such a response from medical professionals: “These percentages are noticeably lower compared with those in study 1 (50% vs. 73%); however, given this sample (medical students and residents), the percentages for false beliefs are surprisingly high.” (Hoffman April 2016)

Once the medical students and residents who believed false statements about racial pain disparities had been identified, the researchers could compare their diagnostic and treatment outcomes to the study participants who did not believe the false statements. The analysis found that study participants who endorsed more false beliefs “rated the pain of a black (vs. white) patient half a scale point lower and were less accurate in their treatment recommendations 15% of the time.” (Hoffman April 2016)

Towards a Better Understanding of Pain

Is pain even the best medical condition to study when looking for the impact of biases on treatment? Pain is universal, so the potential for comparisons is large. But pain is also a slippery target. When studying pain reporting and recollection, Kahneman found that how we experience pain is very different from how we remember it, and that our memory is closely tied to the last moments of an episode of pain. (Kahneman 2011) But it’s possible that we still don’t even understand how pain is generated in our bodies to begin with.

Dr. Frederick Lenz, a Johns Hopkins neurosurgeon, has found an area of the thalamus that, when stimulated, can create a “deep, frightful, squeezing” chest pain in some patients, and only a mild tingling in others. (Gawande 2002) Dr. Lenz has also found patients for whom this stimulated response is not triggered by any discernable physical injury at all. Coupled with the phantom pain that many amputees experience in a limb that is no longer there, this research points to a theory of pain that is as dependent on the brain as on any injury at the point of sensation.

In fact, Canadian psychologist Ronald Melzack, one of the developers of the “Gate-Control” theory of pain, has revised his theory towards one that centers the brain as the origin of pain. In this theory, a patient’s remembered associations and emotions relate to how a pain experience develops in the brain. Attention and focus may even play a part. (Gawande 2002)

If an individual’s experience of pain is affected by associations, emotions, and other non-injury factors, then any past experience of being disbelieved or diminished may have a meaningful effect on how their pain manifests. This makes the diagnostic process muddier, but an understanding of how biases play into the process can help provide insight.

Our Biases at Work

The 2016 University of Virginia study described above is an example of the Illusory Truth Effect: when we hear the same false information repeated again and again, we often come to believe it is true. How could 73% of lay people, and 50 % of medical students, believe at least one false statement about biological differences between blacks and whites? Because they heard it repeatedly. This effect is often compounded when proven truths are not stated repeatedly,

perhaps because they are presumed to be so obvious and widely understood as to go without saying. In these situations, the falsehoods remain unchallenged, and the repetition creates an anchor of belief.

The Illusory Truth Effect is one of several biases and heuristics that can impact the delivery of medical care, either through individual practitioners' behaviors, or on a wider scale through healthcare policies at a practice, hospital, or even a regulatory level.

Affect Heuristic:

A theory proposed by psychologist Paul Slovic, the Affect Heuristic posits that a person's beliefs about the world are influenced by their existing preferences and opinions. (Kahneman 2011) This can have wide-ranging impacts when unconscious or implicit biases are also in play. For example, if a practitioner believes, consciously or not, that women are weaker or less tough, their credence in a woman's self-reported pain level may be diminished. This heuristic is similar to Confirmation Bias, in which a person gives more credence to evidence that confirms what they already believe.

Ambiguity Aversion:

Repeatedly we have seen that humans are, in general, more comfortable with the familiar than with the unknown. We dislike it if a result is ambiguous or unsure, or if an outcome cannot be predicted with reasonable certainty. This results in an Ambiguity Aversion, which impacts the decision-making of both patients and practitioners.

If the effectiveness of a possible treatment is unsure, Ambiguity Aversion makes it less likely that a practitioner will propose it, or that a patient will elect it. (Berger 2013) But Ambiguity Aversion also plays a part in the diagnostic process itself. If a practitioner is averse to

any ambiguity in their diagnostic process, they are more likely to consider ailments that they are more familiar with, and may even be biased to see symptoms that align with the familiar diagnosis.

Relatedly, informed patients who have researched their condition may be dismissed as hyperbolic if their knowledge does not align with the practitioner's area of familiarity.

“Admitting to a patient that you don't have the answer is hard. Admitting it to yourself might be even harder, especially since medical training teaches practitioners to project confidence, even when in doubt. ‘It's easier to say *This is in your head* than to say *I don't have the expertise to figure this out.*” Ed Yong, *Even Health-Care Workers with Long COVID Are Being Dismissed*, The Atlantic, November 24, 2021. <https://www.theatlantic.com/health/archive/2021/11/health-care-workers-long-covid-are-being-dismissed/620801/>.

When patients repeatedly get the message that doctors have authority, it is hard to challenge that authority. But there is another rational conflict here. Patients are discouraged from questioning a doctor's rarified knowledge, yet we concurrently expect a patient without a medical degree to have sufficient knowledge to discern which of their experiences are diagnostically relevant.

Status Quo Bias:

Status Quo Bias is our preference to continue with the current state of affairs. This is related to Loss Aversion, because the current situation is a known and familiar state, and its risks and rewards are also known. If we make a change to a situation or circumstance, the result may be better, but it may also be worse. Our aversion to loss, and our innate desire to avoid future feelings of regret, often causes us to pass up a benefit for fear of a loss.

Status Quo Bias can help explain why women and BIPOC patients will often stick with a white male practitioner, even if they know of the potential for biased treatment. They may even continue to frequent a white male practitioner if biased treatment actually happened. In addition to the fear of change resulting in “going from the frying pan into the fire,” so to speak, change can also cost a lot of effort. When we are offered treatment by white male doctors, it can be difficult or awkward to ask for a different practitioner to treat us. There can also be bureaucratic hurdles to face, depending on the medical facility or insurance issues.

Halo effect

Medical practitioners enjoy an elevated status in our society. They have successfully completed a long and arduous course of study, and as such are generally presumed to be hard-working, dedicated, and knowledgeable. They are usually paid well, and may display signifiers of that financial success in their appearance or dress. They often speak with confidence. All of these factors create a Halo Effect of authority and wisdom, which makes patients more likely to trust their diagnoses and less willing to question or push back.

Patients may presume that because of their ongoing studies, and their exposure to many experiential hands-on examples of illness in their medical practice, that doctors are able to quickly recognize and assess most conditions. But the very presumption that doctors are up-to-date on medical research is itself flawed – in part because doctors, like all of us, are biased towards results that confirm what they already believe.

Neither [physiotherapists] Brown nor Oller knew about post-exertional malaise or ME/CFS before they got long COVID. Oller added that she initially thought little must have been written about it, “but no, there’s a whole body of literature that had been ignored,” she said. And if she hadn’t known about that, “what else was I wrong about?”

(Yong 2021)

Even the most studious practitioner, familiar with a broad range of current medical research, can still be fundamentally under-informed – because medical studies frequently rely on sample sizes that are too small or homogeneous to effectively represent all potential patients, or the manifestation of their symptoms. “Women . . . account for less than 30% of the participants in most studies and trials in cardiology. It is difficult, therefore, to draw conclusive evidence on managing cardiovascular disease in women.” Ghada W. Mikhail, *Coronary Heart Disease in Women is Underdiagnosed, Undertreated, and Under-researched*, BMJ (Clinical research ed.) 467-8 (September 2005). <https://www.bmj.com/content/331/7515/467>.

Sameness Bias:

Another factor that can enhance the Halo Effect in some patients, or lead to incorrect diagnoses for other patients, is Similarity. Humans are more likely to see distinction and nuance in someone who resembles themselves. Therefore, a patient may have more confidence in a practitioner of the same race or gender presentation as themselves. Conversely, a practitioner may be less likely to properly capture or evaluate relevant symptoms in a patient of a different race or gender presentation.

Criminal law has become aware of the effect of own-race bias on cross-racial witness misidentification. *Cross-Racial Witness Misidentification*, Montana Innocence Project <https://mtinnocenceproject.org/cross-racial-witness-misidentification/>. This Sameness Bias can also impact our ability to discern medical symptoms or their severity. The high number of white men in the medical field unsurprisingly leads to less optimal results for patients who are not white or male.

We looked at how women are underrepresented in studies of coronary disease above. (Mikhail 2005) This underrepresentation has resulted in a lessened understanding of and familiarity with how cardiac episodes manifest in women. Women experiencing chest pain are more likely than men to wait, often over 12 hours, before seeking medical treatment. Sophia Antipolis, *Heart Attack Diagnosis Missed in Women More Often Than in Men*, European Society of Cardiology (March 12, 2021) <https://www.escardio.org/The-ESC/Press-Office/Press-releases/Heart-attack-diagnosis-missed-in-women-more-often-than-in-men>. When they do seek treatment, they are more likely to be misdiagnosed than men are; doctors are more likely to suspect a non-ischemic problem in women, “such as anxiety or a musculoskeletal complaint,” *Id.*

Chronic pain, which disproportionately impacts women, is frequently misdiagnosed or under-treated.

ME/CFS and other chronic illnesses that are similar to long COVID disproportionately affect women, and the long-standing stereotype that women are prone to “hysteria” means that it’s still “common to write us off as crazy, anxious, or stressed,” Oller said. This creates a cycle of marginalization.

(Yong 2021) When women begin to expect that their concerns will not be taken seriously, they will fail to report their symptoms or seek treatment. If these symptoms are not brought to the attention of practitioners – particularly male doctors who are less likely to have personal experience with the symptoms, then their lack of familiarity continues, and diagnoses continue to be unlikely. This is the “cycle of marginalization,” and one of the best ways to break it is with more diverse representation in research studies and in recruitment to medical practitioner careers.

Nudges:

Analysis of data from the International Narcotics Control Board shows that global opioid analgesic use more than doubled between 2001 and 2013. Berterame S, Erthal J, Thomas J, et al., *Use of and Barriers to Access to Opioid Analgesics: a Worldwide, Regional, and National Study*. Lancet, 1644–56 (2016). An increase in prescribing has in turn been linked to increases in opioid misuse, abuse, and addiction.

In response to the opioid crisis, health policies are prioritizing efforts to reduce opioid prescribing after surgery. Neuman, Mark, Bateman, Brian, & Wunsch, Hannah, *Inappropriate Opioid Prescription After Surgery*, Lancet, 1547–1557 (2019). Many doctors reduce the initial amount of opioids they prescribe after surgical procedures but will prescribe more later as needed. The theory is that it is safer to prescribe too little medication and then give more as needed, instead of providing too much, and risking developing a dependence. Such a policy is a nudge, consistent with Sunstein and Thaler’s concept of libertarian paternalism. (Thaler 2009) The surgeons are not denying pain medications to their patients outright, they are only making it a little more difficult to get a large quantity.

However, once again biases impact how these nudges play out. In a Harvard/MGH study, 862 white and 177 non-white patients from 2011 to 2015 had surgery for a musculoskeletal injury and were given low amounts of opioids for post-surgical pain. The study found that white patients were much more likely to be re-prescribed additional opiates in the month following surgery. The researchers found that the “difference in opioid re-prescription based on patient race was both statistically and clinically meaningful.” Harrington, Emma, Basilico, Matthew, Bhashyam, Abhiram & Heng, Marilyn, *Racial Disparities in Opioid Re-Prescription for Musculoskeletal Trauma Surgery*, Journal of the American College of Surgeons (2019)

[https://www.journalacs.org/article/S1072-7515\(19\)30813-0/pdf](https://www.journalacs.org/article/S1072-7515(19)30813-0/pdf). This disparity in re-prescribing rates could be due to biases on the part of the prescribing physicians, resulting in an underestimation of the patients' actual pain levels, as discussed above. The lower rate could also be caused by the aforementioned cycle of marginalization, whereby past experiences of having their pain discounted could discourage patients from returning for additional pain relief when needed.

Legislative and Policy Attempts

The current opioid crisis in the United States has prompted lawmakers to look closely at how our healthcare systems treat and manage pain. However, the current focus is on reducing dependence, abuse, and addiction – not on better and more universal success in pain resolution. Massachusetts General Laws Ch. 94C, Sec. 24A requires a practitioner to utilize a prescription monitoring program each time the practitioner issues a prescription to a patient for any narcotic drug in Schedule II or III or a benzodiazepine. This was signed into law August 2018, as a part of the *Act for Prevention and Access to Appropriate Care and Treatment of Addiction*.

The prescription monitoring program utilizes the Massachusetts Prescription Awareness Tool (MassPAT), found online at <https://www.mass.gov/guides/massachusetts-prescription-awareness-tool-masspat>.

This monitoring program is designed to discourage prescription fraud in the form of “doctor shopping,” in which an opioid abuser seeks multiple duplicate prescriptions. The program, and the MassPAT tool, are best suited for flagging multiple prescriptions, or prescriptions filled at multiple pharmacies. Before a prescriber can write a new prescription for

these controlled medications, they must enter the patient's information into the tool, which will flag if the patient already has an active prescription.

While the intended purpose of MassPAT is not concerned with addressing disparities in pain treatment, it can still help address these injustices in the future. This will collect data on pain sufferers and pain treatment on a scale beyond most research studies, and with a much broader and more diverse sample population. As underrepresentation in research is one of the main factors leading to disparate medical treatment, a data collection of this scope could have a significant impact on future medical policies and practices.

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