Working toward gender diversity and inclusion in medicine: myths and solutions

Sonia K Kang, Sarah Kaplan

Women's representation in science and medicine has slowly increased over the past few decades. However, this rise in numbers of women, or gender diversity, has not been matched by a rise in gender inclusion. Despite increasing representation, women still encounter bias and discrimination when compared with men in these fields across a variety of outcomes, including treatment at school and work, hiring, compensation, evaluation, and promotion. Individual and systemic biases create unwelcome environments for women, particularly for those who additionally identify with other traditionally devalued groups (eg, women of colour). This Review draws on several decades of research in the field of management and its cognate disciplines to identify five myths that continue to perpetuate gender bias and five strategies for improving not only the number of women in medicine, but also their lived experiences, capacity to aspire, and opportunity to succeed. We argue for a move away from a singular focus on interventions aimed at targeting individual attitudes and behaviour to more comprehensive interventions that address structural and systemic changes.

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Institute for Management and Innovation, University of Toronto Mississauga, Mississauga, ON, Canada (S K Kang PhD); **Institute for Gender and the Economy, Rotman School of Management, University of Toronto, Toronto, ON, Canada** (S K Kang, Prof S Kaplan PhD); **and Mack Institute for Innovation Management, Wharton School, University of Pennsylvania, Philadelphia, PA, USA** (Prof S Kaplan)

Correspondence to:
Dr Sonia K Kang, Rotman School of Management, University of Toronto, ON M5S 3E6 Canada
sonia.kang@utoronto.ca

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Introduction

The year 2017 marked the first time in history when the number of women enrolling in US medical schools exceeded the number of men.[1] When this historic cohort of female medical students enters the workforce, what kind of work environment will they encounter? Despite the record numbers of women entering fields across science, technology, engineering, mathematics (STEM), and medicine,[2] women continue to experience disadvantage, discrimination, and gender-based violence in their home and work lives,[3–9] a reality that is too often amplified for women of colour, of low socioeconomic status and social class, and of advanced age, and women who do not identify as heterosexual, are disabled, or belong to other traditionally devalued groups.[10–16] In medicine, these inequities manifest for women as everyday experiences of sexism, which includes exposure to sexist jokes in class; sexual harassment by clinicians, faculty, or patients; weaker reference letters than men for medical school faculty applications; lower income than men; channelling into lower paid areas of medicine such as family practice; and a decreased likelihood of being addressed by one's professional title than men.[17–22] While we may be making progress on the numbers—an increase in gender diversity—true progress on improving women's sense of belonging and inclusion is critically lagging.

The disconnect between diversity and inclusion is not unique to medicine. This inability to see the problem as beyond merely the number of women in the field occurs in a wide variety of academic and professional domains.[23–26] In this Review, we offer insights from decades of research on diversity and inclusion in the fields of management and its cognate disciplines, including psychology, sociology, and economics, to propose suggestions for improving not only the number of women in medicine, but also their lived experiences, capacity to aspire, and opportunity to succeed. We acknowledge that most of this work has been done in Europe and North America and therefore might not be generalisable to all contexts. Moreover, any effective intervention would have to be tailored not only to country cultures and laws, but also to the specific organisations and departments in which these interventions are being made. Thus, the solutions proposed here should not be viewed as general fixed principles, but rather as a starting point for making more localised change. We start by debunking five myths that are commonly encountered when examining diversity and inclusion practices, and conclude by offering five research-supported solutions to bring about equity by design, an approach that we argue is particularly well suited to the medical field.

Five myths about diversity and inclusion

Diversity and inclusion policies and practice are becoming nearly ubiquitous in organisational settings. Finding an organisation or institution without a written statement outlining their commitment to diversity is now rare, and billions of dollars each year are used in the efforts to increase the representation of women and minorities.[27,28] To create lasting change and to prevent the current focus on diversity and inclusion from becoming another ineffectual trend in management, it is important to ensure that efforts are evidence-based and do not rely on common myths that might instead perpetuate the problems they are trying to solve. The five myths uncovered in this Review are not mutually exclusive—often being intertwined or potentially conflicting—but represent the most common (albeit inaccurate) assumptions people make about achieving diversity and inclusion.

Myth 1: other people are biased, not me

The first myth that should be debunked is the idea that bias is a problem unique to only a few individuals: namely the racists, sexists, and bigots among us.[29] However, research on the human brain and how it makes sense of the world suggests not only that all of us are biased, but that we must be biased to survive.[30,31] Cognitive biases and heuristics are shortcuts that allow us to interact meaningfully with people, objects, and tasks

without having to exhaust our insufficient attentional resources to decipher every sensory signal.[32,33] Whenever you encounter a person, for example, your brain rapidly engages in a series of calculations to interpret that person's relevance to you by placing them within a social category.[32] The first automatic calculations regard age, race, and gender.[34–36] Because of this perceptual primacy, gender has come to frame the way we see the world; it is an implicit or unconscious bias that serves as a foundation upon which stereotypes, expectations, and norms have been created.[37] Social categorisation is an inevitable part of our perceptual experience, such that the stereotypes we hold about different social groups will alter our perceptions of, and reactions to, individual group members.[33] Further, when it comes to devaluing women's contributions in masculinised settings, women can be just as biased as men, meaning that people of all gender identities can perpetuate gender bias in organisations.[5,38] Rejecting the idea that only some people are biased is a crucial first step to personally engaging with the problem of discrimination so as to bring about change.

Myth 2: the key to controlling bias is controlling how people think

Most of the efforts made to minimise bias in organisations has focused on controlling or eradicating the biases that exist in our minds. Implicit bias training is an example of such efforts. Testing for implicit bias via the Implicit Association Test (IAT)[39] has become commonplace, and has risen in popularity along with implicit bias or diversity training. Despite the millions of dollars spent on administering the IAT and training people to act without bias, the evidence that this kind of training actually changes organisational outcomes is scarce.[40,41] More commonly, diversity training (especially when done alone and not in combination with other organisational interventions) has produced a host of unintended consequences.[42] It has been shown to be associated with reduced diversity,[43] worsened behaviour toward minority co-workers,[44] and the creation of the illusion of fairness such that those who claim to have experienced discrimination are less likely to be believed.[27] Instructing people to avoid the use of stereotypes can paradoxically lead to increased activation of those stereotypes,[45] and attempts to increase the awareness of stereotype prevalence can inadvertently normalise stereotyping and discrimination (such as, if everyone uses stereotypes it must be okay).[46] Eradicating these innate human biases is difficult and likely to be impossible. Although educating people about these biases and providing education on how to recognise them is an important first step, we must go further to create systems and environments in which bias and stereotyping are either less likely to become initiated, or are prevented from resulting in discrimination even when they are active.

Myth 3: under-representation of women is a pipeline problem

The representation of women across a variety of STEM fields and within medicine has been slowly increasing, albeit at different rates within these fields and across nations.[47,48] If we look to the research on child development and psychology, girls perform to an equal or better standard than boys in STEM topics, and report high interest in pursuing careers in STEM.[49–52] Therefore, the pipeline of female trainees and candidates itself is healthy. The real problem is brought about by the pressures that push women out of the pipeline.[18,20,21,53–58] Research shows that discrimination exists against women at each stage of professional life, from recruitment and selection, to recommendation, evaluation, promotion, training, and compensation.[3,59,60] These effects are often exacerbated for women of colour or for those who possess other devalued intersectional identities.[22,61–66] Women are conferred less respect and status, experience greater workplace hostility and harassment, are disproportionately punished for errors, and experience higher amounts of invisible and uncompensated labour, particularly in terms of emotional labour, than men.[54,67–74] It is often argued that women choose to opt out of certain careers or opt in when lower status roles are available due to motherhood. However, research suggests that the effects of this so-called motherhood penalty are structured by discriminatory dynamics.[75,76] Further, if motherhood fully explains women's under-representation in STEM and medicine, then we would not also observe under-representation of men of colour, but we do.[77] Therefore, it is not the case that women are entering the pipeline in too few numbers, but rather that a confluence of factors is pushing them out.

Myth 4: promoting diversity contravenes meritocracy

One of the most commonly cited explanations that people provide for rejecting diversity initiatives is that their organisations are meritocratic.[78] The arguments are that if women were equally qualified, they would be hired and promoted, and that any diversity initiatives aimed at righting the imbalance would compromise quality. However, an abundance of research evidence shows our so-called meritocracies are not so meritocratic.[79,80] Studies that control for underlying quality show that a signal of female gender by itself leads to devaluation: for equal curriculum vitae in which only the name is different, Brian is more likely than Karen to be seen as hireable; with equal business cases for a startup company in which only the video narration voice differs, the male narration is deemed twice as investable as the female narration; female postdoctoral applicants have to be 2·5 times more productive than the average male applicant to be hired; and computers named James are valued nearly 25% more than computers named Julie.[56,58,81–84] So, if anything, underlying biases appear to be causing the current meritocratic systems to bypass many highly capable women and members of other minority groups. We are

drawing heterosexual, white men from much further down the distribution of talent than we are for other social categories.

Myth 5: we have to fix the women

Related to the gender bias in organisations, most programmes attempting to address gender inequality focus on so-called fixing the women, by teaching them such skills as how to lean in, negotiate better, stand up straight, adopt powerful postures, talk more in meetings, and be more assertive, to name a few.[85–91] Although not universally the case, many of these solutions are themselves highly biased, in that they train women to act more like men because the actions of men are more valued and perceived as the correct way to succeed. What is neglected in this approach is the backlash women often experience when engaging in these behaviours. Competent women with agency have been shown to experience backlash for violating expectations of warmth and so-called feminine niceness.[92–95] Research also shows that women are punished more severely than men for mistakes or failures, and that these negative effects can negatively affect perceptions of other female co-workers.[72,96,97] Thus, attempts to fix the women will continue to be counterproductive within a system that is rigged against them.

Five solutions for achieving gender equality in medicine

We turn next to a series of suggestions based on management research for improving the experience of women in medicine. This research shows that intervening at the level of the individual is difficult, perhaps even impossible, and that attempts to alter the behaviour of individuals have not proven effective on their own. The introduction and application of stereotypes and other biases are most common under stress (eg, when time is restricted, when information processing demands are high, or when we are under pressure to perform). Accordingly, perhaps no better environment for unintentionally enabling bias exists than the medical workplace, where demands are high, resources can be low, and the pressure to perform the right action quickly can be overwhelming. Under these conditions, individual change must be embedded within a structure that is designed to enable progress. Management research about the medical profession has shown that practitioners can easily overlook or misinterpret cues in crisis situations, supporting the assertion that educating about and attempting to control bias are not enough.[98] We also know from progress in evidence-based medicine that structural solutions such as behavioural guidelines might be an effective means for physicians and other health-care practitioners to overcome habits and biases.[99,100] Therefore, we argue that medicine is particularly well suited to interventions that target organisational change by designing for equality, and we outline five potential solutions in this context. These solutions are presented as a starting point for the innovation of refined and targeted solutions that consider departmental, organisational, regional, and national contextual needs and constraints. We should also recognise that we cannot achieve equality inside organisations without also achieving equality in people's lives outside of work. Structural inequalities in society should also change. The interventions that we will outline therefore focus on only one aspect of achieving workplace gender equality in medicine, but it is the aspect over which most people in the medical profession have more control.

Solution 1: treat gender equality as an innovation challenge

The general approach to working toward gender equality, and diversity more broadly, has been largely rooted in attitudes and values. Justifications for gender equality are often discussed in terms of the so-called business case, focusing on how equity, diversity, and inclusion are economically productive, rather than focusing on them as the right thing to do.[101] Instead of initiating action toward finding a solution, such discussions on gender equality become stalled when trying to define the nature of the problem and in determining whether or not it is worthy of solving. Further, this type of framing can ultimately cause more harm than good.[101] To make progress in achieving gender equality, we must declare the discussion on whether and why we should pursue equality to be over. From this point, within contexts where this is possible (ie, within some contexts even the recognition of gender equality as a basic human right is still an ongoing challenge), we can switch our focus onto experimentation and innovation.[102] As with any organisational initiative, gender equality should be approached with an open and scientific attitude, and the willingness to experiment and measure outcomes. Because the challenge of achieving equality is complex and multifaceted, openness to failure and the willingness to change tactics is a must, as is transparency via measurement and reporting, so that momentum and accountability for change remain high.

The most promising solutions are probably behavioural and systemic changes that focus on creating a climate for change, an approach widely supported by the so-called nudge theory (with the idea of identifying easy to implement and economical ways to change people's behaviours by structuring their choices),[103] rather than those focusing only on changing individual attitudes or values. Gender-inclusive workplace cultures are those that create a positive social climate for people of all gender identities, and can be cultivated through such practices as increasing the representation of women and gender non-binary people in leadership, by use of gender inclusive photos and pronouns in organisational communications, and adopting anonymous evaluation practices that minimise the potential for bias by

eliminating gender cues such as names and pronouns.[43,104–107] That said, no quick-fix solution is available to offer, and actual change will only follow from the repeated application of commitment, courage, and many iterations of innovative experimentation. Further, just as we should think about solutions for gender diversity innovatively, we should also update our conceptualisation of gender itself to expand beyond the traditional male and female binary, so as to encompass the range of identities that represent gender diversity.

Solution 2: change institutional norms

Norms are the conventional patterns of behaviour that are considered acceptable by a social group.[108–110] People of all gender identities are under pressure to conform to gender norms (eg, women are expected to be kind and nurturing; men are expected to be competent and strong).[111–113] These norms have a powerful influence on our behaviour.[114,115] They result in women being socialised into more communal medical specialties (eg, family medicine) and men being socialised into more agentic specialties (eg, surgery).[21] Over time, these norms have strong effects on other measurable outcomes beyond behaviour. As family medicine has become more feminised over time, for example, the pay gap between family medicine and other specialties has widened considerably.[19,116] Fortunately, because we are a fundamentally social species, changing perceptions of norms also changes behaviour.[117] Theories on the social influence of norms predict that if everyone else in an organisation appears to value diversity, we are more likely to act like we value diversity ourselves. Conversely, if expression of prejudicial attitudes or engagement in discriminatory behaviour (as observed in the so-called iron man surgery culture[118]) is considered normative, these practices will become embedded within a social environment. The most important source of such normative change is that of a group's leaders.[119,120] The behaviour of those at the head of a group have a powerful influence on the people further down the group, and therefore the communication and behaviour of hospital administration and senior staff, for example, must show a commitment to diversity for others to follow suit.

Solution 3: create a culture in which people feel personally responsible for change

One of the reasons that diversity training programmes can be so spectacularly unsuccessful is that they challenge people's sense of autonomy, self-determination, and control.[42,121] Just as humans are inherently prone to bias, so too do we have an inherent drive toward autonomy, which can lead us to resist initiatives that we feel are forced upon us.[122,123] People react negatively to perceived coercion, and overbearing diversity programmes can therefore go wrong and actually make organisations less inclusive. The three most common diversity programmes of the past 30 years, mandatory diversity training, mandatory testing for job applicants, and grievance systems, are associated with decreases in the representation of white women, as well as black, Hispanic, and Asian men and women.[43] Better results are seen with diversity programmes that capitalise on people's need for autonomy, increase contact between diverse groups, encourage personal engagement, and include all members of the organisation rather than only those who are part of the group targeted for intervention. Examples of successful diversity programmes are mentoring programmes, which effectively increase representation among minority women in particular, and the establishment of diversity task forces.[43] Even more effective are sponsorship programmes in which sponsors become personally invested in their protégé's career success, take risks to champion them for recognition and advancement, and actively embed them in powerful networks.[124,125] Combined targeted recruitment and mentoring programmes, in which sponsors are given personal responsibility for recruiting and fostering the success of under-represented minorities can also be effective. These types of programmes are promising not only because they support individual autonomy and engagement, but also because they circumvent the hesitation to participate because an individual believes he or she is not biased. Attempts to control specific attitudes and behaviours can go wrong if individuals feel that their autonomy is threatened, but meaningfully engaging them in organisational change can help to circumvent this type of backlash.[121]

Solution 4: implement behavioural guidelines and action plans

People often encounter difficulty translating their goals into action. This issue can be remedied through a type of planning known as implementation intentions, which links anticipated acute situations to goal-directed responses (eg, "whenever situation x happens, I will initiate the goal-directed response y").[126,127] These kinds of systems are already very common in medical workplaces (eg, code systems clearly link specific situations to a prescribed set of responses). To advance toward the goal of gender equality, one suggestion is to put more emphasis on behavioural rather than attitudinal guidelines for promoting diversity and inclusion. For example, consider what might happen if a hospital decides to combat gender bias during the search for new attending physicians. A typical first step would be clearly outlining the goal (eg, to eliminate gender bias within search committees looking for attending physicians) and the rationale (eg, eliminating gender bias will benefit our team, patients, organisation, and other various stakeholders) This step is where most plans for improving diversity end. People are left with an abstract set of values and goals, but no distinct action plan for achieving them and no indication of how progress will be measured and success identified, which research over the decades has shown is an essential part of effective goal-setting.[128] Worse still, in some cases abstract or attitudinal diversity goals or statements have been

unsuccessful and end up doing more harm than good.[27,28,42,129–131]

To move from abstract plans to actions and avoid unintended consequences, organisations must clearly lay out the specific steps that will be taken to enact their values and goals, and specify the indicators that will be used to measure success, while also taking into consideration the many barriers that stand in the way of individual behavioural change.[132] In the attending physician example, some of these guidelines might include ensuring that at least a third of hiring committee members are women, with success being identified as a steady state of 50:50 men and women on committees within 3 years; ensuring that only standardised questions and structured interviews are used, and using a statistically significant increase in the number of women hired over a 3 year period as an indicator of success. Without specific behavioural guidelines to inform practice, diversity and inclusion are often unable to advance beyond attitudes and goals. Examples of resources to equip managers with the tools to interrupt bias are the toolkits available via Bias Interrupters, an initiative of The Centre for Worklife Law at the University of California Hastings College of the Law (San Francisco, CA, USA), and the Bias Busting Strategies worksheets created by the Engendering Success in STEM consortium. These tools are available for individuals and organisations, list clear behaviours and responses that can be initiated when bias is encountered, and provide a starting point from which to build specific action plans for a given environmental context and set of goals.

Solution 5: create organisational accountability for change

Just as individual change must be embedded within supportive organisational structures, so too must organisational efforts be embedded within larger systems that support and monitor progress toward diversity and inclusion goals.[43,121] Methods for holding individuals, teams, and the organisation as a whole accountable for change can help by measuring and keeping progress on track toward essential milestones, and by signalling the importance of the initiative.[103] The common maxim what gets measured gets done applies just as well to diversity initiatives as it does to any other type of initiative an organisation might wish to set up. Without ongoing data collection and transparency, whether time and resources are being expended effectively or just wasted is impossible to tell. However, to avoid backlash associated with threats to autonomy, organisational accountability must be designed empathetically and with room for failure.[3,29,121] Failure is part of the experimental process, and learning from mistakes allows us to refine, redesign, and retest. Organisational initiatives embedded within accountability frameworks such as affirmative action plans and work processes adhered to and promoted by diversity committees and task forces and diversity managers or departments have shown great promise in increasing and sustaining diversity.[121] Again, the most promising approach is comprehensive, in which individual, structural, and organisational initiatives are combined in the push for progress.

Conclusions

The available evidence is clear: decades of policies and billions of dollars aimed at changing individuals have not been successful in bringing about gender equality. We have made progress, albeit uneven across the world and specialties, in the number of women entering and working in medicine, but true progress on inclusion remains an elusive goal. By understanding more about how bias works and dismissing the myths that have held us back for so long, we can turn our attention and resources toward structural and systemic interventions that have more promise for success.

Contributors
SKan wrote the first draft. SKap collaborated on outlining the ideas and on revisions of the preliminary draft.

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SKap reports advising the Department of Medicine, University of Toronto, Toronto, ON, Canada prior to writing this review. SKan declares no competing interests.

For more on **Bias Interrupters** see https://biasinterrupters.org/

For more on the **Bias Busting Strategies worksheets** see http://successinstem.ca/resources/

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