

EDITORIALS

Links between age and sex of surgeons and patients' outcomes

Unravelling these complex associations will benefit both patients and surgeons

Natalie Coburn *associate professor of surgery*¹, Christopher J D Wallis *urology resident*², Nancy Baxter *professor of surgery*³

¹Division of General Surgery, Sunnybrook Health Sciences Centre, Toronto, ON, M4N 3M5, Canada; ²Division of Urology, Sunnybrook Health Sciences Centre, Toronto, ON, M4N 3M5, Canada; ³Division of General Surgery, St. Michaels Hospital, Toronto, ON, M5B 1W8, Canada

Predictors of surgical outcomes are of interest to patients, referring clinicians, healthcare organisations, and surgeons themselves. In the linked paper (doi:10.1136/bmj.k1343), Tsugawa and colleagues examine the relation between the age and sex of surgeons and perioperative mortality among older US patients undergoing emergency surgery. In this Medicare (federally funded) population, mortality declined with increasing age of surgeon, but the authors found no independent association with surgeons' sex.¹ We applaud their efforts to examine these complex matters. As often happens with observational research, this study raises more questions than it answers.

Previously, Tsugawa found worse outcomes among patients treated by internists with a hospital based practice, as the physicians aged, attributing this to changes in practice since their training and possibly poor adherence to guidelines.² Conversely, the new study finds that outcomes for emergency surgery improve with age of surgeon, the authors suggesting improved surgical skills with extra years in practice.¹

Although technical proficiency affects surgical mortality,³ surgeons' judgment, including selection of patients for surgery, when to consult others, and team coordination, also contributes. Whereas the previous study of hospital doctors included all admitted patients, the new study examined only those undergoing emergency surgery, minimising referral bias. However, by including only patients who had surgery, the true effect of surgeons' characteristics on outcomes remains unknown. For example, significant variation in mortality exists following surgery for lysis of adhesions, but many patients with small bowel obstruction are treated conservatively. Surgical exploration of a patient destined to improve with conservative management will exaggerate the benefits of surgery—the Will Rogers phenomenon.⁴

Conversely, an operation performed on a patient in extremis, who would have died regardless of intervention, is likely to result in an operative death. Outcomes may therefore relate more to selection of patients for surgery than to surgical skills

or postoperative management. Skill erosion in senior surgeons is often discussed, but deficiencies in judgment and lack of experience may also lead to higher operative mortality and may be more prevalent in younger surgeons. To mitigate this, training paradigms now recommend graduated responsibility for less experienced surgeons and an increased focus on coaching and mentoring.

Tsugawa and colleagues found no association between surgeons' sex and patients' outcomes, although patients treated by female surgeons aged 50–59 had the lowest overall mortality.¹ These findings conflict with previous studies of hospital physicians in the US and surgeons in Canada, both of which showed superior adjusted outcomes among patients treated by female clinicians.^{2,5} Taken together, however, these studies are important.^{1,2,5} In 2018 discrimination based on age, race, gender, and sexual orientation persists, albeit in more insidious forms—subtle innuendos, lack of respect, patients and staff assuming women are not surgeons or surgical decision makers, referral biases, and undermining “locker room talk”.

Women are often assumed to be inferior surgeons and may experience more negative backlash when poor outcomes occur.^{5,6} A similar effect has been shown in finance, with women punished more harshly for failed deals.⁷ Much of this behaviour is subconscious, owing to implicit cognitive biases; women who are successful, seek leadership, or break gender norms are deemed less likable.^{8–10} Although not studied in these papers, similar biases occur on the basis of race, ethnicity, and sexual orientation.

These implicit biases are so deeply engrained in societal norms that even people experiencing discrimination may not fully realise that it has occurred, or why.¹¹ Yet these biases impede the recruitment and advancement of women and minority groups in surgery and result in higher rates of burnout.¹² Data showing similar or improved outcomes for female surgeons are important, to dispel myths and speed the evolution of a diverse surgical culture.

Finally, whereas much attention has been paid to barriers for female surgeons, surgical culture may also exert harmful, although different, forces on young or male surgeons. Societal pressures and expectations may encourage some to undertake complex or risky operations beyond their comfort level or without a safety net of colleagues to assist. Coupled with inexperience, this may contribute to inferior outcomes of young surgeons. Importantly, the authors found that provider volume accentuated differences in mortality, highlighting again the importance of volume and expertise on outcomes.¹

Importantly, Tsugawa and colleagues show clear variation in surgical outcomes, identifying opportunities to improve care.¹ Benchmarking of adequately risk adjusted outcomes, accounting for all patients under a surgeon's care and not just those managed operatively, are crucial to understanding when, and eventually how, a clinician exceeds or fails to meet expected outcomes. However, even objective measures are insufficient to overcome systemic bias. To do so, we must learn to recognise and reduce the implicit biases that each of us inherently holds. Surgical care will improve more quickly when we embrace and foster teamwork, communication, and diversity in our field.

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- 1 Tsugawa Y, Jena AB, Oray EJ, et al. Age and sex of surgeons and mortality of older surgical patients: observational study. *BMJ* 2018;361:k1343.
- 2 Tsugawa Y, Jena AB, Figueroa JF, Oray EJ, Blumenthal DM, Jha AK. Comparison of Hospital Mortality and Readmission Rates for Medicare Patients Treated by Male vs Female Physicians. *JAMA Intern Med* 2017;177:206-13. 10.1001/jamainternmed.2016.7875 27992617
- 3 Birkmeyer JD, Finks JF, O'Reilly A, et al. Michigan Bariatric Surgery Collaborative. Surgical skill and complication rates after bariatric surgery. *N Engl J Med* 2013;369:1434-42. 10.1056/NEJMsa1300625 24106936
- 4 Feinstein AR, Sosin DA, Wells CK. The Will Rogers phenomenon: improved technologic diagnosis and stage migration as a source of nontherapeutic improvement in cancer prognosis. *Trans Assoc Am Physicians* 1984;97:19-24. 6535338
- 5 Wallis CJ, Ravi B, Coburn N, Nam RK, Detsky AS, Satkunasivam R. Comparison of postoperative outcomes among patients treated by male and female surgeons: a population based matched cohort study. *BMJ* 2017;359:j4366. 10.1136/bmj.j4366 29018008
- 6 Sarsons H. Interpreting signals in the labor market: evidence from medical referrals. 2017. https://scholar.harvard.edu/files/sarsons/files/sarsons_jmp_01.pdf.
- 7 Egan ML, Matvos G, Seru A. When Harry fired Sally: the double standard in punishing misconduct. NBER Working Paper No 23242. 2018. <http://www.nber.org/papers/w23242>.
- 8 Okimoto TG, Brescoll VL. The price of power: power seeking and backlash against female politicians. *Pers Soc Psychol Bull* 2010;36:923-36. 10.1177/0146167210371949 20519573
- 9 Girod S, Fassiotto M, Grewal D, et al. Reducing Implicit Gender Leadership Bias in Academic Medicine With an Educational Intervention. *Acad Med* 2016;91:1143-50. 10.1097/ACM.0000000000001099 26826068
- 10 Katsarou M. Women & the leadership labyrinth: Howard vs Heidi. <http://www.leadershippsychologyinstitute.com/women-the-leadership-labyrinth-howard-vs-heidi/>.
- 11 Sandberg S. *Lean in: women, work, and the will to lead*. Random House, 2013.
- 12 Cassidy-Vu L, Beck K, Moore JB. Burnout in Female Faculty Members. *J Prim Care Community Health* 2017;8:97-9. 10.1177/2150131916669191 27650035

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