Editorial

Geography and breast reconstruction: the complex business of using travel time to understand how patients access care after surgery

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Breast reconstruction (BR) following oncologic mastectomy has functional, aesthetic and psychological benefits for women (1-5). Yet, BR access inequity exists. Research shows lower socioeconomic and minority ethnic patients, and those living in rural geographic locations have poor access to BR (6,7), information useful when developing healthcare policy and services designed to equalise access. But ensuring BR care is patient-centred from diagnosis through treatment to recovery also means getting under the skin of its social determinants, unpacking these more structural factors through research exploring service-user and practitioner experiences of the patient journey (8,9). Silverstein *et al.* claim their rural USA study of women undergoing oncologic mastectomy with BR provides new insights that help unpack patients' experiences of how geography, a known social determinant of health and care, shapes their decision to access BR care (10).

Patient access to post-BR care is an important but less considered aspect of the patient journey (11,12). Using Google Maps to calculate patient travel time from home to treatment site, Silverstein *et al.* used the median split method to form groups of patients "near" and "far" from post-BR care, with "far" patients found to have fewer post-surgery appointments and delayed diagnosis of complications. The authors make a strong claim about greater travel time from their findings: it is a significant factor underpinning poorer access to post-BR care because it shapes rural and urban patients' *decisions* about whether to access care on their post-BR journey.

The strength of Silverstein *et al.* is that their findings trigger what Bona *et al.* (8) call a "thought experiment" about why we have yet to act on the known social determinants of cancer care inequities. In Silverstein *et al.*'s case, their study highlights the pressing need to recognise the different meanings of geography as a social determinant of the post-BR care inequities patients experience, a headline with implications beyond BR. For example, geography has different dimensions as a barrier to healthcare access (e.g., distance, travel time). These often-unrelated dimensions have potentially different implications for healthcare access but can be conflated by researchers examining healthcare barriers. Travel *distance* and *time*, for instance are not always related given travel time across short distances in urban areas can be lengthy at peak congestion times. Similarly, rural-urban geography, travel distance, and travel time, often used loosely or

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interchangeably when considering geographic barriers to healthcare access, are not coterminous invariably. Silverstein *et al.*'s findings also raise the issue of whether aspects of BR care are neglected in research on barriers to accessing services, an issue which resonates with current concerns about the impact of transportation insecurity on cancer patients care journey (13). For example, the focus on the rural-urban divide in access to BR surgery as a core component of breast cancer treatment, has perhaps overshadowed awareness of the needs of patients who experience geographic barriers other than rural residency, such as travel time at points of their care journey apart from when accessing surgery (e.g., diagnosis, post-BR care). Silverstein *et al.*'s findings suggest that geography can in fact be *a sustained barrier* to accessing care across the patient journey through post-surgery care. Yet, the authors' strong claim that their findings are evidence of travel time being a *significant determinant of patients' decisions* about their post-BR care and recovery is questionable for two main reasons: how the authors use Google Maps and patient appointment data.

The authors' strong claims are predicated on Google Maps travel time reflecting patients experiences of geography as a barrier to post-BR care access more accurately than other measures. Google Maps provides *estimated* travel times using an algorithm comprised of the geographic distance between two locations, road speed limits and if available, real-time road traffic updates for travellers when enroute to their destination whether by car, public transport, bicycle or on foot (e.g., peak or off-peak traffic volume for motor vehicle road users). However, the authors used a "travelling without moving" method given their Google Maps estimates of patient travel time were calculated in isolation from real-time travel information. The questionable value of the authors' use of Google Maps travel time is compounded by their sampling of patients *within a rural area*. Nevertheless, Silverstein *et al.* assume that the quantitative (greater travel time is a greater barrier) and qualitative (greater travel time "feels" like a barrier) meaning of travel time for patients access to healthcare is the same for rural *and* urban residents. Research does suggest travel time is important for cancer patients living in rural and urban locations, but that the meaning of travel time for these patients is more complex and, at times, contrary to Silverstein *et al.*'s assumptions. For example, although travel time to care is typically greater for rural patients, they can develop psychological approaches to managing their healthcare including using effective self-care (14). Similarly, although the meaning of travel time is important for how rural cancer patients manage their treatment and self-care, Silverstein *et al.*'s recommendation that merely reminding them of the importance of attending appointments is a necessary but insufficient strategy (15). Research consistent with Silverstein *et al.*'s claim that travel time can be a barrier for rural and urban cancer patients, also suggests that not only does travel time has different meanings for cancer survivors depending on the stage they are at within their survivorship, but that being "far away" from healthcare can facilitate patients to develop more effective self-care behaviours (16).

Silverstein *et al.*'s use of patient appointment data to claim that "far" patients decide to attend fewer appointments because of their greater travel time to care raises questions about the conceptual value of this and similar research that uses such data to make inferences about patients' psychological processes. Quantitative data on appointments attended and missed is complex to interpret because it is shaped by multiple patient, clinician and healthcare system variables (17-19). Silverstein *et al.*'s strong claim is actually based on proxy rather than actual patient accounts of their decisions about accessing post-BR care. The authors' overinterpretation of patient appointment data is consistent with the more general practice of treating medical outcome data as "good enough" indicators of complex psychological and social processes (20). Unfortunately, Silverstein *et al.* also seem to commit other potential inferential biases when interpreting their finding that "far" patients recorded fewer seromas than "near" patients, contrary to the claim that travel time is a significant barrier to care access leading to delays in complication diagnosis. The authors interpret these counterintuitive findings as evidence of "far" patients *underreporting* post-BR complications but without evidence to support this interpretation.

Concern is growing about transport insecurity and cancer care inequity. Therefore, the authors' nuancing of travel time as a barrier experienced by BR patients across their care journey is timely. However, the authors' overinterpretation of their findings is an important reminder that understanding how geography determines inequalities in healthcare access is a complex business. Importantly, using new technologies to estimate such barriers does not always resolve the complex conceptual challenges we face when using geography to understand patient access to care following BR.

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