Evidence and Architectural Competency within the Healthcare Procurement Ecosystem

Rebecca McLaughlan (1), Kieran Richards (2)

Abstract

Since the emergence of evidence-based design in the 1990s, much has been written about the role of systematically produced research for improving the quality of healthcare facilities. There has been comparatively little discussion, however, regarding the extent to which evidence may be seen to minimise a range of risks traditionally mitigated through the expertise of the architect. Drawing on our own fieldwork alongside relevant secondary literatures, this paper examines the effects of evidence on perceptions of architectural competency within healthcare procurement. While the availability of design-related evidence was not always observed to alter a design approach it did engender more profound forms of communication between stakeholders, enabling more meaningful interactions between the value orientations those stakeholders represent. In this way, we argue, the emergence of evidence-based design is less a challenge to the professional competency of the architect than a tool for validating this competency, couched in terms that stakeholders from other disciplines customarily recognise.

Affiliation:
(1) The University of Sydney, School of Architecture, Design & Planning
(2) University of Newcastle, School of Architecture and the Built Environment

Contacts:
(1) rebecca [dot] mclaughlan [at] sydney [dot] edu [dot] au
(2) kieran [dot] richards [at] sidney [dot] edu [dot] au

Received:
11 June 2021

Accepted:
17 September 2022

DOI:
10.17454/ARDETH10-11.13

ARDETH #10 #11

Introduction

In *Architecture: The Story of Practice*, Dana Cuff wrote that "clients generally prefer to hire architects who have experience with their particular building type, since this may reduce the risk of negative consequences" (1991: 103). Thirty years on from publication, this observation remains largely true. Cuff could not, however, have anticipated the emergence and ensuing influence of evidence-based design on architectural practice shortly thereafter – initially within the healthcare sector, but increasingly within other typologies, including education, workspace and retail design. Evidence-based design has since become thoroughly implicated within the procurement of large-scale projects; those appointed to design, construct, and manage such projects are typically required to ensure that the resulting built outcome responds to the best available research evidence (Anåker et al., 2017; Hamilton, Watkins, 2008).

Evidence-based design has since become thoroughly implicated within the procurement of large-scale projects; those appointed to design, construct, and manage such projects are typically required to ensure that the resulting built outcome responds to the best available research evidence.

For healthcare facilities, the literature of evidence-based design generally encompasses systematic research directed toward harnessing the capacity of the built environment to improve patient outcomes (Centre for Health Design, 2010). While the basic principles of evidence-based design were derived from environmental and behavioural psychology in the 1960s, its formal establishment was inspired by evidence-based medicine (Carr et al., 2011; Hamilton, 2020; Pati, 2011). Early advocates of evidence-based medicine believed that clinicians whose practice was evidence-based would provide superior, more reliable patient care compared to those who relied on "their own clinical experience" (Haynes, 2002: 2). In this sense, the movement toward evidence-based clinical practice could be seen as a challenge to the normative standards of professional competency of that time (Dickinson, 2004). Although it is commonly acknowledged that evidence-based design recommendations should complement the expertise of the design practitioner (Carr et al., 2011), as was the case with evidence-based medicine, it could also be suggested that evidence-based design constitutes a similar challenge to the professional competency of the architect. This is implied by Caren Martin and Denise Guerin (2006), for example, when they suggest that, "normative design practice is no longer sufficient to solve today's more

complex design problems… designers *need* data about how people use space and how the built environment affects people" (Martin, Guerin, 2006: 167-168, emphasis added).

Although architects once tended to control procurement processes from concept to completion, as Jeremy Till observes in a prior issue of "Ardeth", the scope of this influence has drastically declined (Till, 2018). Since the 1970s, the procurement of buildings has entailed an increasingly complex entanglement of human and non-human forces, clients, builders, regulatory bodies, finance capital, the representatives of finance capital, the price of raw materials, and so on (Cook, 2008; Gottschling, 2018; Till, 2009). The declining professional agency of the architect carries significant implications for the values prioritised within the procurement of social infrastructure, healthcare or otherwise. As Till suggests, in the moment that a project is "wrested from the hands" of the architect, it becomes subject to the "methods and values of another" (2018: 15-16). In this paper, we explore how design-related forms of evidence interface with perceptions of the professional competency of the architect, and how the use of such evidence during procurement impacts the agency of the architect more broadly.

Since the 1970s, the procurement of buildings has entailed an increasingly complex entanglement of human and non-human forces, clients, builders, regulatory bodies, finance capital, the representatives of finance capital, the price of raw materials, and so on.

The evidence of evidence-based design may be quantitative or qualitative; it may be derived from financial, econometric, sociological, demographic, or material data; or relate to any number of indexes devised to measure building performance, such as thermal comfort or sustainability. At the limit, one should even include more tacit forms of evidence, such as those based on the skill and experience of the designer. Andrew Leach, William Taylor and Lee Stickells define evidence as "the matter of reason (and reasoned proof)" (2013: 1). We borrow this definition to suggest that, in the context of architectural procurement, this might be translated as the matter of reason and reasoned proof that informs decision-making processes within procurement ecosystems, as well as the outcomes of those decisions. While using different forms of evidence to improve design outcomes is not a new phenomenon, endeavours toward producing evidence-based design research and using it in practice are relatively novel. This may perhaps explain why there is a marked tendency across the literature

to focus more on definitions, epistemological issues, frameworks, hypothesising benefits and barriers, and producing surveys of itself, than on understanding the actual influence of this evidence on the resulting shape of our the built environment. Many have written about the *gap* between research and practice, but few have ventured to explore the concrete intersections of these spheres (Hall et al., 2017). Of course, there are exceptions to this observation, such as in the collection of design-focused case studies and analysis deriving from the healthcare estate developed by Michael Phiri and Bing Chen (2014), or the anecdotes of practitioners integrating research into their process collated by Flora Samuel and Anne Dye (2015), and, more recently, Kathrine Martindale (2022). Relatively speaking, however, such exceptions are rare. We believe there is much work to be done to better understand the impact of evidence on procurement processes and the built world at large.

This paper presents data gathered within twenty-seven interviews with participants engaged in the design and procurement of major healthcare buildings, including sixteen architects, three government representatives and nine medical administrators. Several participants have been involved in the procurement of, not one, but a range of healthcare facilities, most state-funded but several with a philanthropic component. Nineteen participants were based in Australia, while eight were based internationally (six in the UK, one in the USA and one in NZ). Participants were questioned about the use and value of evidence within hospital procurement processes, where our definition of evidence included that which is produced and published within an academic context; alongside varying forms of research undertaken by architectural practices, their research partners, or healthcare institutions themselves, in the service of a project.

This paper presents data gathered within twenty-seven interviews with participants engaged in the design and procurement of major healthcare buildings, including sixteen architects, three government representatives and nine medical administrators.

How evidence enters the procurement ecosystem

While the responsibility for integrating design-related evidence into a given project falls largely into the hands of a design team, multiple stakeholders can be responsible for producing the research documents intended to guide decision making within the procurement of healthcare facilities. Before delineating the typical accumulation of evidence within a healthcare

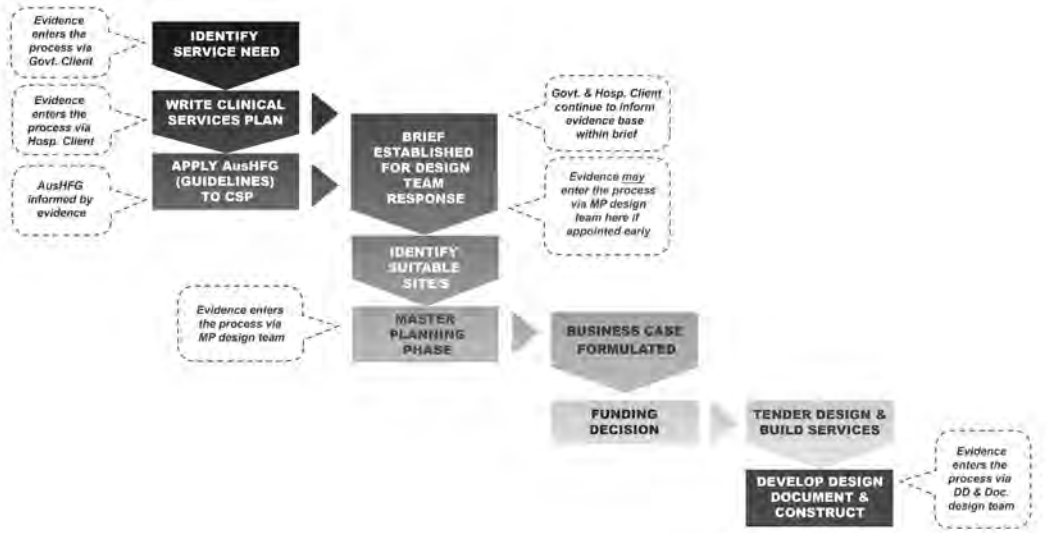

Fig. 1 -The pre-funding and post-funding stages in the procurement of a new healthcare facility within Australia, with typical points at which evidence enters this process indicated. Diagram by Rebecca McLaughlan.

project, we first offer an overview of the role – and thus influence – of the architect, in relation to other project stakeholders in the procurement of this building type. While acknowledging that the architect's role fluctuates between projects, funding models and geographical location, for this paper, we provide a simplified view of the stages of procuring a new healthcare facility within the Australian context (Fig. 1).

The first step is the identificatio of a "service need" this will typically be initiated by a health provider (such as a Local Health District Board) or by a state government. That need is formalised and quantified through the development of a Clinical Services Plan (CSP). The CSP is then translated spatially following the Australasian Health Facilities Guidelines (AusHFG) which provide spatial and functional recommendations for a range of healthcare settings (Australian Health Infrastructure Alliance, 2016). The application of these guidelines to the CSP generates an approximate schedule of accommodation, defining the overall size of the facility to be built. This forms the basis of the brief that designers are asked to respond to. Master planning follows with a range of options investigated relative to the selected site, or across a range of sites under consideration. The information gathered and organised during these "pre-funding" phases is used to inform the business case; the business case determines the feasibility of a given project and the decision on whether, or not, it will be funded. "Post-fund-

While acknowledging that the architect's role fluctuates between projects, funding models and geographical location, for this paper, we provide a simplified view of the stages of procuring a new healthcare facility within the Australian context.

ing" refers to any project stages occurring after that decision has been made, including tendering architectural services for detail design documentation, and construction (these may occur concurrently or under the umbrella of a "design and build" contract).

Different forms of research and evidence can enter a procurement ecosystem during any of the aforementioned phases, through different intermediaries and conduits and, as the conditions of procurement vary, so the influence a body of evidence might exert upon the built form of a project varies with them. Hospital administrators often undertake their own research processes to inform project briefs, including visiting other similar facilities, commissioning scaled architectural models, gathering user-group data, or commissioning independently produced research reports. In the case of large-scale, publicly funded projects, research might also be commissioned at the level of local, state, or federal government as well as relevant regulatory bodies and organisations. Examples include where comprehensive, evidence-led briefs are developed between a state government and hospital staff, or where independent research reports are commissioned from a collaborative team of academic researchers and architects experienced within a particular typology, such as mental health care (McLaughlan et al., 2020; McLaughlan, Willis, 2021). The architects we spoke with confirmed basing design decisions on evidence-based design literature whilst also gathering their own forms of design evidence through precedent studies (often including study visits to other facilities, and conversations with the clients or designers of those facilities), alongside various forms of end-user consultation. In this sense, the evidence upon which design decisions can be based may emanate from both academic and non-academic environments, and it can take on a variety of forms, from the conceptual to the pragmatic.

More important, however, than the type of evidence is the point at which that evidence enters the procurement ecosystem. Several participants agreed that where evidence enters the procurement ecosystem before the funding decision it is likely to exert a more substantial impact on the quality of the built outcome. This effect is also discussed in a recent study by Rebecca McLaughlan and Julie Willis (2021: 1210)

Several participants agreed that where evidence enters the procurement ecosystem before the funding decision it is likely to exert a more substantial impact on the quality of the built outcome.

which detailed how the inclusion of a research report within the briefing documents for a children's hospital became "really powerful in a commercial sense" because the design team analysed it closely to identify aspects that could offer them a commercial edge within the competitive tender process. This example manifested in terms of greater expenditure directed toward an impatient planning arrangement that optimised landscape views, where that expenditure was justified by literature that verified the wellbeing benefits associated with landscape views.

Several participants also agreed that the point at which architects are invited to enter the procurement process exert a similarly substantial impact on the design quality obtainable. Decisions around the timing of architectural engagement reflect the preferred procurement route a jurisdiction has, where each involves different degrees of control and risk bestowed upon clients, contractors, designers, and other stakeholders.[1] These decisions inform the eventual shape of the building by enabling or constraining what solutions a design team can subsequently propose. When not engaged until the master planning stage, for example, by which time decisions regarding the scale and scope of the facility, site and budget are confirmed, architects are left with little latitude to suggest alternative – potentially superior – design solutions. During the pre-funding stage of translating a CSP into a spatialised brief, different jurisdictions will alternatively appoint architects, project managers, or clinical health planners (often with a professional background in nursing) to undertake this task. The varying levels of spatial expertise correspond with varying degrees of reliance on approved guidelines, such as those provided by AusHFG. The subtle inference here is that the knowledge obtainable from an evidence-based design guideline can perform as a reasonable substitute for the knowledge and skill that a competent healthcare architect would bring to these early stages of the procurement process. Yet, as Till observes in Architecture Depends: "the most important, and most creative part of the process [of any project] is the formulation of the brief" (2009: 169). A reliance on guidelines as a substitute for the early engagement of architectural expertise is the first instance we observed of a devaluing of architectural competency relative to the availability of evidence.

1 – For an overview of public-private partnerships and procurement models for social infrastructure in an Australian context, see Jefferies and McGeorge (2009). On the range of different models of procurement generally, see: Cook (2008: chap. 2); and Eynon (2013: 91-99). On those involving private lines of financing, see: Alemán et al. (2020); and Jones (2018: 327–39). On the complexities of architectural procurement in the United Kingdom, see: Gottschling (2018: 626-646).

When not engaged until the master planning stage, for example, by which time decisions regarding the scale and scope of the facility, site and budget are confirmed, architects are left with little latitude to suggest alternative – potentially superior – design solutions.

When introduced into procurement situations, research and evidence predominantly tend to function as a means of defining client needs, scoping out a wider range of potential spatial responses to those needs, and of evaluating those responses from different value-orientated viewpoints.

Evidence establishes a common language

Generally speaking, evidence-based design studies tend to organise data from a multitude of sources into readily digestible, qualified conceptual chunks, such as "nature views can improve patient outcomes" or "a sense of control over one's hospital setting can reduce stress" (Ulrich et al., 2008). The research disseminates synthesised forms of that awareness, and the *evidence* it gathers evaluates and validates those syntheses to varying degrees. When introduced into procurement situations, research and evidence predominantly tend to function as a means of defining client needs, scoping out a wider range of potential spatial responses to those needs, and of evaluating those responses from different value-orientated viewpoints. Many of those we interviewed intimated these functions, but they are also common threads that link much of the secondary literature on the topic (Phiri, Chen, 2013; Rowden, Jones, 2018). For example, one of the architects we spoke with relayed how the chief executive of a major hospital sent several of his staff on an international tour of children's hospitals before finalising a design brief, saying "go and look at the best of the best in the world… so that you are educated and informed… [about] *What works, what doesn't work*" (participant 10). Understanding a range of solutions also assists with problem-solving, as the architect of a palliative care facility recounted, "early on we were debating single rooms versus [multi-bed] ward[s]… and there was a question asked, "there must be a different way to do it; it can't just be black and white?" (participant 1). The subsequent search for alternative solutions led to the identification of an innovative planning arrangement that, alongside the architectural detailing that supported it, enabled patients to balance their own needs regarding privacy and socialisation (McLaughlan, Kirby, 2021). In another example, a medical administrator, reflecting on the involvement of his staff in a research process related to briefing their new mental health facility, observed that the awareness this experience facilitated would help his staff to engage more usefully with the subsequent master planning and developed design phases of that project:

We're getting a better understanding of what the [architectural] language is, what the principles are, what the design actually means… it's going to help us ask questions… I'm not feeling that I know stuff, but… I know how to ask questions about how the relationships are within the design (participant 21).

Through these broad functions, research and the evidence that substantiates it could be said to establish a common language between those who produce or commission it, designers, and project stakeholders engaged in the procurement process. Through this general communicative function, research and evidence become a means of introducing multiple ways of thinking about and responding to general problems associated with a given typology. A range of spatial configurations that project stakeholders may have been unfamiliar with, for example, are rendered *as* possible outcomes with readily comprehensible merits and drawbacks. One architect described this in terms of the "confidence" to pursue less conventional design solutions:

I dropped [the author of the research] an email and said we're doing this project… could you give us more information on this type of ward layout? Could we have a conversation?…. We had a couple of conversations, and it gave us the confidence to put it in front of [our client] (participant 1).

Another architect described how end-user research paper commissioned during the feasibility stages of a small hospice project – that elaborated a set of patient-centred values and the relationship of those to the physical space of care – became a guide that structured the design resolution:

We took the research paper and… cross-checked that against the design decisions being made… we then tested them against the design proposal… as a way of trying to establish whether or not what we were doing was aligned with the aspirations of that [research] report (participant 13).

Subsequently, the same document also came to facilitate more profound levels of communication with other project stakeholders. "This document was a really helpful resource for us… there was an opportunity for us to really reach users and explain the

Research and the evidence that substantiates it could be said to establish a common language between those who produce or commission it, designers, and project stakeholders engaged in the procurement process.

process that we went through" (participant 13). As the report served as a means of cross-checking and testing design decisions, it helped the architects explain the thinking that underpinned those decisions to different stakeholders, and to negotiate the value systems that different stakeholders bring to the procurement process: from those of council representatives awarding planning consent to clinical staff with a focus on the patient experience, and administrators responsible for signing off on project expenditure. The role of evidence, as seen here, establishes a common language to facilitate more profound forms of communication, which tends to engender more profound interactions between different forms of value implicated within procurement processes, and between the stakeholders who represent those different value orientations.

The role of evidence, as seen here, establishes a common language to facilitate more profound forms of communication.

The complexity of hospital construction exacerbates the conflicting interests and priorities anticipated within the procurement of any architectural project. Most of the architects we spoke with shared anecdotes wherein cost-related concerns threatened design elements that were intimately related to patient wellbeing, such as roof gardens homelier (less institutional) materials. It is worth acknowledging, however, that value engineering in the context of healthcare is often entirely reasonable, if not necessary. For example, when a decorative façade treatment carries the same price tag as a CT scanner, or where certain facilities, like cancer centres, attract large amounts of philanthropic funding while other parts of the hospital remain underfunded. One medical administrator used these examples to explain why he rejected an architect's initial proposal "to create the atmosphere of a wellness spa" for the cancer centre on their regional hospital site:

> I said no… and we ended up being able to pull quite a bit of money out of that project and invest it in different ways… for instance, it enabled us to buy a PET scanner, upgrade MRI facilities, increase our car parking (participant 27).

Beyond these compromises, however, there exist further conflicts of value, related not to the patient experience, but to concerns of financial profitability and "safety" (Stevens, 2020). For the representative of capital, what has been done before, what is proven

as profitable and safe, is almost always going to be the most optimal design decision or outcome. As one architect observed: "project managers are interested in very different things other than the best outcome for the users… the business guys are so worried about risk, dollars, budgets, programs. It's quite fascinating, the way that that's such a priority" (participant 10). The inherent limitation of this approach is a prioritisation of profitability and risk that acts to override the multiplicity of values capable of contributing to better built outcomes. The same architect observed:

> there are three parts to any building project, there's scope, versus program, versus quality… but the quality is defined as a very baseline thing: "Okay, does it meet the building regulations? Does it meet the technical guidelines…?" It's not, "Does it provide quality to the user outcome, the user experience?" (participant 10).

The quality is defined as a very baseline thing: "Okay, does it meet the building regulations? Does it meet the technical guidelines…?". It's not, "Does it provide quality to the user outcome, the user experience?".

Evidence introduces diifferent forms of value, establishes confidence and shifts power

In a 2015 study, Rana Zadeh, Hessam Sadatsafavi, and Ryan Xue (58) found that much intended investment relative to evidence-based design recommendations in contemporary hospital construction is "readily eliminated during the capital-investment decision-making process." This, they suggest, is because so little information is available about the financial returns of that investment. Questions of capital and operational funding are also firmly embedded within the foundations of evidence-based design. While a hierarchy between patient and economic outcomes is not explicitly stated, literature within this field infers that improved patient care is valuable only where there are corresponding economic gains. For example, Roger Ulrich's (1984) *View from a Window* study, which predates the formalisation of this field but is considered foundational to it, confirmed that designing a hospital room with a window onto nature could reduce lengths of stay alongside analgesic usage, dangling the promise of a reduction in operational costs per patient (also see Berry et al., 2004). It took only a few years for Franklin Becker, Bridget Sweeney, and Kelley Parsons (2008) to question the cost to benefit relationship of constantly improving the design quality of hospital facilities, cautioning it was only a matter of time

Evidence gathered from user-group consultations and post-occupancy evaluations specifically, can build confidence in design propositions that are novel or innovative.

I think it was [the principal architect's] capacity, in part, to pause the conversation about hospitals, and reset the conversation on precincts and the role that precincts play in job creation, urban renewal, investment, and other things that are important to government….

before the law of diminishing returns would take effect. In the various applications of design evidence discussed herein, however, we observed a shift in conversation away from pure economics to different forms of value. This was enabled by evidence through its communicative role, evidence could introduce and justify different forms of value.

Evidence gathered from user-group consultations and post-occupancy evaluations specifically, can build confidence in design propositions that are novel or innovative. For stakeholders with a concern for the operational functionality of a particular design approach, this research helps to qualify the potential risks associated with one decision or another, and, at least potentially, expand definitions of what is considered as "safe." This effect becomes more compelling as evidence garnered in the life cycle of a building is brought to bear on matters of operational consequence (also see Dye, Samuel, 2015). As one medical administrator observed, "you've actually got to get in and find out what the habits and the routines and the processes are to make the building work. … [Otherwise] it's like presenting somebody with a car when they don't automatically know how to drive it" (participant 21). While forms of evidence help to establish a discourse between stakeholders to open up conversations of value, this also serves to mitigate the risks associated with incorporating those other forms of value. In the example below, a government representative regularly involved in the development of large healthcare projects, explained how drawing on evidence from other architectural typologies – in this case precincts – informed a different solution to master planning a hospital. This provided the key to solving long-standing project challenges, and attracted additional funding in the process:

> this particular project… [had] about 12–13 years' worth of feasibility studies [and] master plans completed, but none of these had really cracked the redevelopment code. I think it was [the principal architect's] capacity, in part, to pause the conversation about hospitals, and reset the conversation on precincts and the role that precincts play in job creation, urban renewal, investment, and other things that are important to government…. Consequently, we've been funded an unprecedented amount of money to plan the development of that project (participant 15).

The same interviewee also explained how this more innovative approach to hospital design subsequently fed into other projects. In a second example, a major hospital was constructed much closer to the city than originally intended, and thus on more expensive land, because evidence was used to expand the criteria for determining the project's feasibility:

> the [site] assessments were done against [a given set of] established criteria… and it became clear that if we were going to change the outcome, we had to broaden the criteria. What enabled this broadening was a conversation… around the importance of precincts and the importance of the colocation of academic and health facilities… to do with the place-based provision of care…. These broadened criteria contributed to relocating [the hospital] from being in the boondocks to being where it is (participant 15).

Visible here is the potential of evidence to loosen the stranglehold of profitability and risk in the procurement of healthcare facilities. It achieves this by minimising the perceived risks associated with the spectrum of possibilities beyond what has been tried, tested, and proven as financially safe.

This general effect of evidence created a secondary effect, many of the participants we interviewed saw evidence as having the potential to shift the balance of power within decision-making processes toward those who wielded it. It must first be acknowledged that design-related research and the evidence that substantiates it weren't always characterised as a silver bullet for the challenges associated with complex project procurement. Emma Rowden and Diane Jones (2018: 332) discuss this in their study of a courthouse project, where the presence of evidence failed to safeguard the architect's intent to provide "natural light and [calming] views to nature" from juvenile holding cells. Yet evidence, as one government representative observed, provides "a kind of scientific backup" to support a particular design proposition during decision-making processes "as opposed to just saying 'designing good hospitals is good for you'" (participant 17). Examples of the types of decisions supported included the choice of unconventional materials, the prioritisation of fresh air over mechanical heating, ventilation, and air-conditioning systems, or challeng-

This general effect of evidence created a secondary effect, many of the participants we interviewed saw evidence as having the potential to shift the balance of power within decision-making processes toward those who wielded it.

ing the accepted logic of AusHFG guidelines. Evidence, in these instances, imbued these design decisions with a *gravitas* that was essential to support their implementation.

In the case of a commissioned research report, another government representative suggested the process of gathering evidence was as least as valuable as the finished artefact. The discussions that occurred as part of that research process provided confidence to those tasked with making funding decisions:

Evidence, in these instances, imbued these design decisions with a *gravitas* that was essential to support their implementation.

> the fact [the research] was being done was enough, and that it had academics involved, and engaged with working groups… It created enough of a buzz for many of the decision-makers to know: "Okay, well, this has been looked at. This is a risk for the project that we no longer need to worry about it. We're more confident in funding it (participant 15).

What is hinted at in the passage above, but observable more broadly within these discussions, is a tendency to equate expert opinion with systematically produced forms of research, but only where that expertise was of a clinical or academic nature. Further, a perception that this expertise is more valuable than the professional expertise of the architect. Unlike the earlier example of reliance on the AusHFG guidelines, in this case, the depreciation of architectural competency relative to evidence was replaced by a hierarchisation of professional competence that seemed to displace that of the architect. This was recognised by architects and government representatives alike, with one commenting: "my arguments are not going to be won unless I've got a surgeon or a nurse or an ED doctor standing in front of me, arguing from a clinical aspect" (participant 17, government representative). In another example, an architect with many years' experience in the healthcare sector explained how his design team wanted to include opening windows, courtyards, and balconies within a new palliative care facility, but that these features were not taken seriously until a medical professor suggested the same thing:

> we don't normally provide verandas … Health works on tight budgets, everything has to be justified… [and] there are so many issues that come up: infection control, safety risk, security, the whole deal…. But in this case, the research

provided stronger evidence than just the designer's opinion that this might be nice to have (participant 11).

Despite this apparent displacement of competency, we regularly observed architects utilising expert opinion to shift the balance of power, relative to key decisions within the procurement process, in favour of their preferred design outcome. In the example above, the *evidence* offered by the expert opinion of the medical professor enabled the architects to successfully challenge the value system of various other stakeholders. For example, concerns held by the mechanical designers relative to "completely unbalancing" the air-conditioning system with openable windows, could be countered with the question: "Do you want to ignore all that evidence?" While hierarchies between cost and patient wellbeing were reweighted, as the architect recounted, "you can't ignore a professor telling you … that a person with slipping consciousness is still going to register [fresh air] as fundamental" (participant 11). The use of evidence – or someone occupied with producing it – is thus both technical and political in its operation; it has the capacity to structure and shift power relations between key stakeholders in ways that can fundamentally alter the outcomes of those relations – in our case, the shape of the built environment.

The effective utilisation of evidence could affect an expansion of the horizon of design possibilities beyond what is tried, tested, and proven.

Conclusion

There is a cumulative force to evidence within the procurement of healthcare facilities. Architects, government representatives, and, to a lesser extent, the medical administrators we spoke with all understood that the effective utilisation of evidence could affect an expansion of the horizon of design possibilities beyond what is tried, tested, and proven. This imbued alternative responses with a gravitas that they otherwise might not have had. By functioning as a means of establishing and developing a discourse around design priorities and possibilities, evidence has the capacity to open procurement situations onto other sources of value in the built environment, oftentimes toward many of the same values that healthcare architects also hold sacrosanct.

The architects we spoke with viewed evidence as a positive contributor to their design process, both that

The use of design-related research in the procurement of buildings can be seen as an emergent dimension of the architect's professional competency.

which they gathered themselves and that which was produced externally, such as that available from the field evidence-based design. Yet, as most participants came from practices with a strong lineage in healthcare design, it was not that they necessarily *needed* externally produced design-related evidence to guide their decision making. In many cases, evidence could instead be seen to act as a numerical or qualified confirmation of the professional expertise that these architects were already bringing to a project.

While evidence may initially present as a challenge the professional competency of the architect, as Martin and Guerin (2006) seem to suggest, it can also afford greater agency to architects within the procurement ecosystem. This occurs because evidence provides a means of translating architectural competency into a format that stakeholders from different disciplinary backgrounds can more readily understand. In this sense, the use of design-related research in the procurement of buildings can be seen as an emergent dimension of the architect's professional competency, one that shifts the balance of power toward designers and the value systems they represent. The skill to look beyond the implementable results of design-based evidence, toward the agency such evidence can afford within the design process, might offer a method for resisting the declining influence of the architect within such large multi-disciplinary projects. This suggests implications for architectural practice and education more broadly that are worthy of further research.

References

Alemán, M. et al. (2020), *Design and Build for Hospitals: How Can We Improve the Performance of Infrastructure Projects in the Region?,* "Inter-American Development Bank" [Online]. Available at: http://dx.doi.org/10.18235/0002936 [Accessed 20 September 2021].

Australasian Health Infrastructure Alliance (2016a), *Section 80 – General Requirements & Section 90 – Standard Components,* "Australasian Health Facility Guidelines: Part B – Health Facility Briefing and Planning" [Online]. Available at: https://healthfacilityguidelines.com.au/part/part-b-health-facility-briefing-and-planning-0 [Accessed 20 September 2021].

Anåker, A. et al. (2017), *Design Quality in the Context of Healthcare Environments: A Scoping Review*, "Health Environments Research and Design", n. 4, pp. 136-150.

Becker, F. et al. (2008), *Ambulatory Facility Design and Patients' Perceptions of Healthcare Quality*, "Health Environments Research and Design", n. 4, pp. 35-54.

Berry, L. L. et al. (2004), *The Business Case for Better Buildings*, "Frontiers of Health Services Management", n. 1, pp. 3-24.

Carr, V. L. et al. (2011), *Integrating Evidence-Based Design and Experience-Based Approaches in Healthcare Service Design*, "Health Environments Research and Design", n. 4, pp. 12-33.

Centre for Health Design (2012), *What is Evidence-Based Design (EBD)?* [Online]. Available at: https://www.healthdesign.org/certification-outreach/edac/about-ebd [Accessed 20 September 2021].

Cook, M. (2008), *The Design Quality Manual: Improving Building Performance,* Chichester, Wiley.

Dickinson, H. (2004), *A Sociological Perspective on the Transfer and Utilization of Social Scientific Knowledge for Policy Making*, in F. Champagne, L. Lemieux-Charles, and W. McGuire (eds), *Using Knowledge and Evidence in Healthcare*, Toronto, University of Toronto Press, pp. 41-69.

Eynon, J. (2013), *The Design Manager's Handbook*, Somerset, Wiley-Blackwell, pp. 91-99.

Gottschling, P. (2018), *Architectural Scripts: Construction Procurement within the User Worlds of Building Events*, "Social & Cultural Geography", n. 5, pp. 626-646.

Hall, S. et al. (2017), *Evidence Based Practice for the Built Environment: Can Systematic Reviews Close the Research–Practice Gap?,* "Procedia Engineering", n. 180, pp. 912-924.

Hamilton, D. K. (2020), *Editorial – Evidence-Based Practice: Four Levels Revisited*, "Health Environments Research and Design", n. 1, pp. 26-29.

Hamilton, D. K., Watkins, D. H. (2008), *Evidence-based Design for Multiple Building Types*, Bridgewater (NJ), John Wiley & Sons.

Haynes, R. B. (2002), *What Kind of Evidence is it that Evidence-Based Medicine Advocates Want Health Care Providers and Consumers to Pay Attention to?*, "BMC Health Services Research", n. 1, pp. 1-7.

Jefferies, M., McGeorge, W. D. (2009), *Using Public Private Partnerships (PPPs) to Procure Social Infrastructure in Australia*, "Engineering, Construction, and Architectural Management", n. 5, pp. 415-437.

Jones, P. (2018), *Private Finance Initiative Hospital Architecture: Towards a Political Economy of the Royal Liverpool University Hospital*, "Sociology of Health & Illness", n. 2, pp. 327-339.

Leach, A. et al. (2013), *Architecture, Evidence, and 'Evidentiality'*, "Architectural Theory Review", n. 1, pp. 1-7.

Martin, C. S., Guerin, D. A. (2006), *Using Research to Inform Design Solutions*, "Journal of Facilities Management", n. 3, pp. 167-180.

McLaughlan, R., Kirby, E. (2021), *Palliative Care Environments for Patient, Family and Staff Well-Being: An Ethnographic Study of Non-Standard Design*, "BMJ Supportive & Palliative Care" [Online]. Available at: https://spcare.bmj.com/content/early/2021/09/03/bmjspcare-2021-003159 [Accessed 20 September 2021].

McLaughlan, R. et al. (2020), *Architecture as Change-Agent? Looking for Innovation in Contemporary Forensic Psychiatric Hospital Design*, "Medical Humanities" [Online]. Available at: 10.1136/medhum-2020-011887 [Accessed 20 September 2021].

McLaughlan, R., Willis, J. (2022), *Atmospheric Inclusiveness: Creating a Coherent and Relatable Sense of Place for a Children's Hospital*, "Journal of Architecture", n. 28, pp. 1197-1218.

Pati, D. (2011), *A Framework for Evaluating Evidence in Evidence-Based Design*, "Health Environments Research and Design", n. 3, pp. 50-71.

Phiri, M., Chen, B. (2014), *Sustainability and Evidence-Based Design in the Healthcare Estate*, Berlin, Springer.

Rowden, E., Jones, D. (2018), *Design, Dignity and Due Process: The Construction of the Coffs Harbour Courthouse*, "Law, Culture and the Humanities", n. 2, pp. 317-336.

Samuel, F., Dye A. (2015), *Demystifying Architectural Research: Adding Value to Your Practice*, London, RIBA Publishing.

Stevens, S. (2020), '*Visually Stunning' While Financially Safe*, "Ardeth", n. 6, pp. 79-99.

Till, J. (2009), *Architecture Depends*, Cambridge (MA), The MIT Press.

Till, J. (2018), *Editorial: The Economies of Architecture*, "Ardeth", n. 3, pp. 15-19.

Ulrich, R. S. (1984), *View Through a Window May Influence Recovery from Surgery*, "Science", n. 4647, pp. 420-421.

Ulrich, R. S. et al. (2008), *A Review of the Research Literature on Evidence-Based Healthcare Design*, "Health Environments Research and Design", n. 3, pp. 61-125.

Zadeh, R. et al. (2015), *Evidence-Based and Value-Based Decision Making About Healthcare Design: An Economic Evaluation of the Safety and Quality Outcomes*, "Health Environments Research and Design", n. 4, pp. 58-76.