

# A health impact assessment on the construction phase of a major hospital redevelopment

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## Abstract

A prospective health impact assessment (HIA) was conducted to identify potential health impacts arising from the planned redevelopment of Liverpool Hospital, a major teaching hospital in New South Wales, Australia. A multidisciplinary team of health professionals oversaw the HIA and a core project team led by population health practitioners conducted the HIA using a structured, stepwise process. Methods used to gather data for the identification of impacts were a literature review, development of a population profile and consultation with stakeholders. A range of positive and negative health impacts were identified and an assessment matrix was used to prioritise the health impacts and develop recommendations for the proponents of the redevelopment plan. The HIA added value to the planning process for the hospital redevelopment, increasing capacity to conduct future HIAs.

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## What is known about the topic?

Health impact assessment, which builds on the well-established discipline of environmental impact assessment, is increasingly being used in health and other sectors to minimise negative health impacts, maximise population health gains and reduce the potential for health inequities.

## What does this paper add?

This paper describes the enablers to an effective health impact assessment process and the adoption of recommendations by decision makers.

## What are the implications for practitioners?

Health impact assessment is a useful, structured process that can add value to planning major projects such as hospital redevelopments. In addition to providing useful evidence from multiple sources, it can raise awareness of potential inequities for vulnerable groups. However, resources and commitment from decision makers are crucial to its effectiveness.

HEALTH IMPACT ASSESSMENT (HIA) is a structured and stepwise process for identifying the potential beneficial and harmful impacts of a policy, program or project proposal.<sup>1</sup> It has its roots in the well known environmental impact assessment (EIS) process,<sup>2</sup> but with a predominant focus on health and social impacts and health inequality.<sup>3</sup> The use of HIA both in Australia and internationally is becoming well established and is being used to enable better consideration of both risks to health and the broader determinants of health and wellbeing.<sup>4-6</sup> HIAs have been conducted on a number of proposed major developments and plans (see [www.hiaconnect.edu.au](http://www.hiaconnect.edu.au)),<sup>7</sup> including health service redevelopments.<sup>8-10</sup>

The intent of HIA is to influence decision making so that a proposed policy, project or program will lead to improvements in population health, or at the least will not be detrimental to the health of the local community or affected population.<sup>11</sup> It is for this reason that HIA is

typically conducted prospectively so that the health consequences of a proposed policy, program or project can be predicted.<sup>1</sup> This information is then used to improve the proposal before its implementation to avoid negative health impacts and to enhance positive health impacts.

The benefits of HIA have been well described.<sup>6</sup> HIA can raise the profile of social determinants of health and health outcomes among policy and decision makers,<sup>12</sup> particularly when those decision makers are involved in planning and conducting the HIA.<sup>13</sup> In addition, the process enables identification of potential equity implications of a proposal through structured consideration of the differential distribution of those impacts on the health of different population groups.<sup>14</sup> The identification of unintended potential impacts of a proposal can also occur during an HIA. As a structured stepwise mechanism that encourages diverse and transparent discussion of values and opinions, HIA can help to enhance intersectoral and interdisciplinary relationships.<sup>15</sup> HIA also has the potential to involve a broad range of stakeholders including those potentially affected by the proposal under scrutiny.<sup>16</sup>

Sydney South West Area Health Service (SSWAHS) has been undertaking extensive planning for the delivery of health services to 2020.<sup>17</sup> A significant feature of this planning has been the physical redevelopment of Liverpool Hospital to provide for the health care needs of the growing regional population of South Western Sydney. In 2006, the New South Wales government announced the allocation of about A\$390 million for the Liverpool Hospital Stage 2 redevelopment project, with construction to commence in 2007.

In July 2006, SSWAHS Population Health was approached by the SSWAHS Executive and the Executive User Group (EUG), the proponents of the redevelopment, to conduct an HIA on the proposal. There were two concurrent drivers for this. Firstly, while NSW legislation requires an environmental impact assessment to be undertaken on major infrastructure projects, health and social impacts are not the main focus of such assessments.<sup>18</sup> Therefore the redevelopment provided an opportunity for the Area Health Service to

conduct a health-focussed impact assessment. Secondly, by undertaking the HIA, SSWAHS was able to expand its capacity to undertake future HIAs through the development of staff skills and expertise and through raising awareness of the discipline throughout the organisation. SSWAHS was supported in this venture through acceptance as a developmental site in the NSW HIA project.<sup>7,19</sup> To facilitate the HIA project, the SSWAHS team undertook HIA training and received ongoing technical support. This allowed the team to apply this learning to undertaking the HIA<sup>19</sup> — a “learning by doing” approach. The NSW HIA project, funded by NSW Health and coordinated by the Centre for Health Equity Training, Research and Evaluation (CHETRE) at the University of NSW, was established to build capacity for the NSW health system to undertake HIAs.

## Methods and results

HIA is iterative across stages that contain methods and produce results and therefore methods and results are reported together. The HIA followed established steps shown in Box 1: screening, scoping, identification and assessment, decision making and recommendations, and monitoring and evaluation.<sup>1</sup>

A multidisciplinary Steering Committee (SC) of twelve people was established. The committee included population health practitioners, health service planning and hospital staff representatives, community representatives and the proponents of the project (including staff from capital works, the appointed project managers and members of the Liverpool Hospital Executive). Two participants from the NSW HIA Project Leadership Development Program also participated. A smaller Project Team was also established as a sub-committee of the SC. The role of the Project Team was to undertake most of the tasks of the HIA and report back to the SC for decision making.

### Step 1: Screening

A preliminary screening stage was undertaken before the HIA formally commenced to determine appropriateness for inclusion in the NSW project.

Acceptance was based on the fact that the redevelopment plans were for a significant infrastructure project.

Once the SC was established, a further screening exercise took place. At this time, a more detailed assessment of the status of the project was undertaken. It was acknowledged by the SC that concept planning for the overall facility was not yet finalised and that time constraints to have the project approved by the NSW government would not allow for an HIA to be undertaken on the final plans.

As a result of this, the SC decided that an HIA should be undertaken on the construction phase of the redevelopment, to ensure a concise scope with achievable timelines. This decision was supported by a brief scan of literature completed by the Project Team before the screening meeting that described various health effects related to construction. During the meeting, members of the SC who were experienced in construction of health care facilities acknowledged that the focus of the construction phase was both pragmatic and achievable.

### Step 2: Scoping

During scoping, the SC agreed on terms of reference, the level at which the HIA was to be

conducted (based on consideration of available resources and capacity), the methods to be used, the priority issues on which to base the assessment, and the desired outcomes of the HIA. The aim of the HIA was to enhance the redevelopment process by identifying and assessing the range of health impacts of the redevelopment on the community, patients and their families and health service staff. The objective of the HIA was to develop recommendations for the hospital planners (through the EUG) to improve the proposal — by either minimising the potentially negative impacts or enhancing the positive health impacts of the redevelopment.

Within the scoping meeting, the SC agreed that an intermediate HIA<sup>10</sup> would be the most appropriate level for this project as this would enable the HIA to be completed within the predetermined timeframes for the redevelopment plan. Intermediate HIAs largely draw on existing secondary data and evidence but also include primary data through consultation to draw out local contextual details.<sup>1</sup> The decision to conduct an intermediate HIA was also based on agreement that SSWAHS Population Health staff would continue their role as the project coordinators and that dedicated resources would be attached to the work.

## I Stages of health impact assessment (HIA)<sup>1</sup>

Stages of health impact assessment	Purpose	Outcome(s)
Screening	Identify whether HIA is required	Recommendation to proceed with HIA
Scoping	Determine the scope of the work to be undertaken	Action plan developed to outline how the HIA will be conducted including the time, resources and tasks required
Identification and assessment of potential health impacts	Identify and assess the potential positive and negative outcomes of the proposal	Documented evidence of potential health impacts through a literature review, population profile and summary of interviews and consultations Assessment matrix developed to systematically analyse the information
Decision making and recommendations	Prioritise potential health impacts and negotiate recommendations	Recommendations report developed for the project proponents (the EUG)
Monitoring and evaluation	Reflect on the HIA process, monitor health outcomes and evaluate the effectiveness of the HIA	Proposed evaluation and monitoring plan developed HIA report finalised and disseminated Evaluation of the HIA process

## 2 Brief summary: population profile for the catchment population

- There is significant population growth forecast for the Liverpool Hospital catchment
- 39% of the population speak a language other than English at home, double that of the rest of New South Wales
- Compared with the rest of NSW there are significant numbers of humanitarian arrivals and Aboriginal people who experience health disadvantage
- The mean taxable income is lower for the catchment area than for the rest of NSW
- The population is ageing rapidly
- Some suburbs are ranked as having considerable disadvantage, based on a range of socioeconomic indicators

The SC determined that three issues were critical to establish the values base for the HIA and to assist decision making among the committee. The first of these was that the HIA adopt a broad definition of health, inclusive of well-being.<sup>6</sup> The second was incorporating equity as a core consideration given the known demographics of the catchment area for the hospital. Finally, the SC agreed to place equal value or weighting on three types of evidence<sup>20</sup> — a population profile, a literature review, and key informant interviews or consultations.

Scoping also led to agreement on four key priority areas of the construction phase on which to base the HIA. These were selected using the information developed and considered during screening and by considering the resources available to the HIA. The four priority areas were:

- Reduced parking for staff, patients and visitors
- Health and wellbeing of staff and the community
- Community and patient safety
- Increased traffic (general and construction)

### Step 3: Identification of impacts

The purpose of the identification stage is the collection of information to identify the potential health impacts of the proposal<sup>1</sup> and was based on a profile of the population in the catchment area of the hospital, a review of the literature, and key

stakeholder consultation or informant interviews.

### Population profile

The population profile was developed as a source of information regarding the people living and working in the catchment of Liverpool Hospital. The profile included population size and diversity, growth projections, social characteristics, mortality and morbidity data and information on the characteristics of staff, patients and users of neighbouring sites (including local educational institutions and businesses). The population profile was particularly useful in identifying the target groups (including the size of these groups) who were likely to be affected by the construction phase. Box 2 provides a brief summary of the key issues that emerged from the population profile.

### Literature review

The literature review covered both peer-reviewed publications and “grey literature” in the form of published HIAs on hospital redevelopments. The parameters of the peer-reviewed literature search using the Ovid Medline database were made specific to the health impacts of the construction phase of health care facility redevelopments. Search terms included “construction”, “building”, “health or health facility”, “health facility planning”, “health facility moving” and “road”.

Following consideration of the population profile, the literature was narrowed to documents that covered the relationships between construction or building projects and health, with specific health effects on staff, pollution, stress, mental health, animals (horses), noise and mould. Thirteen peer-reviewed articles and four HIAs on related projects were included.

The literature search identified both negative and positive impacts of construction of health care facilities tabulated against “Issue”, “Impacts”, “Modifiers”, “Trade-offs”, “Impacts on Vulnerable Groups”, “Type of Evidence”, and “Source” (see Box 3 for an example concerning noise pollution). Negative impacts included general environmental nuisance during construction,<sup>9</sup> noise pollution,<sup>21-24</sup> air pollution and risk of increased infections

### 3 Peer-reviewed literature for noise pollution

Issue	Impacts	Modifiers	Trade-offs	Impacts on vulnerable groups	Type of evidence	Source
Noise pollution	Cardiovascular health		New roads/buildings		Cohort study	Willich <sup>21</sup>
	Children's learning	Timing of heavy truck movements	New roads/buildings	Children	Aircraft noise studies, one road noise study, nil for construction	Sanz <sup>22</sup>

from increased emissions,<sup>25-29</sup> dust<sup>23,24</sup> and mould,<sup>30,31</sup> injury, increased traffic congestion,<sup>9</sup> poor parking access for vulnerable groups such as people with disabilities,<sup>10</sup> poor communication with local people,<sup>10</sup> social exclusion of minority groups,<sup>10</sup> disruptions to staff<sup>32-35</sup> and the compromise of patient care.<sup>34,36</sup> Positive impacts were that hospital construction can stimulate local employment and the local economy,<sup>8,23,24</sup> building trust through communication concerning redevelopments with those potentially affected,<sup>37</sup> and the potential for new premises and ways of working<sup>35</sup> including energy efficient design<sup>9</sup> and improving the image of the local area.<sup>9</sup>

#### Key informant interviews

The SSWAHS Ethics Committee confirmed that ethics approval was not needed to undertake consultations for the HIA. In order to conduct the consultations in a standardised manner, a set of questions were developed across each priority area determined during the scoping stage (see Box 4).

Members of the SC conducted the interviews with key informants as representatives of organisations or groups who were considered likely to be affected by the construction or the redevelopment. Notes were taken at the interviews and then forwarded to the interviewee for verification as an accurate summary of the interview. Those interviewed included representatives from:

- the local TAFE (Technical and Further Education) college which bordered the area to be developed
- the local secondary school which bordered the area to be developed

- the local council
- a local Aboriginal Medical Service
- the SSWAHS Disability Steering Committee
- the Hospital Child Care Centre which was adjacent to a proposed car park
- the SSWAHS Community Participation Committee
- the horse trainers who had their business in the vicinity of the hospital.

#### Consultations

Consultations took the form of three open forums with hospital staff. The forums were advertised by email to all staff from the hospital's General Manager and were held at various times during the day to encourage shift workers

#### 4 Example of key informant interview questions for increased traffic

- 1 In your opinion what will be some of the effects (positive or negative) on **traffic congestion and access** because of the construction in and around the hospital?
- 2 Will there be negative or positive effects from: (Yes/No/Unsure/+ve/-ve)
  - Increase in amount of traffic
  - Delays or road closures
  - Temporary pedestrian or vehicle access
  - Lighting and signage of changes
- 3 What actions or strategies could be useful in reducing the impacts or effects that you have identified in question 1 or 2?
- 4 In your opinion, who will be affected by the things you have identified? (*Prompt: all staff/the whole community or population or various groups*)

**5 Summary of health impacts identified during the Liverpool Hospital redevelopment health impact assessment**

Issue	Positive health impact	Negative health impact
Reduced parking	Increase in physical activity <sup>†</sup>	Increased stress <sup>†</sup> Risk of injury for pedestrians <sup>†</sup> Non-attendance for appointments* Reduced access to services* <sup>†</sup>
Health and wellbeing of staff and the community	Increase in local employment opportunities during construction* <sup>†</sup>	Increased stress from noise* <sup>†</sup> Increased stress from temporary relocation of service* <sup>†</sup> Decreased physical activity for staff due to the removal of facilities* <sup>†</sup> Increase in health issues related to dust exposure* <sup>†</sup>
Community and patient safety (non-traffic)		Increased risk of injury from construction hazards* <sup>†</sup> Increased risk of child protection issues* Increased risk of personal injury to staff (security issues)* Increased risk of health effects of mould <sup>†</sup> Increased risk of injury from disruptions to current fire exits and escape plans* <sup>†</sup>
Increased traffic in the area (general and construction)		Decreased air quality* <sup>†</sup> Increased risk of pedestrian injury* <sup>†</sup> Increased stress from traffic noise*

Key to the source of evidence: \* Consultations/key informant interviews. † Literature review

to attend. A total of 40 staff attended the forums. During each forum SC members presented an overview of the proposal and then asked staff to complete a standard questionnaire which was a replication of the interview questions.

In addition, similar information was presented at key staff meetings including Grand Rounds, the Nursing Unit Managers' Meeting and the Service Managers' Meeting. About 100 staff were present at these meetings. Once again, staff were encouraged to complete the questionnaire. In total, 45 responses to the questionnaire were received.

Box 5 shows a summary of the key health impacts that were identified by the literature review and key informant interviews/consultations.

**Step 4: Assessment of impacts**

The purpose of the assessment stage is to critically assess and make explicit judgments concerning the information collected during the identification stage.<sup>1</sup> To support the task, the Project Team developed an assessment matrix based on HIA Guidance Tools from New Zealand.<sup>38</sup> The matrix (Box 6) included the source of information, the numbers affected and a rating for the consequences and likelihood of the health impact. The assessment grid also included possible actions or strategies to minimise negative health impacts and maximise positive health impacts. The strategies were based on those found in the literature or suggested during the consultations and interviews.

**6 Assessment matrix used by Liverpool Hospital redevelopment health impact assessment**

Issue	Priority	Health impact	Affected group(s)	Numbers affected	Consequences and likelihood	Actions
Positive impacts						
Negative impacts						

As a result of the assessment phase, reduced parking was determined as the issue with the highest priority, followed by health and wellbeing of staff, community and patient safety, and then increased traffic in the area.

### **Step 5: Recommendations**

The purpose of the “decision-making and recommendations” stage is to develop a set of recommendations for acting on the results of the HIA.<sup>1</sup> Three actions were important for this stage: reporting prioritised recommendations, committee agreement regarding prioritisation and the language used in the recommendations report.

Using the assessment matrix, impacts were prioritised by the Project Team and reported to the SC for endorsement. The Project Team then developed draft action-oriented recommendations based on the strategies suggested in the literature, interviews and consultations (see Box 7). The report acknowledged the strategies in place to reduce the potential negative health impacts or to enhance the positive health impacts of construction. These included an asbestos removal strategy; the construction of new access roads; the establishment of a position to facilitate the redevelopment transition and various requirements within the Managing Contractor’s contract, such as erection of effective safety barriers.

The recommendations report was tabled at a final SC meeting for feedback and endorsement. Insights of SC members who were also members of the EUG were particularly useful in framing the recommendations so that they were relevant and appropriate for the decision makers and therefore more likely to be accepted.

In deliberations regarding this phase of the HIA, the SC acknowledged that the recommendations would be implemented at various times throughout construction. Some recommendations, such as negotiations with contractors, needed to occur early in the construction phase while others were not needed until construction was well underway.

A final recommendations report was forwarded to the EUG in December 2006.<sup>39</sup> Two of the members agreed to sponsor the recommendations.

At the EUG Meeting in March 2007, two members of the SC presented the recommendations which were subsequently supported. The EUG also agreed with the SC that a member of the Liverpool Hospital Executive should be responsible for the implementation of the recommendations and quarterly reporting of actions to the EUG.

### **Step 6: Evaluation and monitoring**

The purpose of the evaluation and monitoring stage is to evaluate the processes involved in the HIA and the impact of recommendations.<sup>1</sup> This stage provides a tangible link to the implementation of the proposal.

Given the timeframes to implement the recommendations of the HIA, the SC has focused to date on evaluating the process used to undertake the Liverpool Hospital redevelopment HIA. This process evaluation has been conducted through a review of the minutes of SC meetings, an allocated reflection time at the end of the final two SC meetings, and further reflection during an HIA training session provided by CHETRE in October 2006. The reflection time focussed on the effect of the HIA on the redevelopment process, the contribution of the SC, the HIA process and the outcomes to date.

Monitoring the implementation of recommendations in order to determine effectiveness is an essential aspect of HIA. To this end, the SC presented a monitoring and evaluation plan to the EUG together with the recommendations report. The plan provided a mechanism for the EUG to report against responsibilities and progress/actions taken for the performance indicators developed for each recommendation. As part of the plan, the Project Team identified existing sources to assist in monitoring the recommendations including sick leave reports, incident reports and staff exit/entry reports. The SC felt strongly that it was essential for further resources to determine the impacts of the HIA and to monitor progress with the recommendations.

### **Problems/conflicts/constraints**

There were few problems associated with this HIA. The main constraint was the timeframe of

## 7 Sample of recommendations for priority 2: health and wellbeing of staff and the community

In priority order, the health impacts that were identified in relation to health and wellbeing of staff and the community were:

- Increased employment in the local community (*positive*)
- Increased stress to schools, childcare, Technical and Further Education (TAFE) College, staff and patients from the noise of construction (*negative*)
- Increased stress to the local community from lack of information (*negative*)
- Increased stress from temporary relocation of services (*negative*)
- Increase in health issues related to exposure to dust (*negative*)
- Increased stress from bullying and harassment (*negative*)
- Decreased physical activity due to removal of tennis court and pool (*negative*)

*The increased opportunity for employment is a positive health impact that will result from the construction phase of the redevelopment. The Steering Committee notes that the Managing Contractor has a requirement to comply with New South Wales government policy on aboriginal participation in construction. In addition, we recommend that the Executive User Group (EUG):*

2.1 Ensures that the Managing Contractor also considers the opportunity to contribute to the sustainability of the local area by specifically offering **employment and training opportunities** to those currently unemployed in the local community.

*The Steering Committee notes that effective and current communication was reported as being very important across all phases of the construction and for all groups consulted in the health impact assessment. There was also evidence in the literature and feedback provided that effective communication can reduce the possibility of bullying and harassment during organisational change. We therefore recommend that the EUG:*

2.2 Ensures that the Managing Contractor establishes a **community liaison role** that takes action to respond to complaints and concerns raised by staff, patients, visitors and the local community.

2.3 Ensures that the Redevelopment Transition Manager and the Community Liaison officer (referred to above) **consult with TAFE and schools** to ensure that construction noise does not adversely affect students during exam time and **consult with the childcare centre** to ensure that construction noise does not adversely affect children during play/sleep time.

2.4 Initiates a plan for appropriate and current **signage** and maps in the area surrounding the hospital. This may also require the use of internationally recognisable symbols or translated information.

2.5 Ensures that the Sydney South-West Area Health Service (SSWAHS) website and the Facility Orientation Program contains **current information** regarding the construction of the hospital and any changes to services, parking or access.

*In addition, the Steering Committee recommends that the EUG:*

2.6 Ensures that the Redevelopment Transition Manager has the resources to provide appropriate **personal protective equipment** to staff and patients as required.

2.7 Ensures that the Managing Contractor complies with **dust containment** regulations.

2.8 Works with the Employee Assistance Program and SSWAHS Human Resources to **monitor incidents of bullying and harassment** which may be related to the redevelopment of Liverpool Hospital. It is also important that managers are provided with appropriate and effective change management skills to assist in the prevention of bullying and harassment.

2.9 Uses the redevelopment as an opportunity to establish **facilities that support physical activity** for staff (eg, walking tracks, gym).

the redevelopment project. As the construction phase of the hospital is likely to take more than 3 years, this could make the evaluation and monitoring of the recommendations difficult. In addition, the complexity of relevant data collection sources within hospitals can be a barrier to facilitating evaluation and monitoring. The SC therefore felt it to be important that an executive

sponsor from the hospital be engaged in the long term to ensure the HIA recommendations and methods for monitoring and reporting are kept on the agenda of the relevant decision makers.

Our HIA did not employ a rigorous scientific process but used a subjective group process. For the set outcomes we feel that this approach is the ideal process for this work. We did, however,



validate the evidence through triangulation of evidence used from different sources.

Limitations of our method were that there was relatively limited consultation with hospital service users and no targeted consultation with culturally and linguistically diverse groups. This would have required a longer period of time and additional resources to undertake the HIA.

Our HIA proceeded without a detailed written plan of the hospital redevelopment. To effectively undertake an HIA on a planned hospital redevelopment of this size and complexity, decisions had to be made early about what was achievable given the time and resource limitations. Ideally, the proposal being assessed should be drafted before the commencement of the HIA, as conducting an HIA on a plan that is yet to be completed requires that assumptions are made about the plan.

### **Discussion/lessons learned**

Overall, HIA is a useful, structured process that can add value to planning and implementing major projects such as hospital redevelopments. Our experience with HIA corresponded to the literature on the promise of HIA. Our HIA provided a structured process that enabled constructive interdisciplinary involvement and engagement of stakeholders.<sup>15</sup>

We undertook to use a broad definition of health, which included wellbeing. This enabled the SC to consider a wide range of factors, such as child protection and employment, and an equity focus when considering health impacts. An intermediate HIA provided some opportunity to explore broad health and equity issues, however a more in-depth analysis would have been possible in a longer or more comprehensive HIA.

There was minimal conflict around what to include in the assessment, which was aided by the clear and well defined scoping stage. We also found that involving decision makers who were involved in the redevelopment of the hospital early on and throughout the HIA as part of the SC assisted the relevancy of the decisions made and the recommendations. SC membership included

decision makers and key members of the redevelopment planning team.<sup>16</sup>

The results of the process evaluation highlighted that the diverse membership of the SC was integral to the HIA as it facilitated the introduction of expert advice. Reflecting the diversity of stakeholders in a hospital redevelopment, the diverse membership of the SC enabled the HIA to be directed by different stakeholder perspectives.

In addition, the inclusion of decision makers from the EUG of Liverpool Hospital and members of the redevelopment planning team on the SC was essential for the HIA. This ensured that the HIA operated from a realistic perspective concerning the many decisions that underpin a hospital redevelopment. Interestingly, as evidence of the usefulness of the link to decision making, the EUG made changes to the proposal before the HIA was finalised.

The process evaluation also showed that there was confidence in the ability of SC members to perform required tasks for each step of the HIA and provide credible information to the SC for decision making. Having a smaller, focused Project Team to undertake the majority of the detailed investigation was considered a significant factor in the success of the SC.

The development and implementation of a project action plan for the HIA was also useful to the SC. The action plan outlined tasks and timeframes for each stage and this helped to maintain the momentum for the HIA. Regular SC meetings ensured that the progress of the HIA was monitored and that the committee received regular feedback. Meetings also provided an opportunity to update the SC on changes to the redevelopment plans.

The HIA proved a useful tool for capturing the opinions of stakeholders potentially affected by the HIA<sup>16</sup> who otherwise may not have been consulted regarding the hospital redevelopment (for example horse trainers working adjacent to the hospital). The HIA also directly raised awareness of potential inequities for vulnerable groups, such as people with a disability.<sup>14</sup>

There was minimal conflict around the assessment of impacts and the development of recommendations, despite conflict occurring as part of other HIAs.<sup>40</sup> We feel that this was aided by the clear and well defined parameters for the project which were established in the scoping stage.

By participating in the “learning by doing” approach of the NSW HIA Project, capacity to conduct further HIAs has been developed within SSWAHS. While the steering committee was multi-disciplinary, the HIA was successfully led by a team of population health professionals and demonstrated that population health practitioners are well placed to lead HIAs and can meaningfully contribute to health planning. At the same time however, while the support of the NSW HIA project was highly valued, we also found that resources and commitment from decision makers involved in the hospital redevelopment were crucial.

Reflection about the process evaluation during the last two meetings became problematic due to the time elapsed from the different stages of the HIA. We recommend that others undertaking meaningful process evaluation should incorporate a brief reflection time with specific questions at the conclusion of each stage of the HIA.

## Conclusion

We have found HIA a useful tool to complement planning for a major hospital redevelopment. HIA provided consideration of broader health and wellbeing impacts from both the literature and those potentially affected by the redevelopment. Such impacts are essential for reducing potential health inequalities that may arise from redeveloping hospitals, but without HIA these may not have been considered. Our process has shown that voluntary HIAs undertaken by population health staff can add deeper consideration of the perceived health and wellbeing of those who are likely to be affected by major hospital redevelopments. As an indication of the apparent usefulness of HIA for similar planned developments, since completing the final report, CHETRE has been contacted by NSW Health to develop support for further HIAs on the development of similar major health proposals in NSW.

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## Competing interests

The authors declare that they have no competing interests.

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