Managing health and wellbeing in the workplace

An Evidence Check rapid review brokered by the Sax Institute for SafeWork NSW. January 2018.
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This report was prepared by: Bill Bellew Consulting Associates

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Managing health and wellbeing in the workplace

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Glossary of terms

**Evidence grading**

**Strong evidence**  
‘Strong evidence’ indicates high confidence that the evidence reflects the true effect and further research is very unlikely to change our confidence in the estimate of the effect.

**Moderate (Sufficient) evidence**  
‘Moderate’ evidence indicates moderate confidence in the body of evidence and that further research may change our confidence and the estimate; the accompanying narrative indicates whether the evidence is deemed ‘Sufficient’ to commence implementation with accompanying evaluation.

**Weak evidence**  
‘Weak evidence’ indicates low confidence and further research is likely to change our confidence and the estimate.

**Insufficient evidence**  
‘Insufficient’ indicates that either a body of evidence is unavailable or there was a paucity of studies of reliable quality for the setting / strategy in question.
Executive summary

Purpose of the review
SafeWork NSW would like to develop, promote and facilitate a model or framework for NSW workplaces to manage the health and wellbeing of workers. A review of national and international evidence on what has been implemented and shown to be effective will be used to inform the development of this model or framework. An Evidence Check review is a rapid review of existing evidence tailored to the individual needs of an agency. Evidence Check reviews answer specific policy or program questions and are presented as reports in a policy friendly format. Reviewers identify gaps in the evidence but do not undertake new research to fill these gaps. This report summarises the findings of the Evidence Check review undertaken to address the needs identified by SafeWork NSW with the technical assistance of the Sax Institute.

This review aimed to address the following questions:

Question 1: Evidence of effectiveness
What programs, frameworks or models designed to create healthy workplaces have been shown to be effective to maintain and/or improve the health and wellbeing of workers?

Question 2: Essential program components
Of the papers included in question one, what key components of the program, framework or model have been shown to be effective to maintain and/or improve the health and wellbeing of workers?

Question 3: Implementation success factors
From the papers included in question one, what are the main barriers or facilitators to successful implementation of the program, framework or model?

Question 4: Organisational factors, leadership, systems, policies, culture, work design
What does the evidence suggest regarding the role and impact of organisational factors, leadership, systems, policy, workplace culture, work design and work processes?

Summary of methods
Although an Evidence Check is a rapid style of review, a rigorous approach (normally associated with more lengthy and detailed full systematic reviews) was undertaken. A sentinel search was undertaken to confirm the availability of systematic review (SR) evidence, the recency of analysis, and the adequacy of coverage across the specified research questions. Since the evidence coverage was deemed adequate, we proceeded with a more robust review using a typical selection of electronic databases. Search terms were selected consistent the US National Library Medical Subject Headings (MeSH®) Thesaurus (with modifications as required for specific databases). Grey literature searches were also undertaken using selected key words within the advanced search functions of Google/Google Scholar and limited to the first 200 results in keeping with evidence-based guidance. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocols were used with transparent reporting of search strategy and study retrieval (details in Appendices).
Evidence grading
The review adopted the protocol used by the US Community Preventive Services Task Force (The Community Guide). This protocol is particularly helpful in identifying the strength of a body of evidence. The approach is consistent overall with the evidence hierarchy stipulated by NHMRC, but provides better flexibility when different levels of evidence may need to be considered in an integrated way with respect to a given program, strategy or framework. The approach has been described in detail in the peer reviewed literature. Four grades of evidence are defined in this Evidence Check: Strong evidence, Moderate (Sufficient) evidence, Weak evidence and Insufficient evidence (see Glossary).

Key findings
After screening, in answering the four research questions, the Evidence Check used 160 research studies and reports, of which more than half (53%) were systematic or semi-systematic reviews. Only studies deemed to provide strong and sufficient strength evidence were used to answer the research questions. There has been a rapid evolution of practice and evidence in wellness programs over the past decade. Key characteristics of that evolution include: (a) greater emphasis on leadership, systems approaches, and the importance of organisational culture; (b) use of Health Risk Appraisal (HRA); (c) use of incentives (including financial); (d) integration (more holistic designs); (e) use of digital technology, social media and customisation of programs; (f) extension to the family and wider community; and (g) more sophisticated indicators and metrics, increasingly tied to corporate objectives.

Q1: What programs, frameworks or models designed to create healthy workplaces have been shown to be effective to maintain and/or improve the health and wellbeing of workers?
The US Centers for Disease Control and Prevention (CDC), World Health Organisation and the National Institute for Occupational Safety and Health (NIOSH) provide frameworks which meet these criteria. The evidence is more definitive for well-established components of the frameworks (for example, Health Risk Assessment) and more emergent for the recent or more complex components (for example, systems approaches). We have distilled a model (Workplace Wellness 3.0) which is designed to capture these, whilst also showing the current status of the underpinning evidence.

There is strong (definitive) evidence that lifestyle management interventions as part of workplace wellness programs can reduce risk factors, such as smoking, and increase healthy behaviours, such as exercise and healthy eating; these effects are sustainable over time and are clinically meaningful. Interventions to prevent Type 2 diabetes and to tackle obesity/overweight can be effective, but current models are varied. The greatest weight loss is achieved only through intensive lifestyle interventions (that is, at least four months in duration) that implement one of the available structured, well-established programs.

There is strong evidence that a workplace-based resistance training exercise program can help prevent and manage upper body musculoskeletal disorders and symptoms, and moderate evidence that stakeholder participation and work modification are more effective and cost effective at returning to work adults with musculoskeletal conditions than other workplace-linked interventions.

Evidence on the contribution of wellness programs to productivity is patchy. The Total Worker Health™(TWH) model has been used to develop the Employer Health and Productivity RoadMap™. The Roadmap comprises six interrelated and integrated core elements: (i) optimise environment, (ii) increase healthy behaviours, (iii) minimise avoidable or inefficient acute care, (iv) optimise chronic care, (v) reduce excessive surgery, and (vi) speed transitions from care to home and work. This model is promising but requires confirmatory research evidence.

There is strong evidence for the effectiveness of Health Risk Appraisals/Assessments when used in combination with programs and interventions, in relation to tobacco use, alcohol use, dietary fat intake,
blood pressure and cholesterol. There is sufficiently strong evidence to suggest that for every dollar invested in these programs (HRA+ program combinations) an annual return of $3.20 (ROI median $3.2; range $1.40 to $4.60) can be achieved. It is important, going forward, to raise the standards of quality and consistency of workplace wellness economic research which has to date been very variable.

There is promising evidence that even higher returns on investment can be achieved in programs incorporating newer technologies such as telephone coaching of high risk individuals together with the use of financial incentives; more research is required to be definitive on this point. Linked telephonic lifestyle coaching services (such as Get Healthy at Work) and clinical non-communicable disease (NCD) support services were noted among the fastest growing components in Australia and New Zealand. Yet these components only feature in 37% and 28% respectively of programs (current, planned in next one to three years), which may indicate scope for further uptake of these particular program components.

Total Worker Health™ is a promising concept and has significant strategic momentum. Integrated TWH interventions can deliver the lifestyle benefits already identified, but effectiveness on injuries and overall quality of life are not known and the TWH model will benefit from further confirmatory research.

Q2: What key components of the program, framework or model have been shown to be effective to maintain and/or improve the health and wellbeing of workers?

WHO identifies five such components: (i) leadership commitment and engagement, (ii) involvement of workers and their representatives, (iii) business ethics and legality, (iv) a systematic, comprehensive process to ensure effectiveness and continual improvement, and (v) sustainability and integration. The US Centers for Disease Control and Prevention (CDC) identifies four such components (sub-divided into more detail) (i) Workplace Health Assessment (includes an Organisational Assessment); (ii) Planning the Program (includes Leadership Support and Management); (iii) Implementing the Program (includes Policies); (iv) Determining the Impact through Evaluation (includes Organisational Change, “Culture of Health”). In the TWH approach, NIOSH identifies four fundamental components: (i) Demonstrate leadership commitment to worker safety and health at all levels of the organisation; (ii) Design work to eliminate or reduce safety and health hazards and promote worker well-being; (iii) Promote and support worker engagement throughout program design and implementation; (iv) Ensure confidentiality and privacy of workers; and (v) Integrate relevant systems to advance worker well-being. The Framework of Best Practice Guidelines developed by Workplace Health Association of Australia identifies 15 guiding principles for effective workplace health programs, of which the first is: Active support and participation by senior leadership. There is strong agreement between these organisations and across the key components; the essential key components and principles identified in this Evidence Check were brought together and synthesised into a revised, third generation model for workplace wellness programs, Workplace Wellness 3.0.

Q3: What are the main barriers or facilitators to successful implementation of the (identified) program, framework or model?

Typical barriers identified at leadership/cultural level were “limited management support for the intervention”, an unfavourable health-promoting “organisational culture/climate” and “participation of the worksites in another health promotion activity”. Three main organisational barriers were identified: (i) “organisational structure and the physical work environment” (size, organisational and building structure); (ii) “support for the intervention by management/union representatives” and (iii) resources (time, money, staff and infrastructure). Other organisational barriers were: “changes in organisational structure/work environment” (for example, outsourcing of department individuals), ‘organisational climate’ (for example, pre-existing conflicts and conflicting priorities) and lack of “experience with (workplace) health promotion”. In the intervention phase, identified barriers referred to (a) the (in)appropriateness of the “intervention approach/concept/format” (for example, [non]-use of a participatory approach); (b) “procedural aspects of the intervention” (for example, unrealistic time schedule as obstacle; a timely start of the intervention as
facilitator); (c) “fit between the intervention and structures/expectations” (referring to (dis)harmony of the intervention with existing organisational processes and structures, including the compatibility of the intervention with working hours/processes); (d) “interactivity and interactivity-influencing structures” (for example, the presence/absence of role conflicts); and (e) “an (un)favourable climate during the intervention as well as the quality of communication” (for example, lack of face-to-face communication and multiple communication channels). A detailed summary of barriers and facilitators is provided as Table 4 in the body of the report.

Q4: What does the evidence suggest regarding the role and impact of organisational factors, leadership, systems, policy, workplace culture, work design and work processes?

Building evidence in these complex domains is more challenging and therefore an ongoing ‘work in progress’. Nonetheless, the major international and national health agencies (CDC, WHO, NIOSH, NICE, WHAA) are consistent in stipulating leadership and workplace culture very prominently and typically place this in the first position within the frameworks and models identified. Workplace Health Association of Australia (WHAA) elucidates the role of the leader/CEO as follows: (i) creating the vision (e.g. mission statement), (ii) connecting the vision to organisational values, strategy, practice and policy (i.e. build a health culture), (iii) gaining budget and resource commitment, (iv) educating and engaging senior management; (v) sharing the vision with employees, (vi) serving as a role model (‘walk the talk’), (vii) ensuring accountability and responsibility (for instance, KPI’s for senior management), (viii) rewarding success (for example, incentives, public recognition), (ix) adapting the program content and delivery in light of new findings (i.e. keeping the program current, relevant and efficacious), and (x) integration of work systems/functional units, in particular the integration of OH&S with employee health and wellness initiatives. The National Institute for Health and Care Excellence (NICE) has published (on the basis of reviewed evidence) 2016 guidance and recommendations on improving the health and wellbeing of employees, with a focus on organisational culture and the role of line managers. Guidance is provided in 11 categories, spanning the main substance of Question 4. Interactive links are provided in the main report. A new (2017) framework for leadership development has been developed by researchers; whilst Scandinavian in origin, it represents a useful starting point for considering such a framework for the Australian context. Detailed evidence and principles for better work design processes in the Australian context has recently been issued by Comcare.

Gaps in the evidence

The Research Compendium developed by National Institute for Occupational Safety and Health (NIOSH) provides a comprehensive analysis with a specific section devoted to this issue: Research Agenda: Gaps in Current Literature and Key Issues to be Addressed in Future Research (pp. 32-45 of the Compendium).

The model developed in this Evidence Check, Workplace Wellness 3.0 distinguishes between components supported by Strong and Moderate (Sufficient) evidence respectively. A priority research agenda may be summarised as undertaking implementation and scaling-up research to turn the Moderate evidence into Strong evidence.

With respect to evaluation and evaluation research, important development work has been done by Sorensen and colleagues in the domain of integrated approaches to health protection and health promotion (also known as Total Worker Health™). A large team of researchers have set out a proposed definition of integrated approaches to worker health, accompanied by indicators and measures that may be used by researchers, employers, and workers. The metrics and indicators are included as Table 7 in this report.
Discussion of key findings
From the perspective of a regulatory agency there is nothing specific or unique from the evidence identified in this review to preclude or include specific functions for a regulator. Effective programs are available but the evidence indicates that their effectiveness is driven by good fundamental design (crucially including stakeholder engagement), appropriate targeting, optimal and efficient use of information and communications technology, and customised approaches based on a robust HRA process. The definition of quality standards by Government is an option to consider, overall, and especially in the case of third party providers. So, the core strategic implication for the government to consider is about evidence-based specification for procurement, or for auditing the quality of third party service provision, and the complementarity of any state government approach with that undertaken at the federal level, for example under the auspices of Comcare and in accordance with the (Federal) Work Health and Safety Act 2011.

Table 7 in the main report summarises the main implications from the Evidence Check with respect to the NSW jurisdictional context by considering three criteria: (a) Potential linkage or synergy with the Work Health and Safety Roadmap for NSW 2022, (b) Feasibility or relevance for a regulatory agency such as SafeWork NSW, and (c) Appropriateness and applicability for the NSW context.

Conclusion
The main strategic implications for the NSW government to consider are threefold: (i) evidence-based specification for procurement and/ or auditing the quality of any third party service provision that may be considered, (ii) considering the advantages of an integrated approach to workplace wellness/OH&S/TWH through one lead government agency, and (iii) ensuring the complementarity of any state government approaches with that undertaken at the federal level, for example under the auspices of Comcare and in accordance with the (Federal) Work Health and Safety Act 2011.
Key messages

This report is presented in sections. The key messages from each are highlighted below.

Situational analysis
Situational analysis provides a situational and trend analysis from a Global, Regional and National perspective. The evolution of Workplace Wellness over the past decade has featured the following innovations:

a) Use of Health Risk Appraisal (HRA)
b) Use of incentives (including financial)
c) Integration (with EAP, with more holistic designs)
d) Use of digital technology, social media and customisation of programs
e) Extension to the family and wider community
f) Much more sophisticated metrics, increasingly tied to corporate objectives.

Global predictions for the future of Workplace Wellness suggest that:

(i) Governments and businesses alike will be highly motivated to reverse the current trend of an unhealthy workforce
(ii) Wellness at work will gain further momentum globally in the next 5–10 years
(iii) Organisations will need to adopt a wellness culture as the default, not the exception, to attract and retain good staff
(iv) Companies will recognise that doing right by employees and by the community makes good business sense
(v) The healthiest workplaces of the future may become ‘desirable destinations’ where people go to improve their wellness.

The next generation of more effective programs is predicted to combine a comprehensive approach together with interventions targeting high-risk individuals and incorporating a dose–response model of increasing levels of intensity whilst making optimal use of digital strategies. A revised, third generation model (Workplace Wellness 3.0) is identified in this evidence review.

Results
This section provides an overview and bibliometric analysis of the evidence. There was substantial growth in research conducted in the area of workplace health, with an accelerating trend over the decade from 2007. Alcohol is poorly represented in the research evidence.

Findings
Findings provides detailed evidence on (i) effectiveness (ii) essential program components, and (iii) implementation success factors.

There is strong evidence that lifestyle management interventions as part of workplace wellness programs can reduce risk factors such as smoking and increase healthy behaviours such as exercise and healthy eating; these effects are sustainable over time and are clinically meaningful. There is evidence of effectiveness for interventions to prevent type 2 diabetes and to tackle obesity/overweight in the workplace; however, interventions vary substantially in their effectiveness. The greatest weight loss is achieved only
through intensive lifestyle interventions of at least four months in duration that implement a structured, established program.¹

For musculoskeletal (MSK) injuries (including back pain), there is strong evidence that duration away from work from both MSK or pain-related conditions were significantly reduced by multi-domain interventions encompassing at least two of three stipulated domains: (i) health-focused, (ii) service coordination, and (iii) work modification interventions. Strong evidence supports workplace-based resistance training exercise programs to help prevent and manage upper body musculoskeletal disorders and symptoms. There is moderate evidence that stakeholder participation and work modification are more effective and cost effective at returning to work adults with musculoskeletal conditions than other workplace-linked interventions (including exercise).

Essential key components and principles identified in this evidence review are encapsulated in a newly proposed, third generation model for workplace wellness programs, Workplace Wellness 3.0; see ‘Evidence-at-a-glance’.

There is good quality research on the barriers to and facilitators of implementation. The practical implication of this is for policymakers and practitioners to consider not only the influencing factors at different levels (contextual/organisational), but also for the different phases of implementation. The findings are summarised in Table 4.

**Implications**

The final sections distil the potential implications for policy and decision makers arising from the Evidence Check review findings. From a regulatory perspective, there is nothing specific or unique from the evidence identified in this review to preclude or include specific functions for a regulatory agency. Effective programs are available but the evidence indicates that their effectiveness is driven by good fundamental design (crucially including stakeholder engagement), appropriate targeting, optimal and efficient use of information and communications technology, and customised approaches based on a robust HRA process.

The main strategic policy options for the NSW government to consider are threefold: (i) evidence-based specification for procurement and/ or auditing the quality of any third party service provision that may be considered; (ii) considering the advantages of an integrated approach to workplace wellness/OH&S/TWH coordinated through one lead government agency; and (iii) ensuring the complementarity of any State government approaches with that undertaken at the federal level, for example under the auspices of Comcare² and in accordance with the (Federal) Work Health and Safety Act 2011.³ The policy implications and options in NSW are mapped by the key components of the third-generation model (Workplace Wellness 3.0) overleaf.

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¹ The Diabetes Prevention Program (DPP)
Analysis of key components of Workplace Wellness 3.0 to suggest policy implications and options in NSW

<table>
<thead>
<tr>
<th>Strategic Component</th>
<th>Criteria</th>
<th>Regulatory agency relevance/feasibility</th>
<th>Appropriateness, applicability for NSW context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on NCD prevention, wellness, health and safety</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Incorporate HRA, biometric screening</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Incorporate targeted approaches (high-risk)</td>
<td>Includes a high-risk/‘hot-spot’ approach.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Implement intensive and sustained programs</td>
<td>Not inconsistent. Piloting and phased implementation recommended in the first instance.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Ensure optimal use of ICT including social media and telephonic coaching</td>
<td>Focus includes digital workplace systems, online advisory and mobile field services and digital evaluation.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Develop and implement metrics to guide implementation &amp; ensure value for investment</td>
<td>Consistent with Roadmap; requires design, system testing and implementation support</td>
<td>Feasible (as for RoadMap). Standardised evaluation framework can be mandated for any 3rd party services providers</td>
<td>✔</td>
</tr>
<tr>
<td>Ensure process (implementation) and outcome (results) evaluation</td>
<td>Essential to continue to build knowledge through continuous evaluation, especially of any innovative approaches. “SafeWork NSW’s decisions and actions will be driven by insights and evidence from data”</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Provide incentives (incl. financial) to motivate participation for hard-to-engage workers &amp; for defined outcomes</td>
<td>Not inconsistent. Piloting and phased implementation recommended in the first instance.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Develop an integrated approach to programs Wellness/Productivity management/OH&amp;S/EAP/ Disease management/TWH</td>
<td>“NSW workplaces will be managing health and safety effectively” Functions could be managed by one lead agency spanning these integrated functions (SafeWork NSW) Piloting and phased implementation recommended in the first instance.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Program extension to include family and/or wider community</td>
<td>Not inconsistent. Piloting and phased implementation recommended in the first instance.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Align programs with overall corporate objectives</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Develop quality standards and compliance monitoring</td>
<td>SafeWork NSW will be recognised for working with business to design innovative regulatory approaches aimed at eliminating WHS risk and improve regulatory approaches.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Develop accreditation and auditing systems</td>
<td>Regulatory approach is an option; workplace charter or awards programs (UK and USA models available) represent another option, perhaps through Workplace Health Association Australia?</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>
Evidence at a glance
The graphic below summarises the evidence for the key components and principles for the new (third) generation of workplace wellness programs, based on the current review.

Third generation workplace wellness programs: key components and principles (Bellew 2017)
* key components have moderate strength supportive evidence, sufficient to warrant implementation on the proviso that confirmatory process and outcome evaluation is undertaken. Other components are supported by strong evidence.
Introduction

SafeWork NSW would like to develop, promote and facilitate a model or framework for NSW workplaces to manage the health and wellbeing of workers. A review of national and international evidence on what has been implemented and shown to be effective will be used to inform the development of this model or framework.

Bill Bellew Consulting Associates was commissioned by SafeWork NSW through the Sax Institute to undertake an Evidence Check review of the evidence around programs, frameworks and models which aim to maintain and/or improve the health and wellbeing of workers.

The agreed research questions for this Evidence Check were:

**Question 1: Evidence of effectiveness**
What programs, frameworks or models designed to create healthy workplaces have been shown to be effective to maintain and/or improve the health and wellbeing of workers?

**Question 2: Essential program components**
Of the papers included in answering question one, what key components of the program, framework or model have been shown to be effective to maintain and/or improve the health and wellbeing of workers?

**Question 3: Implementation success factors**
From the papers included in question one, what are the main barriers or facilitators to successful implementation of the program, framework or model?

**Question 4: Organisational factors, leadership, systems, policies, culture, work design**
What does the evidence suggest regarding the role and impact of organisational factors, leadership, systems, policy, workplace culture, work design and work processes?

**Scope of the research questions**
The brief for the review stipulated that the search would take account of the following principles.

**Effectiveness and outcomes focussed**
“Effective” should be understood as maintaining and/or improving health and wellbeing of workers. Outcomes may include (but are not limited to): reduced numbers of sick days, staff satisfaction, return on investment (ROI), increased productivity. Other outcomes presented in the studies may also be included.

Research was confined to:
- Programs, frameworks or models that have been implemented and evaluated
- Programs that could be implemented or funded by a government regulator
- Evidence published since January 2007 to the present.

Take account of specified areas of interest to SafeWork NSW
- Programs that aim to maintain or improve health and wellbeing, rather than those with a focus on workplace safety, and include the Total Worker Health™ concept
- Prevention and management of both communicable diseases (e.g. through vaccination programs) and chronic disease Programs that have been effective in maintaining or improving health and wellbeing through (but not limited to): systems and practices; work design; flexible working arrangements; task design; other as needed.
- Identification of models, frameworks and programs that may be applicable across a range of industries and workplaces programs
• Less emphasis and/or exclusion of areas of lower interest
• The focus of the review is not on programs targeted specifically at mental health; however, where mental health is included as part of an overall approach this can be considered.
• The focus of the review is not on legislation per se; however, where legislation/ regulation has supported the implementation of programs to improve worker health and wellbeing this can be considered.
• The focus of the review is not on workplace safety per se but rather on health and wellbeing, including the Total Worker Health™ concept; however, where workplace safety is integral to programs or models this may be considered.
Situational analysis

Global situational analysis
This section is designed to provide a situational and trend analysis from a **global** perspective. The Global Wellness Institute’s report, *The Future of Wellness at Work* identifies some of the main global trends influencing the development of Workplace Wellness Programs. These are illustrated below in Figure 1.

Figure 1 - Global trends influencing Wellness Programs
Source: Global Wellness Institute (2016)

A combination of global factors is influencing the relationship between work and personal wellness. Some of the trends in these factors are positive: for example increasing numbers of women in the workplace, rising levels of education and access to information, digital health innovations, and growing worker empowerment. However, many of these trends are suggesting a path towards ever-increasing levels of economic insecurity, stress, and healthcare costs in the future. The Global Wellness Institute predictions include the following developments (adapted):

- Companies and governments will be highly motivated to reverse the current trend of an unwell workforce.
- Wellness at work will gain further momentum globally in the next 5–10 years.
- Organisations will need to adopt a culture of wellness as the default, not the exception, if they want to attract and retain good staff.
- Companies will recognise that doing right by employees and by the community is good business.
- The healthiest workplaces will become ‘desirable destinations’ where people go to improve their wellness.
The recent reports from the Global Survey of Workplace Wellness Strategies provide a useful situational analysis.\textsuperscript{2,3}

**Evolution of workplace wellness programs**

The evolution of wellness programs over approximately the past decade is depicted below in Figure 2 as three generations — from Wellness 1.0 through to Wellness 3.0. Key characteristics of that evolution include: (a) use of Health Risk Appraisal (HRA); (b) use of incentives (including financial); (c) integration (with EAP, with more holistic designs); (d) use of digital technology, social media and customisation of programs; (e) extension to the family and wider community; and (f) much more sophisticated metrics, increasingly tied to corporate objectives.

![Figure 2 - Evolution of workplace wellness programs](image-url)

**Wellness 1.0**
- Focus on general health promotion & prevention activity (fun runs, competitions)
- Some health risk appraisals + some interventions such as tobacco cessation
- Little or no measurement of outcomes

**Wellness 2.0**
- Rapid adoption of HRA, biometric screening
- Programs increasingly integrated with EAP and/or disease management programs, often leveraging portals and incentive tracking
- Growth of external (often financial) incentives to motivate participation in various activities, sometimes for defined clinical outcomes

**Wellness 3.0**
- Increasing focus:
  - **Leadership, Systems, Organisational culture**
  - Broader focus on overall wellbeing: more holistic & integrated approach to supporting employee health, wealth and careers.
  - **Shared responsibility** and employer support for wellbeing as part of a compelling employee offer
  - **Sophisticated measurement** and metrics guide strategy and is directly tied to overall corporate objectives
  - Growth of intrinsic incentives/ motivators; recognition of company culture and workplace environment to support behaviour change
  - **Extending programs** more fully to the family and sometimes to wider community
  - Leveraging newer methods such as social media, gamification, mobile technology, automated coaching, and personalized challenges
**Factors driving workplace wellness programs**

Table 1 shows the main drivers of wellness program design (in terms of modifiable risks and issues). Physical activity and stress are the top priorities globally and in Australia. Workplace safety is of highest importance in Asia, Africa/Middle East and Latin America. Figure 4 shows the fastest growing program components and especially the growth of telephonic support and lifestyle coaching services.3

![Table 1](https://via.placeholder.com/150)

Table 1 - Extent to which certain health risks and issues drive wellness strategy – by region

<table>
<thead>
<tr>
<th>Risk/Issue</th>
<th>All regions*</th>
<th>Africa/Middle East</th>
<th>Asia</th>
<th>Australia/NZ</th>
<th>Canada</th>
<th>Europe</th>
<th>Latin America</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Physical activity/exercise</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Nutrition/healthy eating</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Workplace safety</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td>6</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Work/life issues</td>
<td>5</td>
<td>2</td>
<td>13</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Depression/anxiety</td>
<td>6</td>
<td>8</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>High blood pressure (hypertension)</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Chronic disease (e.g. heart disease, diabetes)</td>
<td>8</td>
<td>12</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>10</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Personal safety</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Psychosocial work environment</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>11</td>
<td>12</td>
<td>7</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Sleep/fatigue</td>
<td>11</td>
<td>12</td>
<td>10</td>
<td>6</td>
<td>11</td>
<td>9</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>High cholesterol (hyperlipidemia)</td>
<td>12</td>
<td>15</td>
<td>9</td>
<td>14</td>
<td>8</td>
<td>12</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Obesity</td>
<td>13</td>
<td>12</td>
<td>15</td>
<td>6</td>
<td>12</td>
<td>14</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Tobacco use/smoking</td>
<td>14</td>
<td>16</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>8</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Infectious diseases/AIDS/HIV</td>
<td>15</td>
<td>2</td>
<td>16</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Substance use</td>
<td>16</td>
<td>10</td>
<td>17</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Maternity/newborn health</td>
<td>17</td>
<td>17</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>15</td>
<td>13</td>
</tr>
</tbody>
</table>

1=highest impact, 17=lowest impact

**Source:** Xerox Corporation 20144
Table 2 - Fastest growing workplace wellness components by region (2014)

<table>
<thead>
<tr>
<th>All regions</th>
<th>Africa/ Middle East</th>
<th>Asia</th>
<th>Australia/ NZ</th>
<th>Canada</th>
<th>Europe</th>
<th>Latin America</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephonic physician support (telemedicine services)</td>
<td>Cycle to work program</td>
<td>On-site childcare</td>
<td>On-site employee health fairs</td>
<td>Telephonic physician support (telemedicine services)</td>
<td>Personal health record (electronic summary of personal health information)</td>
<td>Telephonic physician support (telemedicine services)</td>
<td>Telephonic physician support (telemedicine services)</td>
</tr>
<tr>
<td>Cycle to work program</td>
<td>Environmental support*</td>
<td>Cycle to work program</td>
<td>Telephonic lifestyle coaching</td>
<td>Other on-site services</td>
<td>On-site healthy lifestyle programs and coaching**</td>
<td>Telephonic lifestyle coaching</td>
<td>Cycle to work program</td>
</tr>
<tr>
<td>On-site childcare</td>
<td>On-site childcare</td>
<td>Other internet tools (provider quality and cost information)</td>
<td>Telephonic chronic disease management support or coaching</td>
<td>Health risk appraisal (health and lifestyle questionnaire)</td>
<td>Health risk appraisal (health and lifestyle questionnaire)</td>
<td>On-site childcare</td>
<td>On-site healthy lifestyle programs and coaching**</td>
</tr>
<tr>
<td>On-site healthy lifestyle programs and coaching**</td>
<td>Telephonic chronic disease management support or coaching</td>
<td>Work/life balance support (e.g. legal, financial services, elder or child care support)</td>
<td>Telephonic physician support (telemedicine services)</td>
<td>Cycle to work program</td>
<td>Telephonic chronic disease management support or coaching</td>
<td>Work/life balance support (e.g. legal, financial services, elder or child care support)</td>
<td>Personal health record (electronic summary of personal health information)</td>
</tr>
<tr>
<td>Personal health record (electronic summary of personal health information)</td>
<td>Ergonomic adaptations and awareness</td>
<td>On-site employee health fairs</td>
<td>Other internet tools (provider quality and cost information)</td>
<td>On-site occupational health programs</td>
<td>On-site childcare</td>
<td>Other internet tools (provider quality and cost information)</td>
<td>On-site medical facility</td>
</tr>
</tbody>
</table>

Source: Xerox Corporation, 2014*

Australian situational analysis

Table 1 shows that physical activity, stress, and nutrition/ healthy eating are the top three risk influencers for employers in Australia and New Zealand. Employer perceptions of the relative importance of workplace wellness program objectives are shown below as Figure 3, with utilitarian factors featuring prominently but by no means exclusively. It is perhaps not too surprising that in the Australian context, reducing health care or health insurance costs is less of priority than in systems where this might feature more prominently as a corporate benefit; this factor was seen to be extremely or very important to 37% of employers (compared with 88% in the USA).
Perceived program importance to Australian/NZ employers

![Importance of wellness program objectives - Australian/NZ employers](chart)

**Figure 3 - Relative importance of program objectives to Australian and NZ Employers**
Source: Xerox Global Survey (2014)³

In the 2016 Global Health Survey (below) improving performance and productivity rose from 4th to 1st place in order of importance (global ranking).²

![Workplace wellness objectives for Australian Employers](chart)

**Figure 4 – Workplace wellness objectives for Australian Employers**
Workplace Wellness Program Components in Australian and New Zealand

The components of Workplace Wellness Programs in Australia and New Zealand are shown in Figure 5 below.¹ In Table 2 telephonic lifestyle coaching services (such as Get Healthy at Work) and clinical (NCD) support services were noted among the fastest growing components in Australia/NZ; Figure 4 shows that these components feature in 37% and 28% respectively of Workplace Wellness programs (current, planned in next one to three years), which may indicate scope for further uptake of these particular program components.

Figure 5 - Workplace wellness program components – Australia / New Zealand (2014)
Method

Rapid reviews
BBCA works closely with clients in agreeing the initial scope of the review and the research questions to be addressed. We then undertake what we call a ‘sentinel review’, which is an even more rapid scan than Evidence Check and helps us predict whether the questions can be addressed through recent systematic review level evidence of sufficient quality to obviate the need for searching for individual randomised controlled trials (RCTs), quasi-experimental and longitudinal studies. Whilst this can provide a more comprehensive analysis, it is much more resource intensive and is usually out of scope. We typically take the most recently available systematic review of acceptable quality as a marker in time to commence our search for subsequently published studies; the individual studies are only included if it is considered that they will change the strength of the evidence for a given program/intervention or provide some unique and valuable insights for policymakers.

Levels and strength of evidence
Having undertaken many rapid reviews, including those focussed on the workplace setting, we recommend and have worked consistently with the protocol used by the US Community Preventive Services Task Force (The Community Guide)^4^; this approach is helpful in identifying the strength of a body of evidence. The approach is consistent overall with NHMRC, but provides better flexibility when different levels of evidence may need to be considered in an integrated way with respect to a given program, strategy or framework. The approach has been described in detail by Briss and colleagues.^4^

Tabulation of selected papers
Selected studies for which there is strong or sufficient evidence (as per The Community Guide protocol) and which were most salient in the Evidence Check conclusions are featured as Appendix 6. The full database of studies was also provided to SafeWork NSW and The Sax Institute; an overview is featured as Appendix 7.

Our overall approach explained
The process map of our methodology is discussed in Appendix 2 together with the results of the sentinel search.

^4^ [https://www.thecommunityguide.org/task-force/community-preventive-services-task-force-members](https://www.thecommunityguide.org/task-force/community-preventive-services-task-force-members)
Results

After removal of duplicates, the search resulted in 296 records: 271 from the sentinel search, full and grey literature search (Group A), and 25 from the search of more recently published RCTs and longitudinal studies not already captured in systematic reviews (Group B) — see the PRISMA flow diagram in Appendix 3.

A coding framework was developed iteratively, based on the categories of interest to SafeWork NSW and on the content coverage of retrieved studies. This was then re-applied to all retrieved studies for both Group A and Group B. Studies could appear in more than one category so that the cumulative total exceeds the actual number of records. The larger, cumulative total was used as the denominator for the analysis. A bibliometric analysis by category is shown below as Figure 5. ‘Physical Activity’ focussed (including sedentary behaviour) studies were the most numerous (39 or 11% of the total), followed by Mental Health/Stress (34 or 10% of total). Alcohol (3) was the category with the fewest retrieved studies. Studies conducted in Australia/by Australian researchers (34) made up 10% of retrieved studies in this bibliometric analysis.

![Classification of Research Studies by Selected Categories](image)

**Figure 6 - Bibliometric analysis of studies 2007-2017 by strategic theme**

A bibliometric analysis by year of publication is shown below as Figure 7. Overall, analysis of the database resulting from the search strategy suggests an increasing trend over the past decade from the lowest number in 2008 (9) to the highest in 2016 (43). Figures for all of 2017 were not available at the time of the analysis.
Overview of evidence by selected categories

Appendix 6 provides the full list of studies retained in the database after screening for relevance, redundancy and/or duplication. These were further screened and prioritised so that not all listed studies were cited in the final synthesis but are provided for completeness (see PRISMA flowchart, Appendix 3).
Findings

Research Question 1: Evidence of effectiveness

What programs, frameworks or models designed to create healthy workplaces have been shown to be effective to maintain and/or improve the health and wellbeing of workers?

In assessing the evidence of effectiveness, we were able to draw (after initial screening) on more than 120 systematic reviews and 25 more recent RCTs or longitudinal studies.

NCD risk factors: Tobacco, nutrition, physical activity, type 2 diabetes, healthy weight

There is strong evidence that lifestyle management interventions as part of workplace wellness programs can reduce risk factors such as smoking, and increase healthy behaviours such as physical activity and healthy eating; these effects are sustainable over time and are clinically meaningful. There is evidence of effectiveness for interventions to prevent type 2 diabetes and to tackle obesity/overweight in the workplace; however, interventions vary substantially in their effectiveness. The greatest weight loss is achieved only through intensive lifestyle interventions (that is, at least 4 months in duration) that implemented a structured, established program. By contrast, weight reduction was minimal among less intensive interventions, and/or those that did not comply with the specifications of the established model. Further, more work is needed to refine efforts to address socio-economic inequalities in obesity.

Musculoskeletal health and back pain

The evidence with respect to impacts on absenteeism covered several themes. For musculoskeletal (MSK) injuries (including back pain), there was strong evidence that duration away from work from both MSK or pain-related conditions were significantly reduced by multi-domain interventions encompassing at least two of three stipulated domains: (i) health-focused, (ii) service coordination, and (iii) work modification interventions. In addition, there was evidence that stakeholder participation and work modification are more effective and cost effective at returning to work adults with musculoskeletal conditions than other workplace-linked interventions, including exercise. There was also strong evidence that a workplace-based resistance training exercise program can help prevent and manage upper body MSK disorders and symptoms, and there was moderate evidence for the effectiveness of stretching programs, mouse use feedback and forearm supports. A 2014 review identified a management model to reduce absenteeism involving six steps: (i) time off and recovery period, (ii) initial contact with the worker, (iii) evaluation of the worker and his/her job tasks, (iv) development of a return-to-work plan with accommodations, (v) work resumption, and (vi) follow-up of the return-to-work process. The researchers recommended that this model be included within a broader policy of health promotion and job retention.

Productivity

Evidence on the productivity dimension of workplace wellness programs was derived from 7 retrieved studies. Current evidence of the impact of onsite workplace physical activity programs on worker productivity was inconsistent; we await further evidence. One US study across 49 States concluded that reducing multiple health risk behaviours was associated with emotional and physical health, better functioning and productivity. A 2011 review concluded that well-targeted and efficiently implemented diet-related worksite health promotion interventions may improve labour productivity by one to two per cent; in larger workplaces, these productivity gains were deemed likely to be cost-effective. A systematic review of the effects of cancer treatment provided insights that impaired productivity was associated with: (a) disease-and treatment-related effects (for example,

5 The Diabetes Prevention Program (DPP)
disease progression and severity), (b) cognitive and neurological impairments, (c) poor physical and psychological status, (d) receipt of chemotherapy, and (e) time and expenses required to receive therapy.\textsuperscript{34} The TWH model has been used to identify the Employer Health and Productivity RoadMap\textsuperscript{TM}. The Roadmap is designed to provide an integrated and incentivised strategy for employers to address the core drivers of poor health, excessive medical costs, and lost productivity. It comprises six interrelated and integrated core elements: (i) optimise environment, (ii) increase healthy behaviours, (iii) minimise avoidable or inefficient acute care, (iv) optimise chronic care, (v) reduce excessive surgery, and (vi) speed transitions from care to home and work.\textsuperscript{36}

**Organisational factors**

With respect to organisational factors, the review found moderate evidence in support of systems approaches\textsuperscript{38}, including the establishment of a health promoting culture and using strategic communications.\textsuperscript{39} Key elements that contribute to a culture of health are: (i) leadership commitment, (ii) social and physical environmental support, and (iii) employee engagement and involvement.\textsuperscript{39, 40} Strategic communications are those designed to educate, motivate, market offerings and build trust. They are tailored and targeted, multi-channeled, bi-directional, with optimum timing, frequency, and placement.\textsuperscript{39} One review found that small businesses tend to have distinctive social relations of work, apprehensions of workplace risk, and legislative requirements; it questions moves to exempt small businesses from OHS regulations and suggests a legislative focus on their particular needs, together with recommendations for third party interventions and improved worker representation.\textsuperscript{41} The psychosocial and health effects of workplace reorganisation have been examined in two coordinated systematic reviews that addressed: (i) organisational-level interventions that aim to increase employee control\textsuperscript{42}, and (ii) task restructuring interventions.\textsuperscript{43} These reviews concluded that: (a) some organisational-level participation interventions may benefit employee health (the demand-control-support model),\textsuperscript{6} but may not protect employees from generally poor working conditions — more investigation of the relative impacts of different interventions and the distribution of effects across the socioeconomic spectrum is required\textsuperscript{44}; and (b) task-restructuring interventions that increase demand or decrease control adversely affect the health of employees and conversely, those that decreased demand and increased control resulted in improved health.\textsuperscript{45} This is recognised in policy initiatives such as the EU directive on participation at work, which aims to increase job control and autonomy.\textsuperscript{7}

**Health Risk Appraisal/Assessment (HRA) and cost-effectiveness**

The use of Health Risk Appraisals/Assessments (HRAs) is increasingly being incorporated in the design of a Workplace Wellness Program (WWP) and in Australia is expected to rise from 54\% incorporation to over 80\% in the next few years.\textsuperscript{2, 3} There is strong evidence for the effectiveness of HRAs (when used in combination with other interventions) in relation to favourable impacts on tobacco use, alcohol use, dietary fat intake, blood pressure and cholesterol. There is sufficiently strong evidence to suggest that for every dollar invested in these programs (HRA+ program combinations) an annual return of $3.20 (range $1.40 to $4.60) can be achieved; this is described in more detail in a 2012 Australian review.\textsuperscript{44} There is promising evidence that even higher returns on investment can be achieved in programs incorporating newer technologies such as telephone coaching of high risk individuals, together with the use of financial incentives; more research is required to be definitive on this point.

**Total Worker Health\textsuperscript{TM} (TWH)**

TWH was of particular interest in this review. Feltner and her colleagues conducted a comprehensive systematic review to evaluate evidence on the benefits and harms of integrated TWH interventions.\textsuperscript{45} This is a promising concept and one which has significant strategic momentum in the USA. Current evidence indicates that integrated TWH interventions could reduce tobacco use and sedentary behaviour and improve the diet of

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\textsuperscript{6} The Demand-Control-Support Model

\textsuperscript{7} EurWORK: European Observatory of Working Life
workers, but effects of these interventions on injuries and overall quality of life are not known; the TWH model overall will benefit from further confirmatory evidence.

Program evolution
The evolution of Workplace Wellness over the past decade has featured the following innovations:

(a) Use of Health Risk Appraisal (HRA)
(b) Use of incentives (including financial)
(c) Integration (with EAP, with more holistic designs)
(d) Use of digital technology, social media and customisation of programs
(e) Extension to the family and wider community
(f) Much more sophisticated metrics, increasingly tied to corporate objectives.

The next generation of more effective programs may combine a comprehensive approach together with interventions targeting high-risk individuals and incorporating a dose–response model of increasing levels of intensity whilst making optimal use of digital strategies. Linked telephonic lifestyle coaching services (such as Get Healthy at Work) and clinical (NCD) support services were noted among the fastest growing components in Australia and New Zealand. Yet these components only feature in 37% and 28% respectively of current programs (or programs planned in the next one to three years), which may indicate scope for further uptake of these particular program components.

Safety and mental health
Injury/safety and mental health were not stipulated as areas to investigate in this review. Whilst not explored in any detail here, for completeness, the relevant evidence retrieved in these areas was retained in the database and is fully referenced.

Additional research not yet included in systematic reviews
From our analysis of RCTs and cohort research not captured in systematic reviews, 12 studies were retained. These strengthened the evidence base as follows:

Recent individual studies
For mental health, the 2016 Australian study by Jarman and colleagues is noted here for its potential interest to NSW and other policymakers. The study investigated the association between mental health and comprehensive workplace health promotion (WHP) delivered to an entire state public service workforce (~28,000 employees) over a three-year period. Government departments in Tasmania's public service were supported to design and deliver a comprehensive, multi-component health promotion program, Healthy@Work, which targeted modifiable health risks including unhealthy lifestyles and stress. Repeated cross-sectional surveys compared self-reported psychological distress (Kessler-10; K10) at commencement (N=3406) and after 3 years (N=3228). Healthy@Work was successful in attracting participation from men with higher than average psychological distress, and in increasing participation among women with poorer mental health scores. While these contributions were important, they did not translate to a change in men's mental health and only made a partial contribution to the observed reduction in women's psychological distress over time. These researchers concluded, nevertheless, that scope remains for comprehensive WHP to prove its worth as a universal intervention for mental health because direct interventions have evidence of success and because they provide a pathway that raises the profile of mental health, thereby reducing its stigma. Other research from this project found that workers who had variable work schedules, those who smoked, or who had cardiometabolic problems were less likely to participate despite activities being available. Participation was more common among administrative employees and workers who undertook leisure-time physical activity. Given the evolving evidence identified in this review, this finding from Tasmania invites us to carefully consider the
importance of targeted and tailored approaches through HRA, matched with financial and other incentives for Australian programs.

**Diabetes/metabolic conditions**

For prevention of diabetes/metabolic disorders, two studies from the USA were retained: FUEL Your Life\(^7\) and Steinberg et al.\(^6\)

FUEL Your Life (a low intensity intervention) was translated from the Diabetes Prevention Program to better fit within the worksite context. The main difference under scrutiny was the use of peer health coaches to provide social support and reinforcement and an occupational nurse to provide lesson content (six sessions of 10 minutes) to participants instead of the lifestyle coaches employed by the Diabetes Prevention Program, resulting in a less structured meeting schedule. Participants in the intervention program maintained weight/BMI (-0.1 pounds/-0.1 BMI), whereas the control participants gained weight/BMI (+2.6 pounds/+0.3 BMI), resulting in a statistically significant difference between groups. The program was not effective for promoting weight loss, but was effective for helping workers maintain weight over a 12-month period.\(^7\)

Steinberg and colleagues evaluated a year-long program that included a limited genetic profile, a traditional psychosocial assessment, and high intensity coaching in a randomized controlled study of employees with an increased risk for metabolic syndrome. Employee engagement of 50% was sustained over the course of 1 year; 76% of participating employees lost an average of 10 pounds (4.5 kg) (P<0.001 vs baseline weight), and there were trends in improved clinical outcomes relative to three of five metabolic factors. Average health care costs were reduced by $122 per participant per month, resulting in a positive ROI in the program’s first year. The researchers concluded that at scale, such programs would be expected to lead to significant downstream reduction in major clinical events and costs.\(^6\)

**Self-management of chronic diseases and conditions**

In NCD self-management, the recent study by Schopp and colleagues provides the first empirical validation of the Chronic Disease Self-Management Program for a general employee population in a workplace setting with an emphasis on disease prevention and health promotion. Although based on three-month follow-up only, it nonetheless shows that adapting a lay-facilitated NCD self-management program for the workplace holds promise as a replicable, scalable, affordable model for organisations.\(^7\)

**Integrated or TWH approach**

For integration/TWH approaches, one hospital-based quasi-experimental longitudinal study found a significant increase in proximal outcomes over time in the intervention group compared with the control group, and a trend toward improvement in the distal outcomes workability and productivity. Integrating health protection and health promotion, together with a continuous improvement system promoted better staff engagement in health protection and promotion, as well as improving their understanding of the link between work and health.\(^5\)

**Work scheduling**

For work organisation, one US study looking at workplace schedule control/supervisor support in the context of family life was retained. The setting was the Information Technology (IT) division of a US Fortune 500 company; follow-up was three months only. This workplace intervention designed to reduce employees’ work-family conflict had positive effects on the regularity of adolescents’ night time sleep duration, sleep quality, and time to fall asleep (although not sleep duration).\(^8\)
Research Question 2: Essential program components

From the papers included in question one, what key components of the program, framework or model have been shown to be effective to maintain and/or improve the health and wellbeing of workers?

The previous section summarised the evidence for effectiveness of programs addressing prevention of NCDs, musculoskeletal health, safety, stress and mental health; in addition, the TWH approach, use of HRA, cost-effectiveness, organisational factors and productivity were discussed. To describe the key components of effective programs, this section draws on three sources, the US Chambers of Commerce,82 US Department of Health and Human Services/CDC/NIOSH,83 and the Workplace Health Association of Australia.84

The essential components of workplace wellness programs was reviewed for the US Chambers of Commerce in 2016 by Prochaska, Short and colleagues.82 According to this review: “There is no one-size-fits-all wellness program. When designing a program, employers should rely on evidence-based best practice strategies and tailor interventions to their populations. When developing a well-designed workplace wellness initiative, consider the following evidence-based components that spell out IDEAS:

- Infrastructure
- Data
- Evaluation and Planning
- EI Programming
- Success”
Table 3 - Evidence-based best practice components of well-designed workplace wellness initiatives

<table>
<thead>
<tr>
<th>Key Components</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infrastructure</strong></td>
<td>Build an internal foundation to sustain wellness initiatives. An internal foundation includes senior leadership support and wellness champions and teams. A focus on well-being encompasses policy and environmental interventions designed for the workplace.</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td>Collecting baseline data is important to build a targeted workplace wellness program tailored to the population</td>
</tr>
<tr>
<td><strong>Evaluation and Planning</strong></td>
<td>After putting in place the workplace wellness infrastructure and collection of baseline data, evaluate the information collected and then move to craft a customized strategic work plan.</td>
</tr>
<tr>
<td><strong>AEI Programming:</strong></td>
<td>These programs encompass a blend of awareness, education, and behaviour change interventions (AEI) that appeal to a wide variety of participants and to those who are at different levels of preparedness to change. An awareness program, for example, a health risk assessment (HRA) or biometric screening, increases participants’ cognition of their own health status and of the benefits and risks of certain healthy lifestyle behaviours. They are beneficial to those who may not yet be ready to change and may help move them to think about change, prepare for change, and/or commit to action.</td>
</tr>
<tr>
<td>*Awareness programs</td>
<td></td>
</tr>
<tr>
<td>*Education programs</td>
<td>Education programs teach participants about their health, lifestyle behaviours and risks, as well as how to engage in healthy lifestyle behaviours. Education programs inform individuals about health risks and can enlighten participants about their health and well-being.</td>
</tr>
<tr>
<td>*Interventions</td>
<td>Interventions are typically a six-to-eight-week health behaviour change program designed to lead to sustained action and maintenance (e.g. weekly weight loss programs).</td>
</tr>
<tr>
<td><strong>Success</strong></td>
<td>Measuring, evaluating, and monitoring workplace wellness programs on a regular basis leads to success. Making regular adjustments to the program and the strategic plan helps improve engagement and outcomes.</td>
</tr>
</tbody>
</table>

The defining elements of the TWH approach are described in the 2016 publication from the US Department of Health and Human Services (DHHS), CDC, and NIOSH, *Fundamentals of Total Worker Health™ Approaches*. These elements are:

- Demonstrate leadership commitment to worker safety and health at all levels of the organization
- Design work to eliminate or reduce safety and health hazards and promote worker well-being
- Promote and support worker engagement throughout program design and implementation
- Ensure confidentiality and privacy of workers
- Integrate relevant systems to advance worker well-being.

For Australia, the Workplace Health Association of Australia (WHAA) has recently issued revised best practice guidelines which comprise 15 key components.:

1. Active support and participation by senior leadership
2. Health as a shared responsibility
3. Engagement of key stakeholders
4. Supportive environment and culture
5. Participatory planning and design
6. Targeted health interventions
7. Evidence base, standards and accreditation
8. High levels of program engagement
9. OH&S integration
10. Technology and online programs/content
11. ROI – assumptions and calculations
12. Innovative marketing and communication
13. Evaluation and monitoring
14. Commitment to ethical business practices
15. Sustainability.

We can observe elements in common across these three assessments of the essential program components, and we argue that Short, Prochaska et al. may be critiqued for the lack of environmental/safe and healthy by design approaches. Additionally, the emphasis on an integrated systems approach/integration with the OHS/TWH approach, whilst appearing plausible and bureaucratically appealing in terms of possible efficiencies, is in anticipation of, rather than based on, definitive evidence of comparative effectiveness. Integration is most strongly represented in the Total Worker Health™ (TWH) concept; the concept has significant strategic momentum, coming from the USA.

Evidence from our current review allows us to conclude that integrated TWH interventions can reduce tobacco use and sedentary behaviour and improve diet of workers. However, the effects of these interventions on injuries and overall quality of life are not known and the TWH model overall will benefit from further confirmatory evidence.

The essential elements identified above are a mixture of content (evidence based programs such as physical activity) and process (evidence-based cross-cutting principles such as HRA, co-production). These have implications for and feed into the next section, which draws out implementation success factors.
Research Question 3: Implementation success factors

From the papers included in question one, what are the main barriers or facilitators to the successful implementation of the program, framework or model?

For evidence with an explicit focus on barriers or facilitators to implementation, four systematic reviews were retained,\(^{40, 85-87}\) as well as a report published by WHO.\(^{88}\)

Rojatz and colleagues’ 2016 qualitative systematic literature review was carried out to systematically identify and synthesise factors influencing the phases of WHP interventions: needs assessment, planning, implementation and evaluation. The practical implication arising from the research is for policymakers and practitioners to consider not only the influencing factors at different levels (contextual/organisational), but also for the different phases of implementation. Their findings are summarised in Table 4, which is sourced directly from the systematic review.\(^{86}\) By phase, the findings were as follows:

**Needs Assessment**
No influencing factors were reported.

**Planning**
Only a few key factors were found for the planning phase. Contextual factors referred to an economic crisis as an ‘external condition’ (barrier) hindering the organisation to participate in the intervention and to the ‘conducting of a pre-study’ to guide the intervention (facilitator). Factors at organisational level were ‘limited management support for the intervention’, an unfavourable health-promoting ‘organisational culture/climate’ and ‘participation of the worksites in another health promotion activity’. The only facilitator reported at the organisational level referred to the perceived usefulness of the intervention (for example, reduction of sick leave).

**Implementation**
The majority of reported factors were in this phase. Contextual factors were ‘external conditions’ (for example, an economic crisis during intervention as barrier, the absence of adverse effects as facilitator) and three barriers. These referred to problems in ‘coordinating the intervention’ (for example, through delayed arrival of intervention material), “changes in external project management” and ‘resources’ including a lack of control by the external project team. Three main organisational factors were identified; these referred to “organisational structure and the physical work environment” (size, organisational and building structure), “support for the intervention by management/union representatives” and ‘resources’ (time, money, staff and infrastructure). Other barriers were: “changes in organisational structure/work environment” (for instance, outsourcing of department individuals), ‘organisational climate’ (for example, pre-existing conflicts and conflicting priorities) and lack of “experience with health promotion”. The most important intervention design factors referred to were: (a) the (in)appropriateness of the “intervention approach/concept/format” (for example, [non]-use of a participatory approach); (b) “procedural aspects of the intervention” (for example, unrealistic time schedule as obstacle; a timely start of the intervention as facilitator); (c) “fit between the intervention and structures/expectations” (referring to [dis]harmony of the intervention with existing organisational processes and structures, including the compatibility of the intervention with working hours/processes); (d) “Interactivity and interactivity-influencing structures” (referring to, for example, to the presence/absence of role conflicts); and (e) an (un)favourable climate during the intervention as well as the quality of communication (for instance, lack of face-to-face communication and multiple communication channels).

**Evaluation**
The key contextual factor was, ‘seasonal conditions’ (holiday seasons), which was a hindrance limiting the presence of participants. At the organisational level the research identified two main barriers: (a) “changes in organisational structure and work environment”, for example, structural changes at control sites that affected their usefulness for comparability with the intervention sites; and (b) a limited “compliance to the evaluation”,...
such as not returning survey data. The use of an ‘evaluation framework’ was reported as a facilitator, whereas a lack of ‘blinding’ (for instance, not being able to blind the participants to their group designation during randomisation) and ‘characteristics of data’ (for example, missing or inconsistent data) were reported as barriers.

**Workplace wellness programs: barriers and facilitators for needs assessment, planning, implementation and evaluation phases**

Table 4 - Barriers & facilitators for implementation of Workplace Wellness Programs

<table>
<thead>
<tr>
<th>Factor</th>
<th>Needs assessment</th>
<th>Planning</th>
<th>Implementation</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factors at contextual level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External condition (season and economic condition)</td>
<td>B/F</td>
<td>B</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Coordination of the intervention</td>
<td></td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in external project management</td>
<td></td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources (resource intensive delivery and lack of control by external project team)</td>
<td></td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct of pre-study</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factors at organizational level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational structures and physical work environment</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Management) support for the intervention</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources (time, money, human resources and infrastructure)</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in organizational structure/work environment</td>
<td>B</td>
<td></td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Organizational culture/climate</td>
<td>B</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation of worksites in another health promotion activity</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience with health promotion</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived usefulness of intervention</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance to evaluation</td>
<td></td>
<td></td>
<td></td>
<td>B</td>
</tr>
<tr>
<td><strong>Factors at intervention level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention approach/concept/format</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedural aspects of intervention (timing and technical issues)</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fit between intervention and structures/expectations</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactivity and interactivity-influencing structures</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User (un)friendliness of intervention (material)</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support for stakeholders (implementers/participants)</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources (human resources and intervention material/infrastructure)</td>
<td>B/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing and promotion of intervention</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continues over
Factors at implementer level

<table>
<thead>
<tr>
<th>Factor</th>
<th>Implementer</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality and work attitude of implementers</td>
<td>B/F</td>
<td>B/F</td>
</tr>
<tr>
<td>Resources (knowledge and competencies)</td>
<td>B/F</td>
<td></td>
</tr>
<tr>
<td>Accessibility of participants</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Quality of intervention delivery (no show of implementers and intervention material forgotten)</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Side-effects for implementers</td>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

Factors at participant level

<table>
<thead>
<tr>
<th>Factor</th>
<th>Implementer</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants’ characteristics</td>
<td>B/F</td>
<td>B</td>
</tr>
<tr>
<td>Resources (control over intervention and time)</td>
<td>B/F</td>
<td></td>
</tr>
<tr>
<td>Commitment and compliance to intervention/evaluation</td>
<td>B/F</td>
<td>B</td>
</tr>
<tr>
<td>Side-effects</td>
<td>B/F</td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Motivators to participate</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

Factors referring to methodological and data aspects

<table>
<thead>
<tr>
<th>Factor</th>
<th>Implementer</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data-collection issues</td>
<td>B/F</td>
<td></td>
</tr>
<tr>
<td>Evaluation framework</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Blinding</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Characteristics of data (missing data and inconsistent data)</td>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

Source: Rojatz et al. 2016
Research Question 4: Organisation, leadership and systems approaches

What does the evidence suggest regarding the role and impact of organisational factors, leadership, systems, policy, workplace culture, work design and work processes?

The section dealing with question one noted evidence in support of systems approaches, including the establishment of a culture of a health promoting culture and using strategic communications. Key elements identified that contribute to a culture of health are: (i) leadership commitment, (ii) social and physical environmental support, and (ii) employee engagement and involvement. This section deals with these issues in greater detail.

Statements and recommendations from International and National Health Agencies

US Centers for Disease Control and Prevention (CDC)

The US Centers for Disease Control and Prevention (CDC) has recently established a new Workplace Health Resource Center (see web portal) which embraces a systems approach and includes guidance on Planning/Governance and Leadership support. The overarching model is shown as Figure 7.

USCDC set out a systematic approach to building a workplace health promotion program, configured as four main steps:

1. Workplace Health Assessment (includes an Organisational Assessment)
2. Planning the Program (includes Leadership Support and Management)
3. Implementing the Program (includes Policies)
4. Determine Impact through Evaluation (includes Organisational Change, “Culture of Health”)

---

8 Available at https://www.cdc.gov/workplacehealthpromotion/pdf/WorkplaceHealth-model-update.pdf
The World Health Organization (WHO) places a strong emphasis on leadership within the core model (Figure 8) and relevant policy documents which focus on healthy workplaces. These include the Global Plan of Action on Workers’ Health 2008–2017, and Healthy workplaces: a model for action in which WHO sets out a framework for the development of healthy workplace initiatives adaptable to diverse countries, workplaces and cultures.

WHO identifies “Leadership engagement based on core values” as the primary key to success with the underlying principles. Three factors of leadership are further elucidated: (i) mobilizing and gaining commitment from major stakeholders (because a healthy workplace program must be integrated into the enterprise’s business goals and values); (ii) getting necessary permissions, resources and support from owners, senior managers, union leaders or informal leaders (critical to get that commitment and buy-in before trying to proceed); and (iii) providing key evidence of this commitment by developing and adopting a comprehensive policy that is signed by the enterprise’s highest authority and communicated to all workers (this clearly indicates that healthy workplace initiatives are part of the organisation’s business strategy).

WHO has also identified 5 Keys to Healthy Workplaces with leadership being the first of five (Table 5).
Table 5 - Five Keys to Healthy Workplaces

<table>
<thead>
<tr>
<th>Key 1:</th>
<th>Leadership commitment and engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key 2:</td>
<td>Involve workers and their representatives</td>
</tr>
<tr>
<td>Key 3:</td>
<td>Business ethics and legality</td>
</tr>
<tr>
<td>Key 4:</td>
<td>Use a systematic, comprehensive process to ensure effectiveness and continual improvement</td>
</tr>
<tr>
<td>Key 5:</td>
<td>Sustainability and integration</td>
</tr>
</tbody>
</table>

Source: WHO, 2010

Workplace Health Association of Australia

Finally, the 2015 Best Practice Guidelines developed by Workplace Health Association of Australia (WHAA) identify 15 guiding principles for effective workplace health programs; principle number 1 is Active support and participation by senior leadership.

1. Active support and participation by senior leadership
2. Health as a shared responsibility
3. Engagement of key stakeholders
4. Supportive environment and culture
5. Participatory planning and design
6. Targeted health interventions
7. Evidence base, standards and accreditation
8. High levels of program engagement
9. OH&S integration
10. Technology and online programs/content
11. ROI – assumptions and calculations
12. Innovative marketing and communication
13. Evaluation and monitoring
14. Commitment to ethical business practices
15. Sustainability.

The WHAA Code of Ethics (see www.workplacehealth.org.au) serves as a code of professional conduct for all WHAA members, including professional responsibility, confidentiality, professional competency, consumer protection, assessment and referral, and procedures for review of member’s conduct.

WHAA identifies 10 primary roles that the senior leadership team, particularly the CEO, must embrace:

1. Creating the vision (e.g. mission statement)
2. Connecting the vision to organisational values, strategy, practice and policy (i.e. build a health culture)
3. Gaining budget and resource commitment
4. Educating and engaging senior management
5. Sharing the vision with employees
6. Serving as a role model (i.e. walk the talk)
7. Ensuring accountability and responsibility (e.g. KPIs for senior management)
8. Rewarding success (e.g. incentives, public recognition)
9. Adapting the program content and delivery in light of new findings (i.e. keeping the program current, relevant and efficacious)
10. Integration of work systems/functional units, in particular the integration of OH&S with employee health and wellness initiatives.
Empirical evidence

**NICE UK**

Perhaps one of the most useful studies or policy documents retrieved in this rapid review was published by the UK-based National Institute for Health and Care Excellence (NICE) in 2016. On the basis of reviewed evidence, guidance and recommendations on improving the health and wellbeing of employees, with a focus on organisational culture and the role of line managers, the study provides detailed, evidence-based recommendations across the following eleven categories (click links to see recommendations).

1.1 Organisational commitment
1.2 Physical work environment
1.3 Mental wellbeing at work
1.4 Fairness and justice
1.5 Participation and trust
1.6 Senior leadership
1.7 Role of line managers
1.8 Leadership style of line managers
1.9 Training
1.10 Job design
1.11 Monitoring and evaluation

**Eriksson et al.**

The 2017 review by Eriksson and colleagues examined whole-system approaches to workplace health promotion with a focus on management, leadership, and economic efficiency. The review focussed on Nordic countries (Sweden, Finland, Norway, Denmark) with most evidence derived from Sweden. The in-depth analysis (twenty eligible studies) of management and/or leadership approaches revealed four different categories in the published evidence:

1. Studies applying an explicit whole-system understanding, in which management and/or leadership was linked to health promotion, with an explicit aim of measuring the effects on workplace sustainability
2. Approaching sustainability by studying success factors for the implementation of workplace health promotion
3. Studies using sustainability for framing the importance of the study
4. Studies highlighting that an explicit economic focus can counteract sustainability.

Whilst the researchers noted a dearth of true ‘whole-system understanding’ and ‘sustainability’ research, they also concluded that: “leadership can...be seen as playing an important role in inspiring and motivating employees to participate in the development of a sustainable workplace. Participatory leadership may be health-promoting in itself, but may also increase positive forms of work engagement. This, in turn, can contribute to both individual employee health and to employees’ willingness to engage in improvements to work processes” (Eriksson et al. 2017).

The researchers highlight a new framework for leadership development (Figure 10) as well as two examples of research studies that better attempt to address the whole-of-system paradigm.
Figure 10 - Theoretical framework: sustainable leadership for workplace wellness

Source: Dellve & Eriksson 2017 cited in Eriksson et al. 2017

Information is presented according to two highlighted perspectives: (1) the selected key conditions for health and sustainability, and (2) the crafting of sustainable managerial work across systems, applied to the chronoso-socio-bio-ecological model. The arrows illustrate only the overall associations.

Other studies regarding systems approaches retrieved in the rapid review are not discussed further because of redundancy, but for completeness are featured in the Tabulation appendices, 38, 100-106

Work and job design

With respect to work and job design, the NICE (2016) recommendations are of significance, and have previously been highlighted.95 Importantly, the 2014 review by Parker and Griffin107 was commissioned by Comcare to inform the project ‘Good Work Through Effective Design’. In this context ‘Good work’ is healthy and safe work where the hazards and risks created by the work are eliminated or minimised so far as is reasonably practical and where the work design optimises human performance, productivity and job satisfaction.107

Shift work, duration of work shift, flexible working, sub-contracting, outsourcing, home-based work

Other studies (see tabulation for detail) have examined the health and safety effects of shift work, 108, 109 the risks of very long working hours for increasing heart disease and stroke110, the health implications of flexible working arrangements (flexible working interventions that increase worker control and choice (such as self-scheduling or gradual/partial retirement) are likely to have a positive effect on health outcomes).111 The 2008 study by Quinlan and Bohle reviewed international studies of the occupational health and safety (OHS) effects of subcontracting, outsourcing and home-based work undertaken over the previous 20-year period, finding overwhelmingly that outsourcing/ subcontracting and home-based work led to poorer OH&S outcomes. The researchers consider that governments have taken little account of findings on these work arrangements in their laws and policies, in part because neoliberal ideas dominate national and global policy agendas; they make suggestions for future research and policy interventions.112
Implications for policy and decision makers

The evidence synthesis for the current review provided substantial justification for the observed trends in the evolution of workplace wellness programs, described earlier (see Figure 2) as the third generation or Workplace ‘Wellness 3.0’ (see graphic below).

Figure 11 - Third generation workplace wellness programs (Bellew 2018)

* key components have moderate strength supportive evidence, sufficient to warrant implementation on the proviso that confirmatory process and outcome evaluation is undertaken. Other components are supported by strong evidence.
This is an encouraging development, suggesting that policymakers are increasingly mindful of evidence of effectiveness in their deliberations.

As the sentinel review predicted, there was a substantial increase in relevant research output in the decade since 2007. The reviews on TWH clearly establish it as promising, but also not yet definitively proven approach, in the sense of being superior to non-integrated approaches. Conversely, there is no evidence to suggest that the TWH would hinder current efforts were this approach to be adopted by SafeWork NSW as a putative lead agency across wellness as well as OH&S / health protection for the NSW Government.

From the perspective of a regulatory agency there is nothing specific or unique from the evidence identified in this review to preclude or include specific functions for a regulator. Effective programs are available but the evidence indicates that their effectiveness is driven by good fundamental design (crucially including stakeholder engagement), appropriate targeting, optimal and efficient use of information and communications technology, and customised approaches based on a robust HRA process. The definition of quality standards by Government is an option to consider, overall, and especially in the case of third party providers. So, the core strategic implication for the government to consider is about evidence-based specification for procurement, or for auditing the quality of third party service provision, and the complementarity of any State government approach with that undertaken at the federal level, for example under the auspices of Comcare\(^9\) and in accordance with the (Federal) Work Health and Safety Act 2011.\(^{10}\)

________
<table>
<thead>
<tr>
<th>KEY COMPONENTS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure (including leadership, and safe-and-healthy-by-design)</td>
<td>Build an internal foundation to sustain wellness initiatives. An internal foundation includes senior leadership support and wellness champions and teams. A focus on wellbeing encompasses <strong>policy and environmental</strong> interventions designed for the workplace. Design the working environment and work tasks to eliminate or reduce safety and health hazards and promote worker well-being from the outset (safe-and-healthy-by-design)</td>
</tr>
<tr>
<td>Data</td>
<td>Collecting baseline data is important to build a targeted workplace wellness program tailored to the population</td>
</tr>
<tr>
<td>Engagement, Evaluation, and Integrated Planning</td>
<td>Promote and support worker engagement throughout program design and implementation. After putting in place the workplace wellness infrastructure and collection of baseline data, evaluate the information collected and then move to craft a customized strategic work plan. The Plan should consider the benefits of integrating relevant systems to advance worker well-being (e.g. wellness &amp; OH&amp;S, TWH approach).</td>
</tr>
<tr>
<td>AEI Programming:</td>
<td>These programs encompass a blend of awareness, education, and behaviour change interventions (AEI) that appeal to a wide variety of participants and to those who are at different levels of preparedness to change. Awareness programs—for example, health risk assessments (HRA) or biometric screenings, increase participants’ cognition of their own health status and of the benefits and risks of certain healthy lifestyle behaviours. They are beneficial to those who may not yet be ready to change and may help move them to think about change, prepare for change, and/or commit to action.</td>
</tr>
<tr>
<td>* Awareness programs</td>
<td>Education programs teach participants about their health, lifestyle behaviours and risks, as well as how to engage in healthy lifestyle behaviours. Education programs inform individuals about health risks and can enlighten participants about their health and well-being.</td>
</tr>
<tr>
<td>* Education programs</td>
<td>Interventions are typically a six-to-eight-week health behaviour change program designed to lead to sustained action and maintenance (e.g. weekly weight loss programs).</td>
</tr>
<tr>
<td>Success</td>
<td>Measuring, evaluating, and monitoring workplace wellness programs on a regular basis can lead to success. Making regular adjustments to the program and the strategic plan helps improve engagement and outcomes.</td>
</tr>
</tbody>
</table>

**PRINCIPLES FOR DESIGN AND IMPLEMENTATION**

- Evidence informed
- Health as a shared responsibility
- Co-production of plan and design
- Quality standards compliance and accreditation
- Commitment to ethical practice including confidentiality and privacy of workers
- Value for investment
Notwithstanding the compelling evidence for effectiveness reported in this review, recent research from Tasmania gives policy and decision makers pause for thought and provides a case study which also serves as a cautionary tale.\textsuperscript{70} The take home message is that workplace wellness programs, integrated or not, really do need to be very well designed, well targeted and to comply with the evidence-based essential components and design principles identified in this review if they are to be effective. The program interventions also need to be quite intensive to be effective, and it is increasingly becoming clear that financial incentives are required to deliver the best outcomes for those who are at greater health or injury risk, but who are often those most difficult to engage and retain in wellness programs. The current review advances our understanding of the specifications (quality standards) or Workplace Wellness 3.0 – the third generation of wellness programs. Figure 10 and Table 3 respectively show our update of the key components and principles, acknowledging the publications which underpin the revised model.\textsuperscript{14, 82, 83, 88}
Implications for the NSW policy context

The current review allowed us to refine Workplace Wellness 3.0, a revised third generation model (see Figure 10, Table 3). We have noted that the current evidence does not, per se, preclude or include specific functions for a regulator such as SafeWork NSW or NSW Health. Table 7 below summarises the main implications for the review with respect to the NSW jurisdictional context by considering three criteria: (a) potential linkage or synergy with the Work Health and Safety Roadmap for NSW 2022\(^\text{11}\), (b) feasibility or relevance for a regulatory agency such as SafeWork NSW, and (c) appropriateness and applicability for the NSW context.

Table 7 - Workplace Wellness 3.0 and policy implications in NSW

<table>
<thead>
<tr>
<th>Strategic component</th>
<th>Criteria</th>
<th>Regulatory agency relevance/feasibility</th>
<th>Appropriateness, applicability for NSW context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on NCD prevention, wellness, health and safety</td>
<td>See Figure 11</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Incorporate HRA, biometric screening</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Incorporate targeted approaches (high-risk)</td>
<td>Includes a high-risk ‘hot-spot’ approach.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Implement intensive and sustained programs</td>
<td>Not inconsistent. Piloting and phased implementation recommended in the first instance.</td>
<td>✔?</td>
<td></td>
</tr>
<tr>
<td>Ensure optimal use of ICT including social media and telephonic coaching</td>
<td>Focus includes digital workplace systems, online advisory and mobile field services and digital evaluation.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Develop and implement metrics to guide implementation &amp; ensure value for investment</td>
<td>Consistent with Roadmap; requires design, system testing and implementation support</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Ensure process (implementation) and outcome (results) evaluation</td>
<td>Essential to continue to build knowledge through continuous evaluation, especially of any innovative approaches. “SafeWork NSW’s decisions and actions will be driven by insights and evidence from data.”</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Provide incentives (incl. financial) to motivate participation for hard-to-engage workers &amp; for defined outcomes</td>
<td>Not inconsistent. Piloting and phased implementation recommended in the first instance.</td>
<td>✔?</td>
<td></td>
</tr>
<tr>
<td>Develop an integrated approach to programs Wellness/Productivity management/OH&amp;S/EAP/Disease management/TWH</td>
<td>“NSW workplaces will be managing health and safety effectively.” Functions could be managed by one lead agency spanning these integrated functions (SafeWork NSW)</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Program extension to include family and/or wider community</td>
<td>Not inconsistent. Piloting and phased implementation recommended in the first instance.</td>
<td>✔?</td>
<td></td>
</tr>
<tr>
<td>Align programs with overall corporate objectives</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Develop quality standards and compliance monitoring</td>
<td>SafeWork NSW will be recognised for working with business to design innovative regulatory approaches aimed at eliminating WHS risk and improve regulatory approaches.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Develop accreditation and auditing systems</td>
<td>Regulatory approach is an option; workplace charter or awards programs (UK and USA models available) represent another option, perhaps through Workplace Health Association Australia?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Figure 12 - Work Health and Safety Roadmap for NSW 2022 Strategy
Gaps in the evidence and research priorities

As explained in the glossary, ‘Moderate’ evidence indicates moderate confidence in the body of evidence and indicates that further research may change our confidence and the estimate; the accompanying narrative indicates whether the evidence is deemed ‘Sufficient’ to commence implementation with accompanying evaluation. In this review, we have developed a third generation Workplace Wellness model (on the next page). An obvious agenda for research is the elements of the model where the evidence is currently ‘sufficient’.

Many retrieved studies and reports attempt to identify gaps in evidence and to distil research priorities; in this section we identify the studies that in our view provide the best analysis and synthesis of these gaps/priorities.

The Research Compendium developed by National Institute for Occupational Safety and Health, (NIOSH) has done perhaps the most comprehensive analysis. Specifically, the NIOSH compendium contains a section devoted to this issue: Research Agenda: Gaps in Current Literature and Key Issues to be Addressed In Future Research.

Table 8 - Key directions for future research

<table>
<thead>
<tr>
<th>Social epidemiological research</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSH data by race/ethnicity and gender</td>
</tr>
<tr>
<td>Expanding our understanding of social contextual determinants of worker health outcomes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods development research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further specification of integrated interventions</td>
</tr>
<tr>
<td>Further development of measurement tools</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessing intervention efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of intervention efficacy for OSH and worksite health promotion outcomes</td>
</tr>
<tr>
<td>Assessment of the efficacy of diverse types of integrated OSH/WHP interventions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessing intervention effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of the efficacy of interventions for diverse groups of workers</td>
</tr>
<tr>
<td>Consideration of a range of research methodologies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention and implementation evaluation</td>
</tr>
<tr>
<td>Cost and related analyses</td>
</tr>
<tr>
<td>Assessment of worksite characteristics associated with participation</td>
</tr>
<tr>
<td>Process-to-outcome analyses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dissemination and durability research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research of the sustainability of organizational and behavioral changes</td>
</tr>
<tr>
<td>Research on the process of dissemination of tested interventions</td>
</tr>
</tbody>
</table>

Source: NIOSH, Research Compendium: The NIOSH Total Worker Health™ Program: Seminal Research Papers 2012 (p. 34).
Figure 13 - Third generation workplace wellness programs: key components and principles (Bellew 2017)

Other gaps and more specific research needs have been identified in a variety of studies, including regarding people with disabilities, productivity management, and ergonomic interventions. Finally, important development work has been done by Sorensen and colleagues in the domain of integrated approaches to health protection and health promotion (also known as Total Worker Health™). A large team of researchers have set out a proposed definition of integrated approaches to worker health,
accompanied by indicators and measures that may be used by researchers, employers, and workers (Table 9).

### Table 9 - Indicators and metrics for integrated approaches to workplace wellness

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Measures</th>
</tr>
</thead>
</table>
| **Organizational leadership and commitment** | • Top management expresses its commitment to a culture of health and an environment that supports employee health.  
• Both worker and worksite health are included as part of the organization’s mission.  
• Senior leadership allocates adequate human and fiscal resources to implement programs to promote and protect worker health. |
| **Coordination between health protection and health promotion** | • Decision making about policies, programs and practices related to worker health is coordinated across departments, including those responsible for occupational safety and health and those responsible for worksite wellness.  
• Processes are in place to coordinate and leverage interdepartmental budgets allocated toward both worksite wellness and occupational safety and health.  
• Efforts to promote and protect worker health include both policies about the work organization and environment and education and programs for individual workers. |
| **Supportive organizational policies and practices** | • Program managers responsible for worksite wellness and occupational safety and health are trained to coordinate and implement programs, practices and policies to target both worksite wellness and occupational safety and health.  
• Operations managers are trained to ensure employee health through coordination with and support for occupational safety and health and worksite wellness.  
• Job descriptions for staff responsible for worksite wellness and occupational safety and health include roles and responsibilities that require interdepartmental collaboration and coordination of worksite wellness and occupational safety and health programs, policies, and practices.  
• Performance metrics for those responsible for worksite wellness and occupational safety and health include success with interdepartmental collaboration and coordination of worksite wellness and occupational safety and health programs, policies, and practices.  
• Professional development strategies include training and setting goals at performance reviews related to interdepartmental collaboration and coordination of worksite wellness and occupational safety and health programs, policies, and practices.  
• Worksite wellness and occupational safety and health vendors have the experience and expertise to coordinate with and/or deliver approaches that support the coordination and collaboration of workplace health promotion and protection efforts. |
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Measures</th>
</tr>
</thead>
</table>
| Coordinated management and employee engagement strategies               | • Both managers and employees are engaged in decision-making about priorities for coordinated worksite wellness and occupational safety and health programs, policies, and practices.  
  • Joint worker-management committees addressing worker and worksite health reflect both worksite wellness and occupational safety and health. 
  • Workers are actively engaged in planning and implementing worksite wellness and occupational safety and health programs and policies.                                                                                                                                 |
| Benefits and incentives to support workplace health promotion and protection | • Incentives are offered to employees to complete activities to stay healthy (e.g. attend a training on health/safety), reduce high risk behaviours (e.g. quit smoking), and/or practice healthy lifestyles (e.g. gym membership discounts).  
  • Incentives are offered to managers who protect and promote health (e.g. accomplish health and safety in their departments and encourage reporting of hazards, illnesses, injuries and near misses; lead and encourage their employees in health promotion and protection efforts).  
  • Workplace benefits address health, safety, and well-being (e.g. health care coverage, flex-time, paid sick leave, screening and prevention coverage, wellness opportunities). |
| Integrated evaluation and surveillance                                   | • The effects of worksite wellness and occupational safety and health programs are monitored jointly.  
  • Data related to employee health outcomes are integrated within a coordinated system.  
  • High-level indicator reports (e.g., “dashboards”) on integrated programs are presented to upper level management on a regular basis, while protecting employee confidentiality. |
| Comprehensive program content                                            | • The content of educational programs such as classes, online courses or webinars, or toolbox talks, addresses potential additive or synergistic risks posed by exposures on the job and risk-related behaviours.  
  • The content of educational programs such as classes, online courses or webinars, or toolbox talks, acknowledges the impact of job experiences and the work environment on successful health behaviour change. |

Source: Sorensen et al. 2013

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References


44. Bellew B, St George, A., King, L. Workplace Screening Programs for Chronic Disease Prevention: An Evidence Check Brokered by the Sax Institute (http://www.saxinstitute.org.au/) for the Nsw Ministry of


94. World Health Organization. Five Keys to Healthy Workplaces 2010
doi:10.3390/soc7020012
Appendix 1 The Total Worker Health™ Concept

The defining elements of the TWH approach are described in the 2016 publication from US DHHS, CDC, and NIOSH: Fundamentals of Total Worker Health™ Approaches.83

- Demonstrate leadership commitment to worker safety and health at all levels of the organization
- Design work to eliminate or reduce safety and health hazards and promote worker well-being
- Promote and support worker engagement throughout program design and implementation
- Ensure confidentiality and privacy of workers
- Integrate relevant systems to advance worker well-being.

Summary table of key findings and strength of evidence for TWH interventions, from the 2016 systematic review by Feltner et al. is shown in Table 10 below.

Table 10 - Key findings and strength of evidence for Total Worker Health™

<table>
<thead>
<tr>
<th>Population (Reference)</th>
<th>Intervention and Comparator</th>
<th>Time Point, wk</th>
<th>Studies, n</th>
<th>Participants, n</th>
<th>Outcome and Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction (25) and manufacturing (22) workers</td>
<td>Integrated intervention vs no intervention</td>
<td>26-104</td>
<td>3</td>
<td>6056</td>
<td>Self-reported fruit and vegetable consumption, intervention vs. no intervention</td>
<td>Low for benefit</td>
</tr>
<tr>
<td></td>
<td>RCT (n = 3092) (26): mean change from baseline in number of workers consuming ≥5 servings of fruits and vegetables per day, 7.5% vs. 1.1%; P = 0.048</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RCT (n = 2366) rated as having high ROB (10): mean change from baseline in servings of fruits and vegetables per day, 0.22 vs. 0.09; P = 0.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedentary office workers (31, 32)</td>
<td>Integrated intervention vs any comparator</td>
<td>16-52</td>
<td>2</td>
<td>252</td>
<td>Sedentary activity at work, intervention vs comparator</td>
<td>Low for benefit</td>
</tr>
<tr>
<td></td>
<td>RCT (n = 412) (31): change in minutes spent sedentary per day (physical environment intervention vs control group), -57.0 (95% CI, -111.9 to 4.3); P = 0.051</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RCT (n = 60) (32): change in percentage of work time spent sedentary (integrated intervention) vs. OSH-only group), -0.4 (95% CI, -4.4 to 0.2); P = 0.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Feltner et al. 2016 45
Appendix 2 Our approach explained; Sentinel Review 2007-2017

Our overall approach explained
The process map of our methodology is discussed here, together with the results of the sentinel search. We provide a very rapid Sentinel Review to ascertain what systematic review (SR) evidence is available, the recency of analysis, and the adequacy of coverage across the specified research questions.

Assuming these are adequate, we then proceed with a more robust review using typical electronic databases (such as Medline, Pre Medline, Cochrane database of systematic reviews, PubMed and/or Scopus, NHS Economic Evaluation Database, Health Technology Assessment). Search terms used will be consistent with the US National Library Medical Subject Headings (MeSH®) Thesaurus (with modifications as required for specific databases). We also search for any high-quality studies (RCT, Quasi-experimental, Cohort) published later than the most recent Systematic Review. We conduct a supplementary search of the grey literature. For grey literature, searches were undertaken using selected key words within the advanced search functions of Google/Google Scholar; the search is limited to a maximum of the first 200 results, in keeping with recent guidance from Haddaway et al. (2015).¹⁸

If SR coverage is very limited and there is still a desire to explore individual studies, BBCA may not proceed unless the client wishes to review specifications and expected outputs. This is simply because of the labour-intensive nature of searching for and analysing individual studies which, in any event, would be unlikely to provide a robust evidentiary base in the absence of SRs.
**Sentinel review results**

The bibliometric graph below shows the results of a preliminary (‘sentinel’) search using PubMed for titles with Systematic or Review AND Workplace or Worksite. We found 189 reviews which were retrieved and noted that there was a trend towards a higher number of publications in the area in more recent years (29 already published by the mid-point of 2017). This analysis, albeit very preliminary and cursory, together with our detailed knowledge of the literature in this space, suggested that there would be more than enough SR evidence to answer the review questions.

![Figure 14 - Preliminary search results, PubMed](image-url)
Appendix 3 Search strategy

PRISMA flow diagram

Databases searched

Grey literature search terms (Google/Google Scholar)
Workplace, Worksites, Wellness, Health, Health Promotion, Case Studies, Best Practice, Systematic Review, Literature Review, Cost-effectiveness, Leadership, Systems, Policy, task design, flexible work, organisation culture, work process, healthy by design, safe by design.

Electronic database search terms

<table>
<thead>
<tr>
<th>Search Terms</th>
<th>Records retrieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. “Total worker health”</td>
<td>32</td>
</tr>
<tr>
<td>“Workplace”[Mesh] OR “worksite health”</td>
<td></td>
</tr>
<tr>
<td>3. (“Health Promotion”[Mesh]) OR “Accident Prevention”[Mesh] OR “Wounds</td>
<td>204,833</td>
</tr>
<tr>
<td>and Injuries/prevention and control”[Mesh]</td>
<td></td>
</tr>
<tr>
<td>4. (#2 AND #3)</td>
<td>6818</td>
</tr>
<tr>
<td>5. (#1 OR #4) Filters: Humans; English; Publication date from 2007/01/01</td>
<td>2675</td>
</tr>
<tr>
<td>6. #5 Filter “Review Articles”</td>
<td>262</td>
</tr>
<tr>
<td>7. (“Clinical Trial” [Publication Type] OR “Controlled Clinical Trial”</td>
<td></td>
</tr>
<tr>
<td>[Publication Type] OR “Randomized Controlled Trial” [Publication Type]) OR</td>
<td></td>
</tr>
<tr>
<td>8. (#7 and #5)</td>
<td></td>
</tr>
<tr>
<td>9. (#8 Filter: Publication date from 2015)</td>
<td>151</td>
</tr>
</tbody>
</table>

After the main search of systematic reviews/grey literature (yielded 262 studies), we established the most recent comprehensive systematic review as that undertaken by Feltner and colleagues with a temporal search filter of September 21, 2015.119 We ran an additional search using the same protocols, for any Randomized Trials and Longitudinal Studies published after 2015 and with the potential to enhance the review findings which yielded 151 records (25 were ultimately retained); see PRISMA diagram overleaf.

Supplementary searches

Additional searches of the peer review literature were undertaken using the following terms:

Leadership, Systems, Policy, task design, flexible work, organisation culture, work process, healthy by design, safe by design. (3366 records – Filtered to Reviews -> 462 before screening, 82 retained from initial screening by title;)

Additional grey literature searches were also undertaken (16 records after initial screening) (82+16=98)

After full screening, where necessary, of complete papers, the database category for the supplementary search had an extra 60 records.
Records identified through database searching for Systematic Reviews (n=262)

Records identified through sentinel search, grey literature, snowballing, other sources (n=233)

Records identified through database searching for recent RCT and Cohort Studies not included in retrieved Systematic Reviews (n=25 <screened from n=82>)

Records after duplicates removed (n=255 [230 +25]) *

Records screened (n=248)

Abstracts/ Full-text articles assessed for eligibility

Studies included in final qualitative synthesis (n=117)

Records excluded on basic criteria and redundancy (n=7)

Full-text articles excluded* (n=131)

*Full bibliography provided as appendix and (to SafeWork NSW) as database

*List of excluded studies provided
# Appendix 4 Case studies and useful links

Many organisations around the world capture and document good practices in employee health and wellness, work-life balance, supportive company cultures, and related topics. Many of these also provide case studies, with details on effective approaches and policies as well as award schemes operating in several countries. Below is a sample of some of the major case study resources, as well as links to sites where you can find more information and ideas.

### Global


Great Place to Work® Institute: [http://www.greatplacetowork.net/](http://www.greatplacetowork.net/)

World Economic Forum, Workplace Wellness Alliance Case Studies: [http://www.weforum.org/content/pages/case-studies](http://www.weforum.org/content/pages/case-studies)

Society for Human Resource Management (SHRM) – Case Studies: [https://www.shrm.org/resourcesandtools/hr-topics/benefits/pages/wellnessrc-case-studies.aspx](https://www.shrm.org/resourcesandtools/hr-topics/benefits/pages/wellnessrc-case-studies.aspx)

### Australia


ComCare [Home Page](http://www.comcare.gov.au/)

Returns on investment: [https://www.comcare.gov.au/_data/assets/pdf_file/0006/99303/Benefits_to_business_the_evidence_for_investing_in_worker_health_and_wellbeing_PDF_89.4_KB.pdf](https://www.comcare.gov.au/_data/assets/pdf_file/0006/99303/Benefits_to_business_the_evidence_for_investing_in_worker_health_and_wellbeing_PDF_89.4_KB.pdf)


### Canada

<table>
<thead>
<tr>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Agency for Safety and Health at Work</td>
</tr>
<tr>
<td>India</td>
</tr>
<tr>
<td>South Africa</td>
</tr>
<tr>
<td>Discovery, Healthy Company Index: <a href="http://www.healthycompanyindex.co.za/">http://www.healthycompanyindex.co.za/</a></td>
</tr>
<tr>
<td>United Kingdom</td>
</tr>
<tr>
<td>RSA, Fairplace Award: <a href="http://www.fairplaceaward.com/">http://www.fairplaceaward.com/</a></td>
</tr>
<tr>
<td>VitalityHealth/Mercer/The Sunday Telegraph, Britain’s Healthiest Company: <a href="https://www.britainshealthiestcompany.co.uk/">https://www.britainshealthiestcompany.co.uk/</a></td>
</tr>
<tr>
<td>United States</td>
</tr>
<tr>
<td>Wellness Council of America</td>
</tr>
<tr>
<td>Case Studies: <a href="https://www.welcoa.org/resourcecategory/case-studies/">https://www.welcoa.org/resourcecategory/case-studies/</a></td>
</tr>
<tr>
<td>Well Workplace Awards: <a href="https://www.welcoa.org/services/recognize/well-workplace-awards/">https://www.welcoa.org/services/recognize/well-workplace-awards/</a></td>
</tr>
<tr>
<td>American College of Occupational and Environmental Medicine, Corporate Health Achievement Award: <a href="http://www.chaa.org/">http://www.chaa.org/</a></td>
</tr>
<tr>
<td>American Psychological Association, Psychologically Healthy Workplace Awards: <a href="https://www.apaexcellence.org/awards/">https://www.apaexcellence.org/awards/</a></td>
</tr>
<tr>
<td>National Business Group on Health, Best Employers for Healthy Lifestyles Awards: <a href="https://www.businessgrouphealth.org/bestemployers/">https://www.businessgrouphealth.org/bestemployers/</a></td>
</tr>
</tbody>
</table>
Appendix 5 Gaps in evidence and research priorities

Long-term impact of programs
Given the long latency between health risks and development of manifest chronic diseases, a much longer follow-up period will be required to fully capture the effect of worksite wellness programs on health outcomes and cost.

Design of programs
Research is needed on program design features that are most likely to achieve wellness goals. Smoking cessation is an area where additional research could inform program development. A more granular look at different program components would provide valuable insights into the determinants of program success. For example, such analyses could compare the differential effects of modalities for program delivery (e.g., telephone, Internet, and in-person). Research into the relative impact of individual-level and workforce-level interventions could help to increase program efficiency.

Impact on a broad range of measures
Future studies should look at a broader range of outcomes, in particular work-related outcomes and health-related quality of life. Work-related outcomes, such as absenteeism, productivity, and retention, are of critical importance to employers as they directly affect business performance.

Contextual factors that modify program impact
Contextual factors will influence the effectiveness and cost-effectiveness of workplace wellness interventions. Employer characteristics, such as workplace culture and leadership support, might modify the effect of wellness programs. Understanding the role of such modifying factors should be considered for future research. Similarly, we need to understand better how employee demographic characteristics drive decisions about program uptake and how those factors interact with financial incentives.

Effect of financial incentives
“High-powered” incentives that tie a substantial proportion of the cost of coverage to specific health standards remain rare. Thus, comprehensive evaluation of the intended and unintended effects of such incentives and different incentive amounts may require a prospective or even experimental study. In addition, there is limited information on the differential impact of different incentive types (e.g., whether rewards have a different effect from penalties and whether premium reductions have a different effect from cash payments) and of changes in incentives over time.

Employer Health and Productivity RoadMap
Evidence on the contribution of wellness programs to productivity is patchy. The TWH model has been used to develop the Employer Health and Productivity RoadMap comprising six interrelated and integrated core elements (see Chapter 6 – evidence of effectiveness). Further research here is needed.
Effectiveness of extension programs

Workplace wellness/ TWH programs may be extended to the family and/or the wider community. Understanding the effectiveness of these extension programs will be important, together with the research agenda outlined above, in developing the fourth generation of programs – ‘workplace wellness 4.0’.

Adapted from Mattke et al (2013) and enhanced.
# Appendix 6 Tabulation of selected key papers

## Table 11 - Selected studies which made important contributions to the analysis and policy options

<table>
<thead>
<tr>
<th>Source</th>
<th>Country (Population)</th>
<th>Purpose of research</th>
<th>Key findings</th>
<th>Policy relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feltner et al.¹¹⁹</td>
<td>USA Global review</td>
<td>Detailed evidence review and report; can use to inform a workshop on TWH.</td>
<td>The body of evidence was small and diverse in terms of populations, interventions, and measured outcomes. TWH interventions were effective in improving intermediate outcomes traditionally measured in health promotion programs (smoking cessation and fruit and vegetable consumption) and reducing sedentary work behaviour.</td>
<td>High quality global evidence review is relevant for the Australian context. Usual caveats apply about generalisability of specific programs from USA to other countries. Broad scientific findings hold true.</td>
</tr>
<tr>
<td>Lee et al.⁵³</td>
<td>USA</td>
<td>Implementation focussed research compilation. Reflects the evolution and progression of TWH concept into an evidence-based implementation workbook.</td>
<td>NIOSH Total Worker Health™ (TWH) program was established in 2011. Sets out (stepwise) essential elements to implement TWH, which is defined as “policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness—prevention efforts to advance worker well-being”</td>
<td>Essential elements and process steps likely translate to Australian context where several programs are already in existence (e.g. Get Healthy at Work). Integration of workplace safety and wellness concepts may require development work at organisational and govt agency levels.</td>
</tr>
<tr>
<td>National Institute for Occupational Safety and Health (NIOSH)⁸</td>
<td>USA</td>
<td>Implementation focussed research synthesis. Describes organizational practices that can reduce the risks associated with sedentary work.</td>
<td>Prolonged sitting is associated with back and shoulder pain, premature mortality, diabetes, chronic diseases, metabolic syndrome, and obesity. These risks may persist even if a worker engages in recommended levels of physical activity during free time. Obesity associated with occupational injury and decreased productivity at work. It may also be a co-risk factor for occupational asthma and can affect a worker’s response to chemical exposures</td>
<td>Total Worker Health™: Integrated Approach recommended; sets out Recommendations for Incorporating Total Worker Health™ into workplace programs. Sets out specific recommendations for incorporation of movement into workday. Translates readily to Australian context where several organizations are early adopters.</td>
</tr>
<tr>
<td>Source</td>
<td>Country (Population)</td>
<td>Purpose of research</td>
<td>Key findings</td>
<td>Policy relevance</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Dellve, L. Eriksson A. 97</td>
<td>Sweden Global review plus country specific research</td>
<td>Theoretical framework, (theoretical underpinnings and pedagogical principles) for leadership programs that support managers’ evidence-based knowledge of health-promoting psychosocial work conditions, as well as their capability to apply, adapt and craft sustainable managerial work practices</td>
<td>The complexity of interactions among different factors in a work system, and the variety in possible implementation approaches, presents challenges for the capability of managers to craft sustainable and health-promoting conditions, as well as the evaluation of the program components. The evaluation reveals the strength of the program, in providing holistic and context-sensitive approaches to how to train and apply an integrative approach for improving the work environment.</td>
<td>Provides outstanding analysis from a systems perspective. Theoretical framework provides a useful reference point. Would require testing and development for relevance and transferability to Australia/NSW.</td>
</tr>
<tr>
<td>Feltner et al. 45</td>
<td>USA Global review</td>
<td>Systematic review. To evaluate evidence on the benefits and harms of integrated TWH interventions.</td>
<td>Integrated TWH interventions might improve health behaviours (for example, reduce tobacco use and sedentary behaviour and improve diet) of workers, but effects of these interventions on injuries and overall quality of life are not known.</td>
<td>High quality global evidence review is relevant for the Australian context</td>
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<tr>
<td>National Institute for Health and Care Excellence (NICE) 95</td>
<td>UK Global review</td>
<td>Evidence review and guideline; covers how to improve the health and wellbeing of employees; focus on organisational culture and the role of line manager</td>
<td>Detailed, evidence-based recommendations are provided across eleven categories</td>
<td>High quality global evidence review is relevant for the Australian context</td>
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<td>Rojatz, D. Merchant, A and Nitsch, M 86</td>
<td>Austria Global review</td>
<td>Qualitative systematic review to identify factors influencing 4 phases of Workplace Wellness interventions: (i) needs assessment (ii) planning (iii) implementation (iv) evaluation.</td>
<td>Factors at different levels have to be considered; factors at different levels do not affect every phase of intervention. External conditions surrounding the intervention are important; not only must different levels of the intervention but also different phases of the intervention need to be considered. This can lead to better research and to more effective program design.</td>
<td>Important implications are (a) the importance of context and (b) the important of looking at which of phases (i) –(iv) is under consideration and at what level. Global review, with relevance for the Australian context in terms of program design, testing and development.</td>
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<td>Source</td>
<td>Country (Population)</td>
<td>Purpose of research</td>
<td>Key findings</td>
<td>Policy relevance</td>
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<td>National Institute for Occupational Safety (NIOSH)</td>
<td>USA</td>
<td>Implementation focussed research synthesis. Describes organizational practices that can enhance workplace tobacco use prevention and control.</td>
<td>Worksite health promotion programs designed to improve worker health, such as those that help workers stop or reduce tobacco use, have traditionally focused on individual factors and not taken work-related exposures and hazards into account. Through its Total Worker Health™ Program, the National Institute for Occupational Safety and Health (NIOSH) recommends an integrated approach to addressing personal as well as workplace safety and health factors.</td>
<td>Total Worker Health™: Integrated Approach recommended; sets out Recommendations for Incorporating Total Worker Health™ into workplace programs. Sets out specific recommendations for incorporation of tobacco control into workday. Translates readily to Australian context where several organizations are early adopters. Tobacco control interventions are effective independent of workplace context and are advanced in Australia. Supporting cessation is recommended.</td>
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<td>Anger et al.</td>
<td>USA</td>
<td>Systematic Review of TWH evidence: (a) occupational safety and/or health (OSH, or health protection) and wellness and/or well-being (health promotion, or HP) in the same intervention study, and (b) reporting both OSH and HP outcomes</td>
<td>TWH interventions that address both injuries and chronic diseases may improve workforce health effectively and more rapidly than the alternative of separately employing more narrowly focused programs to change the same outcomes in serial fashion (based on 17 studies that met inclusion criteria).</td>
<td>17 articles retrieved in the review provide examples of how TWH interventions can be structured. The potential for simultaneous improvements in safety, health, and well-being warrants TWH research to identify and disseminate best practices. This research agenda is relevant for the Australian context.</td>
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| Parker, S. and Griffin, M. (for ComCare) | Australia | Commissioned review designed to inform best practice in the workplace through effective design and process | • Identifies principles and actions to support the design of good work  
• Provides evidence for these principles and actions  
• Covers the ‘how’ of work design  
• Reviews the key approaches to redesigning work and to enhancing work health and safety more generally  
• Reviews the key principles or ‘lessons-learned’ within each approach. | Authoritative review and framework, specifically developed for the Australian context. Highly relevant |
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<td>Institute of Medicine</td>
<td>USA</td>
<td>Peer-reviewed workshop report on TWH, best practices in the integration of occupational health and safety and health promotion in the workplace</td>
<td>The report identifies prevalent and best practices in programs that integrate occupational safety and health protection with health promotion in small, medium, and large workplaces; employer and employee associations; academia; government agencies; and other stakeholder groups.</td>
<td>The workshop and report represents an example of process more than content (many other evidence reviews provide ‘content’). A similar key stakeholder engagement process would be a likely step in efforts to embrace a TWH approach in NSW or Australia more broadly.</td>
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<tr>
<td>National Institute for Occupational Safety and Health (NIOSH)</td>
<td>USA</td>
<td>Updated versions of 3 specifically commissioned research papers.</td>
<td>Establishes a scientific rationale for integrating health promotion and health protection programs to prevent worker injury and illness and to advance health and well-being.</td>
<td>Scientific rationale likely acceptable to Australian given the global nature of the evidence base. However, consultation and consensus building may be pre-requisites for progress.</td>
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Appendix 7 Overview of full database by selected categories

Note: references used in this appendix do not correspond to those in the main body of this report.

This appendix provides the full list of studies retained in the database after screening for relevance, redundancy and/or duplication. These were further screened and prioritised so that not all listed studies were cited in the final synthesis but are provided here for completeness. Studies may feature in more than one category.

Absenteeism/ Return to work strategies
The search yielded 15 systematic or other reviews dealing with absenteeism and/or return to work strategies and programs.1-15

Alcohol
Three of the retrieved studies address alcohol focussed strategies within the workplace.16-18

Cost-effectiveness
Eighteen studies addressing cost-effectiveness, returns on investment, and/or savings were retained after screening.19-36

Implementation
This category focussed on design recommendations, best practice principles and/or insights into program implementation; 26 studies addressing implementation issues/guidelines were retained.13, 21, 23, 32, 37-58

Injury and Safety
For studies addressing injury (including violence-related injury) and safety issues, 32 studies were retained.4, 34, 59-82

Mental Health
This category covered mental health, mental illness, depression and stress; 34 studies were retained.4, 28, 58, 60, 68, 83-101

Musculoskeletal issues
This category included musculoskeletal impacts (especially lower back), ergonomics, and posture; 19 studies were retained.1, 80, 102-118

Nutrition and healthy eating
After initial screening, 10 studies were retained.27, 29, 31, 119-125

Organisational factors
This category included overall systems and practices, work design, task design managing reorganisation and distinguishing organisational factors applicable to smaller businesses; 29 studies were retained.47, 54, 99, 114, 115, 126-149
Physical activity
This category included physical activity, fitness, sport and sedentary behaviour (sitting) focussed programs and interventions; 39 studies were retained.\textsuperscript{27, 29, 44, 50, 102, 121, 124, 150-180.}

Productivity
Nine studies were retained in this category.\textsuperscript{10, 21, 31, 33, 159, 181-184.}

Sleep
This category included studies dealing with the relationship between sleep, shift work, and employee performance, including safety. This area of research is emergent but likely will acquire greater significance in the future; 11 studies were retained.\textsuperscript{16, 70, 89, 140, 144, 185-190.}

Generic/overview
This category included studies and reports which were deemed strategically important to inform the review, regardless of study design. It included global and national surveillance of workplace wellness programs as well as importance individual reports of particular relevance for Australia; 31 studies were included.\textsuperscript{19, 21, 23, 35, 39, 43, 53, 191-214.}

Tobacco
This category included environmental tobacco smoke (ETS) as well as tobacco related programs; Four studies were retained.\textsuperscript{215-218}

Total Worker Health\textsuperscript{TM}
This category addressed studies focussing on the Total Worker Health\textsuperscript{TM} model. The Total Worker Health\textsuperscript{TM} (TWH) program was established in 2011, setting out (stepwise) essential elements to implement TWH, defined as “policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness–prevention efforts to advance worker well-being”.\textsuperscript{1219} 15 studies were retained.\textsuperscript{26, 33, 48, 89, 107, 136, 150, 183, 210, 215, 219-223.

Obesity
This category included prevention of overweight and obesity, promotion of healthy weight and strategies to address diabetes/ metabolic disorders; 11 studies were retained.\textsuperscript{173, 179, 224-232.}

Women
Studies which focussed on or were relevant to female gender were identified; nine studies were retained.\textsuperscript{85, 151, 163, 188, 233-237.}

Recent randomized trials and longitudinal studies
This category included any recently published high quality studies (RCT, Quasi-experimental, Cohort) not already covered by the retained systematic reviews; 12 studies were retained after screening.\textsuperscript{186, 238-248.}
References for Appendix 7 only


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