Authors' objectives
To evaluate the relationship between drug-testing programmes and changes in workplace injury occurrence.

Searching
Studies were sought from peer-reviewed journals, technical and government reports, and unpublished documents. The following sources were searched: MEDLINE, EMBASE, NIOSHTIC, TRIS, ABI/Inform, Criminal Justice Periodicals Index, ERIC, PsycINFO, Sociofile, AGRIS International, AGRICOLA, NTIS, PAIS, BooksInPrint, Dissertation Abstracts, and Expanded Academic ASAP. References from the relevant studies were examined and experts in the field were contacted for additional material. Full details of the search procedure were reported elsewhere (see Other Publications of Related Interest).

Study selection
Study designs of evaluations included in the review
The inclusion criteria were not defined in terms of the study design. All of the included designs were pre-test post-test comparisons using ecological databases.

Specific interventions included in the review
Drug-testing corporate programmes, other than pre-employment testing as the sole intervention, were eligible for inclusion. The drug-testing programmes included were based on the following: pre-employment screening; reasonable suspicion; involvement in an accident, including regardless of cause and where drug-abuse was a probable cause; and non-random and random testing.

Participants included in the review
Worksites were eligible. The included worksites were of the following types: railroad; power and light; building contractors; businesses paying state worker compensation premiums; and vehicular operators.

Outcomes assessed in the review
Studies that assessed workplace injury or accident outcomes were eligible for inclusion. The individual studies assessed the following outcomes: changes in injury rates; train accidents; vehicle accidents; medical and first aid injuries; recordable occupational injuries and illnesses; passenger injuries; prevalence rates of drug use; and drug-testing failure rates.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
Some aspects of validity, such as study design and potential sources of bias, were discussed in the text but no formal validity assessment was undertaken.

Data extraction
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

The following information were tabulated: the author and year of study; study population, period and design; the nature
of the testing programme; the outcomes assessed and analysis; and findings. Further details were provided in the text of the review. Where possible, the prevented fraction (PF) of the outcome following the instigation of the drug-testing programme was calculated.

**Methods of synthesis**

How were the studies combined?
A narrative synthesis was undertaken.

How were differences between studies investigated?
Differences between the studies were discussed in the text of the review. The few identified reports were often located in publications with limited access. In addition, they were often not subject to peer-review, and were mostly located in professional publications infrequently connected with occupational health and safety.

**Results of the review**

Six pre-test post-test studies (five primary studies and one secondary study) based on ecological data were included.

The methodological deficiencies of the studies included: studies were based on ecological databases with group testing and group rate outcomes; the use of a pre-test post-test design that is subject to numerous potential sources of bias; three reports did not provide actual numbers; only one report analysed results in a statistically rigorous manner; and the potential for selection bias. The results from individual studies comparing the outcomes before and after the institution of drug-testing programmes were as follows. Railroad company (1 study): train accidents attributable to human failure declined from 22.2 (pre-test) to 2.2 (post-test) per million miles. The PF was approximately 90%. Power and light company (1 study): the average number of accidents per month decreased from 5.1 (pre-test) to 4.4 (post-test). The total number of days lost to medical injuries increased and the only reason suggested was a change in record keeping. Building companies (1 study where data were obtained for 31 of the 1,144 companies contacted): there was a non statistically-significant decline in recordable occupational injuries and illnesses per 200,000 person hours per year. The results from individual companies varied: 21 companies reported a decline, 1 company reported no change, and 9 companies reported increases from pre- to post-testing. Business (1 study that contacted all businesses in Wisconsin, and used 12 companies that had various testing programmes for the evaluation): post-accident drug-testing contributed to a significant reduction of the rate of recordable occupational injuries and illnesses. Random versus non-random testing in consecutive time periods.

Transportation company (1 study involving 16,000 employees): the accident rate per million miles decreased from 1.9% (random testing) to 1.5% (non-random testing); this difference was not statistically significant. In addition, the passenger injury rates decreased from 5.2% (random testing) to 3.9% (non-random testing); this difference was marginally significant (p=0.045). Change in positive screening results (1 study compared non-random with random testing): there was a reduction in positive test rates from 3% in the non-random testing period to less than 1% in the random testing period.

**Authors' conclusions**

Despite the extensive use of and management support for worksite-based drug testing, the current evidence on random or for-cause workplace drug-testing is insufficient and limited. Better studies and careful reassessment of this issue appears warranted.

**CRD commentary**

The aims were stated and the inclusion criteria were defined in terms of the intervention and outcome. Many relevant sources were searched and attempts were made to locate unpublished material. No details of the keywords used or the dates searched were reported in the text of the review. In addition, the methods used to select the studies were not described. Relevant information on the included studies was tabulated or described in the text, and several aspects of study validity were discussed. The methods used to extract the data and assess validity were not reported. Given the small number of studies and differences between the studies, a narrative synthesis was reported. Attention was drawn to
the limited evidence provided by the identified studies.

The evidence presented supports the author's conclusions.

**Implications of the review for practice and research**

Practice: The author states that the current evidence on random or for-cause workplace drug-testing is insufficient and limited.

Research: The author states that better studies, which go beyond the ecological designs employed to date, are required.

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**Other publications of related interest**


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**Record Status**

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.