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Aims and Scope

The Journal of Environmental Health Research is a peer reviewed journal published in three formats; Printed Full Journal, Printed Abstracts and Electronic Journal.

The Journal publishes original research papers, review articles, technical notes and professional evaluations covering the diverse range of topics which impinge on environmental health including; occupational health and safety, environmental protection, health promotion, housing and health, public health and epidemiology, environmental health education, food safety, environmental health management and policy, environmental health law and practice, sustainability and methodological issues arising from the design and conduct of studies.

The Journal provides a communications link between the diverse research communities, practitioners and managers in the field of environmental health and aims to promote research and knowledge awareness of practice-based issues and to highlight the importance of continuing research in environmental health issues.

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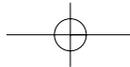
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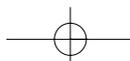
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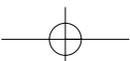
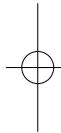
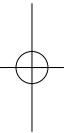
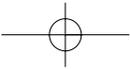
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Editors: Harold Harvey (left) and Paul Fleming

Editorial

The publication of the third issue of the Journal of Environmental Health Research has more than ever convinced the editorial team of the need for capacity building in the reporting of environmental health research. We have undertaken an extensive call for papers and have found that while much good work is being undertaken, relatively little of it is being disseminated at present. This brings into sharp relief a number of issues.

We need to ask why reporting of research is not a priority. In many cases, research is undertaken to pass an academic qualification. The immediacy and relief of finishing the project can lessen the enthusiasm to share findings with the wider professional world. Often those who undertake needs assessments and evaluations as part of their professional role are not given time to disseminate often interesting and important findings. In the academic world, the pressures of teaching and administration can militate against publication.

No matter what the inhibiting factors, we are losing the opportunity to enrich the environmental health profession as a whole and strengthen the evidence base from which we work. Therefore, to assist the large numbers of people who are undertaking research, but who are relatively new to the world of academic and professional publication, we have included a paper in this issue entitled 'Writing for JEHR and other peer reviewed journals'. The aim of this paper is to contribute to the capacity building process which seeks to reinforce the evidence-based practice approach to professional activity which we hope will yield a crop of interesting and informative publications.

The substantive academic papers, which encouragingly have been written by both academics and field-based practitioners, cover an eclectic range of issues from food safety, home maintenance and waste management to health and safety systems in small business. These display a range of research designs and strategies from biochemical environmental monitoring to desk-based research into policy. This range of strategies also contributes to the capacity building agenda in that they demonstrate the wide range of endeavour which bears reporting.

The inclusion of the progress reports on CIEH supported research reminds us of the important contribution being made by the Institute to capacity building through research funding. It is one of the functions of this journal to help practitioners to build up a publishing record which will assist them in the often difficult task of obtaining research funding.

We hope that this and subsequent issues of the Journal will play a part in developing the research culture in environmental health.

Paul Fleming and Harold Harvey

Performance assessment in local authority food safety services.

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Abstract:

Performance assessment has traditionally been a management tool used by private sector businesses to assess their quality, efficiency and effectiveness based on a range of different input and output indicators. Such approaches are being integrated into public services to allow an assessment of the quality of service to be made.

This paper critically examines assessment measures currently in place to evaluate local authority food safety services in England and Wales: 'Best Value', Audit Commission, the Communicable Disease Surveillance Centre (CDSC) data and the Food Standards Agency monitoring data. It concludes that these are biased towards the use of 'efficiency' indicators and that measurement of 'effectiveness' and 'quality' of services is limited.

The use of alternative criteria are examined, including food poisoning data collected by the CDSC and food safety inspection rating scheme data that is collected by all local authorities. Current food poisoning statistics allow the identification of unusually high or low numbers of cases within particular regions of England and Wales. However, there are difficulties in tracing the source of food poisoning cases, as well as issues relating to over/under reporting within different areas of the country. Thus, while such statistics offer an important indicator of general food poisoning activity within the nine general regions of the country, they are of limited use in identifying the effectiveness of specific local authority services in improving standards of food hygiene within food businesses.

Extending the Food Standards Agency's existing use of food hygiene inspection rating scheme (outlined in Code of Practice 9) could enable evaluation of service effectiveness. Data for individual food premises could be analysed to identify their compliance levels, both over time, and with premises in other local authority districts. If analysed in

conjunction with details of enforcement and educational initiatives, it would allow local authorities to assess the performance of their strategies by their effect on inspection rating scores. The shortcomings in the use of such data are acknowledged:

The difficulties in applying a quantitative rating scheme in the assessment of risk within a food business;

The difficulties in accessing inspection rating scheme data within local authorities; and

The difficulties in interpreting statistical analyses of inspection rating data.

In addition, extending the use of performance indicators based on the inspection rating scheme may not be possible until the current review of the statutory guidance is completed. If the inspection rating scheme is altered, it may be several years before local authorities are able to analyse the true effectiveness of their service. At this time, inspection rating scheme data may offer a true assessment of service quality to be made.

Key words: Best Value; Effectiveness, Food safety; Inspection rating scheme; Performance Indicators

Introduction

The increasing pressure to assess the performance of public sector services by the government has also raised awareness amongst professionals of the need to select measures that can accurately evaluate the service being provided (Eccles, 1994). Types of theoretical indicators available for evaluation, and the ways that these can assess service quality, efficiency and effectiveness are examined.

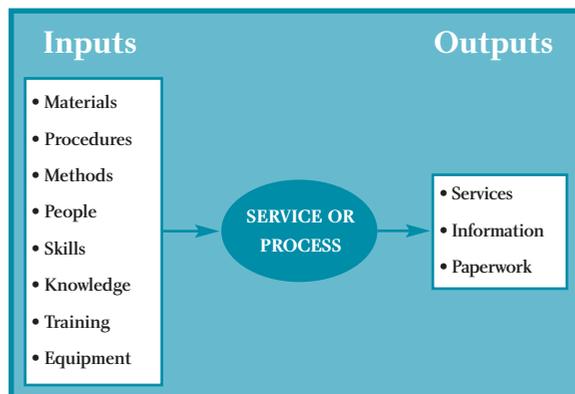
General assessment criteria used in local government include 'Best Value' (BV) indicators and Audit Commission Performance Indicators (ACPIs). These criteria are discussed in terms of their applicability to local authority food safety services and in relation

to performance assessments of such services. The weaknesses of these criteria are acknowledged and alternative, more specific, performance measurement tools are then critically examined. This includes the Food Standards Agency (FSA) monitoring data concerning the activity of food safety services and the Communicable Disease Surveillance Centre (CDSC) information relating to the incidence of food poisoning cases by age and by region in England and Wales.

Performance assessment

Performance assessment has traditionally been undertaken by private sector companies, originally relying upon financial measures to assess performance. The emphasis then shifted to include consideration of other factors, for example innovation, customer satisfaction and market share. This new approach meant that such criteria could also be applied to public services (previous financial indicators were of no use to either 'not-for-profit' services, or those with no direct competition) (Oakland, 1994).

This newly identified range of factors that can assess the performance of a business or service can be divided into two broad types: input and output measurements. The following diagram illustrates the types of factors that can be considered for a public sector service (adapted from Oakland, 1994, p.14):



Applying this concept to a food safety service, inputs could include the numbers of Environmental Health Practitioners and support staff employed by the local authority; details of staff training; and the availability of documented guidance within that service (including both nationally published material - Codes of Practice and Industry Guides, as well as the service's enforcement policy and specific procedure notes). Service outputs could include details of the numbers of inspections undertaken, and the amount of enforcement and educational activity undertaken by the authority.

Input and output indicators are required to measure the objectives of a service in terms of:

Effectiveness (How well does the service meet its stated objective?):

• **Input Objectives = Outputs Obtained**

Efficiency (How well does the service use its resources in order to meet its objectives?):

• **Unit Input Cost vs. Unit Output Cost**

Quality (Does the service meet its customer's requirements?):

• **Input Objectives + Output Factors = Customer Satisfaction**

Performance measurement therefore requires information about both input and output indicators. For example, an input indicator could show who provides a service and how it **should** be provided, but, in order to assess whether this is efficiently provided, an output indicator is required to show whether that service **is** being provided. The effectiveness of such a service involves the examination of the effect of the service on the recipients (an output indicator). As noted by Tomkins (1987) the outcome measured is closely related to effectiveness and the quality of the service involves identification of the service's customers requirements. In order to fully assess whether a service offers true quality, the service will need to be both efficient and effective.

It is important to note that these three factors are distinct from each other. For example, a service may use its resources **efficiently** but offer an **ineffective** service. The measures chosen and the way that they are assessed will therefore be critical in determining how a service performs in any subsequent evaluation. This difficulty in choosing the 'right' factor is compounded by the problems in assessing outputs in public services. These include deciding what the objectives and outputs of a service should be; measuring such outputs; and interpreting the outputs and output measures (Smith, 1994).

This final difficulty of interpreting outputs and output measures presents a fundamental problem in comparing local authority services across the UK. If two authorities have a differing standard of service objectives, which is the 'better' service? Is it the service with a lower standard of objectives that are more easily attainable, or the one that has a higher standard of objectives that are harder to achieve? It is important at this stage to differentiate between an output and an outcome. The output of an activity has no reference to its broader social impact (for example the numbers of food hygiene inspections undertaken). In contrast, an outcome does require some appreciation of "the impact on society of a

particular public sector activity" (Smith, 1996, p.1). Therefore, in an assessment of effectiveness, a satisfactory measure of outcome is necessary.

One of the core objectives of the FSA is to reduce the incidence of food borne illness by 20% by 2006. They aim to do this by improving food safety throughout the food chain and by improving the enforcement of food law (FSA, 2001a). It follows, therefore, that a fundamental aim for a food safety service in dealing with food businesses will be to minimise the risk posed to the public by those businesses. Analysis of service effectiveness will therefore be required to examine how well this is being achieved. Simply assessing the number of inspections undertaken will not identify whether this objective is being achieved. The indicators for performance assessment of food safety services that are presently used are contained within the BV framework, ACPIs and FSA monitoring data.

General Performance Indicators

Best Value

The BV framework was introduced in 1999 by the Local Authority Act ("the Act"). This was one of the responses that the government introduced as part of its 'modernising government' agenda (DETR, 1998). The Act requires local authorities to assess their own service's performance (Section 5) and secure continuous improvements in their services (Section 3). The way in which local authorities undertake this BV process is firstly by having to publish a 'Best Value Performance Plan' identifying their own assessment of its performance against targets. Secondly, local authorities are required to undertake a 'Best Value Review'. This has to fulfil the following requirements:

- "challenging why and how the service is provided;
- comparing the performance with others (including non-local government providers);
- competing – the authority must show that it has embraced the principles of fair competition in deciding who should deliver the service; and
- consulting local service users and residents on their expectations about the service"

(www.audit-commission.gov.uk).

To assist authorities in doing this, a statutory performance management framework has been developed by the Government. This framework sets indicators and standards, which are known as BV performance indicators (BVPs), and against which local authorities can publish data.

For Environmental Health and Trading Standards Services, the BV indicator is known as 'BV 166'. It acts,

however, as a 'checklist' rather than as a standard to be achieved. It was decided that a checklist was more appropriate for these services due to the difficulties in identifying appropriate measures for this type of service (www.local-regions.odpm.gov.uk/bestvalue/indicators). The BV 166 "checklist" is therefore a temporary measure whilst specific performance indicators are developed. The current system in place (for 2002/2003) requires local authorities to score against a checklist of enforcement. There are five main areas for consideration, and ten points in total can be awarded to the service. The five categories are: Written enforcement policies, planned enforcement activity, reactive and responsive enforcement activity, appropriate resources and consultations and satisfaction levels (ODPM, 2002).

Local authorities are given points for implementing and monitoring their enforcement policies; undertaking inspections in line with legal requirements; benchmarking with other local authorities in terms of resources for services. These are **efficiency** issues as they examine the use of resources in meeting objectives. The assessment of the **quality** of the service is partially met by consultation and satisfaction levels in its requirement to consult with customers ('stakeholders'). However, this scored checklist approach is limited as local authorities are given points for undertaking these activities, but there is no requirement to assess the actual content of policies and strategies. This limitation restricts BV 166 in its ability to assess the quality of the service.

There are no specific requirements to assess the **effectiveness** of initiatives or inspection programmes, as the requirement is that food hygiene inspections are made in line with statutory guidance (Code of Practice 9) and that targeted educational and information programmes are undertaken (FSA, 2000). The 'challenge' part of a BV review will examine staffing resources and the financial cost of the service provision. Educational initiatives should consider the cost of the initiative compared with the numbers of people directly accessing and benefiting from it (for example, food hygiene courses). Some local authorities may undertake limited localised assessments of the effect of initiatives on businesses, but these are likely to be on an *ad hoc* basis, rather than in a rigorously programmed manner.

Audit Commission

The BV approach supplements that of the Audit Commission who have been specifying and collecting performance indicators (ACPIs) for local authorities since 1993/94. This followed their report in 1991 which stated that "*there is still too much concentration in the public sector on inputs and outputs (let alone outcomes), and the Commission has had only modest success in altering that*" (Audit Commission,

1991, para.73). However, whilst acknowledging previous limitations in measuring the performance of public services, in 2000/2001 only one ACPI specifically related to food safety, and was concerned with the efficiency (input objective vs. output achieved) of the service:

"The percentage of food premises inspections that should have been carried out that were carried out for:
a. High-risk premises.
b. Other premises." (DETR, 1999, p.83).

Much research has been undertaken to examine the general BV and Audit Commission Performance Indicators that have been developed for public sector services. It is generally acknowledged that whilst current indicators have improved, there are still validity and comparability weaknesses in their use in assessing quality and effectiveness (Midwinter, 1994; Boyne, 1996, 2002; Alford & Baird, 1997; and Sanderson, 2001).

Specific Performance Indicators

Food Standards Agency

The concept of a central body able to develop a coherent food enforcement policy was introduced in the Government's White Paper "Food Standards Agency – A Force for Change" (DETR, 1997). The FSA itself was formally established by the Food Standards Act 1999, and officially launched in 2000. The FSA is involved in developing national food enforcement priorities and objectives and, amongst other issues, has been given specific powers to monitor and audit the performance of enforcement authorities (FSA, 2002c, p.3).

In order to monitor and audit the performance of local authorities within the UK, the FSA requires local authorities to complete and submit detailed monitoring forms to them each year. This allows the performance of individual local authorities to be considered within the UK, as well as on a collective basis as the information is collated on behalf of the UK for submission to the European Union (as part of the requirements of Article 14 of the Official Control of Foodstuffs Directive 89/397). The information collected includes the amount of formal enforcement activity undertaken; the numbers of premises present within a local authority district; and the numbers of inspections carried out. This data gives information about service **efficiency** in terms of enforcement activity being undertaken. However, enforcement activity gives no indication of the service **effectiveness**. As the FSA has noted "*the monitoring data is still insufficient to accurately assess individual Local Authority performance*" (FSA, 2002c, p.11).

The FSA has also identified that the numbers of prosecutions have fallen by 30% since 1999 (ibid, p.19). This may mean that either local authorities are becoming more effective as compliance within food businesses improves due to previous prosecution activity, or that local authorities are becoming less effective as they become unwilling or unable to instigate prosecution proceedings. Data submitted to the FSA has clearly shown that, of the premises inspected in the year 2000, 45% (174,417 premises) had breached food regulations in some way (ibid, p.11).

The information collected by the FSA records the number of breaches in food safety legislation in premises for each local authority. This means that differences in the incidence of non-compliance between authorities is evident. This could be used to show that some authorities are more effective in dealing with non-compliance than others but not the reasons why they are. Useful performance indicators should seek to investigate this issue in more detail to allow effective approaches to be highlighted.

The Framework Agreement on Local Authority Enforcement, issued on 1st April 2001 introduced the local authority audit scheme (FSA, 2001b). The purpose of the scheme is to secure improvements and share good practice identified within local authorities. The programme of audits will investigate the decline in prosecutions highlighted above. In addition, the Agreement includes provisions to collect enhanced monitoring data with a greater focus on inspection outcomes. The FSA therefore now collects information relating to the inspection rating scheme contained within Code of Practice 9 (see below). This is discussed in further detail in section 4.

Finally, in order to investigate service 'effectiveness', the FSA is currently funding several projects that are examining local authority approaches in terms of their effect upon food safety compliance within food businesses. These projects investigate effective communication and enforcement approaches that local authorities can adopt when dealing with food businesses, particularly small and medium sized businesses (employing less than 250 staff). Such projects will need to record and analyse enforcement and education initiatives in order to assess whether these approaches are effective. One indicator of compliance that could be adopted is the food hygiene inspection rating scheme contained within Annex 1, Code of Practice 9.

Food Poisoning Statistics (CDSC data)

Information relating to infectious diseases is collected every week by the CDSC for England and Wales in response to reports made to them by the 'Proper Officer' of the local authority, who in turn

collects information from doctors within their districts. Food poisoning is included within this list of infectious diseases. The information is published by the CDSC and by the Public Health Laboratory Service (PHLS), and is recorded in 3 main formats for each type of infectious disease – the total number of notifications for England and Wales; the number of notifications by age group and the number of notifications by region in England and Wales. This information is recorded weekly, quarterly and yearly (PHLS, 2001).

This information is vital in identifying general trends of infectious diseases across England and Wales. However, it offers several problems when trying to relate food poisoning levels within individual local authorities to the effectiveness of particular food safety services. Firstly, data is collated by region. England and Wales are divided into 9 broad regions, meaning that individual local authority districts are not specifically identified. Secondly, cases of food poisoning cannot always be traced to the source of the problem. Today's population is increasingly mobile and people do not remain within their own local authority district boundaries, or even within the country. This will mean that the case is attributed to a particular region, even if the source of the problem can be traced to another one.

Therefore, whilst food poisoning information is available, the above issues mean that it cannot presently be used to accurately assess the effectiveness of a local authority service upon the rates of food poisoning within their area.

The food hygiene inspection rating scheme

This scheme was initially introduced in Code of Practice No. 9: Food Hygiene Inspections following the introduction of the Food Safety Act in 1990 ("the Act"). The Code of Practice itself was issued under Section 40 of the Act. The Code of Practice has since been revised three times (in 1995, 1997 and 2000). These changes have, amongst other issues, developed and refined the inspection rating scheme.

The existing inspection rating scheme is currently under review again. Initially it was proposed to move towards a general scoring system (FSA, 2002a). This proposal has now been revised in response to comments made by local authorities and a new consultation document has been circulated. The proposal now follows the current system, with a number of less radical changes than originally proposed (FSA, 2002b). If adopted, it will mean local authorities have more freedom to design inspection programmes that do not include inspection of low risk food premises. This will allow, in theory, more

resources to be available to improve standards in higher risk food businesses.

The primary purpose of the inspection rating scheme is to provide an indication of the minimum inspection frequency that a food business should receive. The scheme takes account of all aspects of the business, giving a 'risk rating score' to indicate the relative risk posed to the consumer by that business. The inspection rating score also determines the frequency at which that premises should be inspected. Those with high scores are deemed to be 'high risk' and are inspected the most frequently (every six months for those in the highest risk: Category A). The components of the scheme are briefly set out below, each component being given a score to give a final 'total' (detailed guidance on the scoring system is contained within Annex 1, Code of Practice 9, FSA, 2000):

- a. The type of food and method of handling;
- b. The method of processing;
- c. The number of consumers at risk (with an additional consideration of vulnerable groups);
- d. Food hygiene and safety compliance;
- e. Structural compliance;
- f. Confidence in management/ control systems; and
- g. The significance of the risk

This scoring system is used by local authorities throughout England and Wales following every programmed inspection of the food premises. It therefore provides a useful source of data that could be analysed to indicate the ways in which the scores differ between local authority districts at a particular point in time, and the ways in which the scores may change over a period of time. The FSA has now started collecting information about three of the component scores (food hygiene, structural compliance and the confidence in management scores) with a view to analysing trends in these scores over time. This type of analysis may be able to demonstrate the effectiveness of the local authority service.

However, there are limitations in the use of the inspection rating scheme data as is indicated in the following four fundamental issues which require consideration.

(1) The difficulties in the application of a quantitative rating scheme in the assessment of risk within a food business

There are fundamental difficulties in using any quantitative system to analyse risk. These include a lack of basic evidence linking hazards to food safety risks; data gaps; complexities in assessing exposure; and a lack of the inspection's ability to determine the

presence of hazards. These have been extensively examined (Barnes, 1996; NAS, 1996). The current inspection rating scheme scores the food safety risks posed by the business to the public but the use of scoring systems in risk assessment is limited for the above reasons. Scoring systems are mainly used in comparative situations whereby one business can be compared with another in order to assess which poses the greater risk (Fairman, 2000).

However, such an assessment is based on the correct identification of hazards and the correct appraisal of their significance. This may be the greatest weakness of the inspection rating scheme as a comparative tool – the potential inconsistencies arising from subjectivity between different officers as well as between different local authorities. To try to overcome this, guidance notes accompany the inspection rating scheme. Activities such as ‘inter-authority auditing’, ‘buddy visits’ and ‘peer review’ are also undertaken by local authorities to reduce inconsistency. The FSAs Local Authority Audit Programme indicates that there are many differences between local authorities in all aspects of food hygiene enforcement (www.food.gov.uk).

(2) The difficulties in accessing inspection rating scheme data within local authorities

Whilst Environmental Health Practitioners complete the inspection rating score following guidance in Code of Practice 9, the way in which this data is recorded varies between local authorities across England and Wales. The majority of authorities in England and Wales now use a computer-based system containing details of premises’ history and inspection scores. However, not all will record a full breakdown of sub-scores, instead recording the final total only. The type of information recorded may depend on the type of software being used. ‘Flare’, ‘CAPS’, ‘Osella’ and ‘Swift’ are common software programmes in use. The way in which information is stored on these programmes will obviously differ according to the type of software and the version being used by the local authority. The software programmes are able to run reports containing specified, requested data, as long as it is contained within a “reporting” field of the programme. Some of the earlier versions of software do not include the breakdown of scores within a reporting field, meaning that reports cannot be run using this data (for example ‘Flare’). As resources within food safety services are already stretched, local authorities reliant on these earlier versions of programmes may be reluctant to change the software when it currently meets their service needs perfectly adequately. Indeed, if software is upgraded, historical data may not be incorporated within the newer system in its entirety. It may therefore take time to establish a database that enables an analysis of trends in

inspection rating scores in premises to be undertaken.

Another issue that may arise in requesting reports from a database occurs where unwanted data cannot be screened out. For example, any analysis of premises scores over a period of time will need to ensure that premises have remained under the same management for that time. Local authorities may not enter such information about premises in a way that can be used to exclude them from analysis.

(3) The difficulties in interpreting statistical analyses of inspection rating data

Once the required information has been collected from local authorities in an appropriate format it can then be analysed. Analysis could compare scores of individual local authorities with each other, or compare groups of local authorities undertaking similar approaches. For example, local authorities adopting certain levels of enforcement and educational activity could be compared and analysed for significant differences in inspection rating scores in their food businesses.

Analysis of individual local authorities will allow direct comparisons between local authorities to be made, but will not provide an explanation of **why** one authority may appear to have lower risk food premises than another. Information collected in relation to BV 166 may clarify this in terms of highlighting under-performing areas, for example an absence of procedure notes. FSA enforcement monitoring data assesses enforcement activity. However, the level of educational activity undertaken by authorities is currently not recorded in a manner capable of assessment. Currently, authorities do not submit details of educational initiatives undertaken to the FSA. Such information would need to be collated before any analyses could be completed - this is an area that the FSA will include within monitoring returns in the future, personal communication (Boyle, 2002).

Even once this information is available, caution is needed when interpreting statistical results. Whilst significant trends, and even significant relationships between factors can be identified, statistical tests cannot identify whether a particular factor **caused** a particular outcome. In order to validate any tests carried out, it is vital that all factors that could impact upon the inspection rating data are included within the analysis. This will necessarily include different social, cultural and economic factors relating to the local authority district.

As noted by Smith in relation to public sector organisations generally, it is necessary that “*all the salient differences between the organisations – such as*

environmental circumstances and accounting procedures – have been taken into account...In practice, it is almost always impossible to measure all the relevant variables, and it must be accepted that the analysis is both incomplete and partisan..." (Smith, 1996, p.14-15).

(4) The current reviews of Code of Practice 9 and the food hygiene inspection rating scheme

Whilst the Government is keen to establish comprehensive performance assessment criteria with which to judge local services, it is clear that there are limited ways to assess the quality of local authority food safety services. The use of the inspection rating scheme offers the potential to analyse changes within a local authority district. There is no other way to review changes in individual business compliance within districts on a nationally comparable scale. The first proposal issued by the FSA in 2002 suggested changing the system by removing the standard scoring system and allocating inspection frequencies according to the type of food business (FSA, 2002a). This is now being reconsidered, and a new proposal suggests retaining the existing scoring system, but allow some flexibility for local authorities in dealing with very low risk premises (FSA, 2002b).

Conclusions

The move towards increasing the accountability and quality of public services has meant that a range of input and output indicators have been identified for such services. In order to measure performance of these services in terms of quality, efficiency and effectiveness, it is necessary to consider both input and output indicators. Specifically for food safety services, these indicators will relate to the overall objectives of the service, one of which will be to reduce the risks posed by food businesses to the public.

The current BV 166 'checklist' for Environmental Health and Trading Standards Services requires local authorities to score points against a range of input and output indicators. These include the existence and monitoring of:

- Enforcement policies;
- Policies relating to responding and dealing with source requests;
- Formal inspection programmes in line with legal requirements;
- Benchmarking with similar local authorities in terms of resource issues; and
- Consulting with stakeholders on service provision.

In addition, the Audit Commission requires that local authorities monitor the actual numbers of inspections undertaken against the intended inspections. Whilst both of these indicators are able to illustrate **efficient** service provision, they do not

allow the **effectiveness**, and therefore the overall **quality**, of service to be assessed.

Data collected by the PHLS and CDSC relate to cases of food poisoning within England and Wales. As a key aim of local authority food safety services will be to reduce the incidence of food poisoning within their district, this potentially offers a useful outcome indicator. However, the problems in the reporting format (within the 9 broad regions in England and Wales), and the inability to trace the sources of illness, means that currently, it is not possible to relate these statistics to specific local authorities. Therefore, this information is limited in its use in monitoring the performance of individual local authority services.

The FSA, with its responsibility for developing national food enforcement policies, collects data from all local authorities including the numbers of inspections made and the number of enforcement actions taken. This allows an assessment of service efficiency to be made in the way that food businesses are dealt with in their district. The FSA has also started to collect data relating to inspection rating scores for business premises and plans to analyse this data in terms of identifying trends over time. The FSA is also funding several research projects that aim to identify the most effective local authority approaches in dealing with food businesses. These initiatives will all contribute towards improving our understanding of effective approaches in improving food safety compliance within individual food businesses.

In the future, the food hygiene inspection rating scheme data collected by all local authorities could be analysed to identify trends within the individual local authority, between local authorities, as well as for groups of local authorities undertaking similar initiatives to identify their impact upon business compliance. The main limitations in the current scheme are as follows:

- The difficulties in the application of a quantitative rating scheme in the assessment of risk within a food business;
- The difficulties in accessing inspection rating scheme data within local authorities;
- The difficulties in interpreting statistical analyses of inspection rating data; and
- The current reviews of Code of Practice 9 and the food hygiene inspection rating scheme.

Despite these limitations, it is also clear that this is currently the only source of data capable of assessing the effectiveness of local authority food safety services. Tools are available that can accurately assess efficiency, but until effectiveness is also considered, the government will not be able to achieve its ultimate goal of providing a 'quality' public service.

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Encouraging home-owners to maintain their homes: Initiatives in the Bellenden Renewal Area, Peckham

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Abstract

With declining capital grant expenditure and ageing and deteriorating UK private sector housing conditions, policy makers at national and local level are charged with finding new ways forward in encouraging home-owners to maintain their homes before they fall into disrepair. This is more economical to both home-owners and the state. However, the situation is complicated by a culture that seems to lack initiative to invest in home maintenance. This is for a variety of reasons, which include rapidly rising house-prices, often regardless of condition in some areas, and the inability of low income home-owners to be able to afford, or in some cases, to understand, the importance of regular maintenance. This paper explores literature relating to the history of housing grants, existing home maintenance initiatives and new requirements under The Regulatory Reform (Housing Assistance) (England and Wales) Order 2002 and supporting Renewal Guidance (ODPM, 2002). It then turns to overview how officers in the Bellenden Renewal Area are and will be seeking innovative new ways of encouraging home-owners themselves to sustainably invest in their homes as housing expenditure moves away from public provision.

Key words: Home maintenance, local authority housing grants, private sector housing renewal

Introduction

The UK's private sector housing stock – defined here to include owner-occupied and privately rented housing, but excluding housing association dwellings – is ageing and deteriorating. Whilst the owner occupied sector comprises the predominant tenure requiring the majority of resource available in its renovation, the privately rented sector contains proportionately more unfit homes. Figures on the cost of private sector renovation vary considerably, but if early maintenance and repairs are not carried out, the cost will rise substantially. There seems to be a culture which lacks initiative to carry out regular maintenance, possibly in part due to dependence on

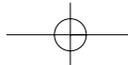
housing grants, which needs to be reversed if conditions in private sector housing stock can realistically be sustainably addressed.

With declining capital expenditure and a return of personal responsibility for home repair and maintenance to owners, local authorities are having to increasingly seek new and innovative ways to inject private finance into existing housing regeneration strategies, rather than continue with various housing grants as a main thrust of their private sector housing renewal strategy (DTLR, 2002). English and Welsh local authorities currently invest almost £400 million on improving conditions for 100,000 households per year and provide support to Home Improvement Agencies (HIA) (DETR, 2001).

Local authorities have traditionally held an invasive role in the privately owned sector, particularly since the Housing Act 1969 in financing various grants (see also Table 1.0). Some argue that this expenditure has partially created a culture of dependency on grants (DETR, 2001; Mackintosh and Leather, 1992) and may, to some extent, be responsible for reduced likelihood of home-owners themselves maintaining their homes. Grants are essentially a one-off injection of funds to enable dwelling fitness and repair, but do not in themselves encourage regular maintenance as they are mainly concerned with an owner's deemed ability to afford works. There has been little progress in marrying grant policy to adequate resource in tackling private sector housing conditions and policies to assist low income home-owners tend to lack direction (Leather, 2000).

The Housing Green Paper (DETR, 2000a) and Consultation Paper on the future of grants (DETR, 2001) raised several key issues in seeking to provide a broad power to provide financial and other assistance for home repair and improvement including:

- More discretion for authorities to address the specific needs of their area;
- More opportunity to target help effectively to those at risk from poor housing;
- More effective use of resources;



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- Less dependency on grants and reinforcement of homeowners' responsibilities toward their properties; and
- More choice for homeowners between grants or loans.

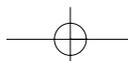
As a result, many local authorities have already been actively seeking new ways of encouraging and enabling home owners to routinely invest their own resource in their homes before they fall into substantial disrepair, rather than continuing to rely on public sector funding through housing grants.

The resulting Regulatory Reform (Housing Assistance) (England and Wales) Order 2002 (DTLR, 2002; ODPM, 2002) subsumed earlier grant provisions relating to repair and improvement (see Table 1.0). It also provided a new power for local authorities to provide assistance for the repair of living accommodation (as well as other matters outside the scope of this paper). Local authorities are required to take into account a person's ability to repay this assistance before enforcing it (such as through a charge on the property) and to provide a written policy

Table 1.0: Initiatives (legislation) in private sector housing regeneration

Act/Policy/Consultation	Key regeneration purpose
Housing Act 1969	New powers for repair; General Improvement Areas introduced
Housing Act 1974	Housing Action Areas introduced
Local Government and Housing Act 1989	Previous grant provisions superceded; Act introduced mandatory means tested house renovation grants based on revised fitness standard; introduced home repair assistance; introduced renewal areas and group repairs schemes; redefined clearance areas and action for individual dwellings. Greater emphasis placed on role of Home Improvement Agencies.
Housing Grants, Construction aid for and Regeneration Act 1996	Switch from mandatory to discretionary grant renovation; further proposals for renewal areas and group repair schemes; home repair assistance extended.
DoE Circular 17/96 (DoE, 1996)	Provided detailed guidance on private sector renewal activity, emphasis on relevant local housing strategies and home-owners responsibilities for repair and maintenance.
Consultation Paper 2001 (DETR, 2001)	Consultation Paper on Private Sector Housing Renewal reviewing the role of housing grants etc.
The Regulatory Reform (Housing Assistance) England and Wales) Order 2002 (DTLR, 2002)	Repealed existing grant legislation (except DFG's) into new local authority power to provide assistance for housing renewal, requiring that local authorities publish their policy.
Housing Renewal Guidance (consultative document) (ODPM, 2002)	Explains above, encourages increasingly strategic context and approach aligning with other corporate objectives

Source: Based on Stewart (2001)



statement. This needs to be set within a wider policy framework which encourages personal responsibility for housing conditions if it is to be successful.

This paper considers the many opportunities available to encourage – and indeed enable – owners to invest in home maintenance and repair. It focuses in particular on the way in which officers at the Bellenden Renewal Area, Peckham, in the London Borough of Southwark are currently promoting home maintenance, through a variety of initiatives, to help arrest inevitable decline in older housing stock. It considers the advantages and disadvantages of such an approach, in particular, how likely it is to harness private sector funding as local authorities adopt a more enabling approach to private sector housing renewal. Such policy has never previously been adopted nationally, and there is currently very little evidence to assess how successful such policy – allied to a wider expectation that home-owners will maintain their own homes – might be in respect of housing stock condition. A key purpose of this paper is therefore to draw together available literature and practice for later evaluation.

Additionally, at the time of writing, there are two other major – and parallel – issues to consider in respect of (private) sector housing conditions. The first is the government’s introduction of the Decent Housing Standard (DETR, 2000b), and the second is the replacement the current statutory standard of fitness with the housing health and safety rating system which are considered in more detail in Stewart (2002). It is not the purpose of this paper to overview these new proposals for assessing housing

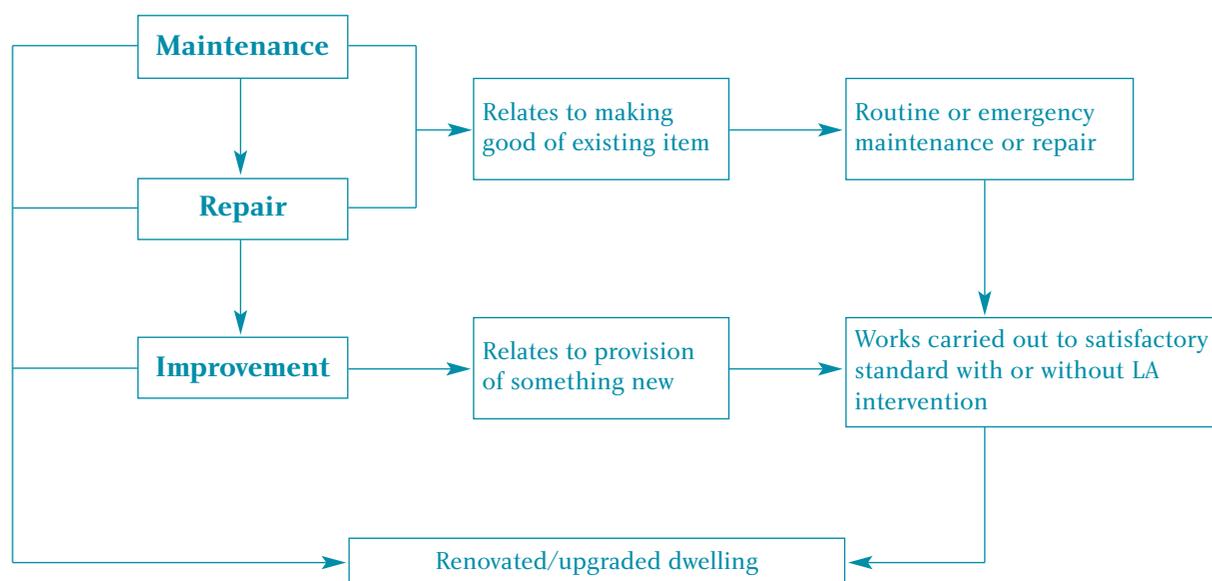
standards, but to explore the direction and focus of future housing assistance intervention and ways in which home owners are able to address issues in home maintenance and repair.

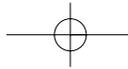
Maintenance, repair and improvement – whose job is it?

The day a house is built it starts to decline. Regular maintenance, which need not require major financial investment, can help arrest that decline. If maintenance is not carried out, or something simply gets worn out, repair (i.e. making something good) will be required which by its nature requires some degree of financial investment and possibly a specialist contractor. (See fig. 1). Financial investment may come from the owner – as owner-occupier or landlord – or in the form of local authority assistance. Improvement is not the same as repair, normally referring to the provision of something new, such as central heating, an enhanced kitchen, or provision of an internal W.C. where none currently exists. Many owners seem prepared to invest in improvements, commonly at the expense of a repair such as a new roof, which may be more cost effective in the longer term.

Government has been withdrawing capital grant expenditure for some time. (Table 2.0). There was a boom in spending in 1983/4, but it has since declined – notably since the Local Government and Housing Act 1989 as a new system of mandatory grants became both means tested and related to statutory fitness. These grants became discretionary under the Housing Grants, Construction and

Figure 1.0: Maintenance, repair and improvement





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Regeneration Act 1996, with an increase in expenditure for 1999/2000 (Revell and Leather, 2000; Wilcox, 2001). Since then, government has increasingly questioned state investment in the private housing sector, proposing an increasingly enabling role with grants as a 'safety net' (DETR, 2000c; DETR, 2001). It advocated further local authority discretion but no firm spending commitment, even though three fifths of low income households live in poor private sector housing (Wilcox, 2001).

There are many reasons why homeowners fail to inadequately invest in their homes. In the owner occupied sector, many simply cannot afford to, despite owning a major capital asset. Older and younger people, and some minority ethnic groups, are the most likely to live in poor housing conditions (Macintosh and Leather, 1993; Revell and Leather, 2000). Older people – frequently occupying some of the worst stock – may not wish to have the upheaval or stress associated with major repair, or may hold valid concerns about trusting some builders. Many have such high outgoings, including mortgage repayments, that they may not be in a position to afford necessary repairs. Younger home-owners, in a position to afford repairs, may simply prefer to spend their income elsewhere, on something frankly more interesting than home repair. Additionally, regional house prices may be a disincentive for a mobile population to invest substantially in repairs, as house prices may increase, regardless of an owner's investment level (Leather and Reid, 1989).

There is little accurate information available on the extent to which individual householders use their own resource for maintenance and repair. Home-owners tend to spend more than other tenures, although the figure shows regional variation. The amount spent rises with income (Leather and Reid, 1989; Revell and Leather, 2000). The English House Condition Survey (EHCS) (DETR, 1998b) probably provides the most accurate estimate of expenditure,

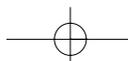
estimating an aggregate £31.5 billion spend by householders, some 28 billion of this (89 per cent of total) by owner-occupiers. During the 1987-91 period, 86 per cent of owners completed major works, but estimates for landlords are not available for improvement, repair or internal decoration (Revell and Leather, 2000). Homeowners tended to spend more on improvements (53 per cent) than repairs (30 per cent). Do-it-Yourself (DIY) represents an important contribution in influencing the state of stock repair – normally for minor rather than major repairs, and generally carried out by younger, higher income home-owners. It is estimated that since there is no labour cost involved, four times the work is possible at the same price, although it is difficult to accurately assess either the quality or quantity of works undertaken (Davidson et al, 1997).

The private rented sector is even more complex. The English House Condition Survey (DETR, 1998b) continues to show that this sector has proportionally more unfit properties than other tenures, with 19 per cent unfitness as compared to 6 per cent unfitness in the owner occupied sector. Landlords of the poorest stock are commonly unwilling to invest in their properties, particularly investment landlords (DETR, 1998c; DETR, 2000b), who lack financial incentive to invest when return from market rent financed by tenant or housing benefit is forthcoming regardless of condition. With inadequate incentive for maintenance, there is certainly little incentive for repair, and practically none for improvement. The situation is further complicated with complex tenancy and rental situations of houses in multiple occupation (HMO), which are in the poorest condition of all (DETR, 1998b). Landlords are frequently compelled into carrying out essential works following service of legal notice by local authorities. What is clear is that a source of money, advice, support and sometimes compulsion, is required, which local authorities are already well placed to deliver and/or support. This sector warrants further specific research.

Table 2.0: Private sector renovation grants (£ million)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
England	316.7	281.6	439.9	361.3	385.6	336.7	316.5	232.1	172.5	237.1
Total *	581.9	482.1	599.0	613.1	605.5	559.9	525.3	409.6	326.2	356.6
Notes:										
<i>Total * refers to England, Wales and Scotland</i>										
<i>Includes grants under 1985, 1989 and 1996 Acts, excludes disabled facilities grants</i>										

Based on Wilcox (2001:47)



Stock Condition and Grant Expenditure

Not all private sector housing investment comes in the form of grant assistance. Many owners are financially able and willing to maintain their homes, but some are not interested and others not able to afford – or perhaps cope the upheaval of – necessary works. In a complex South East housing market, home-owners are not always ‘rewarded’ for regular maintenance and repair and their properties would increase in capital value regardless of condition. Many potential grant recipients are excluded from all local authority assistance, and are deemed eligible to afford works as a result of the ‘means test’, although on practical terms this may not be so. Others regularly maintain and improve their homes and these groups are not normally offered any form of assistance from the local authority.

Home-owners and local authorities may have differing objectives about where housing investment is best spent. Home owners already secure their own repairs and improvements outside of the grant regime, such as through saving schemes, loans, insurance, social fund loans and so on. However, owners and local authority’s strategic housing duties and objectives do not always coincide. Home owners, for example, may invest in improvements such as central heating, re-decoration or a new kitchen, which may not affect fitness, whilst local authorities may prefer to concentrate resource on a strategic enveloping scheme to help prevent further stock decline.

Stock condition

Government policy continues to favour the private sector as housing provider, with almost 70 per cent UK home ownership in 1999 (Wilcox, 2001), but the

increase in this sector has not been matched by a parallel increase in renovation funding. Renovation is generally promoted as a lower cost alternative to demolition (Macintosh and Leather, 1993). In addition, the stock is ageing, requiring continued investment as poor housing is closely related to age of stock as well as household income.

The 1996 English House Condition Survey (EHCS) (DETR, 1998b) reported that 45 per cent of housing was more than fifty years old, with 7.5 per cent of housing stock (1,552,000 dwellings) being unfit, the majority being pre-1919 and converted into flats. Terraced housing tends to be in greater disrepair in comparison to semi-detached housing (Revell and Leather, 2000). Almost 80 per cent of dwellings had some form of defect. 1 per cent of housing stock (200,000 dwellings) lacked basic amenities, almost half of these being vacant, a reduction since the previous EHCS, and grant intervention has been closely linked to major steps forward in such improvements (Wilcox, 2001). There has also been some stock improvements, with 60 per cent of dwellings with double-glazing, which normally falls outside of the grant-assisted regime.

Despite considerable expenditure, recorded disrepair has remained relatively static, and is still a key cause of unfitness. Problems remain even in areas where substantial grant expenditure has been paid (Leather and Reid, 1989; Wilcox, 2001). Disrepair is particularly crucial as nearly a third of all dwellings require urgent repair and swift works are required to arrest further decline. There are two considerations here; either owners cannot afford to, or owners do not appreciate the importance of, regular maintenance to prevent further disrepair. There is a significant correlation between household income,

Table 3.0: English housing conditions: mean average costs for repair and unfitness 1996

Tenure	Estimated cost of remedial repairs (£)			Average cost (£) of remedying unfitness	Number of unfit dwellings (000s)
	Urgent repairs	Repairs and improvement	Comprehensive repairs		
Owner-occupied	1,250	1,850	3,620	5,498	829
Private rented	2,370	3,250	5,030	5,972	393
Total stock *	1,280	1,830	3,420	3,301	1,522

Note:
Total stock * includes LA and HA dwellings

Source: EHCS (1996) and Wilcox (2001)

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unemployment and poor housing conditions (DETR, 1998b; Macintosh and Leather, 1993; Revell and Leather, 2000). In England, 1 in 10 households where income was less than £4000 per annum, lived in unfit dwellings, compared to 1 in 25 who had an income of £24,000. As recorded levels of disrepair have remained relatively static over subsequent house conditions surveys, despite grant expenditure over the period, it is reasonable to assume that a viable, cost effective culture of home-maintenance is somewhat lacking.

Likely costs of renewal are an important consideration in developing appropriate strategy. Analysis of the EHCS estimated that 8.5 per cent of unfit dwellings could be made fit at £500 or less (DETR, 1998a), as 69 per cent of English dwellings are unfit in respect of only 1 criterion, and 18 per cent fail for 2 criteria (Revell and Leather, 2000). Mean average costs of renewal per dwelling for 1996 are shown in Table 3.0. It should be noted that these figures are averaged, and vacant dwellings would cost substantially more. Additionally, the median cost is different as the average figures are skewed, with most dwellings having nil cost. This means that urgent repairs would cost £397, for 46 per cent of dwellings the cost would be more than £5000, with only 20 per cent of dwellings requiring urgent works at around £1,800 (Revell and Leather, 2000).

Grants and renovation

Repair and improvement provisions of the Housing Grants, Construction and Regeneration Act 1996 (see Table 1.0) have now been subsumed into The Regulatory Reform (Housing Assistance) (England and Wales) Order 2002 (DTLR, 2002; ODPM, 2002). This brings an end to House Renovation Grants and Home Repair Assistance (HRA) for smaller scale works. HRA increased as local authorities attempted to spread grant expenditure more widely (Wilcox, 2001), and although this was not the government's intention (DETR, 2001) it led to further residualisation of larger grants as a policy tool (Leather, 2000).

Additionally, local authorities – with government encouragement – have sought to concentrate resource in area activity in an attempt to stimulate private sector investment. There is little local data analysing the impact of grant investment over time or the profile of householders receiving assistance. For example, Group Repair Schemes – introduced to enhance the external envelope of dwellings – were encouraged on the assumption that owners would then be prepared to invest further, but there was no real evidence to support this. Information tends to be property based with, for example, 75 per cent of approvals for pre-1919 stock (Revell and Leather, 2000).

Conversely, the focus on means testing means that grants are based essentially on applicants rather than

property. Although research shows that lack of resource is the commonest reason for owners' lack of investment in housing (Revell and Leather, 2000), many low income households fall just above the grant threshold, and others have substantial outgoings (such as mortgage repayments which are not taken into account) and there is no help for them. By 1990-96, demand for grant had exceeded available government resource in England (Revell and Leather, 2000). Limiting grant availability by means testing and subsequent management mechanisms in this way theoretically targets grant assistance toward the worst housing and the lower-income households. Means testing can have an impact on area renewal schemes, resulting in pepper-potting of repairs and improvements since one neighbour may be eligible for assistance, and another not, even though both dwellings require similar works. The person not in receipt of grant assistance may have other financial outgoings or personal circumstances preventing participation in a renewal scheme.

Households typically respond to, rather than anticipate, repair requirements, and tend to favour low cost solutions that may fail to tackle underlying problems (Leather and Reid, 1989). The grant regime has to a large extent reflected this, essentially being a one-off injection of funds with no conditions attached requiring the owner to take a more proactive role in future maintenance. Some see this as a fundamental flaw in the grant system, which essentially 'rewards' those who have failed to invest – either deliberately or through lack of resource, and does not assist those outside of the grant system at all. A fundamental shift in culture is required to encourage – and to enable – owners to regularly maintain their homes before they fall into substantial, and expensive, disrepair. The private housing sector needs to become essentially self-regulating, with local authorities financially or otherwise assisting those in need. A new proactive and reactive approach is required to prevent the need for grant expenditure in the first place, and also to preserve diminishing funds for the worst stock. The question to local authorities is how can costs and resource requirements be minimised for all?

Can home-owners be encouraged to invest?

Government emphasis is increasingly about home-owners taking responsibility for their own homes (DoE, 1996; DETR, 2001; DTLR, 2002). It is fundamental that local authorities develop realistic strategies based on local circumstance that draw together a range of in-house services and external providers (DETR, 1998d) that provide the right things to enable home owners to maintain their homes. Many local authorities already have strategies in place that incorporate several initiatives.

Table 4.0: Initiatives in encouraging personal responsibility in home maintenance, repair and improvement

Initiative	Comments	Organisation responsible
* LA Home Improvement Loan e.g.	Currently permitted in legislation, but effectiveness could be improved to enable preferential LA rates and terms of interest	LA (private sector would expect preferential interest rate return)
* Equity release scheme (as form of loan cited above)	Use of capital rather than income to repay loan; avoid the need for borrower to make repayment from income, so access capital without affecting income	Private sector
Handy person services	Free or low cost service (available on request or referral) for minor repairs – may have limited contribution to stock condition, but early intervention may help prevent more serious problems. Increase in such services, but likely to remain specialist for vulnerable groups.	Scheme facilitated by local authorities, housing associations, HIA's, voluntary sector etc.
Subscription based Emergency repair services	Nationally available, for provision of accredited builders and available 24 hours. Seen to offer the greatest potential for developing wider demand as already has a growing membership and high satisfaction with service provided; encouraging more work through awareness	Private companies, funded by charging client
Subscription based maintenance service	Includes exterior survey and maintenance plan, with free emergency call out and fees charged. Little interest currently – tends to be for more affluent householders and related to age. 40% scheme members use it for works.	Local building companies – local authorities may initiate such a private sector scheme with appropriate personnel
Money advice	Owners – particularly those on low income – may require advice concerning increased spending on loans, benefits, savings etc.	Local authority, citizens advice, voluntary sector etc
Advice and information	Verbal, visual and literature advice and guidance on repair and maintenance issues and wider issues e.g. energy efficiency – e.g. leaflets, videos, exhibitions, demonstrations. Many schemes exist. E.g. may give schedule for necessary works to someone not eligible for grant	Local authorities, HA's and HIA's, particularly associated with applications for, or completed grants, community associations, residents groups
Home maintenance surveys	Written or verbal survey plus report on short and long term repair and maintenance requirements, how to tackle the problem, likely costs – may help with owner prioritising works required and employing suitably priced builder with LA inspector checking quality of works. May form part of home maintenance strategy, encouraging and enabling works owner would not otherwise tackle.	Local authorities, HA's and HIA's – either free of charge, or fee to cover costs
Tool loans	Including loan of specialist or expensive items e.g. cement mixers, scaffolding, ladders, power tools – saving owner money in enabling them to carry out works	Local authority or community based organisations

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Initiative (cont.)	Comments (cont.)	Organisation responsible (cont.)
Home maintenance training	Training focus on maintenance awareness of specific maintenance skills; surgeries to discuss common problems, DIY, targeted focus. Could be tied to capacity building through project based employment – not common at present	Local authorities as well as possible funding from DFEE, NDC etc
Volunteering schemes	Encouraging residents to assist with vulnerable persons e.g. older people etc	Local authority and/or existing community groups
Builders list	Assurance of trustworthy and competent builder	LA or community group
Maintenance strategy	Useful to help protect LA's investment and encourage people to do works to reasonable standard that they might not otherwise tackle. Draws together several above initiatives for all or part of LA area; funding and staffing considerations	LA
Do-it-Yourself (DIY)	Basic maintenance/repair/improvement work by home-owner and unpaid help (mainly cosmetic).	Private sector

** denotes government favoured options*

Based on Mackintosh and Leather (1992); DoE (1996); Davidson et al (1997); DETR (1998c) and Davidson and Leather (2000).

From several years experience working in the sector the author believes that home- owners fail to carry out necessary works for, a variety reasons, even where they are eligible for grant assistance. These include: Lack of trust in builders; bad publicity for them in the media recently; problems in past of shoddy building work;

- Inability to find suitable builder to carry out small-scale maintenance/repair at viable cost;
- Could do work themselves, but lack time or wrong time of year;
- Do not want the upheaval involved;
- Concern about the cost of initial works, unforeseen works and redecoration and/or necessary relocation;
- Thinking about moving house anyway, so not worth the bother;
- Would rather spend money elsewhere (e.g. new car, holiday);
- Lack initiative or confidence to be proactive.

The government has also identified wider community concerns responsible for lack of maintenance and repair by owners such as high crime in the area, poor environment and a low level of community activity (DoE, 1996). It is essential local authorities that address such concerns in strategic development and implementation.

Financial investment aside, local authorities already have substantial house renovation expertise, experience, organisational arrangements and systems in place which could be readily adapted to encourage and enable home owners to arrange for, and fund, necessary works outside of local authority expenditure to protect their grant investment. Authorities increasingly operate Home Agency Services, in-house or via a partnership arrangement with another organisation, which operate to a variety of levels and suitability. Whilst these services are established to support 'vulnerable' groups such as older people, their role and expertise could be increased to cater for the needs of others. Similarly, existing Direct Service Organisations (DSO) or suitable local building companies, could take on a new role to carry out repairs at more cost effective price, possibly on a self-financing basis.

Several existing schemes have been identified which are of increasing interest to local authorities in acquiring private sector finance (Mackintosh and Leather, 1992; DoE, 1996 and DETR 1998d). These include targeting grants more effectively, home improvement loans and an increasing emphasis on equity release schemes (see summary in Table 4.0). The government is keen to promote interest in effective use of these relatively new schemes. It does,

however, recognise some of the problems of working with the private sector, including possible repossessions and the impact on borrower's benefit entitlement – although the market has been slow to develop, it can be localised and expensive (DETR, 1998d). The government has asked local authorities to take a fresh look at such initiatives in partnership with the private sector (DETR, 2001). Few new initiatives have been proffered since, and few have made major leaps forward in the intervening period, although a combination of such initiatives may help reduce pressure on local authority capital expenditure.

What certainly needs to change dramatically is the culture of maintenance, repair and improvement. The question is how, and with what degree of success, particularly in the context of area regeneration? Fundamental to this, of course, is whether home owners are able to afford works – either directly, or indirectly by releasing capital they already, or by participating in a local scheme whereby maintenance and repair become both affordable and feasible. It is here that local authorities need to increasingly operate realistic strategies.

Local stock condition surveys are fundamental in deciding how best to administer available resource. Local authorities increasingly need to spend the money they have available efficiently, effectively and on dwellings that most require investment as part of a wider strategy. Successful strategic development requires honest appraisal of housing stock and the profile of local residents so that maintenance strategies can be sensitively and appropriately targeted, possibly by development of existing schemes in the area, or the development of new partnership based schemes with advice from operational schemes elsewhere. The DoE (1996) suggest that those least aware of problems with their homes are older people, those with mental health problems, those on low incomes and minority ethnic groups, so maintenance

schemes need to be developed and targeted accordingly. Local strategies also need to recognise that often older, low income households are less able to participate in DIY than their younger, often wealthier counterparts (Table 5.0), and may have to finance both materials and labour, substantially increasing the overall cost (Davidson et al, 1997; Davidson and Leather, 2000). This has important implications for home maintenance schemes.

The recent Audit Commission report on social housing repair and maintenance services (cited in Kemmner 2002) provides some useful lessons. It argued that local authorities need to challenge and improve performance so business plans, planned and capital programmes and responsive repairs contribute to better targets across all areas. Relevant staff need to be fully trained and working toward the required objectives. The strategy needs to be delivered by staff with good project and budget management skills, tied to effective systems based on housing need and decency standards. Involving residents is crucial in setting standards and monitoring repairs and maintenance services and there is a need for greater education in respect of technical issues. Planned works are more cost effective than reactive and emergency works, so they should be prioritised so that budgets can be more easily managed. Close sustainable, interdependent partnership working between public and private sectors is fundamental, operating in a climate of respect and building mutual trust.

Case Study: The Bellenden Renewal Area, Peckham

Bellenden Renewal area is a low-income area within the London Borough of Southwark with a wide ethnic mix and age profile. To date, strategy to repair and improve housing within the Renewal Area has concentrated mainly on existing group repair and

Table 5.0: Householders most likely to use DIY and contractors for major work

Most likely to use DIY	Most likely to use contractor
Young head aged less than 40 years Resident for less than 5 years Head is or was skilled manual worker Within top half of income distribution New dwelling, post-1980	Retired, especially if head aged over 74 Retired for at least 5 years Head is female Within bottom half of income distribution Old dwelling, pre-1919

Source: Davidson et al (1997)

Encouraging home-owners to maintain their homes: Initiatives in the Bellenden Renewal Area, Peckham

individual grant regimes as well as partnership based work with other organisations.

Uncertainty about future funding and projected legislative changes led to the Renewal Area Team re-thinking strategy and how to encourage and enable an ethnically and age diverse profile of low-income home-owners to maintain and repair their own homes. As local housing stock continues to age and decline, new investment needs to come increasingly from owners themselves, and officers are actively seeking culturally viable ways forward in close consultation with local residents.

The Renewal Team's recent survey sought to profile housing grant recipients by age, income and ethnicity. It obtained data on approaches to home maintenance, including works carried out following grant completion – its cost, regularity, who carried/s it out and difficulties encountered. The survey also collated early information on interest in potential council services that may help home-owners with home maintenance, including DIY training, free home maintenance surveys, information video and leaflets, approved builders lists and contracting/instruction arrangements, loans, tool hire and discounted building materials.

The Renewal Team – working closely with residents – has therefore been able to develop some of these ideas into practice, and has produced educational and training literature and an award winning video that provides useful advice on basic construction methods and remedial works. The emphasis of much of this training and advisory information is to encourage low-income residents to be able to carry out maintenance and repair works themselves. However, this aside, the practicalities of affordability of remedial work for low-income households – within a climate of declining capital grant expenditure – remains key.

In view of the issues identified, a Home Maintenance Strategy has been developed for the Bellenden Renewal Area. This approach recognises that some homes require works now, but is also able to cater for properties 'at risk' of falling into disrepair. A primary emphasis is to inform and educate residents of the importance of early home maintenance. A further major objective is to help low-income groups to spend income they have more effectively by considering where their money is currently spent – and how – and what the council can do to help reduce some of the costs. The council are looking at skills and services they already provide that may be adapted to meet the needs of the Renewal Area.

An understanding of the nature of expenditure for low-income groups – with particular reference to cultural difference in approaches to home maintenance due to ethnicity and age – is fundamental in determining

best local strategy to assist home owners in being able to helping fund works themselves. The total costs of remedial works can be broken down to assess where savings could be made to low-income groups and these include:

- Costs of labour. Low-income groups tend to contract labour rather than carry out works themselves, so are already cost-disadvantaged. The cost is proportionately significantly higher for small-scale works where a contractor needs to charge a day's labour to cover travelling time, sourcing materials etc, leaving the overall cost out of proportion to the minor repair required.
- Necessity of works identified by 'builder'. Are the works really necessary?
- Cost and type of materials – both immediate and longer-term (e.g. will new windows need painting in two year's time; can the home owner afford on-going maintenance cost?).
- Quality of work undertaken. Do the works represent value for money, or will they need re-doing due to shoddy workmanship?

The council's emerging strategy seeks to respond to the issues raised by residents. Many are anxious when seeking to have work carried out due to bad publicity about builders; others may have unwittingly instructed a poor quality contractor. To help overcome this, the council is keen to promote a list of suitably qualified, skilled and trustworthy contractors so that residents receive a quality service that represents value for money. The council could also assist in reducing labour costs by developing an area-based approach. This would enable low-income households to 'share' overheads such as travelling costs of an appointed contractor who operates on particular days on a diary basis. Additionally, some contractors specify and carry out works that are unnecessary. The council is considering introducing a 'Home Survey Package' whereby suitably qualified local authority staff could fully survey individual houses and offer advice on what actually needs doing, the priority that should be afforded and advice on best use of a low-income for maintenance and repairs necessary. Either scheme would help householders achieve only necessary works that have been carried out to an acceptable standard.

The Home Maintenance Strategy is being further refined and the council are eager to ensure that services offered reflect what residents actually need and want. In taking this forward, the council is considering commissioning research to identify what home owners feel would be of assistance to them in ensuring effective home maintenance. This partnership approach – developed through focus groups - will help to reveal problems and possible solutions from the perspective of residents and will feed into the council's policy-making process. This is still in early stages, but will be evaluated in the fullness of time.

Conclusions

Most sub-standard housing is in a poor condition because owners cannot afford repairs. The English House Condition Survey continues to report that low income groups – particularly ethnic minorities – are the most likely to occupy poor housing. There is no doubt that properly targeted and funded grant system can have a substantial impact on stock condition in the private housing sector. However, local authorities are faced with reducing capital and increasing disrepair in an ageing housing stock and need to find new and realistic ways to move forward.

The government now requires that home-owners – both owner-occupiers and private landlords – take on greater responsibility for maintaining, repairing and improving their properties. Some may be able to afford to, but do not. Some may not be able to afford to, so do not. Others may simply lack the will, or interest, or knowledge, or have insufficient knowledge, skills or equipment to instigate their own repairs, or confidence to locate and instruct a suitable contractor. Local authorities are well placed to be able to develop strategy that responds to local needs and is able to provide new and viable ways forward in encouraging and enabling home maintenance, but its remains too early to assess the success of new initiatives.

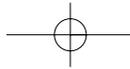
Alternatives to existing grant funded regimes need to incorporate new approaches in initiative and attitude of both home-owners and local authorities in delivering their strategic housing responsibilities. Fundamentally, local authorities need to develop a variety of resource and support initiatives to encourage and enable home-owners to maintain their homes for the future. Regardless of arguments for and against such initiatives, there is little doubt that local authorities need to find new ways of encouraging home-owners to sustainably invest in maintaining their homes. The Bellenden Renewal Team are eager to continue to work toward finding a realistic way forward through a Home Maintenance Strategy that is really able to respond to the needs of low-income groups.

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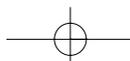
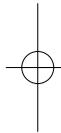
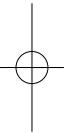
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Safety Management in Small Businesses: promoting good practice in SME's

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Abstract

In June 2000 the Government launched a strategy aimed at 'Revitalising Health and Safety'. Two years on, at a conference in May 2002, the Local Government minister admitted that involving SME's in the strategy process was proving a "challenging" task. He acknowledged that the daily survival pressures on small companies "can often mean health and safety being quietly relegated to the backburner and forgotten about".

This paper reports on the findings from four years' field-research. The crux of the study was the investigation of how safety is managed in small businesses. The research considered how management in micro and small organisations differed from the approaches championed by large employers. The concern was that what is good practice for some businesses might not transpose to others which differ in numbers of employees, managerial complexity and access to information and advice.

The research was based on a multi-method research design utilising case studies which included a postal survey and focus groups. The aim of the study was to identify how control and management of change for safety improvements were effected in small businesses, highlight where there was good practice which could, in full or part, transferable to other SMEs. The case studies were therefore not intended merely to provide an accounting of how many small firms were under-performing, or performing well.

The study revealed four key elements to successful hazard identification and acknowledgement: formal training, experience or awareness of industry norms to facilitate the identification of hazards; regular and thorough workplace inspections and checks; reviews of accident/incident reports for causality; and regular 'intelligence' or feedback from informed staff. Where one, or more, of these elements was lacking the 'safety performance' was found to be worse than where all elements formed part of regular managerial processes.

Keywords: Case studies, environmental health, health and safety, safety-management, SME's.

Introduction

The Government's strategy 'Revitalising Health and Safety' was launched on 7 June 2000 (DETR, 2000) with the intention of "injecting a new impetus to better health and safety in all workplaces" - John Prescott. The strategy recognises "the need for positive engagement of small firms".

Small businesses must be included in any strategy of this type, aimed at promoting better working environments. The small business sector represents a sizeable proportion of all businesses in the UK. Small firms, and the self-employed, represented ninety-nine per cent of all firms by the mid-1990's (Bacon, 1996; Small Firms Statistics Unit, 1995). There is a continuing trend for larger firms to sub-contract peripheral activities. This greater use of contractors and agency staff has resulted in nearly three and a half million firms (90%) employing fewer than five people. Within the UK private sector forty-four per cent of all employment is within smaller firms i.e. those which have fewer than fifty employees. Small firms are therefore an important consideration when it comes to improving occupational health and safety generally. It is predicted there will be a continued increase in the small business sector and that this sector will increase its share of total employment in the UK (HSC, 1998).

It has been reported (Ibbetson, 2000) that small businesses can be staid, that their attitude to change is determined by the size of the organization, with the very smallest reluctant to make any changes to the day-to-day running of their undertaking. This reluctance to manage change can influence how occupational safety is approached. It has been identified by others that we need a better understanding of "how safety is influenced by the way in which we manage organizations" (Hale et al, 1998, p1). Small businesses do not manage health and safety in isolation (Seppala, 1998). Their approach to workplace health and safety is

influenced by the manner in which these businesses manage day to day risks generally.

In parallel with the rise of the smaller business has been a growth in sophistication of approaches to the management of safety, and the development of safety management systems. A new movement in safety has been highlighted (Haber et al, 1990). This has been termed the "third age" of safety (Hale et al, 1998, p3, Hale and Hovden, 1998). This movement focuses directly on the structure and functioning of management. However, in a review of safety research, undertaken only four years ago, there were hardly any studies that evaluated the success of management programmes for organizations, almost all addressed process safety management (ibid). "There is considerable lack of clarity about what is important for the management of safety, particularly in organizations other than machine-bureaucracies" (Hale et al, 1998, p11).

The focus of this paper is the examination of how safety is managed in small businesses. The concern is that what is good practice for some businesses may not necessarily transpose to others. Good practice and legislative control have historically been based on industry norms within the largest businesses. The contention is that there is a mismatch with the needs and abilities of the small employer; and as long as this mismatch continues small employers feel disadvantaged by the control system and non-availability of sources of advice.

The aim of the research was to identify how control of, and management of change for, safety improvements are effected in small businesses. Where there is good practice, to highlight those parts of the approach that may be transferable to others, and if possible describe a method of transfer of that good practice.

Methodology

Previous organisational researchers have suggested that no matter how small the sample, nor what the researcher's interest, it was important to go into an organization with a well-defined focus (Mintzberg, 1979). The design of the fieldwork, in this research, includes multiple case studies, rather than single site.

The research brief included many areas of examination. The concept of 'small' had to be refined. There was also a need to show whether, or not, small businesses differed from large businesses, within the study. However, the primary area of investigation was the way in which small businesses manage safety. Therefore, to refine the concept of 'smallness' for businesses, it was necessary to examine previous research methodologies in order to determine an initial working definition for 'small business'. It was

considered preferable to allow a concept of size to emerge from the preliminary studies rather than adopting arbitrary numerical definitions. However, an initial working definition was necessary in order to refine the sampling criteria for the first study. Thus, for the purposes of this study a 'small' business was taken to be: 'one with not more than 25 employees under contract at any one time, employed either full or part-time. It was legally independent and had no more than one administrative site'.

In order not to exclude too many businesses from the initial investigation a second group of businesses was identified. These businesses were still legally independent, with only one administrative centre but with between 25 and 50 employees. This second group was initially termed 'medium-sized'.

To design a study, incorporating an element of observation, was believed to require a broad knowledge of the operating constraints of the small business sector. The use of language and idioms in relation to workplace safety, and the extent, location and nature of organizations within the small business sector, were also important. To achieve the initial understanding a survey instrument was used. However, surveys could not provide the depth of inquiry deemed necessary to reveal 'how' safety management is accomplished. Therefore, the initial phase of the study also included focus groups. The meetings were scheduled after the questionnaire, so the preliminary data could provide a basis for discussion.

Sampling issues were central to the ability to draw generalized conclusions from the findings of this research. Businesses were selected and compared with the working definition of 'small business' for fit. The initial sample was geographically restricted in that it was centred on a single county: Leicestershire. It was considered desirable to restrict the potential sample group to those subjects within a defined district boundary. It was intended to follow the dictates of area probability (Fowler, 1984).

Leicestershire was the county targeted. The county was already defined, on maps, and subdivision was allowed by following the prescribed political and geographical boundaries of its constituent districts. These district boundaries are clearly mapped and form mutually exclusive sub-areas. Initially businesses were selected and compared with the working definition for 'fit'. A database was created and the sample selection was made from the database. The original assessment of 'fit', with the working criteria, was made on very limited information. The area of Leicestershire, at the start of the study, was divided into nine parliamentary constituencies and included 25,900 businesses registered for VAT (Mistry, 1995). Charnwood had 4,037 of those VAT registered businesses and Rutland

accounted for 523. The VAT registered businesses did not include all businesses. These records could only provide a guide. The target businesses, the 'small' ones, are likely to be below the registration threshold and therefore invisible to the statistics (Ganguly & Bannock, 1985).

While the relative size of each sector was known for VAT registered companies those too small to reach the VAT threshold for turnover are missed from this count (Ganguly and Bannock, 1985). For the early part of the study the assumption was made that the proportion of small businesses to large would remain constant in all sectors, and thus the sample could be stratified using a sectoral model. This assumption was known to have a high probability of being flawed but was adopted for convenience subject to later testing of any results.

There was no adequate register of small businesses and no obvious way discovered to obtain comprehensive information about the small business sector directly. A variety of databases were regularly trawled sorted and checked for duplicate entries and applicability to the sampling parameters. Random selection was only employed after screening out those firms that had already been contacted and those that were obviously larger than the nominal (50 employee) threshold.

The survey distribution was in three tranches. The first postal questionnaire was sent out initially to 250 small and medium-sized companies in the local Charnwood area. In the second tranche a questionnaire was sent to a random selection of 400 businesses from the CHaRM database. Tranche 3 was a survey of a further 100 Leicestershire firms; these were randomly selected from Local Authority Economic Development Business Indices, TEC publications and Chambers of Trade and Commerce publications. The overall response rate was over seventeen per cent.

After the survey phase, focus groups were held with managers from small businesses. However, as it was suspected that many managerial responses may be intuitive, case studies were a key part of the data gathering. Convenience governed the selection and number of respondents interviewed. The initial sample of thirty-five (35) was made randomly from the CHaRM database. This database contained details of Leicestershire businesses gathered from a variety of sources. The sample limitation for focus groups was geographically defined. This was consistent with the postal survey. Consistency of the sample base allowed for later triangulation. The use of the same sample population also saved time and effort in construction of a separate, and unnecessary, second database. The first geographical spread of respondents was determined by the defined

boundaries of the postal survey, 'Charnwood Borough' in Leicestershire. The area was local to the research base, and had 4037, VAT registered, businesses (1993 figures). This base population was considered adequate to support further sampling.

Subsequent to the completion of the survey and focus groups, a case study approach was deemed appropriate because the main purpose of the research was to inquire into the manner in which small businesses manage safety (Mintzberg, 1979). Other more recent research has also adopted the case study approach (Lindsay, 1998; Stuart, 1999; Simard et al, 2000). In all thirty-nine organisations were visited to compile the case studies. The results of the surveys and focus groups were used to guide the design of the main study, the case studies.

The same database was used throughout the research to ensure that no business had been, inadvertently, approached more than once for information. It became clear that the absence of specific data about small businesses might cause problems in determining a stratified sample that adequately reflected the industry sectors within Leicestershire. To overcome this problem the main study focused on a single district within Leicestershire, where information was more readily accessible. In selecting a sub-population for the remainder of the study it was possible to make a judgement about the applicability of that population in terms of industry sectors represented. The chosen district presented a slight anomaly because of the very high proportion of small businesses across a wide range of industry sectors.

The case studies in the sub-population were by inspection, observation, interview and documentary search among a sample of businesses. Professional judgement was used to assess each employer's performance, in relation to the hazards observed and the risks perceived to affect both employees and the public. The judgement was based on the 'standards' of safety, health and welfare observed during each visit. A subjective assessment was also made of the capacity of management to maintain high standards.

Results

Among the thirty-nine organisations visited, the range of business size extended from three to forty-eight employees. The mean size in the sample was sixteen employees. The median was eleven employees. In the sample, there were five businesses with less than five employees, Fourteen businesses with between five and ten employees, Fourteen businesses with between eleven and twenty-five employees and six larger businesses (twenty-six to fifty employees).

The results from the surveys indicated there seems to be natural sub-divisions within the small business

sector, based on the size of the workforce: less than five employees, five to ten employees, eleven to twenty-five employees and twenty-six to fifty employees. There were observable differences in performance, according to the size of the business. More than eighty per cent (87.5%, 7/8) of the businesses performing adequately had more than ten employees. In that same group there was only one of the smallest organisations. Whilst in the group of businesses that were under-performing, sixty-four per cent (16/25) were the smallest businesses.

An understanding of how managerial tasks are allocated was an important issue when considering safety management in smaller businesses. A person who assumes responsibility for a task needs the necessary skills to enable them to fulfil the role. The initial postal surveys had revealed that very few smaller businesses had a large enough workforce to justify employment of a dedicated safety professional. The skills within the workforce may, therefore, be a significant influence on the way health and safety management is perceived, and effected, in many small organizations.

The area in which the safety performance was observed to be weakest was in electrical testing. The next area of poor performance was accident recording; and the third area was training. Overall performance was not good. However, the degree of achievement varied significantly between the businesses.

The survey responses indicated some common areas where regulation was reported to have an impact. A metaphor evolved, "Big Brother", to describe certain managers who saw regulation and legislation as 'a driver for change' ... "an incentive to give health and safety matters due attention" ... "encouraging staff to take safety into account". It was the threat of action that was apparently the driver, Hence the concept of 'Big Brother', [after George Orwell's (1949) supreme

control mechanism]. The inference drawn from the quotes was that 'regulation' was a means of coercing a reluctant response. However, not all respondents in the surveys needed coercion.

During the observations it was found that none of the businesses that were successfully managing safety had a negative attitude towards the process. This is not very surprising. However, in thirty-six per cent (9/25) of cases, the business found to be under-performing had a manager who was positive, or very positive to the idea of managing safety issues. This suggests that although there is a desire to succeed some barrier must exist that is frustrating that desire.

A comparison of structural differences was made between those businesses under-performing and those performing adequately. During the initial studies it had been revealed that in three-quarters of small firms it was the senior manager or proprietor who was nominally responsible for disseminating health and safety advice among the employees. Where it was an owner who assumed the responsibility for managing safety it was likely (59% of those in that category) that s/he would have received no relevant training at all. Therefore the ownership profile could be expected to have a bearing on the adequacy of safety performance.

In the survey results, the percentage of organisations where one manager accepted responsibility for health and safety along with his other duties was seventy-eight per cent [45/58] when only the 'small', 'mini' and 'micro' firms were examined. Most of these managers had received no or very little specialist training.

More than a third of small businesses found to be under-performing were family businesses (Table 1.0). These seem to fit the profile, suggested by the surveys and focus group discussions, of small businesses with limited access to necessary advice and guidance and a lack of necessary skills, in safety management. It

Table 1.0: A comparison of structural differences between poor safety performers and those who performed adequately

	Under-performers		Adequate performance	
	Percentage	Count	Percentage	Count
Family business	36%	(9/25)	0	0
Single owner-manager	40%	(10/25)	13%	(1/8)
Partnership	20%	(5/25)	0	0
Silent owner / professional manager	4%	(1/25)	37%	(3/8)
Board	0	0	50%	(4/8)

was these family businesses and single owner-manager businesses that formed the majority (76%, 19/25) of those business which were failing to achieve the minimum standards of safety practice.

The "silent owner with a professional manager" was frequently represented (37%, 3/8) among those businesses that were successfully managing safety. The professional manager was often a person with experience of more than one business, and formal management training. The Board structure was also represented well in this group (50%, 4/8). From the survey responses it was noted that there was an increase in the management function with size of organization. In the focus groups it was suggested it could be lack of managers in smaller firms that had implications for owners and managers needing to delegate health and safety management tasks. The Board structure gives more scope for individual members of the Board to develop specialisms. Within a Board there is a greater chance of a 'safety champion' emerging; one who has time and skills to push the notion of good safety practice at a strategic level.

From the questionnaires and focus groups it had already emerged that a number of the managers adopted a very passive approach to safety management or attempted to intentionally transfer their duty of care to a third party, by using consultants or relying on their insurers. There were also those who did not perceive the risk of an untoward event as real. The management style was therefore seen as being a key area of investigation in determining good practice, and barriers to achievement.

During the case studies, this prevalence of a laissez-faire attitude was still apparent, among the group of under-performers (Table 2.0). Almost a quarter (24%, 6/25) of the businesses, that were not performing well in areas of safety, were categorized as exhibiting a laissez-faire or passive managerial style. In one

young manufacturing company the owner-manager described his main concerns as the gaining of new customers, and balancing cash flow. During the visit, to this plastic-manufacturing plant, there appeared to be no active supervision. The owner approached no one during the walkabout and engaged no one in conversation. There was no feeling of order or control in the factory. The owner never made eye contact with any employee and many potentially dangerous practices went unchallenged.

Among those businesses that were performing adequately, in achieving safety management outcomes, all could be described as hierarchical organizations. Each of these hierarchies had well established delegation channels, and routes of communications. Roles and responsibilities within the structure were also well understood, even where they had not been formalized or documented.

Of those hierarchies that were poor performers a number had an autocratic owner, or senior manager. The autocrat resisted any pressures to delegate either tasks or authority.

The focus groups also provided some evidence that there were differences between managers in motivation and approach to safety management. From the discussions a picture of the perceptions of the owners, and managers of small, mini and micro-businesses emerged. In general, participants considered health and safety to be important as they cared about their workforce. However, this positive view was not universal.

There was evidence, also from the focus groups, that a number of managers adopted a very passive approach to safety management. Some of these appeared to adopt this approach because of a lack of knowledge, and confidence on how to tackle that area of the business operations; others seemed ambivalent to safety as an issue.

Table 2.0: A comparison of the differences in managerial style between poor safety performers and those who performed adequately

	Under-performers		Adequate performance	
	Percentage	Count	Percentage	Count
Hierarchical with established delegation channels	12%	(3/25)	100%	(8/8)
Autocratic / No delegation	56%	(14/25)	0	
Passive / Laissez Faire	24%	(6/25)	0	
Day to day supervision / Management By Walking About [MBWA]	8%	(2/25)	0	

Table 3.0: Scoring system to reflect the subjective assessment of strengths and weaknesses in performance

2	good or very good performance, examples of good practice identified
1	good performance
0	variable performance, some parts right, evidence of some omissions
-1	poor performance
-2	bad practices observed or wilful disregard

The industrial sector was expected to exert an influence that may affect the approach to safety adopted by the business and the nature of issues addressed. However, within the cases studied the industrial sector did not seem to determine the success of that business, in managing safety (Tables 3.0, 4.0 and Figure 1.0). There were some differences in approach that seemed to stem from industry norms. For example, one brewery was focused on control measures and quality standards, primarily because the brewing process was so sensitive. This notion of control had been transferred into the area of safety management. The manner of managing safety in this plant was traceable, back to the manufacturing process itself.

The surveys and group discussions also revealed an apparent reliance, among some managers of smaller businesses, on the general media for safety information. This media influence seems to have skewed perceptions, and engendered fear of enforcement action. This fear was not based on the personal experiences of those within the pilots but was a widely expressed phenomenon. In some cases this fear was expressed as a general negativity towards enforcement, the legislative duties themselves and the expectation that the manager

should assume responsibility for the safety and welfare of others.

The findings, from the early phases of the study, provided evidence of barriers to safety management. These barriers appear to be both internal and external. The main external barrier seems to be an absence of accessible, reliable, competent advice source for small businesses. Both the survey and the focus group discussions repeatedly revealed a limited safety knowledge and lack of access to necessary skills among managers. The main study seems to confirm the importance of skills in relation to safety management. The skilled and professionally based businesses exhibit a higher rate of success than other businesses; whilst smaller business, within the study, reliant on unskilled staff have a high incidence of under-performing.

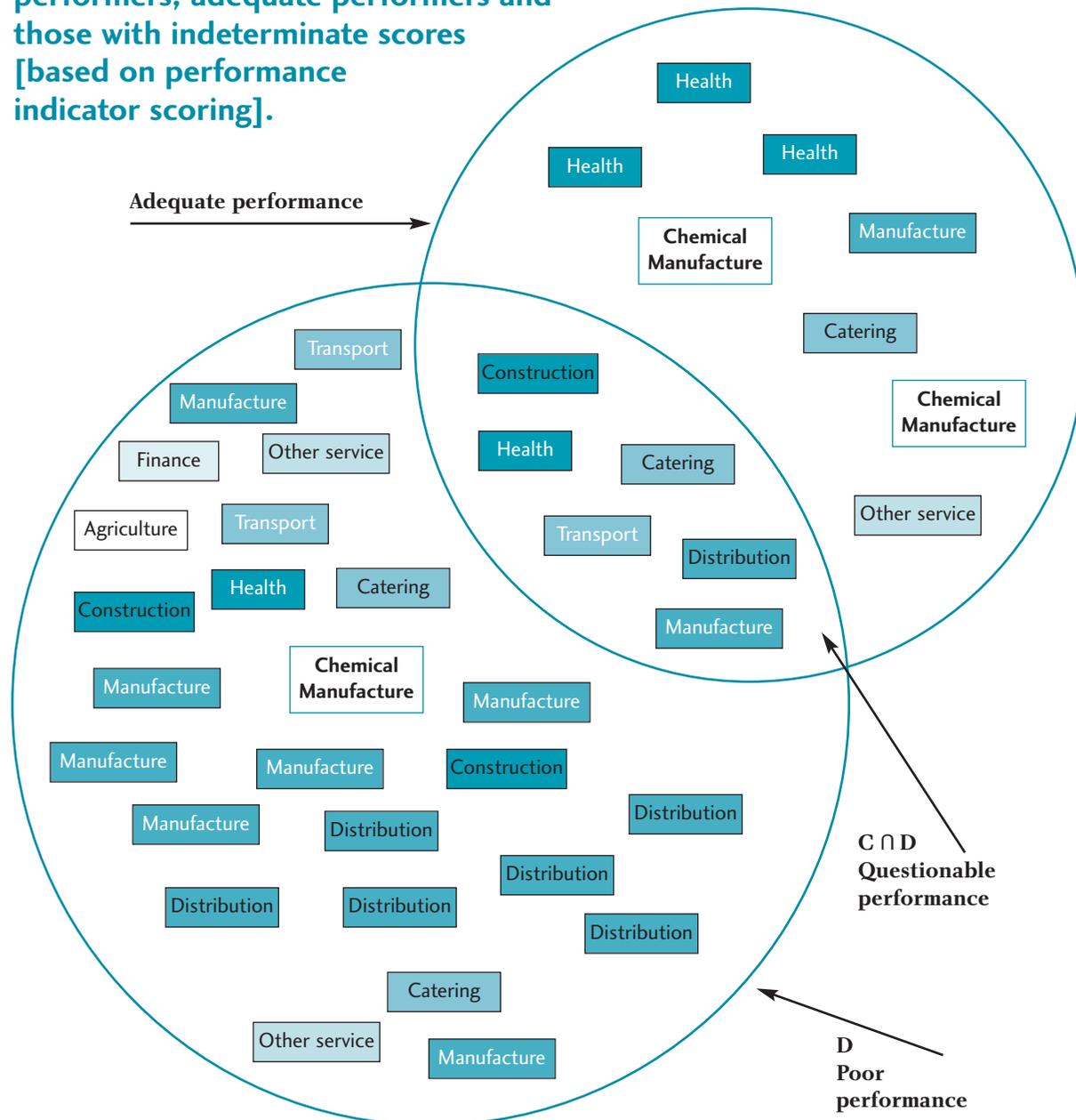
Lack of skills and training opportunities were recurrent themes among 'poor performers'. Smaller firms, within the survey, were deficient in staff trained in health and safety management. This finding mirrors the findings of other research into general training provisions in smaller businesses (Walker, 1995; Abbott, 1993). From the comparison of all cases in this study it would seem businesses reliant on unskilled staff were prone to failure, in attempting to manage safety. It has been suggested an unskilled work force may create a predisposition to poorer safety management. This raises the issue of who needs the safety skills also in which areas the skills are required.

In small businesses systems were generally concerned with day to day running of the business: payroll, invoicing, etc. In each case the systems used were practically based and showed evidence of having evolved. Those small businesses that were performing badly exhibited differences in their use of systems, when compared to those performing adequately. Within the majority of those businesses, that were failing when managing safety, there was no evidence of formalized or documented systems. During the visits it was observed that operations were pursued and controlled by custom and practice of the individuals rather than an overtly systematic approach imposed, sanctioned or even recognized by

Table 4.0: Statistical comparison of the groups of businesses, based on their safety performance rating

	Score range	Mean score	Standard deviation
Adequate Performers	0 to 10	6.13	4.925
Borderline Group	-2 to 5	1.33	2.56
Poor performers	-9 to 3	-4.4	3.07

Figure 1.0: Venn Diagram showing Industry sectors of poor performers, adequate performers and those with indeterminate scores [based on performance indicator scoring].



the manager. Those managing safety adequately had a number of documented systems. Those businesses least effective in managing safety were performing less well overall. The areas where the poor performers had, on average, most difficulty seem to be primarily in seeking remedies to problems. Risk assessments also seem to cause difficulty. The area that seems to be handled better, on average, was hazard identification.

Some other commonalities did seem to emerge from the comparison of approaches. In two businesses the managers exhibited positive desire for sound safety records, in the third the manager seemed much less focused on this as a goal. However, the manager, who claimed to adopt a laissez-faire attitude, because of an

“inherently safe” [his perception] environment; had experienced staff who had assumed responsibility for health and safety. He had effectively, if apparently unconsciously, delegated ‘health and safety’ to a champion within the workforce.

From this investigation it seems there must be leadership to promote safety; an open management style, that encourages rapid and direct vertical and horizontal communication; and timely feedback.

The weakest elements of safety performance were in assessing risk and choosing remedial action (Table 5.0). This is in line with the views expressed during the focus groups. From the survey results it had been discovered less than half of the ‘mini’ and ‘micro’

Table 5.0: Average scores obtained from performance rating process, using original groupings

Performance group	Hazard identification	Hazard acknowledgement	Risk assessment	Remedy choice	Communication of risk
Adequate performers	1.3	1.3	1.1	1	1.1
Intermediate group	0.41	-0.25	0.17	0.17	0.25
Poor performers	-0.64	-0.84	-0.92	-1	-0.8

businesses had even made the attempt at assessing risks in a structured way. Comments indicated that they did not know where to start. The problem seemed to revolve around documenting policies and risk assessments, and exposing them for scrutiny outside the organization.

Impact for those attempting to engage small businesses to meet the government's strategic objectives

Most small businesses are in the local authority enforced sector (HELA, 1998) and many local authority environmental health officers are ideally placed to influence the success of the Government's strategy in this sector. The vision within the strategy is to create more competent employers, led from Board level.

This research has confirmed that very few smaller businesses had a large enough workforce to justify employment of a dedicated safety professional; and in three-quarters of those studied it was the senior manager or proprietor who was disseminating advice. The Board structure and 'professional managers' were a feature of the more successful operations. However, the very small undertakings do not often have a Board, or formalised structure. To create 'competent employers' among small business it may be necessary to excite the interest of the owner or manager in pro-active safety management. It is also may also be important to recognised when that individual has a passive management style or difficulty in delegating or communicating. If the owner or manager seems unsuited to the task it may be prudent to attempt to identify an individual within the business who can act as 'safety champion'.

The research also identified that there was a general desire for a positive safety culture among many managers, although the wish was not universal. It was clear that the desire alone did not result in better performance. A significant barrier to achievement

was the lack of relevant knowledge identified; coupled with a difficulty in accessing suitable sources of advice.

It is in the provision of well targeted, reliable advice that environmental health professionals have long excelled. It was clear from the focus group discussions that many managers were not familiar with the language and idioms of safety professionals and enforcers.

The HSC has placed great weight on the availability of the Small Business Service (SBS) and aim to have "a full range of appropriate material on health and safety issues available to small firms through this channel" (HSC, 2000; Action Point 24). A search of the SBS website on 3 July 2002 using key words "Health and Safety" revealed twenty-one documents. None of these, on cursory inspection, seemed relevant to the query. The search is reliant on the data being available and accessible. Accessibility by search is dependent on the word or phrase used and if managers are not familiar with the language of safety they will struggle.

It seems there may be an opportunity for local authorities to provide advice sessions, directly or thorough partners, through the Community Partnerships/Community Strategy programme. The increasing accessibility of the Internet to many businesses creates an opportunity to promote the use of local authority or community web-sites; either as direct information sources or by providing links to other sites with reliable sources of information. The Health and Safety Executive has promised "sector-specific introductory guidance for small firms, supported by case studies of best practice" on their website (HSC, 2000; Action Point 25). The challenge will be in presenting difficult concepts like 'assessing risk' in a simple and practical way while avoiding "safety-speak".

The research identified a barrier to active safety management, a problem with resources. There were

apparent difficulties in funding either a dedicated safety professional, or safety training, particularly among business with less than forty employees. There is a grant scheme being considered to encourage small firms to invest in better health and safety management (HSC, 2000; Action Point 26). In the meantime DfEE Small Firms Training Loans can provide low cost credit to meet health and safety training.

Local authority inspectors have been asked to draw this loan scheme to the attention of companies when they visit. There seems to be a partnership opportunity, between the high street banks, local colleges/trainers and health and safety enforcement staff, for disseminating this information. If information about funding streams is provided together with advice and guidance on training opportunities, then take-up should be further encouraged.

There may also be an opportunity to gain assistance from the insurance industry. The research showed some attempted to intentionally transfer their duty of care to a third party, by relying on their insurers. The HSC has recognised that the insurance system may motivate employers to improve their health and safety performance (HSC, 2000; Action Point 5). The insurance industry has indicated they would welcome more information about their customers' safety performance, where those customers hold employer liability insurance.

There may be scope to set up a scheme whereby an insurer requires full disclosure of identified risks and accidents, from their customer, before renewing a policy. The local authority inspector could supply to the employer a short report of the outcome of every investigation of a reportable accident; including likely cause (where identified), steps taken by the employer since the incident, and relevant hazard(s) still present at the conclusion of the investigation. The reports, in the hands of the insurer, may prompt a visit by a risk assessor. In this way there is an increased probability that recurrent accident types are discovered by the insurer and that the employer is encouraged to reduce the risk of an incident. Such an arrangement would not replace the enforcement system, including the use of improvement notices where appropriate, but could introduce a back-up system. The insurer would probably wish to see any risk reduction intervention, by the employer, sustained, or improved on, year on year.

The 'Big Brother' metaphor underlines the importance of continuing regulation to safety management. There may always be the 'Big Brother' types, who are motivated to act by threat of prosecution.

Conclusions

The study has provided a rich picture of safety management systems and practices in small businesses. The findings are considered to be valid for those businesses that were subject to inspection, at the time of the visit. There were also common findings across all three phases of the study, which increases confidence in the validity. However, the small business sector is essentially a heterogeneous group and as such, generalizations are offered with a degree of caution. There appear to be four key elements to successful hazard identification and acknowledgement:

- Formal training, experience or awareness of industry norms to facilitate the identification of hazards. This foundation was also required in order for observations to 'register' with the assessor, so that the potential risk is immediately appreciated and the hazard is considered 'worth' noting.
- Regular, and thorough workplace inspections and checks.
- Reviews of accident/incident reports for causality. This information enriches the data from workplace checks and reduces the likelihood of 'missing/ignoring' significant hazards.
- Regular 'intelligence' or feedback from informed staff.

Where one, or more, of these elements was lacking the 'safety performance' was found to be lower than in those organizations where all elements formed part of regular managerial processes.

The enforcement officer's role in workplace audits and inspections are accepted. The educational opportunities arising from this access to small businesses, and the managers, should be exploited to increase the number of 'informed staff' in each organisation. By tailoring advice or guidance in a manner that is designed to reflect the normal operating environment of some small businesses one may make small business managers more receptive. The focus on good practice and the identification of potential barriers to success was specifically aimed at facilitating the practical application of the study findings.

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NB: The opinions expressed in this paper are the author's own and do not necessarily reflect the views or policy of her employing authority.

Characterization of leachates from a municipal solid waste landfill site in Ibadan, Nigeria

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Abstract

Leachates have been implicated in environmental pollution, developmental anomalies, birth defects, surface and groundwater pollution worldwide. The knowledge of the quantity and composition of leachates usually gives an insight into appropriate, effective and sustainable treatment approach. Hence, the study documented the physical, chemical and trace metals characteristics of leachates from the major repository of municipal solid wastes in Ibadan.

The study was descriptive and analytical in design aimed at documenting the quality of leachates with the intention of designing a cost effective treatment method. Integrated samples of leachates were collected during wet and dry periods and analysed for pH, Suspended Solids (SS), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Ammonia, Nitrate Phosphate, Sulphate and trace metals among others. Leachates were alkaline and amber in appearance.

Analyses of samples revealed variation during wet and dry periods, respectively in turbidity (83.4 and 139 Formazin Turbidity Units (FTU)), SS (213.6 and 148 mg/l), BOD (990.6 and 675.0 mg/l). Mean concentrations of SS (176.9 mg/l), BOD (795.8 mg/l) and nitrogen (885.1 mg/l) mainly as ammonia were high and prevailed in leachate samples. Nitrate (0.58 mg/l), phosphate (2.2 mg/l) and sulphate (84.9 mg/l) values were within acceptable limits recommended by regulatory bodies in Nigeria. Iron predominates and total metals concentration (175.8 mg/l) exceeded the regulatory limit of 3 mg/l. The ratio of BOD/COD ranged from 0.11 – 0.40. Therefore, physicochemical and/or biological methods of treatment are required to treat leachates before they are discharged into the environment at the dumpsite to either eliminate, or drastically reduce, the short term and long term detrimental effects on ecology, public health and the environment.

Keywords: Environmental pollution, leachate characteristics, municipal solid wastes, landfill, Ibadan, Nigeria

Introduction

The post independence era in Nigeria has witnessed a series of political and socio-economic developments. Today, the nation comprises 36 States and a Federal Capital Territory in comparison with the initial four regions at independence in 1960. Over the years, there has been a considerable growth in the awareness of environmental pollution problems and it has become a major national and international political issue. Ibadan, the largest, and one of the most populous, cities in sub-Saharan tropical Africa is experiencing the problem of municipal waste management, principally as a result of unplanned development, rural-urban migration and natural increase within the city (Akinbiyi, 1992). Yet this remarkable growth rate has not been matched by improvement in the quality of the urban environment. Instead, the demographic expansion and increased industrial and commercial activities have caused an astronomical increase in the volume and diversity of solid wastes generated in Nigeria (Aluko, 2001).

Although solid waste is an asset when properly managed, its volume has continued to increase tremendously in recent times in Nigeria as a result of socio-economic development including wage increases. In Nigeria, much has been, and is being, invested on municipal solid waste management in cities. But, little progress has been made because of severe financial, technological and institutional constraints within the Public and the private sectors apart from erratic growth of housing units in the inner core of urban cities (Ojeshina, 1999; Omishakin and Sridhar; 1985).

Despite the best attempts at waste avoidance, reduction, reuse and recovery (recycling, composting and energy recovery), landfill and waste disposal sites are still the principal focus for ultimate disposal of residual wastes and incineration residues world-wide (Charlotte, 1998; Waite, 1995). The placement and compaction of municipal wastes in landfills facilitates the development of facultative and anaerobic conditions that promotes biological decomposition of landfilled wastes. Hence, leachates of diverse

composition are produced, depending on site construction and operational practices, age of the landfill, landfill method, climatic and hydro-geological conditions and surface water ingress into the landfill (Campbell, 1993). Leachates therefore migrate vertically and laterally into the environment by direct discharge into the adjacent Omi stream serving about 16 communities around the landfill.

The realisation of the polluting effects of landfill leachates on the environment has prompted a number of studies. These include studies on domestic wastes (Sridhar et al, 1985), leachate quality (Aluko et al, 2000), as well as underground water quality (Loizidou and Kapetanios, 1993).

At the study site, leachates are discharged into the environmental media without treatment. This has resulted in low farm produce, release of obnoxious gases into the environment, contamination of the domestic water sources (Tairu, 1998). For treatment however, neutralisation, chemical treatment, gravel filtration, waste stabilisation pond and constructed wetlands, among other strategies can be investigated in order to develop a cost effective and sustainable method of treatment for leachates at the landfill site. This paper therefore aims to identify the composition of the landfill, with a view to estimating its polluting effects and to designing a sustainable, cost effective and environmentally friendly method of treatment.

Materials and methods

Study location

Ibadan, founded in 1829, has an estimated population of between 2-3 million. The city is situated at an average height of 200 m above sea level, drained by 4 river basins and surrounded by secondary rainforest as well as a savannah. Spatially, it sprawls over a radius of 12-15 km and experiences a mainly tropical climate with an estimated annual rainfall of about 1250 mm (UNCHS/UNEP, 1997). The landfill has been a dumpsite since 1994, incorporating drainage pipes and lined with clay and gravel, even though in reality, it is being used as an open dump. The site was predominantly a containment landfill that was upgraded and commissioned in 1998. The state-owned landfill sites are not properly managed since the operational practices at the site do not follow the standard, normal practices. The landfill covers about 6 hectares of land with solid wastes having being deposited to an estimated depth of about 1.5 meters. It has been used for municipal solid waste disposal for over 8 years. It receives domestic, industrial and institutional wastes by public and private waste management operators (Aluko, 2001). There are about 18 drains at the landfill downstream that collect leachate draining from the landfill into a central pond, from where leachates are discharged into Omi stream. This stream is the dominant source of water for about

16 villages in Ona Ara Local Government area, being used for domestic purposes and to process palm oil, which is their major local industry.

Leachate sampling and analyses

Leachate drains were strategically constructed to collect effluents from the waste mass into a pond by gravity. No precipitation had occurred in the week preceding sampling for dry period samples, while wet season leachates were collected during a rainy period. To determine the quality of leachates, integrated samples were collected from randomly selected leachate drains at the site (APHA, 1998, 1060A3). The samples were collected in well-labelled clean bottles that were rinsed out thrice prior to sample collection.

Analytical methods were according to "Standard methods for examination of water and wastewater" unless otherwise stated (APHA, 1998). Suspended solids and turbidity were determined using a portable data logging spectrophotometer, dialling (650 and 580) in the respective stored programmes, and results were expressed respectively in mg/l and FTU. Colour was determined by Lovibond colour comparator while pH was determined by glass electrode method with a standard calibrated pH. Dissolved solids, temperature and conductivity were metered in situ. An Atomic Absorption Spectrophotometer was used for metals analyses after samples were digested, using concentrated trioxo nitrate (V) and the volume made up to 50ml with de-ionized water. Dissolved oxygen (DO) was determined by Azide modification of Winkler's method. Open reflux method utilising potassium tetra-oxo chromate (VI) in boiling concentrated tetra-oxo sulphate (VI) solution in the presence of silver catalyst was used to determine COD while Nessler's method was used to determine ammonia. Nitrate was determined by phenoldisulphonic acid method (Taras, 1950) while phosphate was analysed by colorimetry using molybdovanadate method.

Results and discussion

The characteristics of leachates are shown in Tables 1.0, 2.0, 3.0 and 4.0. High concentrations of pollutants prevailed in leachates except for nitrate, sulphate and phosphate. This corroborated the findings of Tairu (1998), where a high incidence of mortality was reported among domestic animals, low farm produce and contaminated domestic water sources were reported and attributed to direct discharge of raw leachates into nearby environment at the landfill site. There is no threat of thermal pollution in Omi stream since leachates have an average temperature of 26°C. Leachates were amber coloured and alkaline with pH range of 8.03 to 8.28. This is typical of samples from aged wastes and such wastewater requires high coagulant dosage to ensure

sweep coagulation of pollutants if chemical treatment is desired (Harrison, 1996).

Leachates produced during wet season were more alkaline as compared to those produced during dry period. Leachates collected during wet period showed higher concentrations of pollutants particularly for conductivity, SS, dissolved solids, BOD, COD, phosphate, lead, iron and zinc except in colour, turbidity, dissolved oxygen, ammonia, nickel, cadmium and manganese (Tables 1.0, 2.0 and 3.0). This could be attributed to surface water ingress into the landfill that promotes solubilisation of pollutants from actively decomposing waste mass into leachates emanating from the landfill site (Campbell, 1993).

The suspended solids (176.9 mg/l) and turbidity (114.3 FTU) values indicated the presence of organic and inorganic solids that can provide adsorptive sites for certain chemicals and biological agents.

The dissolved oxygen (1.94 mg/l) was quite low and cannot support desired aerobic organisms downstream. This may upset the ecosystem, encourage development of septic conditions and lead to proliferation of anaerobic biota that may produce anaerobic conditions in Omi stream. The ammonia value (855.1 mg/l) provides evidence of its release from decomposition of nitrogenous substances in refuse. There is no set standard for ammonia in wastewater aimed for discharged into surface waters in Nigeria even though it is highly toxic and lethal to

most fish species even at low concentrations. Conversely, nitrate and phosphate values were within permissible limits (Ogban, 2000; Brock and Madigan, 1988). Iron (48.5 mg/l), manganese (22.6 mg/l) and zinc (12.0 mg/l) concentrations were high and may be responsible for unacceptable colour of leachates. The concentrations of lead (1.5 mg/l), cadmium (0.3 mg/l) and nickel (0.8 mg/l) were permissible for disposal at surface water or land according to the national regulatory standards (Table 3.0). Total metals concentration exceeded the national threshold value of 3 mg/l (Table 4.0). This may be hazardous to the ecosystem and public health since metals are cumulative toxicants that pose danger to organisms near the top of the food chain. It could also lead to bioaccumulation and bioconcentration of these metals in the food chain.

The characteristics of leachates made it mandatory for an appropriate and wise selection of a treatment method that can produce effluents that meet any given discharge standard. Experiments should be conducted at laboratory scale on possible treatment methods. It would have been easy if leachate treatment methods were transferable directly from one location to another. This is because leachates vary greatly in composition from site to site and, after a while, the treatment process initially selected may be inappropriate as the landfill ages (Horan, 1991).

Neutralisation is a process for reducing the acidity or alkalinity of wastewaters by using either bases or acids to produce effluents with neutral pH. In the case of

Table 1.0: Physicochemical characteristics of wet, dry and combined leachate samples

Parameters	Wet season	Dry season	Combined samples	FEPA's Standard
	Mean \pm SD n = 05	Mean \pm SD n = 07	Mean \pm SD n = 12	
Temperature ($^{\circ}$ C)	25.66 \pm 0.75	25.76 \pm 0.98	25.66 \pm 0.84	< 40
pH	8.28 \pm 0.38	8.03 \pm 0.36	8.17 \pm 0.37	6-7
Colour (HU)	423.60 \pm 101.20	434.71 \pm 35.20	426.08 \pm 68.96	7
Turbidity (FTU)	83.40 \pm 37.35	139 \pm 33.03	114.25 \pm 42.46	---
Conductivity (μ S/cm)	5662 \pm 2565.90	4807 \pm 1738.37	5155.75 \pm 2061.38	---
Total Solids (mg/l)	4819.6 \pm 1333.63	3883.43 \pm 1995.80	4270 \pm 1751.07	---
SS (mg/l)	213.60 \pm 99.54	148.71 \pm 51.48	176.92 \pm 77.91	30
TDS (mg/l)	4606 \pm 1367.05	3735 \pm 1981.42	4093.75 \pm 1743.28	2,000
Alkalinity (mg/l)	2208.40 \pm 1547.25	1421.43 \pm 838.54	1731.75 \pm 1206.84	---
Chloride (mg/l)	1606 \pm 765.44	1271.29 \pm 882.65	1450.08 \pm 802.49	600
Sulphate (mg/l)	111.18 \pm 44.66	65.33 \pm 32.53	84.86 \pm 42.79	500
DO (mg/l)	2.09 \pm 0.12	1.87 \pm 0.26	1.94 \pm 0.24	---
BOD (mg/l)	990.60 \pm 626.47	675.57 \pm 82.42	795.83 \pm 419.56	50
COD (mg/l)	3066.6 \pm 1538.46	2802.14 \pm 531.50	2914.50 \pm 1016.85	---

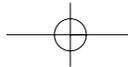


Table 2.0: Nitrogen and phosphate changes of wet, dry and combined leachate samples

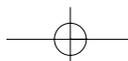
Parameters	Wet season	Dry season	Combined samples	FEPA's Standard
	Mean \pm SD n = 05	Mean \pm SD n = 07	Mean \pm SD n = 12	
Ammonia (mg/l)	622.26 \pm 178.65	1316.27 \pm 1299.95	855.13 \pm 775.34	---
Nitrate (mg/l)	0.47 \pm 0.18	0.58 \pm 0.37	0.58 \pm 0.29	20
Phosphate (mg/l)	2.31 \pm 1.28	2.07 \pm 1.87	2.2 \pm 1.56	05

Table 3.0: Trace metals composition of wet, dry and combined leachates

Parameters	Wet season	Dry season	Combined samples	FEPA's Standard
	Mean \pm SD n = 05	Mean \pm SD n = 07	Mean \pm SD n = 12	
Lead (mg/l)	1.693 \pm 0.64	1.34 \pm 0.89	1.490 \pm 0.783	< 1
Nickel (mg/l)	0.659 \pm 0.48	0.952 \pm 0.29	0.815 \pm 0.379	< 1
Cadmium (mg/l)	0.103 \pm 0.07	0.489 \pm 0.37	0.330 \pm 0.340	< 1
Iron (mg/l)	180.845 \pm 74.12	122.392 \pm 76.01	148.53 \pm 76.352	20.0
Manganese (mg/l)	22.623 \pm 12.87	24.854 \pm 9.90	22.634 \pm 10.645	05.0
Zinc (mg/l)	2.257 \pm 1.35	1.423 \pm 0.51	1.955 \pm 1.073	< 1

Table 4.0: Characteristics of leachates and national regulatory standards in Nigeria.

Parameters	Leachates	FEPA's Standard (recommended values)
Colour(HU)	426.1	7.0
Turbidity (FTU)	114.3	5.0
SS (mg/l)	176.9	30.0
BOD (mg/l)	795.8	50.0
Phosphate (mg/l)	2.2	5.0
Sulphate (mg/l)	84.9	500.0
Iron (mg/l)	148.5	20.0
Total metals (mg/l)	175.8	3.0



leachates from this dumpsite, Perchloric acid was used since leachates were alkaline. Neutralisation may be required prior to application of other treatment processes since it aids some dissolved particles to either flocculate or coagulate (Speight, 1996).

Gravel filtration (biofilter). This is a modified trickling filter, which entails construction of a circular or rectangular reactor that is filled with different sizes (25-100 mm) of permeable media, typically a bed of coarse gravel to a variable depth (1-3 m). Leachates will then be distributed evenly mechanically over the media and percolate through the media to be collected in an under drain system. Biofilm will develop on the filtration media after a period of acclimatisation and this microbial film is responsible for the purification of the effluents via degradation of the pollutants and incorporation of some nutrients into their cell mass. This method is comparatively simple to operate, having low running costs and being tolerant of short and toxic loading due to a short contact time between the wastewater and the microbial slime layer (Aluko, 2001). However, the loading rate would be determined after due experimentation for effective performance.

The waste stabilisation pond is a shallow excavation (1-3 m), which receives a continuous flow of wastewater. The degree of wastewater purification depends on either the length of the pond or the number of ponds in the series, and the retention time of the wastewater in the system (Horan, 1991). This system relies on sunlight for energy and incorporates diverse microbial flora, particularly algae and bacteria, to mineralise pollutants that are present in leachates. Purification is further boosted by sedimentation and an anaerobic metabolism. These are capable of producing effluents with a low BOD and nutrient concentration. The pond requires simple maintenance and can tolerate high hydraulic and organic shock loadings and heavy metals concentration up to 30 mg/l (Horan, 1991, Brock and

Madigan, 1988). This is only feasible where land is freely available at reasonable cost.

Constructed wetland is a treatment method that incorporates a tolerant plant species that is locally available at minimal cost. It can either be free flowing or sub-surface flow in design with a slope (1-4%) to allow gravitational flow of leachates through the system. It may be constructed by having layers of gravel or crushed rock supporting a topmost layer of sand where the plants are growing. The unit may be subdivided into inlet zone, zone of actively growing plants and outlet zone. The inlet and outlet zones are filled with gravel for effective performance. The efficiency of treatment is attributed to the retention time (10-36 hours) and to the development of microbial film and its diversity, which mineralises and degrades leachate components to satisfy energy and biochemical requirements (Brock and Madigan, 1988; USEPA, 1992). Typical features of this system, according to Cooper et al (1989), are: the roots of the plants grow vertically and horizontally to provide maximum contact with the leachates and gravel media; effluents which are treated by aerobic biological activity at the rhizosphere and inlet zone while anoxic and anaerobic treatment takes place at the middle and base of the system. Typical examples where constructed wetland technology is used to treat leachates is the Huneault landfill in Ontario, Canada (Sartaj et al, 1998). Constructed wetland technology offers an economic and sustainable solution for the treatment of leachates in developing countries where conventional treatment methods are hindered by finance,

To design a treatment process for the site, constraints such as lack of skilled personnel, a guaranteed source of power, facilities for plant operation and maintenance need to be considered. Therefore, typical methods of treatment that are sustainable, cost effective and feasible for such sites under the prevailing conditions are neutralisation, gravel filtration, stabilisation pond and application of

Table 5.0: Characteristics of Effluents obtained from some treatment methods and national regulatory standards in Nigeria.

Parameters	Leachates	Neutralization (Perchloric acid)	Gravel filtration	Constructed wetland	FEPAs standard
SS (mg/l)	197.5	146.5 (25.5)	53 (73.2)	37.5 (81.01)	30.0
BOD (mg/l)	712	424 (40.5)	166 (76.7)	99.5 (86.03)	50.0
Nitrate (mg/l)	1.06	1.21 (*14.2)	2.37 (*123.6)	3.67 (*246.2)	20.0
Phosphate (mg/l)	0.61	0.33 (44.5)	0.26 (56.3)	0.14 (76.5)	05.0
Lead (mg/l)	1.64	1.26 (23.4)	0.45 (72.5)	0.03 (97.93)	< 1
Iron (mg/l)	198.14	143 (27.8)	34.24 (82.61)	3.61 (98.18)	20.0

KEY: Values in parentheses are reduction in concentration of effluents in percentages.

* = Increase in concentration.

constructed wetlands, incorporating a locally available, leachate tolerant plant species.

The results obtained so far from some treatment methods (Table 5.0) showed that leachate management using a commonly found, leachate tolerant, aquatic plant (*Ipomoea aquatica* forsk) showed good reduction in effluent values and should be exploited for leachate treatment at the landfill site.

Conclusions

Solid waste management has been a very serious problem in urban centres. Wastes taken to a dumpsite for disposal yield leachates which cause serious problems through contaminating the land and water resources nearby. Developing countries like Nigeria have not been able to address these problems due to high costs involved. Thus, of the various solutions to this problem which are available, an aquatic plant, *Ipomoea aquatica* Forsk is found to reduce various organic and toxic pollutants to the desired levels. This plant is indigenous, tolerant to tropical climate and toxic chemicals. This phytoremediation technique can also be used in combination with other physico-chemical methods which prove to be viable and economic in keeping the environment safe.

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Writing for JEHR and other peer reviewed journals

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Abstract

This paper sets out the fundamentals of the peer review publication process, with particular emphasis on writing for JEHR. It is intended to encourage and advise a range of potential authors including those who wish to convert an academic dissertation into a journal paper (original research paper); environmental health and other professionals who have evaluated a professional practice issue and wish to write it up for JEHR (professional evaluation); and subject experts who wish to undertake a detailed review of the literature (review articles). The reasons for investing the time and effort to get published are examined and the benefits to the individual and the profession explored. In the main, though, the paper concentrates on the practicalities of constructing a paper for submission to the rigors of the peer review process. Advice is given on how to avoid disappointment at the first hurdle by selecting the right journal based on the published aims and scope. How to meet the challenge of converting a 20,000 or more word dissertation into a 6,000 word paper is addressed; compared with a dissertation, a journal paper requires more focus and precision in the theoretical framework, a more succinct literature review, more discriminating use of references, a more controlled description of the methodology, economical use of tables and figures and a more focused discussion of the results. The importance of constructing a paper precisely in accordance with the instructions for authors of the target journal is emphasised and practical advice given on the development of each part of the paper - Title, Abstract, Author(s) Introduction, Method, Results, Discussion, Conclusions and References.

Key Words: Author, dissertation, peer review, professional, publishing, scientific, writing,.

Why publish?

There are many reasons for aiming for publication. For practitioners, who constitute the vast majority of the environmental health workforce, publishing is increasingly seen as part of professional development

for the author. "Writing-up" research, evaluating a practice issue, or carrying out a specialist literature review is undoubtedly a keen learning experience and is recognised as such in many continuing professional development schemes, including those of REHIS and CIEH. It is also important to other aspects of career development. People who can communicate well with their peers are in demand and publishing in journals is an important means of demonstrating your skills. Publishing in journals also leads to the author being recognised by a wider audience and increases the chances of being invited to speak at conferences and seminars. This establishes you within professional networks and helps promote your work and your skills.

For academics, publishing is an important part of subject and career development. Publishing in peer-reviewed journals is one of the main criteria used by Government in the Research Assessment Exercise (RAE) which assesses the quality of research undertaken in a higher education institution. Evidence of publishing in quality journals is critical to being appointed as a university lecturer and in achieving success within that career both in terms of achieving tenure and promotion.

For the whole profession, publishing in professional and academic journals provides a resource for the development of colleagues. Dissemination of current research via peer-reviewed publications, which carry the credibility of a rigorous quality assurance mechanism, is an essential part of developing and maintaining the authority of a profession.

Converting your dissertation into a paper for submission to JEHR

All PhD and vocational doctoral programmes as well as many masters and undergraduate courses incorporate a research project which, typically, involves library and field or laboratory work carried out over a set period of time and written up as a dissertation (a study which is in part-fulfillment of a qualification) or a thesis (a study which is the sole

component of a qualification). Such studies can generate documents comprising from 15,000 to 80,000 words wherein there often lies information of importance to a much wider community than those who will read it in dissertation format.

Converting, for example, a dissertation into a paper for publication is a challenging task! Reducing the 20,000 (or more) word dissertation to perhaps 6000 words (the maximum for JEHR and many other journals) is not an easy task. It must be done with care and, ideally, with the collaboration of your academic supervisor who will be able to help you to decide, in the first instance, if your work is good enough for publication. In most cases it should be, provided the field and/or laboratory work has followed established research protocols.

The substance of the research methodology and findings must be preserved while reducing the extraneous detail that may be important for the academic components of the dissertation but not appropriate in a journal paper. Therefore selecting and rewriting rather than cutting and pasting is usually necessary. There is no need to try to incorporate a condensed version of every piece of information; only the most salient findings should be included. By eliminating the unnecessary, communication is improved! Seek feedback from your supervisor(s) and colleagues on what is salient and what is superfluous. In some cases there may be more than one paper in a dissertation but here you need to be careful about duplicated and fragmented publications; a dissertation should not be the basis for more than one research publication unless each paper is substantially different.

Compared with a dissertation a journal paper requires:

- a tighter theoretical framework (don't include everything about the research topic);
- a more succinct literature review (salient);
- a more discriminating use of references (selective);
- a more controlled description of the methodology (get rid of extraneous words and avoid excessive reporting and repetition);
- a more focused discussion of the results (explicit but not overly detailed);
- care not to over-interpret the validity and significance of the data;
- a more economical use of tables and figures;
- an agreement on the authorship (dissertations are always collaborations between students and their academic supervisors and sometimes practitioners and the names should normally be included in the publication);
- careful attention to the style of the target journal.

Where to publish: the target journal

In terms of academic credibility and status, publication in peer reviewed journals (sometimes referred to as refereed journals) is the ultimate goal. These are scholarly periodicals which require that each manuscript submitted for publication is judged by an independent panel of experts - scholarly, scientific and/or professional peers under the guidance and arbiter-ship of an editor, usually assisted by an editorial team. JEHR uses one academic and one practitioner peer reviewer for each paper submitted. Submitted articles or papers (often referred to as manuscripts at this stage) are evaluated firstly by the editor and, if considered appropriate, are subjected to what is referred to as 'double blind' peer review (see below).

There is a small number of peer reviewed journals dedicated to environmental health. Many others will, however, publish papers on environmental health topics. It is useful to find out in advance if the journal has reviewers who have expertise in environmental health issues.

The 'Double blind' Peer Review Process

When a manuscript is received from the author(s) it is first read by the editor to eliminate those papers which are clearly either not within the journal's remit and those which are well below the standard required. Most papers are, however, sent to two or more specialist reviewers whose identities are not known to the author and the identity(s) of the author(s) are not known to the reviewers - thus the 'double blind' terminology. In the case of JEHR we have a policy of selecting an academic and a practitioner peer reviewer for each paper. Only the editor knows both the identity of the author(s) and those reviewing the manuscript. This is designed to assure the independence and objectivity of the review process.

Following peer review the editor has three possible responses to the author(s):

- accept the paper as submitted (with or without minor amendments)
- request the author(s) to revise the paper based on the comments of the reviewers (with or without further peer review)
- reject the paper

The first two are fine and indicate that you have developed your paper satisfactorily. The third probably means that either you haven't achieved a high enough standard, or that you haven't targeted the right journal for the subject matter of your paper. Most commonly the editors' response is to seek a revision of the paper with the implication that the

paper will be published if it is revised in accordance with the comments of the reviewers and any additional comments from the editor(s).

JEHR administrative procedure

JEHR adopts a fully electronic procedure for the receipt, acknowledgement and peer review of manuscripts. Thus manuscripts are normally accepted only by email, as a single MsWord attachment. On receipt each manuscript is given a unique code (e.g. JEHR 03120 [year, paper number]) which will be used to identify the paper throughout the review process. The author is sent an email acknowledgement which may also give some general comments about the manuscript. Two peer reviewers are selected and the manuscript is sent to each with the authors' names removed and using only the unique code to identify it. Each peer reviewer has a unique ID (e.g. PR105) which is used, rather than their name, in all communications with the author(s).

When responses are received from the peer reviewers these are emailed to the corresponding author using a file name that links the manuscript code with the peer reviewer ID (e.g. 03120_PR105). In some cases the peer reviewer may annotate the original manuscript with the comments being highlighted in red; this is also sent to the author. The author is then expected to modify the manuscript and return it to the editors by email within a reasonable period of time, a couple of weeks perhaps, together with a brief summary of the modifications made or reasons why some of the modifications requested are not acceptable.

Constructing Your Paper

Aims and scope of the target journal/audience

It is important that you send your paper to the right journal. Thus you need to carefully read the aims and scope, which in the case of JEHR are found on the inside front cover of each issue. JEHR has a fairly wide scope and accepts manuscripts within the diverse range of topics which relate to environmental health. Most journals now have specific web sites or pages and much of the information you need to enable you to target the right journal, follow the journal style and submission procedures, can be accessed online; the JEHR website can be accessed at www.jehr-online.org.

It is a good idea to look carefully at other papers published in your target journal to get a better idea of the subjects they cover and how they are treated. Looking at other published papers will also help you with the style followed by the journal.

Instructions for authors

Scholarly articles follow a fairly standard format which commonly includes; an abstract, key words, introduction including a literature review, methods, results, discussion, conclusion and reference list. It is essential that you follow the instructions for authors in every respect. Unlike some professional and popular journals where the publishing team will make adjustments to the paper on behalf of, or indeed without the knowledge of, the author, this will not occur with a peer-reviewed journal. Thus if you haven't included an abstract, or key words, or have too many sub-headings or haven't precisely followed the referencing protocol, the paper will be sent back to you. You are the expert and only you can make adjustments to your manuscript. The Notes for Authors for JEHR are found on the inside back cover of each issue, on the web site and you can take the content of this paper as a further elaboration of the Notes.

The title

The title is important! It should be specific enough to describe the contents of the paper, but not so technical that only specialists will understand. The title usually describes the subject matter of the article, for example, 'The effects of exposure to electromagnetic radiation from mobile phones'. Or you may wish to construct a title which summarises the results of your study, 'Residents in the vicinity of mobile phone masts show higher levels of ill health'. Sometimes a sub-heading may be appropriate, 'The effects of exposure to electromagnetic radiation from mobile phone masts; a study of 1000 families'.

Authors' names and other details

Each person who made a significant contribution to the paper (or the research work on which it is based) is entitled to be listed as an author. This commonly includes the academic supervisor whose name may appear as a joint author. Some journals (e.g. BMJ) require an explicit description of the contribution of each named author.

The names should be formatted exactly as instructed by the journal. Sometimes this will include post nominal letters (letters after your name), sometimes not. Mostly authors affiliations will be included (i.e. employer or organization) and one author must be identified as the 'corresponding author' whose contact details will be published. For JEHR the style is:

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The Abstract

An abstract, or summary, is published together with the paper and is usually located on the first page. The abstract has several purposes. It gives the reader an overview of the content of the paper and may determine whether your paper is read or not. Abstracts are commonly published separately in bibliographical sources, such as MEDLINE and Environmental Abstracts. These large databases allow readers to quickly search and scan the extensive literature-base, and decide which articles they want to read in depth. Today they are typically electronic and facilitate comprehensive searching and downloading. JEHR publishes the abstracts in a separate publication which is distributed in printed form to all CIEH members.

The Abstract is typically between 100 and 350 words and you must follow the specification for your target journal. In the case of JEHR we specify the upper end of the word limit (300 words) to facilitate the construction of a meaningful separate Abstracts publication. Your abstract should therefore summarise the purpose, methods, results and conclusions of the paper. It's not easy to include all this in just a few words. Start by writing a summary which includes all that you think is important, and gradually edit it down to size by removing unnecessary words and phrases, while still retaining the necessary concepts, or, start by writing a bullet-point list of all the essential elements of each section, decide how many words you can allocate to each point and then create the abstract accordingly. Normally you shouldn't use abbreviations or citations in the abstract - it should stand alone without any reference list or bibliography.

Introduction

Those who are well informed about the subject suggest that you have about 30 seconds worth of readers time in the introduction to confirm to them that they should continue to read your paper! The introduction should therefore be fairly concise, but its length will vary depending on the subject and the overall length of the paper. It should be well referenced in accordance with the protocol followed by the target journal (see later). The introduction typically outlines the topic, explains to the reader why you were interested in the subject, summarises the relevant literature by means of a literature review

and states how your work, which you are just about to describe, contributes to the subject. The literature review should identify the key contributions of past researchers, and identify theories or patterns or schools of thought/key debates. You could end the introduction by suggesting that the current research is needed to answer some outstanding question and/or a concise paragraph which explains the aims of your paper.

Method

If you are reporting on a laboratory or field experiment you should include enough information here to allow other experts to repeat your experiment. The same can be applied to the methods section whatever type of research work your paper is based on. If you followed a complicated protocol, it may be helpful to include a diagram, table or flowchart to explain the methods you used. It is always necessary to provide the reader with as much confidence as possible in the way you carried out your work by explaining how the methods selected are appropriate, together with adequate reference to documented and evaluated methods.

Results are not usually included here although it may be appropriate to include preliminary results that were used to design or refine your method, for example, the results from a pilot procedure. The method section is usually where you outline how analysis of results was undertaken and assure your readership of the validity and reliability measures taken (trustworthiness in qualitative research) and any relevant ethical considerations. For example, if you used human subjects, did they give their consent?

Results

Obviously this is where you present your findings, but you need to think carefully about how you will present them within the constraints of a paper for publication; what would be suitable in a 20,000 word dissertation will almost certainly be beyond the scope of the average academic paper. Use tables and graphs if appropriate but it is a good idea to also summarise your main findings in the text. Many journals (including JEHR) request a minimal use of tables and graphs or suggest a maximum number allowable. If you do use tables or graphs make sure that you include an explanatory title. If you can summarise the information in a sentence, then a table or graph is not necessary.

The Results section is not the place to discuss the data; that comes in the formal discussion unless you have opted for a combined results/discussion section which may be appropriate in some papers. It is, however, the place to record data which may prove

that you 'failed' to prove your hypothesis (or 'hunch' in qualitative work). Remember, recording and discussing the research which 'didn't work' is as important as recording that which did. If you have conducted your research rigorously, then results differing from what you expected are as interesting and valid to report. You could prevent the wastage of many person-hours and considerable sums of research funds by warning others of pitfalls and unsuccessful designs!

Discussion

In this part of the paper you discuss your findings in the light of various themes. The structure and content will vary depending on the type of work you have done but it would usually be appropriate to include

- an analysis of your findings in relation to your main research question
- discussion of the relationship between your findings and the existing literature
- the significance of your findings to practice.

Here you can make full use of your earlier literature review and show how your results agree, disagree or add to the existing knowledge. It is not usual to introduce new literature into the discussion which has not previously been placed in context and had its inclusion justified.

Once you have finished a first draft you should go back and read your title, aim, objectives and research questions and then read the draft again. Does your writing reflect what the title claims the paper is focusing on? Are the aims, objectives and research questions adequately addressed? If they are, then your discussion is appropriate to the paper.

Conclusions

The characteristics of a good 'conclusions' section are simplicity, logic, ease of understanding and inclusiveness; not easy to achieve in a few words! Yet the Conclusions and the Abstract may be the only parts of the paper that some people read. It would be appropriate to include a brief summary of the paper's main points including the clear answers that you have been able to come to as a result of your work. Don't be afraid to say if questions remain unanswered as it may be appropriate to suggest some further research work to provide further answers. You may also wish to ask a provocative question and/or call for some sort of action.

References

The various academic disciplines use their own editorial styles for citing sources and for listing the

works that have been cited. For example, publications in humanities commonly follow the MLA style (MLA, 1999) and those in psychology and social sciences use the APA style (APA, 2001). There are several others including Harvard and Vancouver styles. Indeed different journals have their own style which may be a combination of documented styles, making it rather confusing for authors. Nevertheless the style required by your target journal must be followed precisely; you cannot expect the editor or the editorial team to adapt your referencing system – it will be returned to you for revision and could be one of a number of issues which leads to the rejection of your paper.

Fundamentally referencing is a way of indicating your sources in the body of your paper and of listing more details at the end. The purpose is to allow readers to easily see what sources you have used and to give sufficient information for them to conveniently locate the source in the literature. Whole textbooks are written on the topic of referencing (see below) and thus in this short paper we will give a brief outline of the system used by JEHR which is based on the Harvard system.

Referencing in the body of the text

Within the system described here there are several ways of citing (or acknowledging) the work of others in your text.

You can simply refer to the work in the course of your discussion:

In a survey of professional groups Murphy and Smith (1992) found that each of the groups thought there would continue to be an important use for printed leaflets in their work whilst others showed that the demand for printed material remains high, despite other methods of communication becoming available (Frazer and Smith, 1997).

Or you can use a short quote

Fleming and Harvey (2002) define work-related violence as "an action or perceived intention of a perpetrator which results in the threat of, or actual injury (physical and/or psychological) to the victim in the course of their work"

Note that you don't include the authors initials here and, where there are more than two authors, you use the term 'et al' after the first author's name to indicate that there are several other authors, all of whom will be in the reference list at the end of your paper. Page numbers are not normally included in the text if you are citing a journal article as the full details will be given in the reference list. However, if you are citing from a text book it is usual to give the page number in the text here (eg. Hetherington, 2001, p146).

The reference list or bibliography

This provides information on all the sources cited in the text and appears as a list at the end of your paper presented in alphabetical order of authors. The presentation is slightly different depending on where the source is to be found. In the following examples take careful note of the use of capital letter, italics, commas, periods and brackets.

Journal paper or article

Murphy, G.R., Ford, N.J. and Casstles, H. (2002) Investigating the Acceptability of Computer Based Training for Local Authority Health and Safety Enforcement Officer Training. *Journal of Environmental Health Research*, 1(2), 66-73.

A book

McCarthy, A. and Pritchard, C. (2001) *Health Promotion for Environmental Health*. London, Chadwick House Publishing

Chapter in an edited book

Fleming, P. (1999) *Health Promotion for Individuals, Families and Communities*. In Long, A. (ed) (1999) *Interactions for practice in community nursing*. Basingstoke, Macmillan. pp 228-59

Government sources

Government of Ireland (1997) *Sustainable Development; A Strategy for Ireland*. Dublin, Government Publications.

Legislation

Government of Great Britain (1998) *Human Rights Act 1998*, Chapter 42, London, Stationery Office Limited.

Web Site (this aspect of style is still developing and there are many variations – see Internet Resources below)

Trades Union Congress (2003) Union safety reps call for better health and safety training for bosses and workers http://www.tuc.org.uk/h_and_s/tuc-6632-f0.cfm [accessed 9 May 2003]

Conclusions (for this paper)**Internet Resources**

<http://www.jehr-online.org> (Aims, Scope, Notes for Authors, example published papers for JEHR)

<http://www.dianahacker.com/resdoc/humanities/pdf/dalypaper.pdf> (sample of a paper on the health effects of mobile phone users in MLA style)[accessed 17 Jan 03].

<http://www.agius.com/hew/resource/searchap.htm> (resource on searching, appraising and citing environmental and occupational health information on the Internet) [accessed 17 Jan 03].

<http://www.aresearchguide.com/styleguides.html> [Research, Writing, and Style Guides - MLA, APA, Chicago, Harvard] (accessed 17 Jan 03).

<http://www.ulster.ac.uk/library/magee/citing.htm> (Writing and Citing) [accessed 14 Mar 03].

http://www.bournemouth.ac.uk/learning_support/unit_8.html (citing bibliographical references – the HARVARD system) [accessed 14 Mar 03].

References

Publication manual of the American Psychological Association (5th ed.). (2001). Washington, DC: American Psychological Association

MLA Handbook for Writers of Research Papers (5th ed) (1999). New York: MLA.

CIEH supported research

Project descriptions and progress to date

Noise Induced Hearing Loss in Occupational Motorcyclists

Chris Jordan, University of Ulster

The exposed population of occupational motorcyclists is significant. UK Numbers total over 25,000 with the majority of occupational motorcyclists being couriers, professional racers and police motorcycle officers. World-wide the number of occupational motorcyclists is estimated to be in the region of 2 million.

The measurement of noise levels under motorcycle helmets is by no means an easy task. The methodology used consisted of a miniature microphone placed over the rider's ear canal which fed to a calibrated DAT recorder. Both sound pressure level and frequency analysis of the wind noise was then obtained from the tape. The motorcycles and helmets tested were similar to that used by occupational motorcyclists. These included the modification of a number of helmets, variety of motorcycle styles, helmet types and configurations. This took over 6 months and the results were analysed and useful conclusions have been drawn as follows;

- the noise level the rider is exposed too at over 40 mph is predominantly wind noise, under 40 mph the noise level is predominantly from the tyres, road, engine etc.
- for most motorcycle configurations, the rider is exposed to 90 dB(A) from as little as 35 mph rising to 110 dB(A) at 70 mph.
- the difference between various helmet styles (open or closed face) and motorcycle styles (naked or faired) made little difference to the noise exposure level.
- as a daily dose value, all occupational motorcyclists tested exceeded the second action level of the Noise at Work Regulations.

I am currently studying the noise exposure levels of American police motorcyclists in Mississippi and the surrounding states. Provisional testing has shown

that they are exposed to slightly higher levels than their UK counterparts as the helmets they use, 'skull caps', do not cover the ears.

The measurement of noise level contribution from radio communication headsets is the next area of research. A pilot study has already been completed and the full study will commence at the beginning of June.

Housing Transfer and the Impact on the Strategic role of Local Authorities

Robert Cogings, Derbyshire Dales District Council & Sheffield Hallam University

Large Scale Voluntary Transfer (LSVT) is an option local authorities are encouraged to consider when developing plans for sustained improvement of Council Housing. Despite the reported successes achieved by over 150 such transfers of Council stock to new Housing Associations, and various other forms of transfer, there is a lack of reported knowledge of the impact of LSVT.

This research will attempt to show that LSVT has a detrimental affect on the strategic housing functions of local authorities. Reference to private sector housing services is particularly relevant given its prominence in the new role of LSVT local authorities.

Councils who have transferred their stock are often faced with the prospect of delivering the continuing housing functions, when many of the original housing staff having transferred to the newly formed housing association. Housing responsibilities are often sidelined within a larger Council department with little or no direct officer representation at a senior level.

A key Government aim in encouraging local authorities to stock transfer is the separation of the management role of social housing, from the

strategic role of the local authority. Reported assessments of Council performance have indicated that local authorities have not benefited from this separation.

The Strategic Housing role of a local authority following transfer has a greater emphasis on the work of private sector housing services. The outputs of such services together with other assessments will be used as markers to assess performance before and after transfer.

A case study approach is planned which will focus on a small number of similar rural authorities within the East Midlands Region.

Noise Complaints: A local Authority Perspective

Stephen Grime, Borough of Telford & Wrekin & University of Birmingham

Whilst the numbers of noise complaints made to the UK local authorities is now reported to be levelling off after many years of increase, the current figure is approximately ten times greater than 15 years ago.

For the last 60 years researchers have had a keen interest in the quantification of what makes sound develop into noise. The answer remains as elusive today as it did 60 years ago. A plethora of differing noise metrics have been developed to characterise any noise. Unfortunately each of these is only useful in describing the noise characteristics for which the descriptors were developed.

To understand why people complain about noise it is necessary to investigate (i) if there are any links between the social data for the area and the number of complaints from that area and (ii) if there are any common themes as to why persons complain. This is the main aim of this project.

The first strand uses the GIS system. The use of mapping techniques will allow social data to be overlaid with complaint data. The data will then be analysed to look for any statistical associations. There are at least six social indicators in use within the UK, each with a subset of individual parameters that can all have differing weightings within the social indicator.

The second major strand to the research is to use qualitative methods. The use of semi-structured interviews with people who have complained about noise to the local authority; this should allow any common themes to be identified. These themes could

then be used in the formation of hypotheses to provide further insight into the nature of the complaints made.

Four years of noise complaint data have been collected so far. These show distinct groupings in areas of high housing density. They are, however, higher than would normally be expected. The best fit of data appears to be with the "Townsend Score" social indicator ($r = 0.4$). There are, however, problems because of incomplete data. Some values of the dependent values are null. If these are included the line of best fit is quadratic. If excluded the fit becomes closer to linear. More data may provide clarification to this.

It becomes apparent when the data is analysed that it is very rare that the complainant lives adjacent to the perpetrator of the noise. Whilst the reasons for the complaints vary, it is common to find that the complainant has suffered other problems in the near past. These are often found to be contributory factors in their decision to complain.

Counterfactual thinking following slipping and tripping accidents

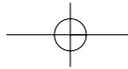
Paul Lehane, London Borough of Bromley & London Metropolitan University

After an unwanted outcome e.g. an accident, people seem to spontaneously engage in counterfactual thinking; that is, they think about how things could have been different, sometimes referred to as "if only...." thoughts. Thus to bring about a different outcome, an antecedent event is identified and then changed. For example, if you miss your flight due to a traffic jam on the motorway, you may think, 'if only I had left earlier I would have caught my flight'.

Previous research has looked at various aspects of the antecedent chosen for change. These have included 'counterfactual direction' (is a better or worse outcome chosen), is an action or inaction selected for change, is the outcome achieved by adding or subtracting something from the original sequence of events. Almost all of the previous research has used psychology students in the experiments and few have involved occupational accidents.

This research seeks to validate the existing general research findings against populations of people who have a real but varied psychological involvement with occupational accidents including safety professionals, managers and accident subjects.

The first stage of the research will be undertaken by



CIEH supported research – Project descriptions and progress to date

way of a scenario-based questionnaire using a slipping and tripping accident in a supermarket with manipulations of outcome injury severity (minor -v- serious) and amount of information provided to the respondent (minimal -v- maximum). Participants will read the scenario and answer a range of questions including completing a sentence "If onlythings could have been different". The responses to this will be coded and compared.

Data collection is underway and a good response has been obtained from the safety professional population; accident subjects and managers are currently being recruited. It is anticipated that this phase will be completed by late summer 2003. Analysis of the data will follow and a further phase of research will be based on the results. It is likely that this will involve a more qualitative approach.

The research hypothesis is that there will be differences in the way the three populations apply counterfactual thinking to slipping and tripping accidents, and that safety professionals will focus on matters that are earlier in the antecedent chain than managers. Managers will focus change on the actions of the accident subject but safety professionals will focus on inactions rather than actions.

The research is currently in its second year (part time) and further details are available at www.lgu.ac.uk/psychology/staff/lehane/index.htm.

- Developing a questionnaire relevant to the sunbed industry in order to investigate the present state of knowledge, information and precautions already in place in the sun tanning salon businesses in Leeds.
- Personal visits to approximately fifty sunbed salons within the Leeds City Council area to carry out structured interviews with proprietors to assess their awareness, understanding and knowledge of health issues and risks of sunbeds, including the legal requirements under Health and Safety legislation.

Using the information collected from the literature review and structured interviews/questionnaire it is intended to produce a 'Code of Practice' for sunbed salons and a 'Tool Kit' for use by proprietors when carrying out risk assessments.

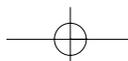
Sunbed Salons: An investigation into the knowledge of the risks and precautions taken by proprietors of sunbed salons in the City of Leeds

Paul Barnwell, Leeds City Council and Nottingham Trent University

This project will review the literature to indicate the extent of health issues surrounding the sunbed industry, investigate the current extent of knowledge, information and precautions in place in Leeds sunbed salons (including the use of risk assessments) and investigate methods of producing information and educational systems to ensure information and training materials are available in Leeds sunbed salons.

The methods will include;

- Contact with relevant bodies both in UK and abroad including HEA, HSE, CIEH, Sunbed Association, press, manufactures, trade associations, local authorities and other research projects in this study area.



Book Review – Dictionary of Environmental Health

David Worthington

Spon Press (2003)

Price: £55

What are the essential texts on the bookshelf of any professional in the environmental health field? Perhaps the first book which will come to the mind of many EHPs will be Clay's Handbook of Environmental Health, the textbook used by students and officers alike since what seems before the dawn of history.

Under the stewardship of Bill Bassett, the Handbook has been joined by a number of texts related to environmental and public health, to form Clay's Library of Health and the Environment. The latest addition to the Library is the Dictionary of Environmental Health by David Worthington. No doubt this book will find its way on to many bookshelves as an essential reference for that moment when some additional understanding, or a clear definition is required. How many times have we searched a range of sources to find a clear definition of a term and wished that we had a comprehensive yet concise reference source at hand.

The author has very considerable experience as an environmental health professional, both within local and national government and has been responsible for the production of the CIEH electronic encyclopaedia series, Environmental Health Today. Whilst a wealth of information is available in electronic form, there is still room for book which can be quickly lifted off the shelf for easy reference.

The Dictionary is intended to cover the full spectrum of environmental and public health although the author acknowledges that it is difficult to know where these fields begin and end and that there will inevitably be omissions and topics perhaps, in the view of an enquirer, not adequately addressed.

There are more than 3000 entries in the dictionary, including terms and concepts, abbreviations and acronyms. Want to know what HACCP stands for? You'll get not just a definition, but also a discourse on its history, development and principles. Too embarrassed to ask a colleague what 'sarking' is in a roof? You'll have the answer in no time with the dictionary. Topics covered range through disease, food, occupational health and safety, pollution, built environment, government and even subjects, which don't appear at first site to be strictly related to environmental health. There is actually an entry on the term 'environmental health'.

Inevitably not every enquiry will be catered for. In

such a broad field this is just not possible. However there would appear to be a number of strange inclusions and also omissions. For example the significance of an entry on 'plutonic' rocks is not entirely obvious while on the other hand it would seem to be a little strange that, for example, 'noise induced hearing loss' and definitions of heat transfer terms related to food processing have not been included.

So how useful will it be? The book does not claim to be an all embracing text on environmental health and in many cases entries will not supply sufficient explanation. In those situations it will be necessary to search other texts for enlightenment. It will, however, be of value to many practitioners and to students as a ready reference to fill in gaps in knowledge, or provide some explanation.

Reviewed by Oliver Hetherington

Book Review - Food Deserts: A Practical guide

Nargis Kayani

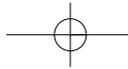
Chadwick House Publishing

Price: £25.95

The increasing trend of developing out of town, or edge of town shopping centres, coupled with the demise of local neighbourhood shops has a host of impacts on both urban and rural communities. The term "food deserts" was first used in 1995 by the Low Income Project Team of the Nutrition Task Force to describe areas where access to food shops is difficult and there is a lack of small retail shops to meet demand for healthy, affordable food.

Nargis Kayani makes it clear in this well presented work that food deserts result from a complex matrix of factors that impinge on health inequalities, social exclusion, and the downgrading of local economies. In particular she argues the case for environmental health professionals to take up the challenge posed by food deserts. This involves expanding the understanding of "safe food" to encompass food which is also healthy and affordable.

All too often publications that claim to be "practical guides" fail to deliver. In this regard the author has the advantage of extensive hands-on experience through her research work on a food desert in the Stepney neighbourhood of the London Borough of Tower Hamlets. The description of this work is a model of clarity, and has the added advantage of being readily adaptable to a wide range of similar



Book Reviews

investigative exercises. The outcomes from this study are both thought provoking and encouraging, and demonstrate how well designed and delivered research can lead to concrete developments.

The final chapter dealing with the wider concerns of food deserts paints a very broad canvas, but would benefit if the linkages between the individual elements were more clearly demonstrated. In fairness, a very comprehensive set of references (including web sites) is provided for readers' wishing to delve further into the subject. By the author's own admission, it is difficult to encompass all the elements of a very complex topic in a publication of this nature.

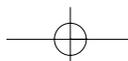
While the term "food deserts" has shades of the instant news bite about it, the issue is an increasingly important one that has particular resonance for those interested in seeking joined up solutions to joined up problems. This timely publication serves to bring the issue to a wider audience while keeping the sceptics onboard.

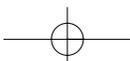
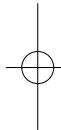
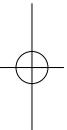
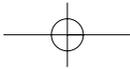
Reviewed by Martin Fitzpatrick

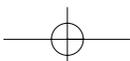
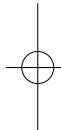
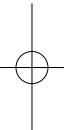
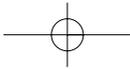
Have you found a new book which you think would be worth reviewing by JEHR? Have you produced a book which you would like to be considered for review by JEHR? If so, please contact the Editor at JEHR@lycos.co.uk or hd.harvey@ulster.ac.uk for details of the review process.

Letters and comments on the Journal

The editors invite comments on any aspect of the Journal including your overall impression of JEHR, particular strengths, weaknesses and areas for improvement, letters on specific papers and topic suggestions for professional evaluations and book reviews. Correspondence on these issues should be sent to Harold Harvey at JEHR@lycos.co.uk or hd.harvey@ulster.ac.uk.







Notes for Authors

Aims and scope of the Journal

The Journal of Environmental Health Research is published by the Chartered Institute of Environmental Health (CIEH). The Journal publishes original research papers, technical notes, professional evaluations and review articles covering the diverse range of topics which impact on environmental health.

Particular emphasis is placed on applied research and reviews which facilitate the improved understanding of a particular aspect of environmental health. It is intended that the Journal will help to promote improvements in the professional practice of environmental health as well as contribute to the research knowledge base.

Invitation to contributors

Contributions are invited on any of the diverse aspects of environmental health including occupational health and safety, environmental protection, health promotion, housing and health, noise and health, public health and epidemiology, environmental health education, food safety, environmental health management and policy, environmental health law and practice, sustainability and methodological issues arising from the design and conduct of studies.

Contributions should have the potential to improve practice through the dissemination of the results of research projects, reviews based on scholarly reflection and technical notes and professional evaluations which provide critical insights into practice issues. It is likely that most papers published will be based on work carried out as part of a research project or programme associated with an academic or other research institution.

Contributions are expected to be of a high standard, not only in respect of subject matter and its treatment, but also in the quality of the writing. Particular attention should be paid to clarity and conciseness of expression.

Originality

Only original articles are considered for publication. Submission of a manuscript represents certification on the part of the author(s) that the article submitted has not been published nor is being considered for publication in another journal. Contributions may, however, be based on a prior conference presentation.

Peer review

All contributions which are considered by the Editors to be within the aims and scope of the Journal are subjected to peer review by at least two reviewers. It is likely that one reviewer will have an academic research background and the other a practitioner or management background. Decisions on publication are made by the editors who are informed by the comments of the reviewers and the responses from the author(s) to the peer reviews.

Style

These notes are intended to guide authors in some details of presentation so that papers conform to a consistent Journal style. More details on style and paper preparation can be accessed at www.jehr-online.org.

Authors must comply with the style requirements in every respect. For example, manuscripts which are too

long, have too many headings or tables or references which do not fully conform to the Harvard protocol will be returned to the author(s). Thus authors are encouraged to study these notes and those on-line carefully whilst preparing their manuscript.

Length

Research papers; 3,500 to 6,000 words.

Reviews: up to 8000 words.

Technical notes and professional evaluations: not normally more than 2000 words.

Tables, Charts and Photographs

These should be kept to a minimum consistent with the concise nature of the papers published in this Journal.

Language

Manuscripts are accepted in English only.

Layout/Sequencing

The manuscript should normally be sequenced as follows: Title; Author(s); Abstract (300 words +/- 10%); Key words (up to 8); Introduction; main exposition (typically this section consists of the Methods and Results); Discussion; Conclusions; Acknowledgements; References.

Further essential details on each on these is available at www.jehr-online.org and in: Harvey, HD and Fleming, P (2003) Writing for JEHR and other peer reviewed journals. Journal of Environmental Health Research, 2 (1), pp 38-43.

Electronic submission

The submission of manuscripts will normally be by Email and word processed file attachment only, with no requirement for the submission of printed copies. The word processed document should conform to the following specification to facilitate the peer review process and editing:

- MsWord (.doc) is the preferred word processor format but WordPerfect (.wpd) and Rich Text Format (.rtf) are acceptable.
- Times New Roman, 12 point, Single spacing.
- Do not indent paragraphs, do not number the pages nor insert headers or footers.
- The Cover Page should give the title of the paper, the name(s) and affiliations of the authors plus an Email address, telephone number and postal address for the corresponding author. Add a page break at this point and go on to the First Page.
- The First Page should repeat the Title only (not the authors details) plus the Abstract, Key Words and continue into the Introduction and the remainder of the manuscript.
- All tables and charts should be included as part of the manuscript in a single file, unless there is pressing technical reason for having separate files.
- The file should be named with the name of the first author e.g. Wilson.doc.
- Photographs should also be included in the text; if the paper is accepted for publication high quality .tif files will be requested from the author.
- Email to JEHR@lycos.co.uk or hd.harvey@ulster.ac.uk

Communication from the Editors will normally be by Email only.

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