

Effective mine risk education – a shared responsibility

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SUMMARY

The focus of this paper is effective health education and promotion in the field of mine awareness, or what has more recently been re-titled mine risk education. According to the United Nations, mine risk education comprises educational activities that aim to reduce the risk of injury from landmine/unexploded ordnance (UXO) through raising awareness and promoting behavioural change and includes public information dissemination, education and training, and community mine action liaison.

Specifically, this paper is an empirical study of mine risk education practices using data collected during the implementation of a mine risk education programme that commenced in Lao PDR in 1996 and is ongoing. In particular, it considers lessons learned from the programme's monitoring and evaluation process. The authors argue that in a country such as Lao PDR, where communities have lived with UXO infestation for over 25 years, more mine risk education is not necessarily needed. This paper concludes that common programmes of mine risk education using top-down educational methods, based on the assumption that ignorance of landmine/UXO risk is the key factor in mine accidents, are inadequate. Evidence from the literature on health promotion and the experience of the programme indicate that there is a need to supplement or replace existing common mine risk education practices with techniques which incorporate an understanding of the economic, social and political circumstances faced by communities at risk.

Key Words: Lao PDR landmines/UXO injury prevention

INTRODUCTION

Landmines and unexploded ordnance (UXO) are a major public health threat in current and former war-zone areas of the world (World Health Organization, 2004). A landmine

is an explosive device, usually victim-activated, laid just below the ground's surface and designed to kill, injure or destroy or damage vehicles. UXO are explosive munitions that have failed to function as intended, and are left unexploded and live. They may have been fired, dropped, launched or specifically placed and include grenades, rockets, mortars, artillery shells, bombs, cluster ammunition and fuses. UXOs function in almost exactly the same way as landmines and can explode when stepped on, hit or touched. They are unstable, detonated easily and, unlike most landmines, are designed to kill.

When landmines/UXO detonate, they can result in long-term medical and psychological sequelae as well as a huge financial burden to affected individuals, families, their communities and health services. Landmine/UXO survivors often require a disproportionate amount of health-care resources (Andersson *et al.* 1995). In addition, landmine/UXO contamination restricts access to clean water sources, arable land, roads, markets and immunization and other health facilities and can indirectly contribute to waterborne and infectious diseases as well as malnutrition. Frequently in the post-conflict period, the dead and injured are non-combatants and include men, women and children. Often, those who suffer a landmine/UXO injury are aware of the risk (International Campaign to Ban Landmines, 2000; Geneva International Centre for Humanitarian De-Mining, 2003).

This paper draws on the experience of working in a landmine/UXO risk reduction programme in the Lao PDR. The first author worked on the programme from the end of 2000 to mid-2002 and advised on appropriate evaluation at different stages. The third author has worked on the programme since its inception. First, a brief historical overview of the development of mine action and specifically landmine/UXO risk education programmes is provided. The paper then provides a brief summary of landmine/UXO in Lao PDR and the national Lao PDR UXO programme before reviewing the relevant mine risk education and health and safety promotion literature. Second, it outlines the steps taken to monitor and evaluate the Lao PDR programme and describes its data collection methods and findings in detail. Finally, the lessons learned from the programme are

discussed and recommendations are made for improving the effectiveness of approaches to mine education.

BACKGROUND

Overview of Mine Action

Mine action is the term used to describe those activities that attempt to address the problems faced by people as a result of landmine/UXO contamination. It is composed of five components: mine clearance and survey; stockpile destruction; mine risk education; survivor and victim assistance; and advocacy and aims to recreate an environment in which people can live without landmines/UXO and in which mine survivors are fully integrated into their societies (United Nations, 2003a).

Mine action has developed as a response to the landmine/UXO problem in current and former war zones and is now governed by international standards and operating procedures. Historically, mine action has its roots in the military and early mine action interventions generally took place under the auspices of peacekeeping missions to enable safe passage of humanitarian services (Eaton *et al.* 1997).

In the early 90s, NGOs involved with humanitarian mine action were also formed with programmes established in Afghanistan, Cambodia and northern Iraq. These NGOs took a more community-focussed approach to demining. The aim was to reduce risk and return land and infrastructure to safe productive use to a specified depth through as close as possible to 100 per cent clearance (Eaton *et al.* 1997). Different methods of landmine/UXO clearance have been tried, (for example using dogs or mechanical clearance techniques) however, there is a general consensus that manual clearance, although time consuming, costly and labour intensive, is the most effective.

Countries with mine risk education programmes include Cambodia, Thailand, Lebanon, Sri Lanka, Afghanistan, Iraq, Angola, Sudan and Mozambique. The primary focus is on influencing the behaviour of those directly affected by landmine/UXO pollution. However, there are a few different examples, such as Croatia and Bosnia-Herzegovina, where more diverse approaches were adopted including targeting journalists, local celebrities, tourists and the general public (Geneva International Centre for Humanitarian De-mining, 2002). A recent programme implemented in south Sudan in 2003 (previously led by the first author) identified the military, civil society structures, international and national service providers, legislators and policy makers as key target audiences for mine-related information.

The Lao PDR Landmine/UXO Risk Reduction Programme

During the Indo-China war, Lao PDR suffered intense covert bombing by the United States of America. Between 1964 and 1973, it is estimated that over 2 million tonnes of ordnance were dropped on the country. Up to thirty per cent of this ordnance is estimated to have malfunctioned, leaving widespread UXO contamination (Handicap International, 1997).

Although landmines have been found in Lao PDR, UXO pose the greatest humanitarian threat. Most of the UXO contamination is due to the especially dangerous bomblets from cluster munitions. Bomblets are fist-sized weapons that are packed together in air-dropped cluster bombs, which may contain up to 670 bomblets. They scatter over a large area and may remain just under the surface of the ground. .

As a response to the continuing landmine/UXO threat, the Government of the Lao PDR, with assistance from UNDP and UNICEF established the Lao PDR Trust Fund for UXO in 1995 to finance a national programme of clearance and education. A National Survey on the Socio-economic Impact of UXO was conducted (Handicap International, 1997) and of the eighteen provinces in Lao PDR, fifteen reported contamination in 2,861 villages (25% of all Lao villages). 948 rural villages reported UXO in the centre of the

village. As a result, UXO was deemed a major safety and development issue and a mine action programme was established.

In common with most other mine action programmes, the Lao national UXO programme (1996-ongoing), aims to reduce risk through survey, marking, surface and sub-surface landmine/UXO clearance and mine risk education. Prioritisation of clearance tasks although finalised at the central level, is based on consultation with and the participation of provincial and district representatives. As expected for a mine action programme of its time, the mine risk education component is underpinned by psychological theories of behaviour change, such as the Health Belief Model (Rosenstock 1974).

The first community education teams in the Lao programme were trained by personnel from a military psychological operations unit (Wheatley, forthcoming) and the programme was primarily based on the premise that, by providing information and thereby increasing knowledge, targeted individuals would adopt low-risk behaviours. Mobile community education teams visited villages in contaminated districts disseminating safety messages through a range of multi-media techniques and, where possible, followed by survey and roving surface clearance teams who conduct marking and surface clearance operations. A set of centrally generated messages was also disseminated through the Ministry of Information and Culture, the Ministry of Education and the Lao Youth Union and included messages such as ‘don’t touch UXO’, ‘report UXO finds to authorities’ and advice and safety precautions to follow when digging, burning land or making domestic fires.

Relevant Literature on Mine Risk Education Programmes

Mine risk education, as it is generally practised, is principally a message-based process that seeks to engage the recipient population. Most programmes are based on two main strategies (Wheatley, forthcoming): (i) public awareness approaches, including the use of the mass and traditional media, and (ii) educational approaches. Educational approaches

include strategies such as developing school-based curricula and incorporating risk reduction messages in formal and non-formal education programmes.

Messages are often centralised and set by a national mine action co-ordination body and disseminated through various channels and implementing partners. Generally, messages are based on UN (1999) guidelines and include:

- Recognition of explosive ordnance
- Recognition of areas likely to have landmine/UXO contamination
- Safe behaviour in a landmine/UXO infested environment
- Emergency procedures in the event of finding oneself in a minefield or in the case of an explosion

In mine risk education as Wheatley (forthcoming, p.22) observes, ‘doing something’ has generally been favoured over trying to identify and understand the contributing factors in the aetiology of injury. This approach has placed the responsibility for change solely within the individual with few realistic alternatives being offered. Wheatley (forthcoming) is opposed to the common centralised approach to developing risk reduction messages and notes that realistic alternative behaviours have rarely been offered. He advocates localised responses and messages developed in negotiation and consultation with affected communities.

Contemporary paradigms in health and safety promotion, influenced by the principles of the Ottawa Charter for Health Promotion (World Health Organization 1986), take a broad view of health. This approach recognises structural issues such as the social, political and economic factors that also determine healthy outcomes. Recent health and safety promotion literature also suggests that, on its own, a message-driven approach may be inadequate as a strategy for promoting sustainable behavioural change.

Green and Kreuter's (1999) social ecological model of health promotion where health and safety are understood within the context of the whole ecological system is useful. Within this system, three dimensions can be identified: the individual and behaviour, the physical environment and the sociological environment. This model emphasises the dynamic interface between these three dimensions and, from this perspective, the most effective way to reduce an individual's risk profile is to systematically address the environmental and sociological issues that contribute to risk, thereby modifying the risk profile of the whole system.

Based on this model, risk factors are separated into behavioural and non-behavioural causes of the health problem. Factors that affect behaviour may include:

- Predisposing (motivating) factors, for example, knowledge, beliefs, values and attitudes
- Enabling (facilitating) factors which enable a behaviour or situation to occur.
- Reinforcing (maintaining or rewarding) factors which provide incentives for health behaviours to be maintained. Reinforcement may come from an individual or group, from persons or institutions or society.

Modification of predisposing, enabling and reinforcing factors can help to bring about the targeted health or safety-related behaviour. In some cases a person may be motivated to perform the target behaviour but be prevented to do so because of the influence of other factors.

Whilst there is increasing recognition in mine action that unsafe behaviour is often related to livelihood issues, scant attention has been paid to the broader socio-environmental and political factors that contribute to landmine and UXO injury as utilisation of Green and Kreuter's (1999) model of health and safety would suggest. Two recent Cambodian studies are exceptions and provide a useful insight into the motivations of villagers to undertake their own demining and the deliberate handling of live ordnance (Bottomley, 2003; Moyes, 2004). Both Bottomley and Moyes argue that,

paradoxically, mine action with its insistence on 100 per cent clearance and strict operating procedures, actually contributes to risk by failing to meet the needs of communities.

With the more recent development and implementation of the international mine risk education standards (United Nations 2003b), programmes are becoming more sophisticated and incorporating additional strategies such as mine marking, reporting and survey linked, where possible, to rapid response explosive ordnance disposal teams. In addition, more programmes now include a community liaison function that aims to make a bridge between communities and deminers in three phases: pre, during and after clearance.

Finally, there have been few empirical studies into the effectiveness of mine/UXO risk reduction education programmes. As Filipino (2000) has noted, mine risk education programmes have generally developed in an unsystematic and ad hoc manner, with little attention given to needs analysis or systematic monitoring and evaluation procedures.

This paper is an attempt to examine the effectiveness of one such programme by drawing on the monitoring and evaluation experience of the Lao PDR programme and offering suggestions for more effective approaches than are currently common.

MONITORING AND EVALUATION OF THE LAO PROGRAMME

In the first three years of the Lao programme, initial data collection included a review of the relevant documentation including a review of programme monitoring reports.

To begin with, the programme monitoring was primarily quantitative and related to programme outputs, such as, the number of beneficiaries reached and materials distributed. This confirmed that the programme was being implemented as intended although it provided little information on programme effectiveness.

In 2001, as part of a broader programme review and in line with the first author's brief, a knowledge, attitude and behaviour (KAP) survey was undertaken. The KAP found generally high levels of awareness of the landmine/UXO threat and safe and unsafe practice. UXO Lao injury data, programme staff observations and anecdotal evidence indicated that safer behaviours were not necessarily being adopted or sustained.

In order to understand some of the barriers to change, a second phase of evaluation involving the collection of qualitative data was undertaken in Khammouane Province. Khammouane was chosen because of its high level of contamination, recent increase in injury reports, easier access with the presence of the UXO Lao national mine risk education programme and observations of non-compliance with safety behaviours. Data were sought around relevant and local structural issues and the process was informed by Green and Kreuter's (1999) ecological model of health and safety promotion. The aim was to understand the social, economic and political features underpinning high-risk behaviour in the hope that this would lead to more effective interventions in mine action.

Purposive sampling was used to identify appropriate villages based on levels of contamination, landmine/UXO injury, access and reports of high risk behaviour. The main evaluation tools were structured interviews with key informants, focus group discussions and observation. Prior to the evaluation, interview guides for the semi-structured interviews and focus group discussions were developed, field tested and staff trained in collecting data.

Participants included male, female and youth who were normally resident in the village for at least 8 months a year and had lived in the village for at least 12 months. Village authorities and development committees were interviewed in separate group discussions. Key informants were selected through a snowballing technique whereby people interviewed were asked to recommend others who might be useful informants. Informants included the local teacher, the youth union leader, the mother of a UXO

victim, adolescents, the security officer and people engaged in the war scrap trade. Content analysis was used throughout to identify key barriers to changing behaviour.

FINDINGS

New Understandings of Landmine/UXO Risk

Men and adolescent boys engaged in the most common high-risk behaviours which included: farming potentially contaminated land with a hoe, fishing with explosives removed from UXO, deliberately handling UXO, looking for sub-surface metal and war scrap, and non-reporting of UXO. Predisposing factors related mainly to knowledge, perceptions of risk, and attitudes towards the implementing agency.

Almost all of the farmers interviewed knew that some of their farming and household practices placed them at risk. Further, the safer farming behaviours advocated by the programme were often perceived to be impractical and too time consuming such as using shovels instead of hoes for cultivating land. There was, however, some self-regulation of behaviour with individuals taking a range of actions to keep themselves and their families safe. For example, farmers spent longer burning land prior to cultivation as a way of detonating sub-surface explosive ordnance.

Another practical limitation on the effectiveness of safety advice was recognition that risk behaviour did not always eventuate in a landmine/UXO explosion or injury. For example, sometimes a farmer would move an item of UXO and it would not explode. Vaughn (1993) suggests that where the environment is familiar and individuals have not yet experienced negative outcomes, the perception of risk is reduced. Further, there was little empirical evidence to suggest that there was a direct causal link for local people between following safety advice and avoiding injury.

A particularly high-risk behaviour practised by men was the deliberate tampering with UXO. This included moving UXO to a place considered safe to protect women and

children and the dismantling of UXO for its components. Given that these components had a monetary value, the decision to continue handling UXO seemed a reasonable and pragmatic response to living in a landmine/UXO contaminated environment.

Other predisposing factors included negative perceptions of the implementing agency and concerns such as food insecurity and inadequate access to clean water to which the villagers gave a higher priority than avoiding the landmine/UXO-related risk.

The key enabling factors related mainly to: food insecurity and increased cash needs. With greater access to the scrap metal market as a result of improved roads, war scrap was an important cash commodity. The lack of alternative income-generation activities coupled with dwindling forest resources meant that families needed alternative income-generating activities. Accessing the scrap metal market enabled families to supplement their income, and sometimes provided the necessary start-up cash for other economic enterprises. Further, the extent and visibility of the war scrap trade indicated at least tacit government approval of the trade at the district level. It also indicated that, at the political level, there had been little diffusion or adoption of UXO risk reduction activities.

Other enabling features included proposed NGO development activities which sometimes entailed exposure to risk, for example, food for work programmes which involved building irrigation channels. Further, if safety advice was followed, it sometimes meant additional time was required to perform tasks, for example, digging a hole to a depth of 20 cm prior to building a fire. Slow and inadequate landmine/UXO clearance and lack of community access to the process of prioritising areas for clearance and explosive ordnance disposal tasks was also a common problem along with educators sometimes being poor role models,

Reinforcing factors included a lack of legislation regarding the regulation of the scrap metal trade, few alternative income sources and the removal of UXO from villages by clearance teams being viewed as the removal of a source of tangible income.

An example of how these various factors contributed to the decision by men and adolescent boys to deliberately tamper with UXO is provided in Table 1 below.

Risk behaviour: Men and adolescent boys deliberately tamper with UXO by moving, burning in-situ or opening and dismantling UXO to sell		
Predisposing factors	Enabling factors	Reinforcing factors
<ul style="list-style-type: none"> ◆ A belief that they have the necessary skills and understand how to dismantle UXO ◆ A belief that some UXO, for example BLU3, are relatively easy and safe to dismantle ◆ A belief that big bombs are less dangerous than “bombies” ◆ Ex-soldiers have experience of dismantling UXO from the war ◆ People do not consider the risk that their behaviour poses to others ◆ UXO is seen as a cash crop ◆ A belief that burning smaller types of ordnance which villagers are not confident about dismantling removes the threat to their families and children ◆ Cultural beliefs in karma and fatalism 	<ul style="list-style-type: none"> ◆ Insufficient reporting of UXO ◆ Scrap metal and explosives from UXO can be traded to supplement income ◆ Few alternative income generation activities and dwindling forest resources ◆ Vietnamese and Lao traders will purchase bomb casing and explosive once dismantled ◆ The scrap metal trade is highly organised with middle men operating in the villages ◆ Good road access (dry season) linking Vietnam, Laos and Thailand to facilitate trade and movement 	<ul style="list-style-type: none"> ◆ No fines or sanctions imposed against people who dismantle UXO or trade in military ordnance ◆ Sanctioned by the village head ◆ Other villages in the area also participate in the scrap metal trade ◆ The price of scrap metal has increased significantly in the last two years ◆ UXO accidents through the opening of UXO cause the price to increase ◆ No micro-credit or bank lending schemes to provide villagers with the initial start-up cash to participate in small commerce enterprise or income generation activities ◆ Increase of consumer goods available in the village increasing cash needs ◆ Scrap metal can be exchanged for cash or consumer goods ◆ When UXO are reported to mine action agencies they either destroy the bomb by “high order” explosion or remove the bomb after rendering it safe, thus removing a cash resource from the village

DISCUSSION: LESSONS LEARNED FROM THE PROGRAMME

The monitoring and evaluation process, in particular its qualitative dimension, raised a number of important considerations for mine risk education programmes in facilitating behavioural change. This is especially so in countries where the conflict is either protracted or finished many years ago and landmines/UXOs are, to a large extent, considered a facet of the environment with high-risk behaviours becoming routine. A number of lessons can be learned from the Lao experience.

First, the data that informs mine risk education programmes needs to be drawn from a variety of sources using different processes. Primarily quantitative programme monitoring and the KAP study, whilst useful, were insufficient on their own. The subsequent qualitative evaluation yielded much richer data about the issues underlying continued risk behaviour.

Second, risk behaviour needs to be understood as mostly a logical and strategic response to UXO contamination. It may be unreasonable to expect individuals to adopt low-risk behaviours, which are often impractical, while they wait for years for clearance operations.

Third, and perhaps more importantly, the broader socio-economic and political context and, paradoxically, mine action itself, might actually promote unsafe behaviour. To reduce risk and prevent injuries, a broad range of interventions based on what can be understood about the important structural issues underpinning risk behaviour is needed. This demands a re-examination of mine action, including mine risk education as it is currently practised so that broader structural issues are a key consideration.

The Lao PDR programme was based on the narrow premise that cultural practices and attitudes, coupled with a lack of pertinent knowledge contributed to unsafe practices. Causal factors for unsafe behaviour were seen as located primarily within individuals'

and communities' cultural practices and beliefs. The assumption made by the programme was that, by providing relevant knowledge in a culturally appropriate and sensitive way, individuals could be persuaded to adopt safer practices. However, while the culture of the local people was emphasised, scant attention was given to the culture of mine action and pertinent social, economic and political factors.

To a certain extent, the culture and practice of mine action, with its insistence on near absolute risk reduction and the exclusion of those most affected in the prioritisation process means that clearance is not necessarily meeting the needs of its primary clients. Further, risk, a key term in mine action, is itself a cultural concept. As discussed, mine risk education generally attempts to mitigate risk by the promotion of centrally developed messages promoting low-risk behaviours. Whilst, for example, the practice of moving and dismantling UXO is untenable for the mine action community, it can be acceptable to villagers when considered against the need for cash and other fears such as protecting one's children and feeding one's family. In this study, important contextual factors such as increased economic and social development, user-pays systems and improved road infrastructure were contributing to increased cash needs.

In this context, while the possible risk was generally recognised, dismantling UXO for its components was an economic opportunity. This was compounded by the apparent complicity of local officials in the scrap metal trade, a lack of legislation and an emphasis on vertical programmes rather than a coordinated approach that tried to integrate development activities and provide rural people with sustainable alternative income-generation activities. This demonstrates clearly that whilst knowledge is a prerequisite to change, the importance of the social and economic context cannot be underestimated.

A more sophisticated form of mine risk education is needed that comes up with more lateral thinking and creative alternatives that relate to local structural issues. This would encourage integration of mine action with development and income generation initiatives. It would also seek to encourage communities to participate more fully in mine action activities and to take a greater ownership in responding to the problem. If this were to

happen, local communities could develop their own standards and to use community-based sanctions when community members contravene those standards.

CONCLUSION

Mine risk education has become an important component of mine action. We suggest, however, that relying simply on educating affected communities is inadequate as a strategy for preventing landmine and UXO injuries. As our experience in Lao PDR indicates, the beliefs, attitudes and culture of individuals are not necessarily the main impediment to change and adopting safer practices. Focussing primarily on information dissemination, albeit in a culturally sensitive way, assumes that all individuals have the ability to enact safer behaviours. As our experience shows, behavioural decisions are made in a complex milieu of interlocking cultural, social, political and economic factors. In planning interventions, mine risk education practitioners need to broaden their focus to include an examination and critique of the structural factors and local perceptions of risk. Green and Keuter's (1999) model of health and safety promotion provides a useful framework for this analysis and can be used to analyse the situation and identify appropriate interventions. Viewing mine risk behaviour through a more holistic lens will bring into relief not only the cultural barriers to change but also the political and economic barriers which need to be considered when designing effective mine risk education programmes.

We suggest that the role and function of community liaison in mine action should be further developed and strengthened. We believe that community liaison has the potential to provide a powerful mechanism for involving key community stakeholders in developing their own solutions thus enabling communities, and ultimately individuals, to change their environment and behaviour to reduce the risk of landmine/UXO injury.

We propose that landmine/UXO injury is analysed from a multiple factor causation perspective, identifying predisposing, enabling and reinforcing factors. As shown, such an analysis will highlight a complex web of injury causation and provide a rich context

for mine risk education interventions that acknowledges both personal obligations and societal responsibilities. Such an analysis may suggest a restructuring of mine action as well as a combination of programmes designed to change individual behaviour; develop legislation; train law enforcement personnel; develop coalitions with government, community and business organisations; train service providers in landmine safety; and advocate for societal and organisational change.

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