



Using Barrier Analyses to Improve Explosive Ordnance Risk Education



Introduction

Worldwide in 2018, mines and other explosive remnants of war caused more than 18 injuries or deaths every day.¹ While the end goal of humanitarian mine action organisations is to rid the world of explosive hazards, these organisations recognise that such clearance cannot happen overnight. In the interim, they provide Explosive Ordnance Risk Education (EORE) to people who are affected by hazardous items, with the intent of providing them with information on how to identify such items, the risks they pose, and behaviours that can help the EORE recipients to be safer and limit those risks.

These EORE sessions and activities are, in the first instance, about improving people's knowledge and awareness regarding explosive items. Ultimately, however, the intent of EORE is to help people change their behaviours, shifting from actions that put them more at risk of an incident to those that reduce the risks to themselves or others.

To that end, over the last several years organisations delivering risk education have become increasingly interested in understanding the mechanisms that drive individual behaviours and those that drive behavioural change. The International Committee of the Red Cross, for example, published reference material on *Increasing Resilience to Weapon Contamination through Behaviour Change* in 2020.² The guidance emphasises the importance of understanding the specific contexts in which operators work, in particular through identifying the explosive ordnance threats faced, the groups that are most at risk of accidents, and the behaviours that put them at risk. In 2019 the UN Mine Action Service (UNMAS) in Afghanistan also designed a risk education campaign based on "Behaviour Change Communication".³ Throughout that campaign, the organisation sought to identify target groups' priorities, and leverage those priorities in their risk mitigation messaging. For example, upon finding that people felt economic pressure to work in dangerous areas, their core message to that group became "save a life today, build a life tomorrow".⁴ This messaging overtly recognises that the recipients' end goal is to build a better life for themselves, and emphasises that in order to build that better life, the person must be alive and well.

The implementation of these "designing for behaviour change" and "behavioural change communication" approaches to EORE has taken the sector a good step forward in the design and delivery of risk education sessions and messaging. One component of this behaviour change approach that is still underdeveloped, though, is a practical method for understanding why some groups are at greater risk than others, and the determinants of behaviours that EORE messaging might be able to affect. This gap is particularly acute in contexts in which explosive ordnance casualty monitoring is not

¹ SWI. 2019.

² ICRC. 2020.

³ UNMAS. 2019.

⁴ UNMAS. 2019. p. 33.

yet systematic or widespread. In those instances, understanding who is at risk and the knowledge, attitudes, and behaviours that lead to those risks is largely based on anecdotal evidence. This lack of generalizable data then sometimes leads to EORE interventions that are not based on empirical evidence, which rely on generic, less targeted, and possibly less applicable messaging, or messaging targeted at those who are *perceived* to be at the highest risk, while possibly missing groups who actually are at higher risk.

Barrier analyses, or borrowing from components of the barrier analysis approach, may help mitigate both of these limitations in the current practice. Conducting barrier analyses can help determine what groups are most likely to engage in risky behaviours, and can give risk education operators a more complete picture of why each group engages in those behaviours.

This article describes the barrier analysis approach as it was implemented in Mosul, Iraq, by The HALO Trust and Al Ghad League for Women and Child Care. It begins with a discussion of what a barrier analysis is and the theories of behaviour that underlie the approach. Then a description of the methodology used in Iraq is provided, followed by the findings and ways in which the barrier analysis informed the team's EORE. Finally, suggestions for incorporating components of the barrier analysis into future EORE project designs are put forward.

Conducting Barrier Analyses

Barrier analyses are surveys that are designed to improve understanding of the factors that influence particular behaviours. In the survey, respondents are asked whether they do or do not engage in certain behaviours of interest. They are then asked a series of questions about the personal, social, and environmental factors that might affect those behaviours. Finally, the data are analysed by comparing the personal, social, and environmental factors among the “doers” with those of the “non-doers” of the behaviour of interest. If the responses between the two groups are similar, then that factor is *not* considered an influencing factor in the behaviour itself. If the responses of “doers” and “non-doers” are different, however, then the assumption is that factor influences the behaviour in some way.

In a complete barrier analysis, questions related to 12 “determinants of behaviour”⁵ are included alongside the questions related to the specific behaviours of interest. These determinants are derived from theories of behaviour, and they include people's perceptions of:

- *Self-Efficacy*: The belief that one has the knowledge and skills to do the behaviour.
- *Social Norms*: The perception that people important to the actor think they *should* do the behaviour.

⁵ FSN Network. 2017.

- *Positive Consequences*: The positive things the person thinks will happen as a result of doing the behaviour.
- *Negative Consequences*: The negative things the person thinks will happen as a result of doing the behaviour.
- *Access*: The availability of needed products or services required for doing the behaviour. This includes barriers related to the cost, distance, and cultural acceptability of products and services.
- *Policy*: The presence of laws and regulations that may affect whether people are able to do a behaviour.
- *Culture*: The extent to which local history, customs, lifestyles, values, and practices may affect behaviours.
- *Cues to Action / Reminders*: The presence of reminders that help someone remember to do the behaviour.
- *Susceptibility*: A person's perception of how likely it is that the negative consequences of a behaviour will occur.
- *Vulnerability/Severity*: The perceived degree of severity of the negative consequences that could occur.
- *Action Efficacy*: The extent to which a person believes a behaviour will lead to the associated positive consequences or avoid the associated negative consequences.
- *Divine Will*: The extent to which a person believes actions and their consequences are the result of God's will and therefore out of their control.

Because the survey questions are designed around each of these 12 determinants, it is possible to discover during the data analysis which of the twelve have the greatest influence on a particular behaviour. Historically, the first four: perceived self-efficacy, social norms, positive consequences, and negative consequences are the most significant determinants of behaviour.⁶ Therefore, it is recommended that they always be included, while the others may be more or less useful depending on the context.

In addition to the determinants of behaviour, it is recommended to use the survey to determine who are people's "influencers." That is, who do they listen to and most trust regarding how they should act? This information, coupled with their reasons for action, then helps those designing behaviour change interventions to know what they need to influence, and who they need to get messaging to in order to have the greatest effect.

⁶ [FSN Network, 2017](#), p. 12.

Applying the Barrier Analysis Approach in Mosul, Iraq

The HALO Trust in Iraq partnered with Al Ghad to deliver risk education in Mosul Old City, and to design an additional open-ended project aimed at limiting the risk of a target group who was identified by the local community. HALO and Al Ghad began the project with a desk assessment of accident and victim data in the area, and they quickly found that—with no centralised accident monitoring system in Federal Iraq—the data available for the area were limited in the time periods covered, and that it was difficult to tell whether accidents that were recorded in the available data were the result of the fighting itself or of the explosive remnants remaining afterward. With that, they knew they would need to develop a better understanding of both who was at risk and why.

HALO and Al Ghad, with support and consultation from GICHD, decided on a three-stage process to engage with the community and answer these questions. First, a series of key informant interviews (KIIs) were conducted to discuss who was at risk and why, and to help identify potential participants in male and female focus group discussions (FGDs). Then, two focus group discussions were held to determine who community members considered most at risk, why they were at risk, potential solutions to those risks, and the community's priorities if and when multiple solutions were proposed. Finally, a survey of the identified at-risk group was conducted, which included the barrier analysis and the group's perspectives on the kind of intervention that would limit their risks the most.

The planning and preparation for the interviews and focus group discussions took two weeks, with a workshop held at the end of the second week to train the M&E teams on the data collection techniques and tools. The KIIs and FGDs were held in week three. Due to COVID-19 restrictions the FGDs had to be held online, and the participants were provided with data credit in order to join the call on Zoom. The FGDs each had 8-10 participants, and the moderators trained ahead of time to encourage participants to use the “raise hand” feature both for those who wanted to add to the conversation and for voting on priorities and for demonstrating agreement with statements when asked. The use of hand raising, and incorporating questions throughout the session that involved voting in addition to open-ended responses, allowed participants to stay engaged in the session throughout, even if not speaking.

Overwhelmingly, both male and female FGD participants identified children and teens as the most at-risk groups. Incidentally, they also overwhelmingly suggested the development of a recreational space to provide alternatives for playing and relaxing in unsafe areas.

While the response from the community was largely uniform regarding who to target and the solution proposed, HALO and Al Ghad still wanted to survey the children teens themselves to determine what they thought about what put them at risk, or their proposed solutions and priorities. Due to resource limitations, the specific constraints of the project, and the community's belief that children's risk stemmed from their being unaware of the dangers—which could be addressed through risk education

sessions--HALO and Al Ghad decided to focus their efforts on adolescents (13-24 year olds). Developing and training the teams on the survey/barrier analysis took another week following the FGDs, and the teams then spent two weeks gathering responses.

The full process above, then, included approximately two months of preparation, training, data gathering, and data analysis. However, the time required can be substantially shortened if operators are only looking to survey their populations of interest, or by incorporating a few components of a barrier analysis into EORE-related surveys.

Survey Design

Given the constraints and aims of the project, four behaviours were included in the survey:

1. Whether the teens had touched or moved explosive items in the last year.
2. How often the teens go into areas where there is rubble nearby (often, sometimes, or never).
3. How often the teens go into areas where they have seen explosive items in the past (often, sometimes, or never).
4. How often the teens go into areas where adults do not go or other abandoned areas (often, sometimes, never).

These four behaviour questions served as the dependent variables, with the answers to these questions tested against the determinants of behaviour to illustrate which of the determinants affected the likelihood of engaging in safe or unsafe behaviours. The determinants tested included:

1. *Self-Efficacy*, determined by asking:
 - Do you think you can avoid an accident from explosive items? (yes, possibly, no, I don't know)
2. *Social Norms*, including:
 - What do your friends say about going into areas where there is rubble? (they encourage it, they discourage it, they do not talk about it)
 - What do your friends say about going into areas where you have seen explosive items? (they encourage it, they discourage it, they do not talk about it)
 - What do your friends say about going into areas where adults do not go? (Or, if 18+) What do your friends say about going into other abandoned areas? (they encourage it, they discourage it, they do not talk about it)
 - What do your friends think about those who touch or move explosive items? (they also touch or move items, they approve of it, they disapprove of it, they do not talk about it)
3. *Perceived Susceptibility*:
 - Do you think you'll see an explosive item in the next six months? (yes, no, prefer not to answer/maybe)

4. *Perceived Severity:*

- How serious would it be if you set off an item by accident? (very serious, serious, somewhat serious, not serious at all, don't know/won't say)

5. *Influencers:*

- Whose opinions matter most to you about how you should act? (friends, mother, father, sisters, brothers, teachers, religious leaders, other adult male, other adult female, other: _____)

For the questions regarding what the respondents' friends say, surveyors were trained not to provide answer options, but to listen to the response and determine whether it best fit into the category of "encouragement", "discouragement", or not talking about the action.

In addition to the determinants and influencers, open-ended questions regarding what the respondent knows that can help keep them safe, what they would like to know to help them avoid an accident, and thoughts about the project that could help them stay safer were asked.

Finally, due to the overwhelming leaning among the adults toward a park or recreational area, the teens were specifically asked whether they believed a recreational space would help them, and if it would, what type of space they would use. The complete survey is included in the annex below.

Survey Methodology and Sample

The surveys were disseminated in Mosul Old City over a two-week period in October of 2020. They were delivered in conjunction with risk education sessions, and so session attendees who were in the 13-24 year old age range were asked to participate, as well as others in that age range who the survey teams came across during the course of the day. The goal was to survey 60 people, and ultimately 67 respondents were included. Their demographic characteristics are given in Table 1 below.

The table illustrates that the respondents were roughly half male and half female. The plurality were between 13 and 15 years old, while the older age groups within the 13-24 age range are slightly underrepresented. This distribution is not surprising, as the surveys were conducted during the day, and it is likely a greater proportion of those in the older age groups would have been at work.

Just 13% of the respondents are currently enrolled in and attending school, while 31% had school suspended due to COVID-19 precautions and 21% had graduated. Approximately one-third of the respondents were not in school. These findings related to enrolment are significant in that risk education sessions are often given in schools, but a substantial proportion of the group identified to be most at-risk in Old City—adolescents—do not currently attend school. Therefore, alternative methods of delivering risk education are needed for that group.

Table 1: Demographic Characteristics of Survey Respondents

Characteristic	Number	Percent
Sex		
Female	32	48%
Male	35	52%
Age		
13-15	27	40%
16-18	18	27%
19-21	10	15%
22-24	12	18%
School Enrollment Status		
Currently Enrolled	9	13%
School is Suspended*	21	31%
Graduated	14	21%
Not Enrolled	23	34%
IDP Status		
Returnee	27	40%
Did not leave Old City	40	60%
Disability Status (WGSS)		
Reports Disability	2	3%
No Disability	65	97%

*Due to COVID-19

Approximately 40% of the adolescents reported that their families left Old City during the fighting and have subsequently returned. Returnees are known to be a high risk group in all contexts,⁷ and those risks are particularly acute in a context like Mosul, where the use of IEDs and booby-trapped household items was widespread.⁸ This high rate of displacement suggests that not only should risk education be delivered within the bounds of Old City, but also that risk education messaging should be delivered in the surrounding areas to target anyone still planning to return.

Finally, the Washington Group Short Set of questions, meant to identify those with self-reported limitations in seeing, hearing, mobility, self-care, communication, and cognition, was asked of the respondents. Only two people (3%) reported disabilities of any sort, which suggests that adolescents with disabilities are grossly underrepresented in the sample reached. This limitation is unfortunate, as prior surveys in Iraq have found that people with disabilities are even more concerned by the presence of EO than are those with typical abilities. In addition, because the sample was drawn from attendees at the sessions, it suggests that increased effort needs to be put into reaching people with disabilities in the sessions themselves.

⁷ See, e.g., UNMAS's *Guidelines on Explosive Hazards Risk Education (EHRE) for Safer Return*. 2020.

⁸ Kossov, Igor. 2017. USA Today.

Current Behaviours

The data were first analysed to determine the prevalence of each of the four behaviours of interest: whether explosive hazards are touched or moved, and whether the respondents go into places with rubble, where they have seen EO in the past, or where adults do not go/other abandoned areas. Each of these behaviours would be considered “unsafe”, and the goal was to determine whether and why adolescents engage in them.

To begin, the respondents were asked whether they have seen explosive ordnance in Old City in the past year. Over 85% (58 adolescents) responded that they had, which suggests adolescents do experience a high rate of exposure to EO. Of the 58 who have seen an item in the last year, 38% reported they had touched or moved a found item at least once.

Table 2: Percentage who have Encountered Explosive Ordnance and Have Touched or Moved Found Items

	Yes	No	N
Has seen EO in Old City in the last year	87%	10%	67
Touched or moved the item			
Female	33%	66%	27
Male	42%	58%	31
13-18	33%	67%	40
19-24	50%	50%	18
Total	38%	62%	58

The percentages who had touched or moved items varied somewhat by sex and age, with boys being slightly more likely to say they had touched or moved items compared with girls, and older adolescents more likely to have touched or move items than were the younger age group.

The frequency with which the adolescents enter potentially dangerous areas is presented in the table below. Overall, over half of the adolescents report at least sometimes going into potentially dangerous areas. There were some differences between the males and females and between the age groups in the sample. Females reported going into areas where there is rubble nearby at a substantially higher rate than did males. Those in the older age group were also slightly more likely to report going into areas with rubble than the younger age group were.

Similarly, more than half of the respondents who have seen EO in the past report at least “sometimes” going into areas where the EO was spotted, with 22% reporting often entering such areas. Again, there are few differences between sexes or age groups, with the older age group just slightly more likely to report going into areas where they have seen EO in the past.

Table 3: Frequency of Entering Potentially Dangerous Areas

	Often	Sometimes	Never	N
Go into areas where there is rubble nearby				
Female	34%	28%	38%	32
Male	31%	17%	51%	35
13-18	31%	22%	47%	45
19-24	36%	23%	41%	22
Total	33%	22%	45%	67
Go where EO seen in the past				
Female	22%	30%	48%	27
Male	23%	29%	48%	31
13-18	23%	28%	50%	40
19-24	22%	33%	44%	18
Total	22%	29%	48%	58
Go where adults are not/abandoned areas				
Female	0%	25%	75%	32
Male	12%	29%	60%	35
13-18	2%	31%	67%	45
19-24	14%	18%	68%	22
Total	6%	27%	67%	67

Finally, the frequency with which adolescents enter areas where adults do not go or that are otherwise abandoned was explored. These abandoned areas are the least frequently entered dangerous area overall, with just 6% of respondents often and 27% sometimes entering them. Here, the differences between men and women were stark, with no women often entering abandoned areas compared with 12% of men. There were also some differences between the older and younger age groups. While the overall percentage who ever enter abandoned areas was similar, the older group reportedly entered the areas much more frequently, with 14% saying they “often” go into such areas compared with just 2% of the younger group.

While it is not possible from these data to compare adolescents’ risk taking with other groups, the data do suggest that there is a high level of risky behaviour among those surveyed, and that there is a substantial amount of room for adolescents in Mosul Old City to alter their behaviours to help keep themselves safer. The data also suggest that both females and males are engaging in these behaviours, with girls being more likely than boys to enter areas near rubble, while boys are slightly more likely to touch and move items or go into abandoned areas. Therefore, while existing accident data often suggests boys are at higher risk of accidents, the behaviours data indicates that girls can equally benefit from EORE messaging and should continue to be targeted.

The questions that follow from this behaviour data are, “what is driving these behaviours, and what messaging or means of message delivery could help to limit them?”

Determinants of Behaviour

As described above, four potential determinants of behaviour were included in the survey: self-efficacy, social norms, perceived susceptibility, and perceived severity. In addition, respondents were asked about their influencers, and they were given the opportunity in open-ended responses to describe the knowledge and skills they currently have in order to stay safe as well as what they would like to know.

The responses to the determinants questions were then cross-tabulated with those from the behaviour questions above to determine whether and to what degree each of the determinants is related to the behaviours. The findings and conclusions from those cross-tabulations are discussed below.

Self-Efficacy

The primary question related to self-efficacy asked in the survey was “Do you think you can avoid an accident from explosive items?”

The table below shows the relationship between those who believe they can avoid an accident, those who think they can “possibly” avoid an accident, and those who do not believe they can avoid an accident, and the four behaviours surveyed.

Table 4: Behaviours among those who think they can and cannot avoid an accident

	Yes, can avoid	Possibly	No, cannot avoid
Touched or Moved Item			
Yes, touched/moved	0%	33%	44%
No, has not touched/moved	100%	67%	56%
Enter Areas with Rubble			
Yes, sometimes or often	50%	53%	66%
No, never	50%	47%	35%
Enter areas EO Seen in Past			
Yes, sometimes or often	50%	60%	52%
No, never	50%	40%	48%
Enter Abandoned Areas			
Yes, sometimes or often	12%	35%	41%
No, never	88%	65%	59%

The findings suggest a strong relationship between perceived self-efficacy and behaviours among those included in the sample. Among those who believe they *can* avoid an accident, not one reported touching or moving an item that they have found. In addition, just 12% of those who believe they can avoid an accident report entering abandoned areas, compared with 41% of those who do not believe they can avoid an accident. A similar but weaker trend is found in regards to entering areas with rubble,

with half of those who think they can avoid an accident going into such areas compared with two-thirds of those who do not think they can avoid an accident.

The one behaviour for which there does not seem to be a relationship between perceived self-efficacy and the action is entering areas where explosive ordnance has been seen in the past. However, taken together these findings indicate that one aspect of the messaging toward adolescents should be that through improving their knowledge and awareness, and slight adjustments in behaviour, they can at least decrease their risk of being in an accident.⁹ If the adolescents' perception of their ability to reduce their own risk improves, they may also decrease the frequency of risky behaviours.

Social Norms

The questions regarding social norms all centred around the respondents' perceptions of their friends' thoughts on each of the behaviours. Surveyors asked what the respondents' friends said about going into areas where there is rubble, going into areas where they have seen explosive items, going into areas where adults do not go, and touching or moving items. The surveyors were instructed to listen to the responses, and record whether what was said fit best into "they encourage it," "they discourage it" or "they do not talk about it." Regarding touching or moving items, the possible categories included "they touch or move items", "they approve of it", "they disapprove of it", or "they do not talk about it".

The relationships between each behaviour and friends' acceptance or encouragement of it are given in tables 5 and 6:

Table 5: Touching or Moving Items by Friends' Attitudes

	They Touch/Move	Approve	Do Not Discuss	Disapprove
Touched or Moved Item				
Yes, touched/moved	100%	88%	20%	27%
No, has not touched/moved	0%	13%	80%	73%

As with perceived self-efficacy, there is a strong relationship between the social norms surrounding behaviours and the behaviours themselves. Every adolescent who reported that their friends touch or move items said that they touch or move items as well, while 88% of those who reported their friends approve of touching or moving items indicated they had touched or moved an explosive hazard. Conversely, just 27% of those whose friends disapprove of touching or moving items reported doing so themselves.

A similar trend is seen regarding entering potentially dangerous areas. When friends encourage the behaviour, between 90 and 100% of respondents report engaging in the unsafe behaviour. When friends discourage the behaviour, however, it is only done 21 to 56% of the time. The strongest relationship is between friends' perceptions and entering abandoned areas, which may be due to the

⁹ It should be noted that the messaging should not be that risk can be eliminated, as this messaging is both incorrect and it could be used to place undue blame and/or shame on accident victims.

other behaviours more often being out of economic or geographic necessity (e.g., there are no alternatives to taking paths with rubble or where EO was seen previously), while entering abandoned areas would more often be by choice.

Table 6: Entering Dangerous Areas by Friends' Attitudes

	Encourage	Do Not Discuss	Discourage
Enter Areas with Rubble			
Yes, sometimes or often	100%	28%	56%
No, never	0%	72%	44%
Enter areas EO Seen in Past			
Yes, sometimes or often	100%	45%	38%
No, never	0%	55%	62%
Enter Abandoned Areas			
Yes, sometimes or often	90%	24%	21%
No, never	10%	76%	79%

These findings suggest that if a goal of EORE sessions is to limit people's dangerous behaviours, then two forms of messaging could be beneficial. First, adolescents should be encouraged to spread safety messages to one another. Following behaviour change communication practices, these messages should be positive and should appeal to the youths' perceived social roles. For example, "friendship means keeping one another safe," or "As your friend, I think you should leave that alone." Second, it may help to equip adolescents with possible responses when friends do encourage them to behave in unsafe ways.

Perceived Susceptibility and Severity

To measure perception of susceptibility, respondents were asked whether they think they'll see an explosive item in the next six months. To determine perceived severity, they were asked how serious it would be if they set off an item by accident, with the possible answer options very serious, somewhat serious, not serious at all, or don't know/prefer not to answer.

Overwhelmingly, the respondents believed they would see an item in the next six months, with 78% saying yes, they would see an item, 12% saying no, and 10% saying "maybe". In addition, those who said they *would* likely see an item also reported they were *more* likely to go into potentially unsafe areas than did those who said they would not likely see an item. Rather than this finding indicating that increases in "perceived susceptibility" drives less safe behaviour, though, it more likely indicates the respondents have an accurate understanding of where items are likely to be found. That is, those who go where there is rubble, where they have seen EO in the past, or into abandoned areas report increased susceptibility because they are more susceptible, not because the perception of susceptibility is driving the behaviour.

Perceived severity of an accident, however, may influence adolescents' behaviours. The relationship between perceived severity and behaviours is presented in Table 7. Only one respondent believed that accidentally setting off an item would be "not at all serious", so their responses are combined in the table with those who believed an accident would be just "somewhat serious".

Table 7: Behaviours and Perceived Severity of an Accident

	Very Serious	Serious	Somewhat/ Not at all Serious
Touched or Moved Item			
Yes, touched/moved	23%	55%	42%
No, has not touched/moved	77%	45%	58%
Enter Areas with Rubble			
Yes, sometimes or often	39%	73%	79%
No, never	61%	27%	21%
Enter areas EO Seen in Past			
Yes, sometimes or often	32%	64%	83%
No, never	68%	36%	17%
Enter Abandoned Areas			
Yes, sometimes or often	21%	36%	50%
No, never	79%	64%	50%

There is a clear difference in behaviours among those who believe an accident would be "very serious" and those who think it would be "serious" or just "somewhat serious". Among those who believe the consequences of setting off an item would be "very serious" between 21 and 39% report engaging in the risky behaviours. In contrast, among those who believe the result of an accident would be just "somewhat" or "not at all serious", between 42 and 83% of the respondents report engaging in the risky behaviour.

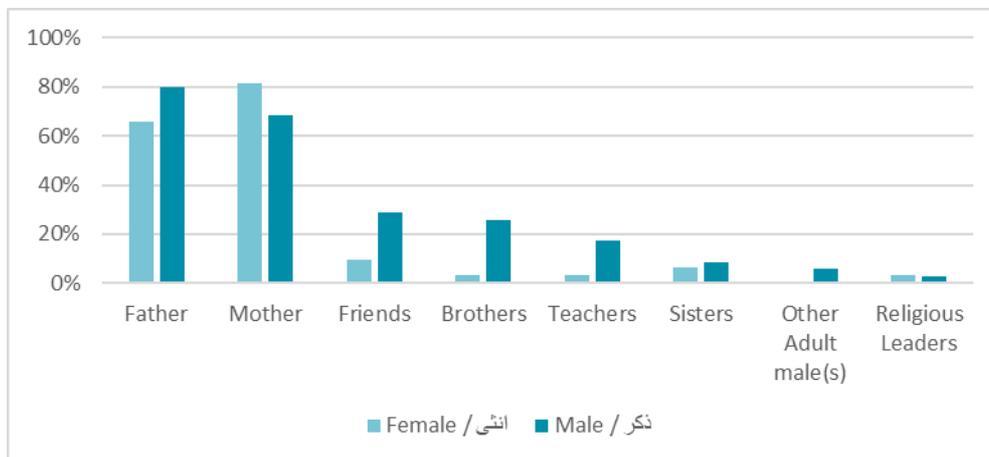
Among EORE practitioners, it would be easy to believe that all attendees at a session inherently understand the potential severity of an accident. However, these data suggest not only that there is a wide discrepancy in adolescents' perceptions of what the result of an accident might be, but also that this discrepancy leads to differences in how they act in regards to EO. Emphasising the real dangers and consequences of explosive hazards, therefore, may help reduce risky behaviours among the target group.

Influencers

In addition to the determinants of behaviour described above, the adolescents were asked whose opinions matter to them the most regarding how they should act. The survey participants were able to select multiple options, including father, mother, brothers, sisters, friends, teachers, religious leaders, other adult males, and other adult females.

Over 80% of the respondents listed a parent as a primary influencer, with the girls slightly more likely to list their mothers and the boys slightly more likely to list their fathers. Friends were the second most often-mentioned group, but were much farther behind, with 30% of boys and 10% of girls mentioning them. Siblings, teachers, religious leaders, and other adults were mentioned less frequently.

Figure 1: Reported Influencers among Girls and Boys



This finding regarding influencers is significant in that it means safety messaging targeting adolescents should not only be given directly to adolescents, but also to parents. While friends’ behaviour and encouragement related to specific behaviours may be a factor, parents’ direction and guidance has a substantial role to play as well. In addition, this finding that teens and young adults state their parents are their biggest influencers should be shared with parents in EORE sessions, as a means of encouraging them to understand, absorb, and pass on to their children the safety-related messages they hear.

Summary

Perceptions of self-efficacy, social norms regarding behaviours, and the perceived severity of an accident were all related with the likelihood of engaging in unsafe behaviours among the respondents surveyed. These findings suggest that emphasising the youth *can* limit their risks of an accident, and providing realistic depictions of the severity of an accident may help in promoting safer behaviours. In addition, providing messaging adolescents can give to one another and equipping them with the means to respond when friends encourage unsafe behaviours may limit their risks. Finally, involving parents in disseminating and emphasising safety messages could be fruitful, as adolescents overwhelmingly cite parents as a key influence in how they behave.

While the findings related to the external risk-reduction project are not discussed here as they were not part of the barrier analysis itself, the youth overwhelmingly spoke in favour of developing a park or greenspace in Old City to provide a safe place to relax and play. The park is scheduled to be complete in August 2021.

The incorporation of the barrier analysis into the community engagement portion of this project proved useful for several reasons. First, it allowed HALO and Al Ghad to determine a baseline of behaviours that can be tested against at the endline of the project. Second, it drew out several unexpected barriers to safe behaviour including perceived self-efficacy and perceived severity. Without the barrier analysis, teams would have alluded to, but may not have emphasised the ideas that teens do have some control over their risk levels, and that the remaining hazardous items are still able to kill. In addition, it gave teams evidence to present to adults that the messaging they pass to their own children is influential, and the adults should continue to promote safe behaviours when they have the opportunity.

In exchange for a few weeks of data gathering and analysis, HALO Iraq and Al Ghad were able to greatly improve the evidence base for their EORE messaging, and give themselves data against which their interventions can be tested. The endline barrier analysis data will be gathered later in 2021, and they look forward to sharing the findings.

Limitations, Potential for Future Use, and Conclusions

HALO Iraq's incorporation of a barrier analysis into their EORE project in Old City highlighted a few limitations to the approach and suggestions for the future.

The sample included in this analysis was limited by the time available for data collection. The 67 participants provided a reasonable sample for comparing those engaged in safe and unsafe behaviours. However, a larger sample would have allowed for more meaningful tests of statistical significance and for the comparison of sub-groups (e.g., male "doers" or "non-doers" versus female "doers" or "non-doers", smaller age categories, those enrolled in school versus not in school, etc.). Drawing a larger sample in future data collection would help address this limitation.

Outside the sampling and methodological concerns, barrier analyses are primarily designed for the testing of a single positive behaviour rather than multiple negative behaviours. The HALO Iraq team's approach illustrated that multiple behaviours can be tested, but that each additional behaviour substantially lengthens the survey, and so testing of multiple behaviours is best done as part of a stand-alone data collection exercise. If questions along these lines are to be added to existing surveys, a specific behaviour of interest should be chosen and focused on.

Prior research also suggests that if only a select few determinants will be included, self-efficacy, social norms, perceived positive consequences, and perceived negative consequences should be among them. In the version of the barrier analysis discussed, perceived positive and negative consequences were not included, as it was assumed that in relation to explosive hazards the answers would be similar for all respondents. The variation in response to the potential severity of an accident suggests, however, that the positive and negative consequences of safe or unsafe behaviours may be worth capturing. Future

surveys would benefit from including questions along those lines in addition to the other determinants of behaviour not yet tested.

Finally, this research and analysis focused only on the quantitative components of the barrier analysis. The responses to open-ended questions regarding the knowledge respondents have that they believe helps keep them safe as well as the information they would like to know was of course hugely beneficial in improving the design and delivery of targeted and responsive risk education.

The use of the barrier analysis in this project also illustrated three ways a similar approach may be incorporated into and improve future EORE design and delivery.

First, the approach can simply be repeated in other areas and with other demographic groups. It is unlikely that the drivers of behaviour for adolescents in Old City will be the same as those for rubble removers in Syria, scrap metal collectors in Afghanistan, or agricultural workers in Colombia. Barrier analyses can be useful tools at the project design phase to determine which groups are enacting unsafe behaviours at the highest rates and specific messaging for those most at risk.

Second, components of the barrier analysis can be incorporated into the ongoing monitoring and evaluation processes of EORE delivery. Many operators conduct pre- and post-session surveys to measure knowledge change and evaluate the quality of their session delivery. If the resources do not exist to gather behavioural and determinant data systematically up front, a few questions can be added to these existing tools so that over time the behaviours and constraints on behaviour of different groups can be better understood. The information gained from these survey questions can help give a better idea of what groups are engaging in risky behaviours when there is dearth of accident data, and it can feed into the design and delivery of future RE sessions or materials.

Finally, over the last several years risk education practitioners have increasingly recognised the importance of measuring behaviours and behavioural change associated with their activities. The measurement of changes in behaviour has been met with several challenges, though, including that behaviour toward EO typically is not directly observable, and so its measurement relies on self reports. In addition, several assumptions need to be made about the reasons underlying changes in reported behaviours. Adding questions to existing surveys regarding the barriers to safe behaviours may be useful in addressing some of these challenges. That is, where attributing changes in actual behaviour to risk education can be difficult, it may be more straightforward to attribute a reduction in barriers to safe behaviour to risk education messaging. For example if 50% of the youth surveyed pre-session report their friends encourage them to touch or move items, but only 20% report friends encourage them to touch or move items in a 6-month follow up survey, that finding provides some evidence that messaging regarding how to interact with friends regarding EO is having the intended effect.

The experiences of HALO Iraq, the Al Ghad teams, and GICHD in delivering and analysing a barrier analysis in Mosul Old City suggest it can be an efficient and useful tool for understanding target groups' behaviours and the determinants of those behaviours. The findings can then be used to develop specific messaging and delivery techniques that can improve the effectiveness of EORE sessions and materials. Further, this line of questioning may be useful in measuring the impact of EORE. While behaviours themselves are not directly observable and can be difficult to capture, questions related to barriers to safe behaviour can help determine whether EORE is effectively reducing those barriers. This measurement can be done either through stand-alone data collection exercises or through the incorporation of components of the barrier analysis into already existing monitoring and evaluation tools.

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Annex: Explosive Hazards Barrier Analysis Survey

For use with *adolescents, 13-24 years old*

Section A: Demographic Information			
Surveyor: _____		Date: _____	
Respondent's Name: _____		Consent: <input type="checkbox"/> No <input type="checkbox"/> Yes	
Age: _____	Phone #: _____	Sex: <input type="checkbox"/> Female <input type="checkbox"/> Male	
Are you in school? <input type="checkbox"/> Yes <input type="checkbox"/> No, not enrolled <input type="checkbox"/> No, school suspended for COVID-19 <input type="checkbox"/> No, I graduated/am finished with school.		Did you leave Old City during the fighting? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't know	
If yes, what year/grade? _____ If graduated, what was the highest grade completed? _____		Who is the head of your household? <input type="checkbox"/> Father <input type="checkbox"/> Mother <input type="checkbox"/> Brother <input type="checkbox"/> Sister <input type="checkbox"/> Self <input type="checkbox"/> Other	

Introduction/Consent:

Hi, my name is _____, and I am part of a team that wants to support your community in finding ways to stay safe from explosive items. This survey will help us understand what you do around EO and why. You don't have to take the survey, and you can skip any questions you don't want to answer. If you do answer the questions, it will help us if you answer as honestly as you can. We won't share what you say with anyone outside our organisation.

It is OK if we ask you these questions? Yes No *If not, thank them for their time and let them leave.*

Does a parent also consent to the child taking the survey? Yes No *If not, thank them for their time and let them leave.*

Washington Group Short Set

1. Do you have difficulty seeing, even if wearing glasses? <input type="checkbox"/> No, none <input type="checkbox"/> Yes, a little <input type="checkbox"/> Yes, a lot <input type="checkbox"/> Cannot do at all <input type="checkbox"/> Prefer not answer	2. Do you have difficulty hearing, even if using a hearing aid? <input type="checkbox"/> No, none <input type="checkbox"/> Yes, a little <input type="checkbox"/> Yes, a lot <input type="checkbox"/> Cannot do at all <input type="checkbox"/> Prefer not to answer
3. Do you have difficulty walking or climbing stairs? <input type="checkbox"/> No, none <input type="checkbox"/> Yes, a little <input type="checkbox"/> Yes, a lot <input type="checkbox"/> Cannot do at all <input type="checkbox"/> Prefer not to answer	4. Do you have difficulty remembering or concentrating? <input type="checkbox"/> No, none <input type="checkbox"/> Yes, a little <input type="checkbox"/> Yes, a lot <input type="checkbox"/> Cannot do at all <input type="checkbox"/> Prefer not to answer
5. Do you have difficulty with self care (such as washing all over or dressing)? <input type="checkbox"/> No, none <input type="checkbox"/> Yes, a little <input type="checkbox"/> Yes, a lot <input type="checkbox"/> Cannot do at all <input type="checkbox"/> Prefer not to answer	6. Do you have difficulty communicating or being understood by others? <input type="checkbox"/> No, none <input type="checkbox"/> Yes, a little <input type="checkbox"/> Yes, a lot <input type="checkbox"/> Cannot do at all <input type="checkbox"/> Prefer not to answer

Section B: Current Behaviours

7. Have you seen an explosive item in Old City in the last 12 months?
 Yes No Not sure/Don't Know
8. [If yes] In the last year, have you touched or moved an explosive item?
 Yes No
- 8a. [If yes] Why did you touch or move the item?
9. Do you go into areas where there is rubble nearby? *If they say yes, then ask "often or just sometimes?"*
 Yes, often Yes, sometimes No, never
- 9a. *[If often or sometimes - ** This question must be asked in a way that we are not accusing the youth of doing something wrong]* In what situations do you go into those areas?
10. *[If they say they have seen ERW]* Do you go into areas where you have seen explosive items? *If they say yes, then ask "often or just sometimes?"*
 Yes, often Yes, sometimes No, never
- 10a. *[If often or sometimes - ** This question must be asked in a way that we are not accusing the youth of doing something wrong]* In what situations do you go into those areas?
11. [If <18] Do you go to areas where adults do not go? [If 18+] Do you ever go to other abandoned areas?
 Yes, often Yes, sometimes No, never
- 11a. *[If often or sometimes - ** This question must be asked in a way that we are not accusing the child of doing something wrong]* In what situations do you go into those areas?

Section C: Determinants of Behaviour

Perceived Self-efficacy

12. Do you think it is possible to avoid dangerous places in Old City right now?
 Yes (*Go to Q 13*) No (*Go to Q 14*) Do not know (*Go to Q 14*)
13. Are there things that make it difficult to avoid dangerous areas? [If yes] What are those things? *Write all responses below. Probe with "What else?" Then, go to Question 15.*
14. What makes it difficult to avoid dangerous areas?
15. Are there any things that would make it easier to avoid dangerous areas? [If yes] What are those things? *Write all responses below. Probe with "What else?" If it's unclear why this would help, ask why and record their answer.*
16. Is there anything that makes it difficult for you to avoid touching or moving explosive items? [If yes] What are those things? *Write all responses below. Probe with "What else?"*

17. *[If there are things that make it difficult]* What would make easier for you to avoid touching or moving explosive items?

Influencers

18. Whose opinions matter most to you about how you should act? *Probe with "Anyone else?"*

- Friends Mother Father Sisters Brothers
 Teachers Religious Leader Other adult male(s) Other adult female(s)
 Other: _____

Perceived Social Norms

19. What do your friends say about going into areas where there is rubble? *Do not read the answer options. Decide which option fits best based on the respondents' answer.*

- They encourage it They discourage it They do not talk about it

19a. Notes/Comments/Explanation....

20. *[If have seen ERW]* What do your friends say about going into areas where you have seen explosive items? *Do not read the answer options. Decide which option fits best based on the respondents' answer.*

- They encourage it They discourage it They do not talk about it

20a: Notes/Comments/Explanation....

21. (If <18) What do your friends say about going into areas where adults do not go? (If 18+) What do your friends say about going into other abandoned areas?

- They encourage it They discourage it They do not talk about it

21a. Notes/Comments/Explanation....

22. What do your friends think about those who touch or move explosive items? *Do not read the answers.*

- They also touch or move items They approve of it
 They disapprove of it They do not talk about it

22a: Notes/Comments/Explanation....

Perceived Susceptibility

23. Do you think you'll see an explosive item in the next six months?

- Yes No Prefer not to answer / Maybe

Perceived Severity

24. How serious would it be if you set off an item by accident?

- Very serious Serious Somewhat serious
 Not serious at all Don't Know / Won't say

Rules

25. Are there any rules about where you are allowed to spend free time?

- Yes No

25a. If yes, what are they?

25b. *[If there are rules]* Do you follow them?

- Yes, always Yes, usually Yes, sometimes No

Section D: Recreational Areas

26. Do you think having more safe recreational spaces in Old City would help you to avoid unsafe areas?

- Yes No

27. *[If yes]* What kind of recreational spaces would you be most likely to use? *Probe with, "Anything else?"*

28. Can you explain a bit about how the space would help you be safer?

29. Do you have any other ideas about what could help you and your friends stay safer from explosive items? *If they give an answer, probe with "Anything else?"*

Thank you very much for taking the time to complete this survey