BARRIER ANALYSIS and
Explosive Ordnance Risk Education

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In early 2020, The HALO Trust (HALO) in partnership with Al Ghad conducted a "barrier analysis" with youth in Mosul, Iraq to determine the constraints they faced in adopting safer behaviors related to explosive ordnance (EO). Through the barrier analysis, HALO and Al Ghad found that youth with lower perceived self-efficacy, beliefs that an EO accident would not likely result in severe consequences, and friends who encouraged unsafe behaviors were all more likely to engage in less safe behaviors than their counterparts were. The findings enabled HALO and Al Ghad to tailor their EORE messaging to these barriers in an effort to promote safer behaviors and reduce risk taking. This article outlines the process of conducting the barrier analysis survey and analysis of the findings. In addition, lessons are identified for those who may wish to adopt a similar approach in the future.

While the intent of explosive ordnance risk education (EORE) is to encourage shifts in behavior, across the mine action sector, there are few practical methods of gathering and analyzing data that helps operators understand why some groups are at greater risk than others and the determinants of behaviors that EORE messaging might be able to affect. This gap is particularly acute in contexts where EO casualty monitoring is not yet systematic or widespread. In those instances, understanding who is at risk and the knowledge, attitudes, and behaviors 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 and that 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 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 behaviors and can give risk education operators a more complete picture of why each group engages in those behaviors.

Conducting Barrier Analyses

Barrier analyses are surveys that are designed to improve understanding of the factors that influence particular behaviors. The approach surveys whether respondents do or do not engage in certain behaviors of interest. Respondents are then asked a series of questions about the personal, social, and environmental factors that might affect those behaviors. Finally, the data are analyzed by comparing the personal, social, and environmental factors among the *doers* with those of the *non-doers* for the behavior of interest. If the responses between doers and non-doers are similar, then that factor is *not* considered an influencing factor in the behavior itself. If the responses of doers and non-doers are different, however, then the assumption is that factor influences the behavior in some way.

In a complete barrier analysis, questions related to twelve "determinants of behavior"[1] are included alongside questions related to the specific behaviors of interest. These determinants were derived from theories of behavior, and they include people's perceptions of:

- **Self-Efficacy:** belief that one has the knowledge and skills to do the behavior
- **Social Norms:** the perception that people important to the actor think the actor should do the behavior
- **Positive Consequences:** the positive things the person thinks will happen as a result of doing the behavior
- **Negative Consequences:** the negative things the person thinks will happen as a result of doing the behavior
- **Access:** the availability of needed products or services required for doing the behavior, including 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 behavior
- **Culture:** the extent to which local history, customs, lifestyles, values, and practices may affect behaviors
- **Cues to Action/Reminders:** the presence of reminders that help someone remember to do the behavior
- **Susceptibility:** a person's perception of how likely it is that the negative consequences of a behavior 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 behavior 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 twelve determinants, it is possible to discover during the data analysis which of the twelve have the greatest influence on a particular behavior.

Photo courtesy of HALO.

Applying the Barrier Analysis Approach in Mosul, Iraq

HALO in Iraq partnered with a local organization—Al Ghad League for Women and Children—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, with remote support and consultation from the Geneva International Centre for Humanitarian Demining (GICHD), conducted a series of key informant interviews and focus group discussions (FGDs) to ascertain the community's perceptions of who were the most at-risk groups in Old City, and their proposed solutions for those groups. Overwhelmingly, the key informants and 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 target group to determine what they thought put them at risk, their barriers to safe behaviors, and their proposed solutions and priorities. Due to the specific constraints of the project, HALO and Al Ghad decided to focus their efforts on adolescents (13- to 24-year-olds).[2]

Survey Design

To separate the *doers* from the *non-doers*, four behaviors were included in the survey:

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

These four behavior questions served as the dependent variables, and the answers to these questions were tested against the determinants of behavior to illustrate which of the determinants affected the likelihood of engaging in safe or unsafe behaviors. The determinants tested included *self-efficacy*, *social norms*, *perceived susceptibility*, and p*erceived severity*. Further detail on the specific questions asked is given in the next section.

In addition to the behaviors and determinants, open-ended questions were asked of respondents:

- what they know that can help keep them safe
- what they would like to know to help them avoid an accident, and
- what they think about a project that could help them stay safer.

Finally, due to the overwhelming preference 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 available upon request.[3]

Survey Methodology and Sample

The surveys were disseminated in-person in Mosul Old City over a two-week period in October 2020. They were typically delivered in conjunction with risk education sessions. EORE attendees between 13- and 24-years-old were asked to participate, as were others in the target age range who the teams saw outside of the sessions. To limit the potential spread of COVID-19, EORE sessions and surveys were conducted outdoors, the teams maintained physical distance, and the surveyors wore surgical masks. The goal was to survey sixty people, and ultimately sixty-seven respondents (thirty-two female and thirty-five male) were included. The plurality of male respondents (43 percent) were between thirteen- and fifteen-years-old, and a further 29 percent were sixteen- to eighteen-years-old. Among female respondents, 38 percent (twelve) were between thirteen- and fifteen-years-old, while 25 percent (eighteen) were sixteen- to eighteen-years-old.

Current Behaviors

The data were first analyzed to determine the prevalence of each of the four behaviors of interest: whether the respondents touch or move explosive hazards, and whether they enter places with rubble, where they have seen EO in the past, or where adults do not go/other abandoned areas. Each of these behaviors would be considered *unsafe*, and the goal was to determine whether and why adolescents engage in them.

Of the fifty-eight respondents who had seen an item of EO in the last year, 38 percent reported they had touched or moved a found item at least once. Over half (55 percent) of the adolescents reported at least sometimes going into areas where there is rubble nearby, and similarly, more than half (52 percent) of the respondents who have seen EO in the past report at least "sometimes" going into areas where the EO was spotted.

Finally, the survey explored the frequency with which adolescents enter areas where adults do not go or that are otherwise abandoned. These abandoned areas are the least frequently entered dangerous areas overall, with just 6 percent of respondents reporting that they often and 27 percent reporting that they sometimes enter them. Here, unlike the questions related to rubble and where they had seen EO, the differences between men and women were stark, with no women often entering abandoned areas compared with 12 percent of men.

While it is not possible from these data to compare adolescents' risk-taking levels with other groups, the data suggest there is a high level of risky behavior among those surveyed, and that there is a substantial amount of room for adolescents in Mosul Old City to alter their behaviors to help keep themselves safer. The data also suggest that both females and males are engaging in these behaviors, with girls being more likely than boys to report entering areas near rubble, while boys are slightly more likely to touch and move items or enter abandoned areas.[4] Therefore, while existing accident data often suggests boys are at higher risk of accidents, the behaviors data indicates that girls can equally benefit from EORE messaging and should continue to be targeted.

The questions that follow from this behavior data are, "what is driving these behaviors, and what messaging or means of message delivery could help to limit them?"

Determinants of Behavior

As described previously, four potential determinants of behavior were included in the survey. The responses to the determinant questions were then cross-tabulated with those from the behavior questions to determine to what degree each of the determinants is related to the behaviors.

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?" Table 1 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 as well as the four behaviors surveyed.

The findings suggest a strong relationship between perceived self-efficacy and behaviors among those included in the sample. Among those who believe they *can* avoid an accident, no one reported touching or moving an item that they have found. In addition, just 12 percent of those who believe they can avoid an accident report entering abandoned areas, compared with 41 percent of those who do not believe they can avoid an accident.

In all, these data indicate that one aspect of the messaging toward adolescents should be that through improving their knowledge and awareness, and slight adjustments in behavior,

	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%

Table 1. Behaviors among those who think they can and cannot avoid an accident.
Figures courtesy of the authors/HALO.

they can at least decrease their risk of being in an accident.[5] If the adolescents' perception of their ability to reduce their own risk improves, they may also decrease the frequency of risky behaviors.

Social Norms

The questions regarding social norms all centered around the respondents' perceptions of their friends' thoughts on each of the behaviors. 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 behavior and friends' acceptance or encouragement of it are given in Tables 2 and 3:

	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%

Table 2. Touching or moving items based on friends' attitudes.

As with perceived self-efficacy, there is a strong relationship between the social norms surrounding behaviors and the behaviors themselves. Every adolescent who reported that their friends touch or move items said that they touch or move items as well, while 88 percent of those who reported their friends approve of touching or moving items indicated they had touched or moved an explosive hazard. Conversely, just 27 percent 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 behavior, between 90 and 100 percent of respondents report engaging in the unsafe behavior. When friends discourage the behavior, however, it is only done 21 to 56 percent of the time.

These findings suggest that if a goal of EORE sessions is to limit people's dangerous behaviors, then two forms of messaging could be beneficial. First, adolescents should be encouraged to spread safety messages to one another. Following behavior

	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 Abandonded Areas			
Yes, sometimes or often	90%	24%	21%
No, never	10%	76%	79%

Table 3. Entering dangerous areas based on friends' attitudes.

change communication practices, these messages should be positive and 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 will 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. Possible answers included "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. In addition, those who said they *would* likely see an item also reported they were *more* likely to go into potentially unsafe areas than those who said they would not likely see an item. Rather than indicating that increase in "perceived susceptibility" drives less safe behavior,

	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 Abandonded Areas			
Yes, sometimes or often	21%	36%	51%
No, never	79%	64%	50%

Table 4. Behaviors and perceived severity of an accident.

this finding 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 behavior.

Perceived severity of an accident, however, may influence adolescents' behaviors. The relationship between perceived severity and behaviors is presented in Table 4. 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." There is a clear difference in behaviors among those who believe an accident would

be "very serious" and those who think it would be "serious" or just "somewhat serious," with those perceiving the less severe outcomes also being more likely to engage in risk behaviors.

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. Emphasizing the real dangers and consequences of explosive hazards, therefore, may help reduce risky behaviors among the target group.

Conclusion: Potential for Future Use

Perceptions of self-efficacy, social norms regarding behaviors, and the perceived severity of an accident were all related with the likelihood of engaging in unsafe behaviors among the respondents surveyed. These findings suggest that emphasizing youth *can* limit their risks of an accident and providing realistic depictions of the severity of an accident may help promote safer behaviors. In addition, providing messages that adolescents can pass along to one another and equipping them with the means to respond when friends encourage unsafe behaviors may limit their risks.

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 favor of developing a park or greenspace in Old City to provide a safe place to relax and play: the park opened in August 2021.

The use of the barrier analysis in this project illustrated three ways a similar approach may be incorporated to 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 behavior 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 behaviors 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. A few determinant-related questions can be added to existing risk education tests so that, over time, the behaviors and constraints on behaviors 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 behaviors when there is insufficient accident data, and it can feed into the design and delivery of future RE sessions or materials.

Thirdly, over the last several years, risk education practitioners have increasingly recognized the importance of measuring behavioral change associated with their activities. While there are several challenges with measuring changes in actual behaviors, it may be more straightforward to measure changes in *barriers to safe behaviors* that can be affected by EORE. Borrowing questions from the barrier analysis would be useful in that regard.

In delivering and analyzing a barrier analysis in Mosul Old City, the experiences of HALO Iraq, the Al Ghad teams, and GICHD suggest it can be an efficient and useful tool for understanding target groups' behaviors and the determinants of those behaviors. 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 behaviors themselves are not directly observable and can be difficult to capture, barrier-related questions regarding safe behavior 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. ℂ

See endnotes page ##

Barrier analysis delivery in Mosul, Iraq.
Photo courtesy of HALO.

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1. "Designing for behaviour change: A practical field guide," FSN Network (Food Security and Nutrition Network), 2017, https://bit.ly/2XdMrVu.
2. The project requirements stipulated that the risk mitigation component should target the highest-risk group in the area that was either "reckless" or "forced." The FGD participants suggested children were primarily at risk because they were "uninformed" or "unaware," and that traditional EORE sessions should limit their risks. Teens and young adults, however, were identified as a high-risk group who were a combination of reckless and forced, in that they did not have any alternative places to spend their free time. The wide age range (13¬–24) was selected due to their perceived risk and that they fit the risk profile criteria rather than an assumption that the group members behaviors were driven by similar factors.
3. "Explosive Hazards Barrier Analysis Survey," The HALO Trust, https://bit.ly/3cZLFzv.
4. The girls surveyed explained that they entered these areas because it was on a route they regularly use. The boys surveyed explained that they enter these areas because they collect scrap metal, are rubble cleaners, or construction workers. Both explanations suggest that girls and boys are at-risk and should be targeted with messaging.
5. 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.