Lost Person Behavior - Statistics from Iceland

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Abstract

To be able to find the missing person you must search in the right place. The faster you can pinpoint the correct search location, the faster you will find the missing person. By analysing previous searches, planners can predict what others will do in similar situation. Since 2010 the Icelandic Association for Search and Rescue (ICE-SAR) has recorded searches according to ISRID standards and though the records are not continuous, the ICE-SAR database has 189 incidents. At the Rescue 2018 conference held by ICE-SAR, the following statistics from ICE-SAR database were presented.

KEY WORDS: *Lost Person Behavior, Iceland, Statistics.*

Introduction

This paper examines Lost person behavior theories from ICE-SAR's perspective and experience. ICE-SAR has used the International Search and Rescue Incident Database (ISRID) data presented in Robert J. Koester's *Lost Person Behavior* (2008) for many years). Since 2010 ICE-SAR has collected its own data, though the data collection has not always been continuous, At the 2010 Rescue conference, the first statistics were presented. Now, eight years later, we have 150 additional incidents in the ICE-SAR database.

Since search is an emergency and every search needs an immediate response. The sooner searchers correctly use the established search theories, the sooner we will accomplish our goal: to search in the right place!

Lost person theories are not new and are not something that ICE-SAR brought to the scene. The first book to be published about lost person behavior was Syrotuck's 1977 *Analysis of Lost Person Behavior: An Aid to Search Planning*. In his book, Syrotuck presented statistics from 229 incidents and categorized them into eight categories. Since then the development has been profound. Robert J. Koester published *Lost Person Behavior* in 2008 with over 50.000 incidents.

As shown by the growing body of literature, lost person behavior is an invaluable tool to search planners. Lost person behaviour is the analysis of past searches which allows us to find patterns in past searches that can be applied to the current search, to help figure out what the lost person was doing and where the search planners should begin their search.

The International Search and Rescue Incident Database, ISRID, was founded in 2002 by Robert J. Koester, with a grant he received from the United States Department of Agriculture, to collect and analyse SAR statistics from around the world (Koester, e.d.). One of the products resulting from that work is the book *Lost Person Behavior*, which includes over 50.000 SAR incidents categorized into 41 subject categories. In 2015 an application was lunched and is available for Android and IOS which allows searchers to take the search data into the field. The next version of the book, Koester's book will contain 150.000 incidents. ICE-SAR has sent 100 incidents and will contribute an additional 90 cases.

Since 2003, attempts have been made to start ICE-SAR database for lost persons. ICE-SAR got a grant to hire a student to collect and analyse cases over the summer, but the student quit before anything of value was produced. Then the "Missing person" form was made by collaboration between ICE-SAR and the National Commissioner, but it was never officially implemented and was therefore never widely used. Soon after when ICE-SAR got a new incident and crisis management software, the form was imported into the software but still remained unused.

At the conference Rescue 2010, Dagbjartur Kr. Brynjarsson and Sigurður Ólafur Sigurðsson gave a lecture of the first statistics from the ICE-SAR database, it contained 30 incidents. They analysed old incidents and recorded new cases during the summer of 2010.

Method

The recording of incidents in the ICE-SAR database is done manually. It has varied between the person in charge of the recording how protocol has been, but always followed ISRID standards.

Current protocol is that when a search mission starts, the person in charge of the database goes on monitoring the incident and crisis management software used by ICE-SAR. If necessary and if circumstances allow, he will contact the incident commander and ask for the missing information.

The incident and crisis management software used by ICE-SAR can't export the necessary data into a convenient format, sot he information is then manually typed into the ICE-SAR database.

Results

One of the main purposes of keeping Icelandic data is to contribute to ISRID because we have been users of and benefitted from that data for years. However, the biggest reason is we want to see how Iceland compares to ISRID. Local data always gives the best picture.

Today we are using the DRY Domain data from ISRID. We don't know how accurate that data is compared to our polar landscape. ISRID 3.0 is expected to publish polar data, and it will collected from Iceland, Canada and Alaska, US.

Significant differences are between the genders in the ICE-SAR database, approximately 64% of lost subjects in Iceland are males and 34% are females. Mixed gender groups are 3%. Solo subjects account for 91% of the incidents compared to 67% in the ISRID (Figs 1 & 2) (Koester, 2008, p 42).
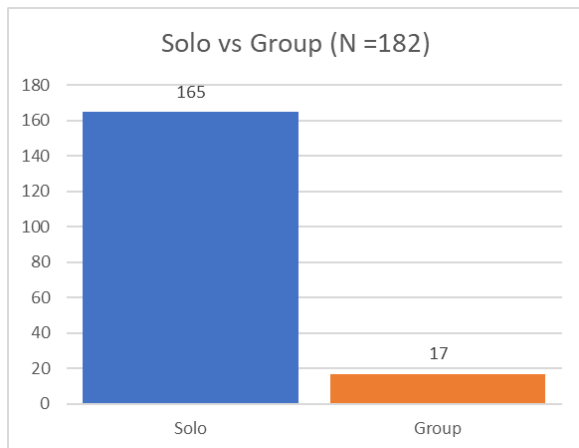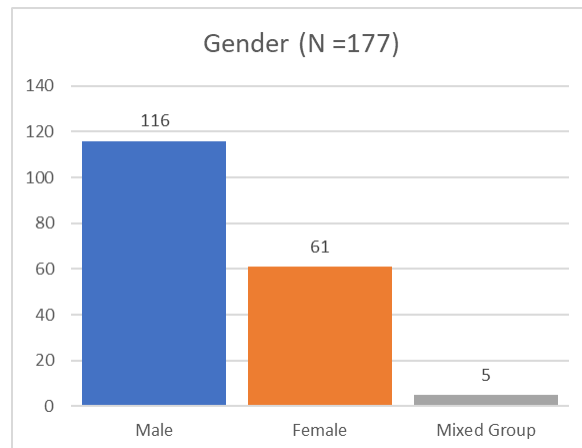

Fig 1: Solo vs Group

Fig 2: Gender

Fatality rate in the ICE-SAR database show incidents from all searches not just rescues. Subjects found well were 64% of the overall data, which is similar to the ISRID database's report of 62% of subjects found well, though the ISRID database includes both searches and rescues in its calculations (Koester, 2008, page 46). Another difference between the data is that the category hypothermia was added. Although cases of hypothermia could be classified under injured, incidents have been registered as hypothermia, as severe cold is a risk factor in Iceland all year around.

Another difference between the data in ISRID and ICE-SAR is that incidents with no trace of the victim have not been logged into the ICE-SAR database. Since 1970 there have been 43 incidents in Iceland with no trace of the subject („43 óupplýst mannshvörf síðan 1970 - Vísir", e.d.). (Fig 3)

The general find location for most searches matches well to the bicycle wheel model and the reflex tasking. Most of the subjects are found in linear features (spokes) and the reflectors.

Search technique training for ICE-SAR searchers emphasize these areas.

After the presentation at the Rescue conference in 2018, we found four more incidents where the subject was found in the river, those cases will be added into the ICE-SAR database.

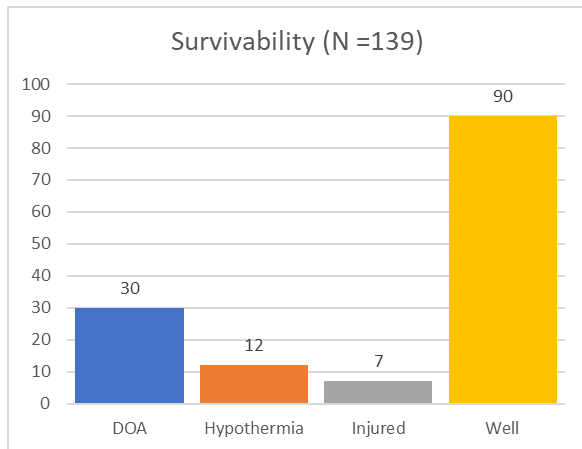The subject strategies graph is in Icelandic alphabetical order. (Fig 4)
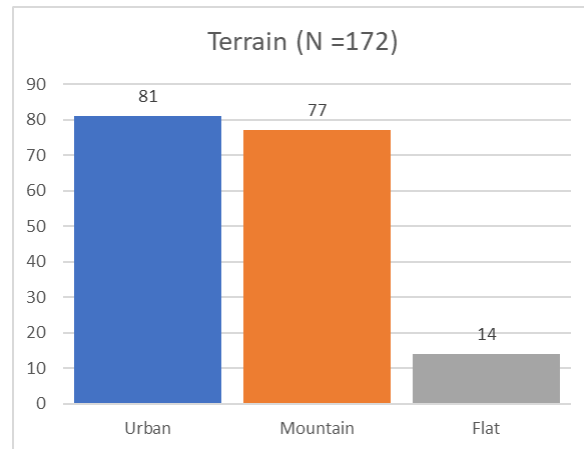

Fig 3: Survivability   Fig 4:Terrain

The ISRID database contains mostly wilderness incidents (68%) (Koester, 2008, page 40). The ICE-SAR incidents contain 53% wilderness incidents. Although some might conclude that downtown Reykjavik is more difficult to navigate then other cities, it's not. The reason the percentage of wilderness incidents is lower than ISRID's is that ICE-SAR has a good working relationship with authorities and ICE-SAR is part of the initial response when someone gets lost in urban environment. Obligations and responsibilities of ICE-SAR and SAR personals for Urban response are bound in law from the Icelandic Parliament („43/2003", e.d.).

Not many incidents are on flat environment. Those who are familiar with Icelandic wilderness know that in a flat environment you will stand out for kilometres and the lack of vegetation makes it easy to find your way back. But as the data shows, some people do become lost there, most often because of weather conditions, medical issues or substance abuse. (Fig 5)

In terms of knowing who found the subject, only 137 incidents note who found the missing person. We know from experience that the air-scent dogs and tracking dogs have found more than the data shows but it has not been logged. It varies how the information is logged between incident commanders who log into the Sareye Incident and Crisis management software („Proven Incident and Crisis managment software | Sareye", e.d.). In Iceland we have specialized search techniques teams that have more education and training than regular searchers. They are often called out first or handed special assignments. It's likely that some of the search team categorization is based on a specialized search technique, but we can't say for sure because it's not logged. We hope that recent update to the Incident and Crisis management software will improve this data because know searchers can tag there certifies to their names. (Fig 6)
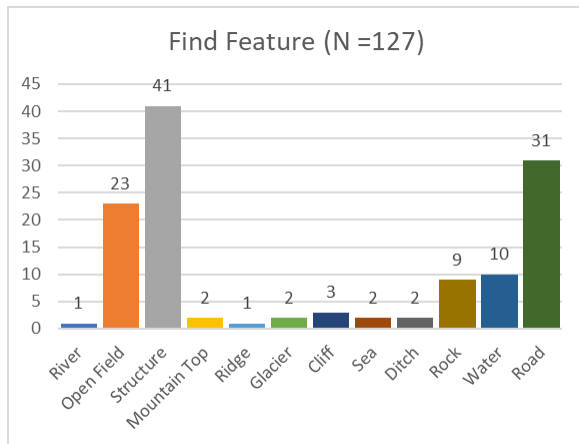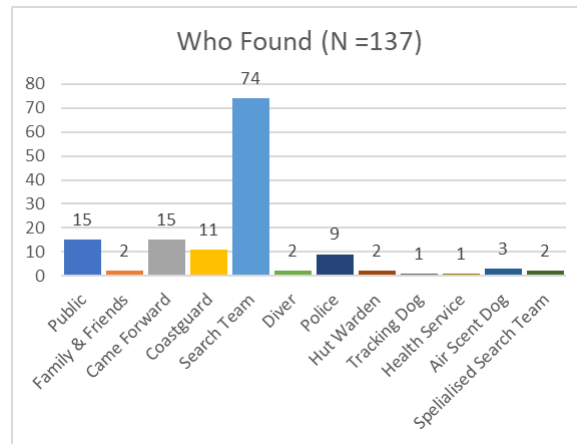
Fig 5:Find Feature

Fig 6: Distribution of finders

The ICE-SAR database contains 19 subject categories unlike the ISRID database that contains 41 categories. The chart below shows three data fields that contain two categories. Although the hierarchy of subject categories would tell you to use the category "vehicle" before you use the category "dementia," it was decided to keep them together as they were logged during search planning, where the categories were deemed equally important.

Until recently, nationality was not part of the ICE-SAR database. It was thought to be necessary to add it because of growing number of lost tourists. In 2017, for example, there were 2.2 million (Ferðaþjónustu, e.d.) who took off from Keflavik airport. The questions arose: who is more likely to get lost, an Icelander or a tourist and do the tourists and Icelanders respond differently when lost?

When we looked more closely at the subject categories and compared them to ISRID we found out that we have fewer incidents involving hikers, hunter and abductions, but more cases of those with dementia, despondency, and mental illness.

We think the reason for lower incident rates for hikers and hunters in Iceland vs ISRID is because Iceland has newer data. In recent years the public's knowledge of hiking and on the outdoors has increased and people are now better equipped, often having smartphones with better signals than previous mobile devices and easy access to GPS and PLB. Therefore, those individuals that would have gotten lost 15 years ago can now find their way back to safety or get in touch with their families without the help of SAR.

Growth in dementia incidents we think is caused by growing life expectancy and larger population.
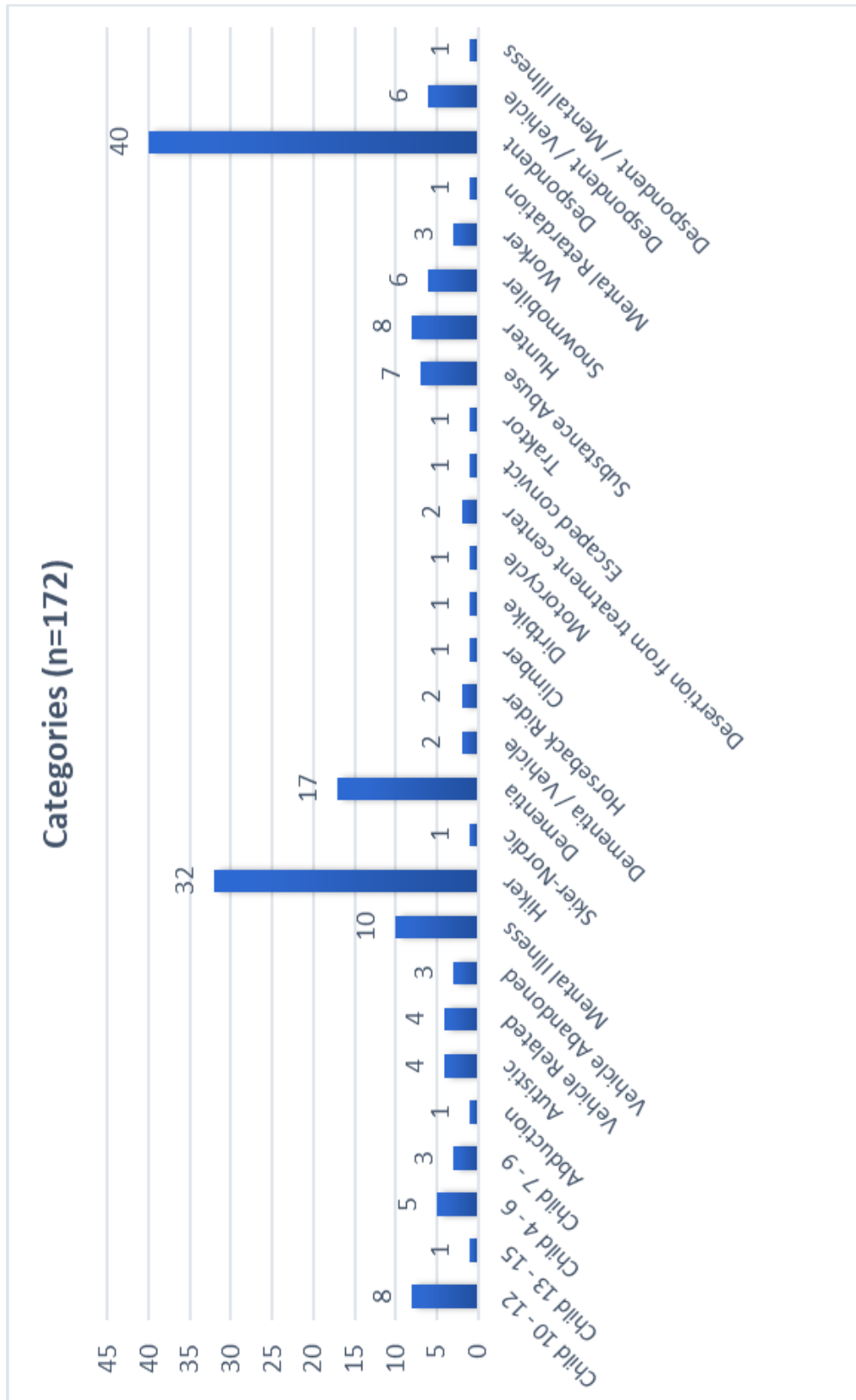
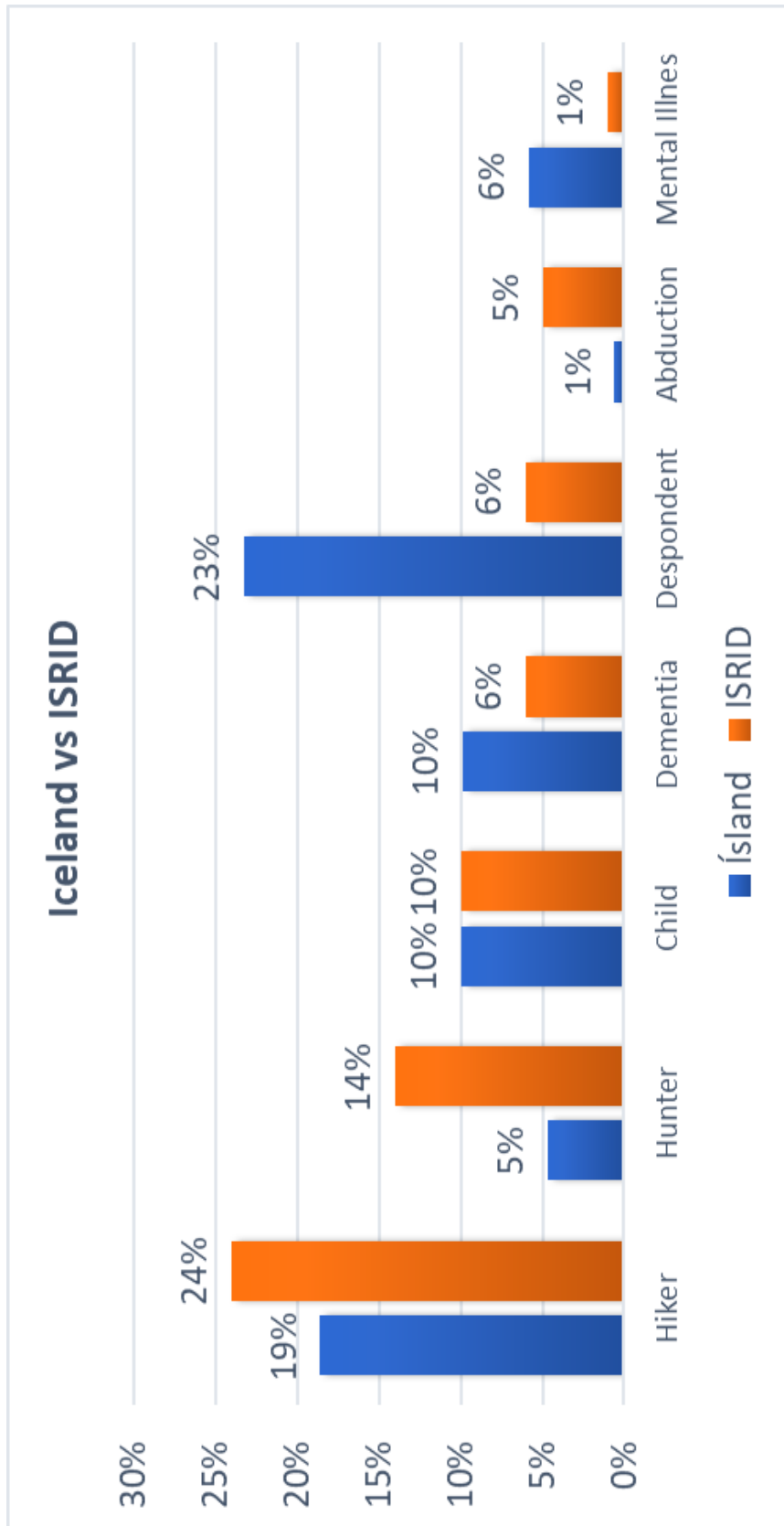Fig 7: Distribution across categories

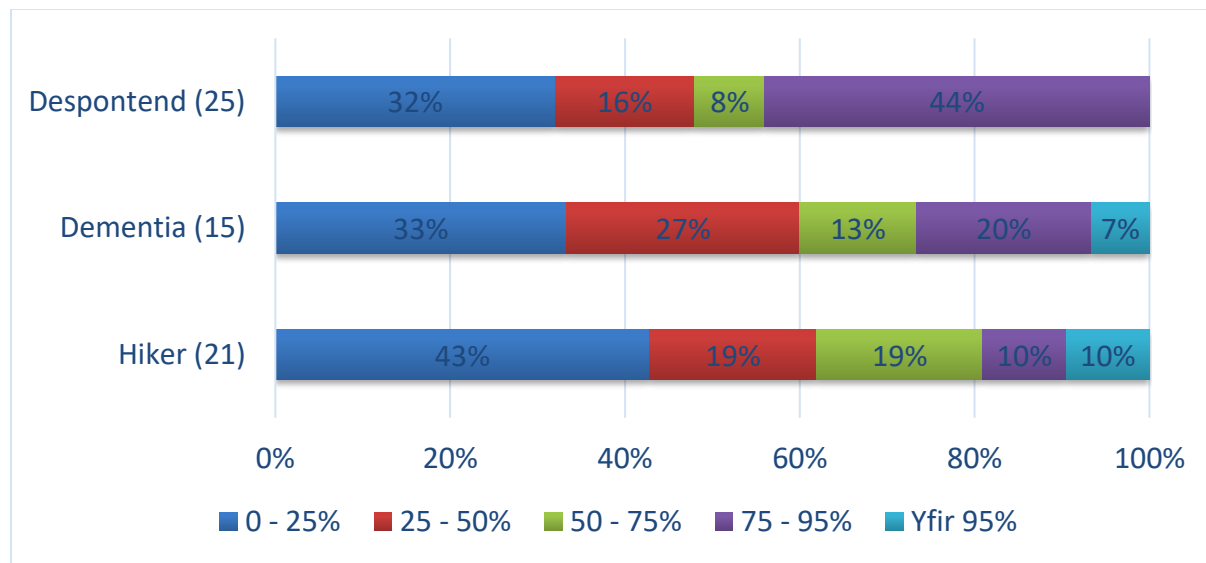Fig 8: comparison of Iceland and ISRID statistics

Fig 9: **The most common subject catagories and ther distance from IPP**

We are concerned by the high rate of incidents involving despondents and those with mental illness and are unable to explain why Iceland's rate is higher than its counterpart in ISRID. . It could be because of a Vitamin D deficiency or seasonal depression caused by the limited daylight during the winter, but it is clear that these numbers require deeper analyse. (Fig 8)

The data that we found most interesting was the distance from the Initial planning point (IPP), as it allowed us to finally answer the question of whether The question subjects in Iceland travel farther than those in ISRID. In the pie chart below all the ICE-SAR data is merged together. Cases were analysed individually and compared to corresponding subject categories and the distance from the IPP was marked in the appropriate quartile.

The answer to the question of relative ICE-SAR/ISRID distance travelled is not a clear yes or no, but depends on the cases at hand. The first quartile between 0-25% is bigger which means that a larger number of incidents are found closer to the IPP than ISRID. The middle quartiles from 25-75% are smaller, meaning that fewer subjects are found in those quartiles then ISRID. The last quartile 75-95% is bigger than ISRID, meaning there are more subjects that travel farther than ISRID.

Fortunately, only 5% go farther than "normal." in other words, a perfect match with the ISRID data only 5% of ICE-SAR subjects were found beyond the 95% ring.

When we take a closer look at the distance from the IPP and look at the three most common subject categories we find out that they are not the same as ISRID. Two things particularly stand out: the last quartile for despondent is 44%, which means that subjects in that category go farther away from IPP;

additionally, hikers in Iceland seem to be found closer to the IPP or they go farther away than the 95% quartile. (Fig 9)

Discussion

This data from the ICE-SAR database gives us an idea of the variation between ISRID and ICE-SAR. The importance of local data is significant as it gives us the best and most realistic picture of how far the subject will travel and where he is most likely to be found.

We will continue to use the ISRID database but know we can also use local data, and the the three main categories we have found in ICE-SAR: despondent, dementia, and hikers.

Our goal for the future is to publish data from the database more frequently and apply those data findings to our teaching.

More automation needs to be integrated into the collection and recording of the data into the ICE-SAR database. The best way to do this is to build an export operation into the Incident and Crisis management software ICE-SAR uses. This improvement remains a question of time and money.

The higher proportion of despondent incidents relative to ISRID is concerning. Further research needs to be done. It's important that we look at the data from our neighbours in the U.K. Questions like what impact of the time of year has on despondency and the suicide rate in Iceland relative to its surrounding countries remain to be answered.

Acknowledgements

About the Author

Einar Eysteinsson has a general Teacher Education, B.Ed. from the University of Iceland and is an M.I.S. student at the UI. Einar teaches 3rd grade. In 2005, Einar joined the local rescue team, Hjálparsveit skáta í Kópavogi (HSSK). He became certified as a specialized search technician in 2008 and is an instructor. He conducted sweep width estimation for ground search and rescue in Iceland in the summers of 2010 and 2011. In 2015, Einar earned his instructor qualifications in the dbS Productions course *Lost Person Behavior.* Since then he has overseen the registration of data in the ICE-SAR database.

Abbreviations

ICE-SAR   Icelandic Association for Search and rescue
ISRID   International Search & Rescue Incident Database
IPP   Initial planning point

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