

The ISRID statistics and UK missing person incidents

This review looks at the ISRID statistics from the point of view of the UK search manager, and wonders what they provide that is above and beyond the statistics produced within UK.

First impressions

At first sight, the ISRID statistics should be ideal for incidents involving missing persons in the UK: they are based on data from over 50,000 incidents (p.25) and cover most of the categories found in the August 2011 report from the UK Missing Person Behaviour Study Statistics (referred to from now on as UKMPBSS). UK categories not found in ISRID are 'health related' (8 incidents) and 'other vulnerables' (83 incidents); many of these are either elderly or walkaways from care situations, and form a small but significant proportion of UK missing person incidents.

UKMPBSS contains 1271 incidents, and one's initial reaction therefore is that ISRID will add to those UKMPBSS categories with small volumes of data. One category in UKMPBSS that springs to mind here is Substance Related; more on this later.

However, on p.75 we learn that while the ISRID database might well contain data on over 50,000 incidents, for various reasons the ISRID statistics are based on only 16,863 of them.

The basic premise

The basic premise of ISRID is that the behaviour of a missing person is consistent across an eco-domain. Thus a person missing in Northumberland is expected to behave in a similar manner to a person missing in the eastern half of USA or the eastern fringe of Australia or indeed everywhere else in Europe and beyond (p.19). This is a colossal assumption, and given the wide range of sources of the ISRID data it seems remarkable that Koester has gone ahead without testing it in any way. He flirts with 'cultural differences' (p.38) but then dismisses the idea by saying that 'a quick examination of the data suggests that lost individuals are more similar than different from a cultural point of view'. One wonders what his 'quick examination' involved; what a pity he is not more specific.

It seems that he had had an idea, and wasn't going to let the statistical validity – or otherwise – get in the way.

Some years ago, when Koester's published statistics related only to Alzheimer's patients who went missing in eastern USA, this reviewer did a comparison of his statistics and what were at that time the most recent UK Alzheimer's statistics. This showed that the locations at which the missing persons were found were significantly different between the two populations, as were the distances travelled. Put simply (and I seem to have lost the actual analysis and results) the UK distances from LKP were greater and the UK locations tended more towards roads and less towards bushes, hedges and vegetation. One might argue that these differences could be classed as cultural, since they arise from geographical differences between the places where the incidents occurred; this seems a more likely explanation than Koester's observation (p. 38) that greater distances in UK are brought about by our right to roam policy for private land.

In any case, it seems staggering that Koester has not tested his eco-domain hypothesis when it underpins his entire approach.

What statistics does a search manager need?

UKMPBSS provides three different statistics for each category of missing person (and sub-division of a category, for example by gender or type of terrain, where there is sufficient data to support analysis and sufficient difference to make it worth showing). These are:

- outcome: what condition (dead, unhurt or injured) was the missing person in when found, and in how many incidents were they were not found at all
- location found: where the missing person was found, selected from a list of ten options, including 'open ground', which in itself is not only a location type but can act as a catch-all
- distance travelled: the straight line distance in kms between the original LKP (last known point) and the location where the missing person was found

Of these, the most useful is the location found; 'outcome' suggests how likely it is that we are searching for someone who is dead and therefore unresponsive; the distance statistics can be used to provide a check on the scale of the search.

ISRID gives these three statistics, but of these only 'outcome' is in a similar form. Koester describes the problems (p.83) of converting the 124 location descriptions in the raw data into the ten that he reports; one is left wondering if more has been lost than gained in this exercise. Interestingly, the UK find location 'open ground' has no equivalent in his list; it accounts for 17% of the UK total, so it would be useful to find out where these incidents have gone. His terms 'brush' and 'scrub', which describe a similar type of location but in different eco-regions, have no significant UK equivalent.

More worrying is the fact (p.36) that his threshold category size for a full report is $n = 14$, and to make matters worse if $n \geq 14$ for an entire category then even though the sub-divisions within the category (temperate, dry and urban) may have $n < 14$ they still get the full treatment; for example, the ISRID category 'autistic' (p.115) has $n = 62$, which makes it eligible for the full statistics; only 10 of these were urban incidents for which a find location was reported (p.117), but we nevertheless get the full percentage analysis by location found, with each urban missing person therefore contributing 10%. To this reviewer, this shows a remarkably low level of statistical sophistication and understanding. In UKMPBSS the cut-off for a full level of reporting is $n = 50$, with levels of reduced reporting for smaller values of n (UKMPBSS p.7). With a value of $n = 50$ each missing person is 'worth' 2% in the statistics, which is just about a comfortable lower limit. With $n = 14$ each person is 'worth' over 7%, and the effect therefore of a clerical or data entry error that, for example, put someone in the wrong find location, would be excessive. From a statistical point of view, for $n = 50$ the 95% confidence interval is barely acceptable; for $n = 14$ it is roughly twice the size and is, in this reviewer's opinion, quite unacceptable.

In addition, Koester offers us six other statistics for each category (p.75), of which only two might be useful: 'scenario' gives a list of eleven one word options as to why the person was missing (e.g. lost, overdue, trauma); 'survivability' tells us for how long the missing person survived, but is a very crude statistic (p.89) - it might be worth spending some time to see the extent to which it varies between categories. The other four statistics 'elevation change', 'mobility hours', 'dispersion angle' and 'track offset' would seem, for various reason, to be of little value to the UK search manager.

Comparison with UKMPBSS's most frequently occurring categories

This section will do a short comparison between the UKMPBSS statistics and the ISRID temperate and urban statistics for the categories despondent, dementia, walkers and children. In the UKMPBSS these account for 991 incidents, or 78% of the total; in ISRID they account for 7519 incidents, or 45% of the 'useful data' (p.75).

In the UK, The Centre for Search Research teaches a search management method for the Initial Response to a missing person incident (the first few hours, during which up to 95% of them are found). This is based on creating scenarios: where might the missing person have been heading for, and what route might they have taken to get there. A crucial component of this is the 'location found' statistic. This comparison will therefore focus on the location found statistics for the four categories identified in the previous paragraph; the numbers of temperate and urban ISRID incidents shown below are those with find locations given; the ISRID total shown below is the overall total for the category, referred to as the 'headline' total.

Despondents

Total numbers of incidents are:

UKMPBSS	non-urban n = 348	urban n = 109	total	457 incidents
ISRID	temperate n = 337	urban n = 81	total	962 incidents

In both the non-urban and urban types of terrain, the UKMPBSS are based on a greater number of incidents with find locations specified. In addition, UKMPBSS gives much more detail with regard to fatality rates and find locations, particularly in the non-urban environment; for the urban environment, the find locations in the two sets of statistics are very similar, but that might reflect the fact that the ISRID statistics are based to a large extent on the UK statistics that were made available to Koester when he asked us for incident data.

Dementia

Total numbers of incidents are:

UKMPBSS	non-urban n = 95	urban n = 99	total	194 incidents
ISRID	temperate n = 207	urban n = 223	total	1051 incidents

Travel aids and buildings are the major find locations for urban incidents, and the percentages are very similar for IDRIS and UKMPBSS. For non-urban incidents, the UK statistics showed a significant gender difference, and the statistics for males and females are shown separately. No such details are shown in ISRID. Overall, there is much more detail in the UK statistics.

Walkers (groups) and walker (solo) (both UK), hiker (ISRID)

UKMPBSS distinguishes between solo walkers and groups of walkers, since analysis showed that there were significant differences between them with regard to fatality rate, condition when found, find location and distance from LKP (see 'Incidents involving more than one person' (2011) on www.searchresearch.org.uk/www/ukmpbs/report_archive for the report). Koester (p.41 et seq) provides plenty of examples to suggest that there are differences between the behaviours of solo walkers and walkers in groups, then does nothing about it ... a missed opportunity.

In the following table, the UKMPBSS numbers combines incidents involving solo walkers and walkers in groups. Total numbers of incidents are:

UKMPBSS	non-urban n = 227	urban n = 0	total	227 incidents
ISRID	temperate n = 312	urban n = 17	total	3837 incidents

The majority of the ISRID headline total for this category did not have location data; in fact, there is not much apart from the data provided to ISRID by UKMPBS, but much of the original information appears to have been lost in transit. For example, UKMPBSS distinguishes between the genders, and gives separate statistics on solo walkers and walkers in groups; ISRID doesn't. Similarly UKMPBSS explores and reports on the gender bias for solo walker fatality rates; ISRID only alludes to them.

The find location 'open ground' accounts for 36% overall of UKMPBSS walkers but does not feature in the list of ISRID find locations. In UKMPBSS it is the most frequently occurring find location for walkers in groups and solo walkers, and additional information is provided in UKMPBSS to explain exactly where the missing person was found in about half of the 'open ground' incidents. Not having this available in the ISRID statistics is a serious omission.

Children aged 1 to 16 years (UKMPBSS), child (in five separate age groups) (ISRID)

UKMPBSS combines the data for all children in the age range 1 to 16, and explains why (UKMPBSS p.10). No statistical justification is given in ISRID for presenting statistics in separate age groups.

Examination of the ISRID child age groups shows that the same location found statistics are given for the four youngest categories, and only the category 'child / youth' has its own location statistics. Therefore the actual total number of incidents for which ISRID provides location found information for children is 341, and not the headline figure of 1669. This is an important fact, and deserves more than the mention it is given at the bottom of p.129.

Total numbers of incidents are:

UKMPBSS	non-urban n = 68	urban n = 45	total	113 incidents
ISRID	temperate n = 256	urban n = 85	total	1669 incidents

Statistical considerations apart, this reviewer is not convinced that a child's behaviour is determined solely by their precise chronological age, and feels that the best approach when offered information broken down by age groups like this is to look at the age group on either side of the missing child's as well as the one that their chronological age puts them in. This is our recommended approach for using the UK Grampian Police statistics, for example, but there is nothing here to suggest that the five categories are anything other than separate and watertight.

Substance related

This data was originally contained within the categories 'despondent' and 'miscellaneous' in UKMPBSS, until eventually there was enough of it to create a category in its own right. There is, though, not enough data to look for gender or terrain differences. It was suggested at the start of this review that ISRID might offer more information, and possibly show gender difference. The ISRID category is called 'Substance Abuse', and this is how the find location statistics compare: total numbers of incidents are

UKMPBSS	non-urban n = 26	urban n = 7	total	33 incidents
ISRID	all eco-domains n = 20	urban n = 8	total	68 incidents

In other words, UKMPBSS contains more location data than ISRID.

Conclusions

- Whatever else, one has to admire Koester's dedication or tenacity or charm or whatever it was that enabled him to persuade all those people and organisations to give him all that data.
- There is a lot of useful detail in UKMPBSS (for example relating to despondents) that is not available in ISRID.
- Wherever there are significant differences between different types of terrain or between genders, then UKMPBSS shows this; where they are not shown it is because they don't exist - they have been tested for and not found. ISRID avoids the issue.
- The headline overall numbers in ISRID are misleading, and might suggest to a reader who did not look further that the ISRID statistics were all based on considerably more data than UKMPBSS. This is not true.
- There are some parts of ISRID that could be used as useful background reading, for example chapters 4 and 5 (based on work by Ken Hill).

Overall conclusion

- In the opinion of this reviewer, the UK search manager should be able to manage any missing person incident without ISRID since UKMPBSS generally provides more information than ISRID.
- If required, background material specific to UK is provided by the Grampian Police statistics.
- There are serious statistical issues relating to ISRID.

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